

Endocrine Abstracts

April 2023 Volume 91
ISSN 1479-6848 (online)

Society for Endocrinology
Endocrine Update 2023



published by
bioscientifica

Online version available at
www.endocrine-abstracts.org

CONTENTS

SOCIETY FOR ENDOCRINOLOGY ENDOCRINE UPDATE 2023

Society for Endocrinology Clinical Update 2023

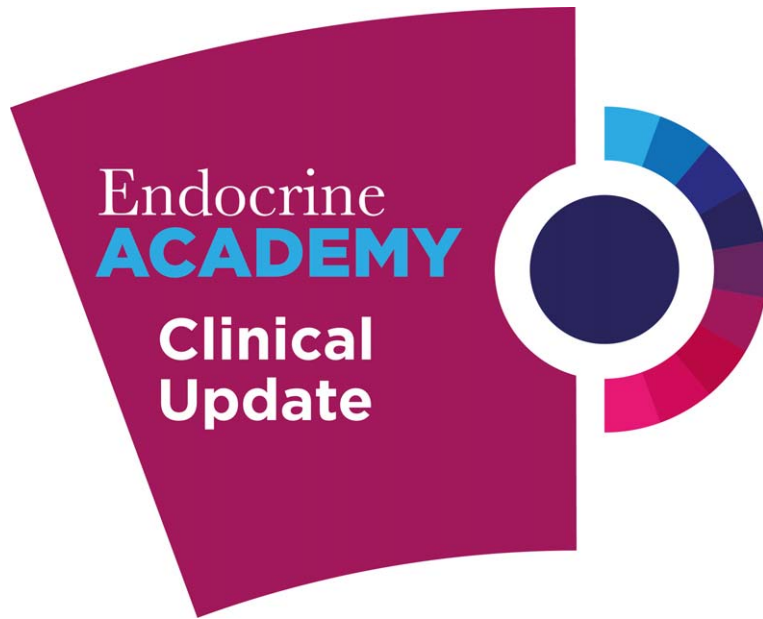
| | |
|--|----------|
| Workshop A: Disorders of the hypothalamus and pituitary | WA1–WA16 |
| Workshop B: Disorders of growth and development | WB1–WB6 |
| Workshop C: Disorders of the thyroid gland | WC1–WC16 |
| Workshop D: Disorders of the adrenal gland | WD1–WD16 |
| Workshop E: Disorders of the gonads | WE1–WE8 |
| Workshop F: Disorders of the parathyroid glands, calcium metabolism and bone | WF1–WF12 |
| Workshop G: Disorders of appetite and weight | WG1–WG6 |
| Workshop H: Miscellaneous endocrine and metabolic disorders | WH1–WH7 |
| Additional Cases | CB1–CB69 |

Society for Endocrinology National Clinical Cases 2023

| | |
|--------------------------------|----------|
| Oral Communications | OC1–OC10 |
| Poster Presentations | P1–P48 |

SOCIETY FOR ENDOCRINOLOGY CLINICAL UPDATE 2023 INDEX OF AUTHORS

SOCIETY FOR ENDOCRINOLOGY NATIONAL CLINICAL CASES 2023 INDEX OF AUTHORS



Society for Endocrinology Clinical Update 2023



Endocrine Abstracts

Volume 91

April 2023

Society for Endocrinology Clinical Update 2023

Hilton Birmingham Metropole Hotel, National Exhibition Centre

24–26 April 2023, Birmingham, United Kingdom

Programme Chair

Professor Maralyn Druce (*London*)

Strands, Convenors and Facilitators

| | |
|--|---|
| Disorders of the hypothalamus and pituitary | Convenor: Dr Niamh Martin (<i>London</i>) Facilitator: Dr Niamh Martin (<i>London</i>) Facilitator: Dr Rob Murray (<i>Leeds</i>) |
| Disorders of growth and development | Convenor: Dr Talat Mushtaq (<i>Leeds</i>) Facilitator: Dr Guftar Shaikh (<i>Glasgow</i>) Facilitator: Dr Helena Gleeson (<i>Birmingham</i>) |
| Disorders of the thyroid gland | Convenor: Professor Simon Pearce (<i>Newcastle</i>) Facilitator: Professor Simon Pearce (<i>Newcastle</i>) Facilitator: Dr Catherine Napier (<i>Newcastle</i>) |
| Disorders of the adrenal gland | Convenor: Professor Michael O'Reilly (<i>Dublin</i>) Facilitator: Professor Michael O'Reilly (<i>Dublin</i>) Facilitator: Dr Yasir Elhassan (<i>Birmingham</i>) |
| Disorders of the gonads | Convenor: Dr Richard Quinton (<i>Newcastle</i>) Facilitator: Dr Richard Quinton (<i>Newcastle</i>) Facilitator: Dr Channa Jayasena (<i>London</i>) |
| Disorders of the parathyroid glands, calcium metabolism and bone | Convenor: Dr Rachel Crowley (<i>Dublin</i>) Facilitator: Dr Rachel Crowley (<i>Dublin</i>) Facilitator: Dr Ruth Casey (<i>Cambridge</i>) |
| Disorders of appetite and weight | Convenor: Dr Saira Hameed (<i>London</i>) Facilitator: Dr Saira Hameed (<i>London</i>) Facilitator: Professor Robert Semple (<i>Edinburgh</i>) |
| Miscellaneous endocrine and metabolic disorders | Convenor: Professor Maralyn Druce (<i>London</i>) Facilitator: Professor Maralyn Druce (<i>London</i>) Facilitator: Dr Helen Simpson (<i>London</i>) |

CONTENTS

| | |
|--|----------|
| Workshop A: Disorders of the hypothalamus and pituitary | WA1–WA16 |
| Workshop B: Disorders of growth and development | WB1–WB6 |
| Workshop C: Disorders of the thyroid gland | WC1–WC16 |
| Workshop D: Disorders of the adrenal gland | WD1–WD16 |
| Workshop E: Disorders of the gonads | WE1–WE8 |
| Workshop F: Disorders of the parathyroid glands, calcium metabolism and bone | WF1–WF12 |
| Workshop G: Disorders of appetite and weight | WG1–WG6 |
| Workshop H: Miscellaneous endocrine and metabolic disorders | WH1–WH7 |
| Additional Cases | CB1–CB69 |

Workshop A: Disorders of the hypothalamus and pituitary

WA1**Prolactinoma: a 13 year story**

Natasha Galloway
NHS Lothian, Edinburgh, United Kingdom

A 73 year old male presented to his optician with reduced vision in his right eye. He was found to have a right sided visual field defect and referred to Ophthalmology. An MRI scan was arranged which showed a 29 x 22 x 17mm pituitary fossa mass, elevating and flattening the optic chiasm. He was therefore referred urgently to Endocrinology. He denied any symptoms other than some lethargy, a mild headache and erectile dysfunction. His anterior pituitary function tests are displayed below: His past medical history included hypertension, previous colorectal cancer and a microprolactinoma diagnosed 13 years prior. At that time, he had presented with erectile dysfunction and hyperprolactinaemia (664-832mU/l), with low testosterone (5.7-6.6nmol/l, FSH 5u/l, LH 1u/l). Other anterior pituitary function unremarkable at the time. An MRI pituitary at that point had shown a 5mm diameter pituitary microadenoma. He was commenced on Quinagolide with subsequent improvement in his prolactin (124 mU/l) and a rise in his testosterone to 10nmol/l, but no clear improvement in erectile dysfunction. 4 months later, he was diagnosed with colorectal cancer and was subsequently lost to endocrine clinic follow up. Following his representation recently, he was commenced on Cabergoline 500 micrograms once weekly along with Levothyroxine 75 micrograms once daily. 3 months later, he reported improvement in his vision, confirmed by repeat visual field testing. A repeat MRI pituitary showed a reduction in the size of the pituitary lesion to 25 x 17 x 15mm, with reduction in mass effect on the optic chiasm. His bloods showed a reduction in prolactin, to 3054mU/l. His cabergoline was uptitrated to 750 micrograms per week. The patient's main concern was erectile dysfunction and a trial of topical testosterone was commenced. 3 months later, there was some improvement in sexual symptoms, as well as energy levels. He continues on Cabergoline, Levothyroxine and topical testosterone, with a plan for a repeat MRI in 12 months' time, and ongoing endocrine follow up.

| Anterior pituitary function | Result | Normal range |
|----------------------------------|---|---|
| Prolactin | 16234 mU/l | 86-496 mU/l |
| Short synacthen test 0min-30mins | 241 nmol/L/494nmol/l (pass = 430 nmol/l) | Stimulated Cortisol 'pass' = 430 nmol/l |
| TSH | 0.25 mU/l | 0.23-5.6 mU/l |
| T4 | 7 pmol/l | 9-28 pmol/l |
| FSH | 0.7 u/l | 1.5-12.4 u/l |
| LH | 0.5 u/l | 1.7-8.6 u/l |
| Testo | <0.1 | 8.6-29 nmol/l |
| IGF-1 | 30 mg/l | 39-186 mg/l |

DOI: 10.1530/endoabs.91.WA1

WA2**Giant prolactinoma requiring surgery**

Maria Omer & Janki Panicker
Liverpool University Hospitals NHS Foundation Trust, Liverpool, United Kingdom

35-year-old lady, has a background of Hypertension, oophorectomies for ovarian cancer and previous 2 IVF attempts, referred to endocrinology with three-week history of blurred vision, bitemporal hemianopia and large pituitary mass on MRI. Upon assessment, she reported visual disturbance and intermittent headache. She has no periods which is expected with the history of oophorectomy, but she denied galactorrhoea or any symptoms suggestive of pituitary hormone excess or deficiency. Examination was unremarkable apart from the bitemporal hemianopia. Investigations

Prolactin 47004mU/l(102-496mU/l), Low FT4 was 9.9 pmol/l(12.0 - 22.0) with inappropriately normal TSH2.2mU/l(0.27 - 4.20). Pituitary profile otherwise unremarkable. MRI pituitary revealed large pituitary mass measuring 45x52x25mm with invasion of the sphenoid and clivus, right cavernous sinus, and large suprasellar extension encircling the optic chiasm. A diagnosis of giant, extensive macroprolactinoma was made, and she had genetic tests done (MEN1, RET, CDC73, CDKN1B and AIP) which came back negative.

Treatment course

The case was discussed in the pituitary MDT. The patient was started on Bromocriptine initially and then switched to Cabergoline. Her prolactin dropped to 30080 in 6 weeks and continued to drop slowly with the titration of cabergoline. She showed a good tolerance to cabergoline and stability in terms of her symptoms. On the maximum cabergoline dose her prolactin levels ranged from 14532mU/L-21480mU/L and her MRI scan 3 months and 6 months after treatment showed no measurable change in size of the large pituitary adenoma suggesting a weak response to treatment. Accordingly, treating team thought that with the risk

of tumour progression during pregnancy, surgery would be better option compared with medical treatment alone. With patient agreement transsphenoidal surgery with debulking done, which complicated by CSF leak post-operatively alongside infection requiring 3-week admission. She recovered well after drop with subjective improvement in her peripheral visual field. Prolactin level dropped from 21480mU/l preoperative to 4646mU/l postoperative. Further discussions about off licence use of cabergoline 5 mg per week aiming for further drop in prolactin level was agreed by the patient. Post Operative glucagon stimulation test done which showed adequate cortisol response and Growth hormone deficiency that required a regular follow-up. She was successfully weaned off steroid and currently she is awaiting IVF treatment.

Conclusion

Late diagnosis of prolactinoma in our case could be attributed to the absence period secondary to oophorectomy. Management of cabergoline-resistant prolactinomas is challenging and surgical debulking can improve the outcome. Off licence use of high dose cabergoline remain controversial.

DOI: 10.1530/endoabs.91.WA2

WA3**A Challenging case of prolactinoma**

Amit Verma¹ & David Carty²

¹East Surrey Hospital, Redhill, United Kingdom; ²Glasgow Royal Infirmary, Glasgow, United Kingdom

45/M presented to hospital with h/o assault on head (hit by meat cleaver). Background history of drug abuse and previous drug induced psychosis. Trauma CT head revealed mass in the enlarged pituitary fossa. MRI head revealed 5 x 4 cm mass in the sella turcica encasing the internal carotid vessels but sparing optic chiasma. Visual field examination was normal and no other clinical symptoms were present. Serum prolactin was 67922. Tumor was not for resection so medical treatment advised, started on cabergoline and serum prolactin levels declined. Later, on treatment, he presented with depression and compulsive shop lifting behaviour. So his medical treatment had to be stopped as per MDT and neurosurgical opinion was sought. Because of the extent of involvement of the key brain vessels, surgery was risky. Repeat MRI head was advised but patient didn't turn up and didn't pick up phone. Incidentally he had X-Ray skull available from 13 years ago, done to r/o skull fracture post head assault at that time, which was reported normal by radiologist at that time. But the Radiologist who reported MRI head this time was able to view the X-Ray skull 13 years ago, and reported that there was bony re-modelling present in the X-Ray in area of sella turcica, indicating the long-standing nature of this prolactinoma. This case was interesting as the patient had no clinical symptoms despite large size of the pituitary mass and he had developed the well known but rare side effect of dopamine agonist therapy (compulsive behaviour), which improved upon stopping the therapy.

DOI: 10.1530/endoabs.91.WA3

WA4**A challenging-to-manage biphasic response following pituitary surgery for acromegaly**

Osada Ramlochan Singh & Ben Whitelaw
Kings' College Hospital, London, United Kingdom

A 51F domestic worker presented with classic clinical and biochemical features of acromegaly. This included a long history of arthralgia, increase in hand and foot size, paraesthesia requiring bilateral carpal tunnel release and coarsening of facial features. She was also newly diagnosed with hypertension and diabetes. On examination she demonstrated central adiposity, a prominent supra orbital ridge and nasal bridge, prognathism, interdental spacing, skin tags, and broad hands and feet. Pituitary MRI revealed a 16 mm X 23 mm lesion and visual fields were normal. Biochemistry showed IGF1 - 114.4 nmol/l(NR 6.5-35.5) GH 21.2 mg/l(with nadir of 18 on OGTT), decreasing to 4.2 on octreotide test dose and an otherwise normal pituitary profile. A diagnosis of acromegaly was made. On MDT consensus, pre-treatment with the somatostatin analogue Lanreotide 120 mg, 4weekly was given for 3 months to gain biochemical control and arrest tumour progression whilst the patient awaited trans-sphenoidal surgery (TSS). Surgery went well with no immediate postoperative concerns. On day 3, the patient developed transient DI followed by a protracted period of SIADH which proved challenging to manage. In this instance, there was limited response to multiple challenges with HTS (1.8% Hypertonic Saline) and the patient was successfully managed with repeat trials of Tolvaptan (See: Table 1). By day 16, SIADH had subsided with sodium levels returning to baseline. These findings are

consistent with a biphasic response following pituitary surgery which is often challenging to manage. Histology was found consistent with a mixed somatotroph/lactotroph tumour with Ki67 1% and relevant outpatient follow-up was arranged.

Table 1 An outline of key post-surgical events and interventions.

| Events | Serum Na mmol/l | Intervention |
|--|-------------------------|------------------|
| Day 2: | 137 | |
| Day 3: FB -700ml over 3 hr (DI) | 143 | DDAVP 1 mg |
| Day 4: Plasma osm 281, urine osm 155 | 132-> 133 | - |
| Day 5: Plasma osm 282, urine osm 510 (SIADH) | 131 | - |
| Day 6: | 128 | - |
| Plasma osm 273, urine osm 799 | | |
| FB +1L | 124 | HTS 1.8% |
| Day 7: No significant improvement following HTS FB + 800mls | 125-> 124 | |
| Day 8: Plasma osm 254 urine osm 750 Poor response to HTS ->Tolvaptan | 121 | Tolvaptan 7.5 mg |
| Day 9 :Brisk response to Tolvaptan | 121 -> 125 -> 128 | Dextrose 5% |
| Day 10: Plasma osm 254 urine osm 750 | 124 -> 123 | HTS 1.8% |
| Day 11: Tolvaptan | 121 | Tolvaptan 7.5 mg |
| Day 12: Brisk response to Tolvaptan | 126-> 132 -> 134 -> 143 | Dextrose 5% |
| Day 13: FB - 775mls | 138-> 133 | |
| Day 14: | 133 | |
| Day 16: (Return to baseline) | 143 | |

DOI: 10.1530/endoabs.91.WA4

WA5

A Case of Giant Prolactinoma with pituitary apoplexy and hypopituitarism

Huzaifa Dawood

Ninewells Hospital, Dundee, United Kingdom

42-year-old male with past medical history of intermittent migraines, only 1 episode this year and no known family history was referred by ophthalmology with history of sudden onset of visual loss for 4 weeks. He described having woken up with visual blurring 4 weeks ago and same degree of blurriness has remained since with no improvement or progression. He denies any headaches, nausea, vomiting or limb weakness. He suffered from covid 19 infection 1 week before presentation. On examination visual acuity was limited to hand moment, visual field assessment was limited due to reduced visual acuity, but at least bitemporal hemianopia. Rest of the neurological examination was unremarkable. Urgent MRI head was done which showed large 4.8*5.1*4.4 cm (TR*CC*AP) part cystic part solid central sellar/ suprasellar mass tenting/compressing optic nerves and optic chiasm. Solid component shows contrast enhancement and cystic component is T1 bright, protein or hemorrhage. Pituitary profile was sent which showed prolactin 26493 (normal < 350), cortisol 295, FSH 0.7 (normal 1-9), LH 0.4 (normal 1-9) IGF1 74 (normal 63-201), TSH 0.03 (normal 0.4-4), testosterone 4.1 (normal 8.0-27.4). A diagnosis of Pituitary giant prolactinoma with apoplexy and hypopituitarism was made. Due to social issues patient refused to stay as an inpatient, he was offered both surgical and medical treatment with risks and benefits explained. Patient refused to go for surgery and decided to go for cabergoline 0.5 mg three times/week. He was also started on hydrocortisone and levothyroxine, with weekly ophthalmology assessment and follow up in joint neurosurgery and endocrine clinic. 8 weeks later pituitary hormone profile was repeat which showed prolactin of 20. Short synacthen test was repeated after 6 weeks which was negative. Patient himself and ophthalmology assessment noted improvement on visual field and acuity. Dose of cabergoline was reduced from 0.5 mg three times/week to once a week.

Discussion

1. During initial discussion it was thought that patient might benefit from surgical approach as he had sudden visual loss in context of giant prolactinoma and pituitary apoplexy to achieve restoration of vision but he regained his vision back to normal just on medical therapy.
2. Any implication of covid 19 infection in causing pituitary apoplexy in patients with preexisting macroadenomas. Cases have been reported in the literature of patients presented with pituitary apoplexy after covid 19 infection.

DOI: 10.1530/endoabs.91.WA5

WA6

Trying to conceive: is the prolactinoma to blame?

Ekenechukwu Young, Richard Bell & Ngai Kong

Stepping Hill Hospital, Stockport, United Kingdom

A 47 year old lady referred to the endocrine clinic following raised prolactin levels picked up on investigation for infertility in 2013. She had irregular periods with cycle length up to 50 days. Peak prolactin following diagnosis was 1309mIU/l. She had no headaches, visual problems or galactorrhoea. An MRI head had picked up a 6.3 x 6.9 x 8.3mm right sided pituitary mass in 2013. She was commenced on Bromocriptine. Her periods normalised on treatment to 24 to 25 day cycles. She had a few unsuccessful IVF attempts as at April 2015. At the time of referral to our clinic in April 2018, she was established on Bromocriptine 7.5 mg once day for 5 years, prolactin was 176mIU/L; nadir prolactin level was 65mIU/L in 2017. MRI showed no significant change in the size of the adenoma, no suprasellar mass or optic chiasma compression, with very slight bulging into the adjacent cavernous sinus. By Sep 2018, prolactin rose again to 738mIU/l. She was switched to Cabergoline 500microg a week, which was subsequently increased to twice a week, with the aim of suppressing prolactin to undetectable levels as she was planning conception. She struggled to cope with the increased dose and took it in 3 to 4 divided doses a week. On further review in April 2019, she was planning another IVF cycle, and the plan was to increase to 750micg per week if tolerated. However, by December 2019, Cabergoline was stopped with a plan to repeat the prolactin in 6 months. There was no further IVF planned due to her age and the finding of uterine fibroids. A repeat MRI was to be done in 5 years to monitor any growth of the microadenoma. On further review, in Sep 2021, prolactin had increased to 841mIU/l. Cabergoline was restarted at a dose of 500microg once a week and withdrawn when the prolactin reduced to 76mIU/l. She remained asymptomatic. By November 2022, she had developed irregular periods. A repeat MRI scan showed that there was no change in the size of the adenoma. Repeat prolactin was 177, Oestradiol 513, FSH 20, LH 75. She continues to remain off cabergoline.

| DATE | PROLACTIN mIU/l | MEDICATION |
|------------|-----------------|------------------------------------|
| 2013 | 1309 | Bromocriptine 7.5 mg |
| NOV 2017 | 65 | Bromocriptine 7.5 mg |
| MAR 2018 | 176 | Bromocriptine 7.5 mg |
| AUG 2018 | 193 | Bromocriptine 7.5 mg |
| SEP 2018 | 738 | Cabergoline 500microg weekly |
| DEC 2018 | 183 | Cabergoline 500microg twice a week |
| APRIL 2019 | 160 | |

DOI: 10.1530/endoabs.91.WA6

WA7

A Rare Presentation of Macroprolactinoma

Abigail Mula, Sarah Craus & David Coppini

Mater Dei Hospital, Msida, Malta"

A 41 year-old gentleman, known case of type 2 diabetes, presented to the emergency department after a witnessed episode of jaw clenching followed by unresponsiveness. The patient was amnesic to the event. He was noted to have a lateral tongue bite. He also reported a similar episode 8 months previously. Initial blood investigations including a random blood glucose were normal. A sulphonylurea induced hypoglycaemia was excluded. Brain imaging by means of a Computed Tomography (CT) Brain showed a large sellar lesion measuring 3.7x4.6x5 cm extending suprasellarly in close proximity to the anterior horn of the left lateral ventricle. This was further evaluated via a Magnetic Resonance (MR) scan of the pituitary which demonstrated a cystic macroadenoma extending suprasellarly compressing the hypothalamus and third ventricle, optic chiasm and encasing the internal carotid arteries.

A diagnosis of epilepsy secondary to macroprolactinoma was made. The patient was treated for his epilepsy with sodium valproate and for the prolactinoma via Cabergoline at 0.25 mg twice weekly.

Further investigations included;

- Formal visual field perimetry – surprisingly minimal appreciable bitemporal hemianopia
- Bone Mineral Density – Osteopenia (T score Lumbar spine -1.8, Hip 0.2)
- Baseline echocardiogram – Normal

Hormone profile as follows.

| Hormone | Result | Reference range |
|------------------------------------|---------------|------------------|
| Follicle Stimulating Hormone (FSH) | 3.2 U/l | 0.7-11.1 U/l |
| Leutenising Hormone (LH) | 3.1 U/l | 0.8-7.6 U/l |
| Thyroid Stimulating Hormone | 1.089 mIU/l | 0.3-3 mIU/l |
| Thyroxine | 14.3 pmol/l | 11.9-20.3 pmol/l |
| Prolactin | >21,200 mIU/l | 45-375 mIU/l |
| Cortisol | 508 nmol/l | 145-619 nmol/l |
| Total Testosterone | 3.81 nmol/l | 9.5-32 nmol/l |
| Growth Hormone | <0.05 mg/l | 0-3 mg/l |

Within three months the prolactin had decreased to 3841 mIU/l with a minimal change appreciable on imaging. The patient denied further seizures. Cabergoline was increased to 0.25 mg three times per week. An MR pituitary six months later showed a significant reduction in size with a decrease in the degree of cavernous sinus involvement and no compression of the optic chiasm. Latest prolactin levels have gone down to 680 mIU/l. Despite decrease in prolactin levels testosterone levels remained lower than 10 nmol/l. The patient denied any sexual dysfunction, however in view of osteopenia the patient was started on testosterone enanthate.

DOI: 10.1530/endoabs.91.WA7

WA8

An interesting case of pituitary macroadenoma with/without apoplexy
 Muhammad Taqi, Shahzad Akbar & Shiva Mongolu
 Hull Royal Infirmary, Hull, United Kingdom"

A 52 year old gentleman was referred for an inpatient Endocrinology review. He was admitted after incidental finding of severe hyponatremia of 119. He felt unwell after having an episode of vomiting at home a few days ago and then had his bloods done at primary care. He denied any headache, dizziness, or visual disturbance. Further investigations were requested which revealed plasma osm 247, urine osm 350, and urine sodium 132. A diagnosis of SIADH was established and he was put on fluid restriction. His sodium level failed to improve over the following days and rather dropped to 114. CT TAP was organised which did not show any pathology. Short synacthen test showed suboptimal cortisol rise. Bloods showed normal prolactin, and low T4 with normal TSH. CT head was requested which showed an incidental finding of pituitary mass. MRI pituitary was organised which showed likely pituitary macroadenoma with internal haemorrhage. Impression of pituitary apoplexy was made and he was started on IV hydrocortisone was started. A detailed plan was made to discontinue fluid restriction, continue IV hydrocortisone, anterior pituitary profile, neurosurgery opinion, and ophthalmology referral for formal visual field testing. This case was discussed at pituitary MDT where the diagnosis of macroadenoma without apoplexy was established. He underwent trans-sphenoidal surgery to remove the tumour. I followed him up on the neurosurgery ward for Endocrinology input. He was commenced on hydrocortisone, levothyroxine replacement. A plan was made to discharge him with the follow up at Endocrine clinic.

DOI: 10.1530/endoabs.91.WA8

WA9

First presentation of a prolactinoma with Pituitary Apoplexy
 Mohammad Salah Uddin, Harshal Deshmukh & Afrin Kabir
 Hull Royal Infirmary, Hull, United Kingdom

Pituitary apoplexy is a rare but potentially life-threatening condition that occurs due to sudden hemorrhage or infarction in a pre-existing pituitary adenoma. Here, we present a case study of a 20-year-old girl who presented to the emergency department (ED) with severe headache due to pituitary apoplexy. The patient had a history of one-year intermittent headache, which was diagnosed as migraine/cluster headache in previous ED visits. She was on Mirena coil and had amenorrhoea for a year. On her most recent ED presentation, she complained of temporal severe headache, associated with heaviness in the neck and nausea, which had been increasing in intensity and frequency over the past month. Her blood pressure and other vitals were stable at presentation. CT head and MRI pituitary revealed a 15x20x18 mm heterogeneous intra/suprasellar lesion with fluid level on T2 sequence, mainly cystic, with no significant mass effect but contact with the optic chiasma, consistent with macro adenoma and pituitary apoplexy. The patient was managed with hydrocortisone and kept under medical admission for observation and subsequently discharged with oral hydrocortisone Repeat Pituitary hormone profile was normal except raised prolactin and repeat MRI pituitary showed appearances of the hemorrhagic pituitary macro adenoma... Prolactin levels had risen from 5300 mu/l at presentation to 7000 mu/l in two months and she was subsequently started on cabergoline. This case highlights the importance of considering pituitary apoplexy as a differential diagnosis in young patients presenting with severe headache who have contraceptive induced amenorrhoea. Early diagnosis and management can prevent further complications and improve patient outcomes.

DOI: 10.1530/endoabs.91.WA9

WA10

A Young lady with a massive prolactinoma
 Pyei Aung & Alexander Lewis
 Manchester Royal Infirmary, Manchester, United Kingdom

Introduction

Prolactinoma are the commonest functioning pituitary tumors. Pressure symptoms such as headache and visual field defect are common in patients with macroprolactinoma. Early investigation and intervention can deter permanent visual impairment, pituitary apoplexy and panhypopituitarism.

Case vignette

27-year-old lady presented to ophthalmologist with two months history of headache with visual impairment on the right side. She was found to have Inferior-nasal quadrantanopia, reduced colour vision and relative afferent pupillary defect on right side. CT brain showed 29 x 28 x 23 mm sellar and right parasellar hyperdense lesion. Subsequently, MRI pituitary confirmed the sellar mass had appearances in keeping with a macroadenoma compressing of the right pre-chiasmatic optic nerve. It also protruded into sphenoid sinus, right cavernous sinus and partially encased cavernous carotid artery. She was referred to Endocrinology team. She did not have any galactorrhoea and was otherwise asymptomatic. She used progesterone only pill continuously to avoid menstruation. Baseline blood tests showed Prolactin of 124250 mU/l (ULN - 496mU/l), FSH 0.7 IU/l (Low), LH <0.3 IU/l (Low), Oestradiol 18 pmol/l (Low). IGF-1, cortisol, thyroid function and routine bloods were normal. Cabergoline 500 micrograms twice weekly was initiated with the counseling on the risk of CSF rhinorrhoea with rapid tumour regression and risk of disinhibition with dopamine agonist therapy. Her Prolactin level reduced significantly (23 folds) in four weeks. Headache improved significantly but gonadotrophins and oestradiol remained low. After 4 months, her prolactin level normalized and gonadotrophins were starting to rise. Her colour vision and visual field dramatically improved. Repeat MRI demonstrated reduced tumour volume and regression away from the pre-chiasmatic optic nerves and optic chiasm. Her genetic test result for multiple endocrine neoplasia type 1 is still pending but there is no evidence of other clinical manifestation to date.

Discussions

- Macroadenomas can have varying appearance on CT and MRI is the gold standard imaging test to confirm the diagnosis
- Massive macroprolactinoma in a young patient (<30yr) prompts for genetic testing.
- Women of child bearing age taking POP pill could mask menstrual disturbances caused by prolactinoma and may delay early diagnosis
- Although galactorrhoea is a common presentation (80-90%) of prolactinoma, it was not present in our patient despite a large macroprolactinoma with prolactin level more than 250 times above normal range.
- Dopamine agonist therapy is safe and well tolerated by most but patients should be counselled on associated risks of the medication itself and effects on tumour size

DOI: 10.1530/endoabs.91.WA10

WA11

A case of macroprolactinoma
 Arwa Alyamani
 Queen Elizabeth Hospital, Birmingham, United Kingdom

A 44 year old man was referred in 2012 to his local endocrine service for headaches and visual deterioration with bi-temporal hemianopia. His prolactin was found at 107,240 mU/l (85-325) and pituitary MRI demonstrated a 3.1x1.5x3.3 cm adenoma, compressing the optic chiasm. He was commenced on cabergoline 0.5 mg twice per week and hydrocortisone 20 mg and 10 mg empirically and was referred to us. On review in our Pituitary clinic, he reported considerable improvement in his headaches and vision. Formal assessment of his visual fields had shown no deficits. Blood tests showed prolactin 18174 mU/l (85-325), 11: a.m. testosterone 2.3 nmol/l (7.0-27.0), SHBG 17.4 nmol/l (19.0-95.0), FSH 3.1 IU/l (1.5-12.4), LH 2.2 IU/L (1.7-8.6), IGF-1: 17 nmol/l (13-37) and free T4 15.5 pmol/l (9-19). He had normal cortisol response on the short Synacthen test and he was advised to stop hydrocortisone. Baseline echocardiogram showed a good biventricular systolic function and normal valves. During the subsequent follow-up, his prolactin continued to decline slowly with also significant shrinkage of the tumour. In 2014, the dose of cabergoline was increased to 0.5 mg three times per week due to a slight increase in the prolactin levels. This led to a further gradual reduction of the prolactin, as well as normalisation of his testosterone levels. In 2018, follow-up echocardiogram showed normal function and structure of the heart, with no evidence of valve disease. On last assessment in January 2023, he was still on cabergoline 0.5 mg three times a week with no

reported side effects. The repeat prolactin is awaiting and his pituitary scan MRI demonstrated an empty sella.

DOI: 10.1530/endoabs.91.WA11

WA12

Perioperative management of patients with Cushing's Disease

Miral Abumuaileq

Leeds Teaching Hospitals, Leeds, United Kingdom

A 29yr lady presented to endocrinology clinic with 2-3 stone weight gain over a 3 year period which was central in nature, associated with rounding of her face, muscle weakness, fatigue and ease of bruising. She was plethoric and had a number of violaceous striae since age 22yrs suggesting her Cushing's syndrome was long-standing. Her past history included renal calculi, liver focal nodular hyperplasia and hidradenitis suppurativa. Initial investigations showed LH 5.5iu/l, FSH 6.9iu/l, testosterone 1.9nmol/l, HbA1c 43mmol/mol; ODST on two occasions showed 9am cortisol 491nmol/land 530nmol/L; Urinary free cortisol 339 (> 147) nmol/d. ACTH was raised on two occasions. A diagnosis of ACTH-dependent Cushing's syndrome was made. MRI pituitary showed minor asymmetry with no discrete nodule but suggestion the left aspect of the gland was larger. High-resolution MRI suggested a focal area of hypoenhancement within the midline anterior superior aspect of the adenohypophysis. IPSS confirmed a pituitary source with lateralised to the left. She was commenced on metyrapone whilst awaiting surgery. During pre-assessment she was diagnosed with severe OSA and was commenced on CPAP. Metyrapone was discontinued on the day endonasal transphenoidal resection. Histology confirmed an ACTH-secreting adenoma. Ki67: 14% with scattered p53 positivity in <5% of cells. The surgery was undertaken in the morning and by the evening she complained of dysuria. Bladder scan showed 500ml of urine. She was catheterised and her urine output in the following hour was >1500ml. Paired blood and urine samples showed serum sodium 142mmol/l, creatinine 60umol/l, serum osmolality 294mOsmol/kg and urine osmolality 168mOsmol/kg. Input-output monitoring was undertaken. She was reviewed by the endocrine team when she complained of thirst and passing clear urine. Serum sodium was 154mmol/l and I/O in 12 hours was 6550/4040. Repeated urine osmolality was 42mOsmol/kg and serum osmolality 314mOsmol/kg. A diagnosis of likely AVP-deficiency was made. Her sodium improved to 147mmol/l on IV fluids to compensate for the urinary loss. She received 50 mg desmopressin orally. Six hours after desmopressin her sodium level improved to 144mmol/l accompanied by reduction in thirst, urine output and sodium levels stabilised without further desmopressin. She was commenced on parenteral then converted to oral hydrocortisone post-operatively, as per protocol. Day 2 post-op 9am cortisol was 53nmol/l indicating surgical success. She was discharged on maintenance hydrocortisone and enoxaparin prophylaxis for a period of 6 weeks. Her hydrocortisone dose was doubled at her day 7 follow up as she had adrenal insufficiency symptoms.

DOI: 10.1530/endoabs.91.WA12

WA13

Dopamine agonist resistance: A prolactinoma responsive biochemically but not radiologically to cabergoline

Bhavna Sharma

Imperial College London, London, United Kingdom

The goals of treatment for a prolactinoma are to normalise serum prolactin and decrease the size of the tumour. Dopamine agonists (cabergoline is first-line) represent primary therapy for almost all prolactinomas. Some prolactinomas exhibit resistance to dopamine agonist treatment and require higher doses. Our patient was a 35-year-old male who presented to Ophthalmology in March 2021 with visual disturbance, confirmed to be secondary to a bitemporal hemianopia. OCT showed bilateral reduced RNFL thickness, worse on the right. Initial bloods revealed: prolactin 28 000 mIU/l (<300), FSH 2.9 IU/l, LH 1.7 IU/land testosterone 4.6 nmol/l. 9AM cortisol, thyroid function and IGF-1 were normal. MRI Pituitary showed a 3.5*2.5*2.6 cm suprasellar mass compressing the optic nerves and chiasm. He started cabergoline 250 mg twice a week with the dose gradually increased, aiming to reduce prolactin into the reference range and to restore normal gonadal function. Once the weekly cabergoline dose exceeded 2 mg/week, annual echocardiography was organised with close monitoring of behaviour for impulse control disorder throughout. Three months after starting cabergoline (June 2021), his visual fields showed some improvement. In August 2021, MRI pituitary revealed minimal change in the size of tumour in with

compression of the chiasm and distortion of the pre-chiasmatic optic nerves, especially the right. The cabergoline dose was further increased to 4 mg/week. Serum prolactin steadily fell with normalisation of testosterone and corresponding improvement in libido and erectile function. Annual echocardiography was organised with close monitoring of behaviour for impulse control disorder throughout. However, further pituitary imaging again showed little reduction in the tumour size with ongoing chiasmatic compression. At this stage his serum prolactin remained above the reference range at 744mIU/l. To try to achieve further reduction in tumour size and normalise serum prolactin, cabergoline was increased to a weekly dose of 7 mg/week. This was tolerated well by the patient. Surprisingly, subsequent imaging revealed only a marginal reduction in tumour size despite a normal serum prolactin with ongoing mass effect on the optic chiasm. The patient underwent trans-sphenoidal pituitary surgery in March 2023. Post-operative MRI showed an excellent resection and we wait ophthalmology review post-operatively. Histology confirmed staining for GH and prolactin, with a Ki67 index of <3%. Since this histology may reflect a somatomammotroph adenoma, which is a more aggressive histopathological subtype, we will monitor this closely with imaging. We are interested why prolactin normalised with dopamine agonists (at high dose) but the tumour size did not change.

DOI: 10.1530/endoabs.91.WA13

WA14

Pituitary macroprolactinoma with apoplexy following commencement of GH replacement therapy

Robert McEvoy & Antoinette Tuthill

Cork University Hospital, Cork, Ireland

A 19-year-old man attended his optician with an 18-month history of decreased visual acuity. Formal visual field testing revealed significant bitemporal hemianopia. On further questioning in hospital, his voice had deepened only 6 months previously. He had no facial hair. He had no difficulty with erections or libido. He had felt fatigued for months, but had no headaches, weight loss or postural dizziness. There was no history of galactorrhoea, gynecomastia, nocturia, or excessive thirst. Physical examination revealed normal height and weight. He had sparse axillary and pubic hair and decreased testicular volume. There were no features to suggest GH or glucocorticoid excess. Laboratory investigations revealed a normal gonadal axis. IGF-1 was suppressed (38 ng/ml). Free T4 was low for our assay (9.0 pmol/l), with normal TSH (2.29 mIU/l). A short Synacthen test demonstrated a blunted cortisol response. Serum osmolality was normal. Prolactin was markedly elevated (248,358 mIU/l). An MRI pituitary demonstrated a large (31 x 30 x 48 mm) solid and cystic pituitary mass with suprasellar extension and chiasmatic compression. An escalating regimen of cabergoline was commenced, in addition to hydrocortisone replacement. Prolactin levels dropped steadily, and the dose of cabergoline was up-titrated, targeting a prolactin level in the normal range. Over the following months there were steady improvements in serial visual field testing, correlating with MRI improvements. An insulin tolerance test (ITT) confirmed a blunted GH response and blunted cortisol response. A TRH stimulation test showed a normal TSH response. Free T4 remained inadequate, and levothyroxine was commenced. Twelve months after the initial presentation, a repeat ITT showed continued blunting of the GH axis, but recovery of the cortisol axis. Hydrocortisone was weaned. Growth hormone replacement was introduced. One month thereafter, the patient attended outpatients with a 3-week history of anorexia, vomiting, fatigue, postural dizziness, and decreased visual acuity. He was admitted emergently and hydrocortisone was re-commenced. MRI revealed a recurrent pituitary cyst with chiasmatic compression and evidence of sub-acute intra-cystic haemorrhage, consistent with apoplexy. He underwent transsphenoidal adenectomy soon thereafter. Currently, the patient has been stable for 8 years following TSS, and is maintained on cabergoline, hydrocortisone, and levothyroxine. Dynamic testing has demonstrated that the cortisol and GH axes have not recovered. There are no case reports in the literature describing pituitary apoplexy following commencement of GH replacement. The patient has declined to re-commence GH therapy and, nevertheless, enjoys a good quality of life.

DOI: 10.1530/endoabs.91.WA14

WA15

Macroprolactinoma in a young male; a cause of delayed puberty

Evgenia Foteinopoulou & Rohana Wright

Edinburgh Centre for Endocrinology & Diabetes, Edinburgh, United Kingdom

A 19 year old male was referred urgently due to a significantly raised Prolactin. He had seen his GP due to a cough, who then noted the patient had not progressed through puberty and organized further testing. On examination he had a BMI of 47. His height was 178 cm with a target of 184.5 cm (range 176-193). He had bilateral gynecomastia with micropenis and pre-pubertal testes. He had never shaved and his voice was high-pitched. He did not report anosmia. Visual fields were normal. There was no relevant family history and his older brother had gone through puberty normally. He was otherwise healthy working as a car mechanic. Investigations showed raised Prolactin at 21,036mU/l. Gonadotrophins were suppressed with Testosterone at 1.6nmol/l. The rest of his anterior pituitary profile was normal including a normal short synacthen test. Pituitary MRI showed expanded right side of the pituitary fossa with a rounded 11 x 11 x 11 mm mass. There was minimal bulging into the suprasellar system, but no contact with optic nerve or the chiasm. Bone age was calculated as 17.95 (TW2), and 16.48 (TW3). A diagnosis of macroprolactinoma was established and he was commenced initially on Cabergoline 500 mg weekly with the usual precautions for the risk of CSF leak and impulsive behavior. He was reviewed 2 months later and his Prolactin had improved to 8,885mU/l. Then at 4 month review the Cabergoline dose was increase to 500 mg twice weekly as Prolactin had plateaued. He was also started on testosterone replacement with testosterone gel to induce puberty. **Current status;** He is now 12 months post diagnosis. His Cabergoline dose is 1.5 mg twice weekly and latest Prolactin is 3,804mU/l. Repeat MRI showed decreased volume of the macroadenoma. His testosterone has increased to 13.5nmol/l and he has developed body and facial hair. He also reports sexual drive and erections.

Discussion points:

- Strategies for puberty induction in the context of macroprolactinoma
- Further optimization of Dopamine agonist at this level of Prolactin.

DOI: 10.1530/endoabs.91.WA15

WA16

Recurrent Pituitary Apoplexy in a young male with giant Prolactinoma: A management consternation

Dhulashiha Jegavanthan¹, Charles Antonypillai¹, Sonali Gunathilake² & Dineesha Kumarathunga¹

¹National Hospital Kandy, Kandy, Sri Lanka; ²District Hospital Nuwara Eliya, Nuwara Eliya, Sri Lanka

Introduction

Pituitary apoplexy is an endocrinological emergency that can be life-threatening if treatment is delayed. Apoplexy occurs either due to haemorrhage or infarction of a pituitary tumour.

Case History

A 19-year-old male, presented with a sudden severe headache and visual disturbances. The examination was normal with stable haemodynamic parameters and tanner staging 5. An urgent MRI pituitary revealed a haemorrhagic pituitary macroadenoma compressing the optic chiasm. Neuro-ophthalmology revealed bitemporal hemianopia (Apoplexy score 2). He was commenced on prophylactic steroid replacement. Further investigations were as below.

A diagnosis of prolactinoma with apoplexy was made and he was commenced on Cabergoline. The repeat MRI pituitary after 6 months revealed significant size reduction with no optic chiasma compression. Prolactin levels were normalized. Unfortunately, He developed a second episode of apoplexy with deterioration of visual acuity and fields. MRI pituitary showed a significant interval upgrade in tumor size with subacute bleeding and compression of the optic chiasm, 3rd ventricle with para-sellar extension. At this point, the pituitary apoplexy score was 4/10, therefore, urgent surgery was offered. He made an excellent recovery.

Discussion

Pituitary apoplexy complicates about 2-12% of pituitary tumours with the majority being previously undiagnosed as in our case. This condition was first described as a haemorrhage into a pituitary tumour by Bailey in 1898 (1). The best management approach is largely controversial between conservative and surgery. To determine a uniform clinical assessment and decision-making, Rajasekaran *et al* have introduced a pituitary apoplexy score (PAS) based on 4 parameters such as visual acuity, visual field defects, ocular paresis, and Glasgow coma scale (2). A score of ≥ 3 indicates surgery. An early surgical treatment within 7-8 days is associated with a better neuro-ophthalmological and endocrinological outcome.

References

1. Bailey. P. Pathological report of a case of acromegaly with special reference to the lesions in the hypophysis cerebri and in the thyroid gland; and a case of hemorrhage into the pituitary. Philadelphia Med J. 1898; 1: 789-792.
2. Rajasekaran. S, *et al*. UK guidelines for the management of pituitary apoplexy. Clin Endocrinol (Oxf). 2011 Jan;74(1):9-20.

| Investigations | Results | Reference range |
|---------------------------|--------------|-----------------|
| Sodium | 141 mmol/l | 135-145 |
| Potassium | 4.2 mmol/l | 3.5-5.1 |
| Random cortisol (by 4 pm) | 201.7 nmol/l | |
| Prolactin | 38431 mIU/l | 86-324 |
| TSH | 1.18 mIU/mL | 0.27-4.20 |
| FT4 | 1.03 ng/dL | 0.93-1.70 |
| FSH | 3.13 mIU/mL | 0.5-12.0 |
| LH | 1.43 mIU/mL | 1.7-8.6 |
| 9 am testosterone | 10.8 nmol/l | 10-38 |

DOI: 10.1530/endoabs.91.WA16

Workshop B: Disorders of growth and development

WB1**Lumps, bumps and organ failure following childhood cancer therapy**

Simon Berry & Miguel Debono

Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom

Background

The late effects of childhood cancer therapy include a higher risk of subsequent primary cancers, fertility issues, and other endocrine dysfunction.

Case

A 47 year old woman was treated at age 9 for acute myeloid leukaemia with chemotherapy (DAT, MACE, and cyclophosphamide), total body irradiation (990 cGy) and allogeneic bone marrow transplantation. Aged 22, a rapidly enlarging right sided thyroid nodule developed in the context of a multinodular goitre. Histology from fine needle aspiration was inconclusive so she underwent total thyroidectomy. Two parathyroid glands were preserved. Histology showed a 9mm papillary thyroid cancer. Aged 33, on investigation for causes of secondary infertility, she was found to have premature ovarian insufficiency with LH 17 IU/l, FSH 31 IU/l, oestradiol 66 pmol/l and AMH <1.5 pmol/l. Fertility treatment with donor egg IVF was unsuccessful and hormone replacement therapy was commenced. Aged 40, she developed easy bruising and a marked increase in weight over the course of a few months. A low dose dexamethasone suppression test was carried out showing a baseline ACTH of 5.8 ng/l with a 48 hour suppressed ACTH of <5.0 ng/l and a non-suppressed cortisol of 99 nmol/l consistent with ACTH-independent hypercortisolism. CT of the adrenals showed bilateral adrenal gland enlargement and a 1.3 cm right adrenal nodule of 5 Hounsfield units. Given the bilateral enlargement and absence of metabolic complications, the decision was made for conservative management with monitoring of cardiometabolic risk factors. At the age of 42, she developed breast cancer with metastases to the pelvis and was found to have a co-existing lung adenocarcinoma. On annual review blood tests, hypercalcaemia of 2.83 mmol/l was noted with PTH 11.5 pmol/l. Urinary calcium was low. FHH genetic testing was negative. US of the parathyroid gland showed two hyperplastic parathyroid nodules consistent with primary hyperparathyroidism.

Conclusion with points for discussion

This case illustrates the wide spectrum of late effects of childhood cancer therapy and the importance of long-term follow up and screening. Radiation to the neck predisposes to a high risk of thyroid and parathyroid dysfunction. The options for thyroid cancer surveillance include patient self-monitoring, periodic thyroid palpation and ultrasound surveillance but there is no clear consensus on which option should be used. Fertility complications are common and up to 80% of women receiving total body irradiation will develop premature ovarian failure.

DOI: 10.1530/endoabs.91.WB1

WB2**Transitional clinic from pediatric to adult; case of missed male with possible hypogonadism and short stature**Assaad Aldafter^{1,2,3}¹Noor Specialist Hospital, Manama, Bahrain; ²Aldafter Medical Center, Manama, Bahrain; ³Aldafter Medical Clinic, Baghdad, Iraq

A 17 years old male student was following pediatric clinic for short stature for about 5 years, investigated thoroughly for cortisol Growth hormone deficiency Gluten enteropathy but serum testosterone level was never done, growth hormone replacement was given for 18 months and then stopped, during history and complaint in his current visit his concerns was not short stature only but reduced libido and no hair growth in face and axilla.

On examination he looks pale and has no hair growth in face or axilla Tanner stage 2 to 3. **CVS** normal **s1s2**, **chest** normal, **abdomen examination** not remarkable.

Investigations Anemia Hb 9.6 TSH 1.6 IU/ml Total T4 6.1 ug/dl normal thyroid function, Prolactin 9.61ng/ml normal LH 1.19 mIU/ml below normal, FSH 1.87mIU/ml, testosterone Total 0.06 ng/ml remarkably reduced.

Ultrasound Testes small in size Right 27*17*11mm 2.8 cc left 26*18*10 mm 2.5 cc, **MRI pituitary** normal unremarkable, waiting for karyotype semen analysis as patient unwilling to do but he agreed to do next visit.

Diagnosis

1-Hypogonadotropic Hypogonadism with Growth hormone deficiency

Treatment: Testosterone propionate Sustanone injection, every two weeks for two months, changed medications to Testosterone undecanoate Nebido 1000 mg Deep IM. Feed back after testosterone replacement patient was dramatically improved from course of two months treatment he has more hair growth change in voice and size of his testes and other sexual organs, he has more power less fatigue and not pale any more

Questions

1-Can be testosterone deficiency presented as short stature or affect constitutional growth.

2-Transition from pediatric to adult clinic can be done earlier than 17 years.

3-Do we need combined team to assess patients in age 13 to 14 to decide which one to be shifted to adult clinic earlier and what is plan of management.

4-Is there any chance to start Growth hormone if needed.

DOI: 10.1530/endoabs.91.WB2

WB3**Multiple Endocrinopathies associated with Childhood Cancer Treatment in a patient**

Dooshyant Tulsi & Gul Bano

St George's Hospital, London, United Kingdom

A 48 year old man was reviewed in the late endocrine effect of childhood cancer treatment clinic. He was diagnosed with Acute Lymphoblastic Leukemia back in 1983, at the age of 9 and underwent chemotherapy with UKALL X regime, craniospinal irradiation, followed by total body irradiation and autologous bone marrow transplant the same year. Subsequently he was found to be growth hormone deficient 2 years later and by the age of 21 he developed hypopituitarism. In 2001, by the age of 27, he was also diagnosed with Type 1 DM. He also had an impressive complex background of Dilated Cardiomyopathy secondary to anthracycline therapy, Pulmonary Fibrosis from Sarcoidosis, Recurrent strokes in childhood related to radiation vasculopathy, pancreatic exocrine insufficiency and SMART (Stroke-Like Migraine Attacks after Radiation Therapy) Syndrome. When he was seen in clinic in December 2022, he was on the following medications: Levothyroxine 100 mg OD, Nebido 1gr every 12 weeks and on an insulin pump for diabetes. His Growth Hormone (Subcutaneous Genotropin 0.1 mg OD) was ceased in February 2022 as it was felt that the latter could be contributing to his poor glycemic control and possible insulin resistance. Interestingly he was never on hydrocortisone as replacement as his HPA axis remained intact. He was requiring a substantial 300 Units of Insulin via the pump and even then, his blood glucose readings were off target. In clinic, he was mostly concerned about his erratic blood glucose readings and worsening exercise tolerance due to shortness of breath and fatigue. He had evidence of shaving on examination with obvious facial stubble. He reported having early morning erections and a good libido overall. He had his bloods checked on the same day and his endocrine panel was as follows: LH <0.1, FSH <0.1, Testosterone 28.8, TSH 1.16, FT4 15.5, IGF-1 20.2, Prolactin 173, PTH: 4.8, Adjusted Ca 2.52. Since his AGHDA score remained unchanged off the growth hormone injection (14/25) and in view of his poor glycemic control, the latter was not restarted and no changes were made to his medications since the rest of his blood tests were unremarkable. Given his persistent high insulin requirement for his diabetes, investigations and genetic tests were sent for possible insulin resistance syndrome.

DOI: 10.1530/endoabs.91.WB3

WB4**A case of Childhood onset GH deficiency being transitioned to adult endocrinology service- Three phases of GH replacement and dose/device indications**

Idowu Olaogun

University College London Hospital, London, United Kingdom

Growth hormone replacement is not essential but it is an important treatment for adult with GH deficiency and for adults with childhood onset GH deficiency, the aim of management changes as they grow which involves testing and retesting, clarification of the replacement aim and adjustments of the dosage accordingly. This is a case of a 29 year old man who presented with short stature during childhood at the age 7 yr old and subsequently found to have growth hormone (GH) deficiency. Other pituitary hormones are normal and pituitary MRI done twice showed a small anterior pituitary gland with other intracranial appearance reported as normal. He had GH (Zomacton 1.4 mg daily) treatment between age 7-17 and stopped. He was subsequently transitioned to adult endocrinology service a year after and the most prominent symptoms on assessment was excessive tiredness. Repeat pituitary and general screening were essentially normal. He had the end of growth assessment with ITT with peak GH level of 1.0 despite adequate hypoglycaemia achieved. He was therefore restarted on GH (Easypod at the adult dose of 0.4 mg daily) at the age of 18 years. He was reassessed after three months and there was improvement in the energy level. At the age of 25 years, GH was discontinued and he had a repeat assessment with ITT which showed the peak GH of 0.8 and had the AGHDA questionnaire checked off GH with score 24/25 which improved when he was started on Omnitrope to 10/25 the

following year. This case illustrates the three phases of GH replacement in childhood onset growth hormone deficiency. This is because the longitudinal growth is the aim during the childhood, between age 18 and 25, growth hormone is important for body composition and well being. However, after the age of 25 years, the only indication for replacement is the quality of life which is assessed by the AGHDA questionnaire and not strictly only the biochemical finding of GH deficiency. The case also highlights the dose and device indications as the dosage changes during this period and in this case, there was also a change of the GH devices from the group 2 products to the cheaper group one product- and this calls for review of the indications for those devices at each stage of reassessment in order to reduce the service cost.

DOI: 10.1530/endoabs.91.WB4

WB5

Secondary Effects of Childhood Cancer Therapy

Henna Patel, Nadia Osman & William Drake
Bart's Health Trust, London, United Kingdom

A 31 year old female presented to the Endocrine day ward due to headache and dizziness in 2015. She had a background of childhood acute lymphoblastic leukaemia diagnosed at age 7 treated with chemotherapy. She had a cerebral recurrence at age 10 and underwent cerebral radiotherapy, further chemotherapy and subsequently total body irradiation and bone marrow transplant. Following this treatment she was diagnosed with panhypopituitarism and required hormone replacement therapy with growth hormone, hydrocortisone, levothyroxine, oestrogen, progesterone and desmopressin. She reported severe headaches and dizziness with an episode of collapse, with similar episodes found to be secondary to hyponatraemia. She also reported changes in her right breast, with nipple inversion. On examination there was a mass palpable within the right breast and was referred to her local breast clinic. She was found to have breast cancer and underwent a right-sided mastectomy and axillary node clearance. Her oestrogen was stopped and was started on Letrozole. Her genetic screen was negative. She underwent a prophylactic left mastectomy which subsequently showed an invasive ductal carcinoma. She was advised to continue Letrozole. In 2022 she was found to be hypercalcaemic and following investigation found to have primary hyperparathyroidism. A bone density scan showed significant osteoporosis at the femoral head. She is currently undergoing imaging to guide surgical treatment of primary hyperparathyroidism given high risk of worsening bone health given her oestrogen deprived state. Our patient demonstrates several secondary effects of her childhood cancer treatment. Early on her management plan she received high dose whole brain irradiation. Cerebral irradiation has been long shown to lead to endocrine deficiencies with varying degrees of pituitary dysfunction secondary to the radiation field and the radiation dose. Growth hormone and gonadotrophins are the most sensitive to radiation with abnormalities in TSH and ACTH related to higher doses of radiation¹. The drop in gonadotrophins appears to be a major contributor in the high rates of

osteoporosis in patients following childhood cranial irradiation.⁴ Total body irradiation is used in conditions such as lymphoma, leukaemia and multiple myeloma. It provides radiation to the entire body allowing penetration to areas that are often less accessed by chemotherapy². It is also used prior to stem cell transplantation. Following total body irradiation, patients are at 2.8 times higher risk of subsequent malignancy with the highest risk associated with the highest doses³. Surveillance programmes for childhood cancer survivors remain difficult given the wide variety of complications.

DOI: 10.1530/endoabs.91.WB5

WB6

Development of Hypopituitarism over a decade of diagnosis of Sheehan syndrome

May Thin Khine
QHEB, Birmingham, United Kingdom

Sheehan is an interesting disease; post-partum bleeding can cause dangerous pituitary gland necrosis. Sheehan's syndrome is a well-known condition that is generally diagnosed several years postpartum or can present acutely. Hypopituitarism after diagnosis of Sheehan syndrome can be present in insidious ways and there may be delay to diagnosis of over a decade because symptoms are often vague and pituitary dysfunction progresses gradually. We presented the case of hypopituitarism after a decade of diagnosis of Sheehan syndrome.

Case Presentation

A 75 year-old woman, presented to the clinic for feeling tiredness and lethargy in 1994. She was diagnosed with Sheehan syndrome in 1945 after post-partum haemorrhage with shock and inverted uterus. She was subsequently found to have growth hormone, cortisol deficiency as well as central hypothyroidism in 1994 and on hormonal replacement therapy. She was also treated for hyperlipidaemia with rosuvastatin and fenofibrate. Furthermore, Raloxifene 60 mg daily was given for 4 years to prevent from the effect of the steroid therapy and stopped after satisfactory DEXA scan.

Conclusion

Sheehan syndrome is a rare condition of progressive pituitary dysfunction, which can present with nonspecific symptoms and a myriad of laboratory abnormalities until an adrenal crisis is triggered years after the precipitating event. Screening patients for hypopituitarism by free thyroxine levels and adrenocorticotropic hormone (ACTH) stimulation testing is vital for determining whether hypopituitarism is the cause in the appropriate clinical scenario. Use of thyroid-stimulating hormone levels and morning cortisol testing alone will miss this diagnosis, and free thyroxine levels and ACTH stimulation testing are vital.

DOI: 10.1530/endoabs.91.WB6

Workshop C: Disorders of the thyroid gland

WC1

Beyond the Baby Blues: A Case Report of Postpartum Thyroiditis Presenting with Debilitating Lethargy

Kyle Cilia

Hafz-Zebbug, Hafz-Zebbug, Malta

A 25 year-old female was referred to endocrinology outpatients from her general practitioner (GP) in view of abnormal thyroid function tests (TFTs). She gave a 2 week history of increasing lethargy limiting her daily activities, loose stools and palpitations. She denied changes in appetite or weight and no neck pain or swelling. No recent history of illness. She has no past medical history and was not on any regular medications. She gave birth to her first child 6 weeks ago. Pregnancy was uneventful. She is a non-smoker. On physical examination, her blood pressure was 125mmHg over 65mmHg and heart rate of 85 beats per minute, regular. Neck examination revealed a smooth non-tender goiter with no cervical lymphadenopathy. Rest of physical examination was unremarkable. TFTs taken 5 days ago by her GP showed suppressed thyroid stimulating hormone (TSH) at a level of 0.016µIU/mL (reference range 0.3-3) with elevated free thyroxine (T4) and triiodothyronine (T3) at a level of 42.12 pmol/l(11-18) and 11.3 pmol/l(3.5-6.5) respectively. Previous TFTs during her pregnancy were normal. Thyroid antibodies were taken and showed a negative TSH receptor antibody with a positive anti-thyroid peroxidase antibody (80IU/ml, reference range 0.0-50.0). Thyroid scintigraphy scan showed an enlarged smooth thyroid gland with decreased tracer uptake. A diagnosis of postpartum thyroiditis was made. She was started on propranolol 40 mg three times a day and a "watch and wait" approach was applied. The patient was reviewed 1 month after and she noticed an improvement in her energy levels. She also noticed decreased in her palpitations. Biochemically, there was evidence of subclinical hypothyroidism with T4 and T3 at a level of 15.42 pmol/l and 4.2 pmol/l respectively and elevated TSH at 6.68µIU/ml. Propranolol was stopped. During her visits, the patient remained well and felt back to her normal self. Also reported regular menses after 4 months from her delivery. TFTs continued to improve and euthyroidism was achieved 8 months postpartum. No thyroid hormone replacement was started as she was always asymptomatic and with no over hypothyroidism biochemically.

| Weeks/months post partum | 6 weeks | 10 weeks | 3 months | 5 months | 8 months | 13 months |
|--------------------------------|---------|----------|----------|----------|----------|-----------|
| TFTs (range & unit) | | | | | | |
| TSH (0.3-3µIU/ml) | 0.016 | 6.675 | 4.060 | 3.45 | 1.95 | 1.94 |
| T4 (11-18 pmol/l) | 42.12 | 15.42 | 17.21 | 19.62 | 14.59 | 14.55 |
| T3 (3.5-6.5 pmol/l) | 11.3 | 4.2 | 4.3 | 4.2 | 3.8 | 3.8 |

DOI: 10.1530/endoabs.91.WC1

WC2

Amiodarone induced thyrotoxicosis- A challenging case to manage

Muhammad Faheem, Umaira Aziz & Gaurav Malhotra

Basildon University Hospital, Basildon, United Kingdom

Amiodarone is commonly prescribed anti-arrhythmic drug which can lead to thyroid dysfunction manifesting as either hypothyroidism or hyperthyroidism. This clinical case of amiodarone induced thyrotoxicosis is being reported to highlight the challenges faced during its management. A 72-year-old gentleman was admitted with history of recurrent falls. He had past medical history of non-ischemic cardiomyopathy, CRT, atrial fibrillation, vascular dementia, osteoporosis, primary hyperparathyroidism, type 2 Diabetes mellitus, severe frailty. He was on amiodarone for last 3 years for atrial fibrillation. Other than confusion and mild tremors, his systemic and thyroid examination was unremarkable. As a part of his confusion screen thyroid functions were tested which showed thyrotoxicosis with suppressed TSH (<0.01) and high T4 (59.9 pmol/l) and FT3 (12.2 pmol/l). These

(Abstract WC3)

| | Normal | 18/3/22 | 7/10/22 | 16/11/22 | 28/11/22 | 16/1/23 |
|----------------------|---|---------|-------------|-------------|-------------|--|
| TSH | 0.274.2mU/l | 1.78 | <0.01 | <0.01 | <0.01 | 13.1 |
| FT4 | 12-22 pmol/l | 39.6 | 24.4 | 24.4 | 18.9 | 11.6 |
| FT3 | 3.9-6.7 pmol/l | 15.2 | 9.2 | 6.6 | 6.6 | 4.3 |
| Anti-TPO | 0-35 IU/l | | | | 16 | |
| Anti-TSH receptor Ab | <2.9 IU/l | | | | <1.5 | |
| | Negative | | | | | |
| | 2.9 -3.3 IU/L- Equivocal | | | | | |
| | > 3.3 IU/L- Positive | | | | | |
| Li levels | 0.4-1 mmol/l(maintenance-12h post dose) | 0.70 | 0.62 | | | |
| Carbimazole | | | 20 mg daily | 20 mg daily | 10 mg daily | Not taking. Restarted 2 days ago Advised to stop |

tests were confirmed by repeating them. His thyroid antibodies were negative. Vascular ultrasound of thyroid did not show increased vascularity. Likewise, technetium uptake scan of thyroid revealed absent uptake on the expected location of thyroid. As likely diagnosis in this case was amiodarone induced thyrotoxicosis type 2, prednisolone was started at 30 mg daily for 2 weeks with aim of gradual tapering in 2 to 3 months. Cardiologist consultation was taken and amiodarone was stopped. After 2 weeks there was no improvement in thyroid functions and with suspicion of mixed Type I and Type II AIT, carbimazole was added on to the treatment regimen. The dose of Prednisolone and carbimazole was gradually increased to 40 mg and 60 mg respectively. Even after 4 months of the above treatment thyrotoxicosis persisted (Table 1). Due to other medical conditions and family's unwillingness surgical management was not an option in this case. Afterwards, Cholestyramine was added to treatment regimen and in next 2 months, patient's confusion state and TFTs started improving and became euthyroid (Table 2). Further plan of management is made to gradually taper off steroids and carbimazole with frequent monitoring of TFTs. This case highlights the challenges in the management of Amiodarone induced thyrotoxicosis. It was unusual that despite on high dose of steroids and carbimazole patient responded slowly. It should also be noted that other than steroids and carbimazole, cholestyramine is also an adjunctive to treat this condition.

Table 1

| | 11/01/23 | 28/11/22 | 10/11/22 | 27/9/22 | 12/9/22 |
|-----|----------|----------|----------|---------|---------|
| TSH | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| FT4 | 75.5 | 67.7 | 69.4 | 60.2 | 59.9 |
| FT3 | 15.3 | 14.7 | 18.9 | 11.9 | 12.2 |

Table 2

| | 24/2/23 | 07/02/23 |
|-----|---------|----------|
| TSH | <0.01 | <0.01 |
| FT4 | 14.6 | 44.1 |
| FT3 | 5.4 | 7.1 |

DOI: 10.1530/endoabs.91.WC2

WC3

Li-induced Thyrotoxicosis

Amna Kiran Sarwar

Hereford County Hospital, Hereford, United Kingdom

Lithium is commonly used for management of Bipolar disorders. Li-induced thyroid dysfunction, including hypothyroidism and goitre are the most prevalent while hyperthyroidism is very infrequent, mainly characterised by transient painless thyroiditis but it increases the propensity to thyroid autoimmunity in susceptible individuals. Thyroid profile, thyroid auto-antibodies, assessment of thyroid size should be performed among patients initiating lithium, at baseline and later annually.

Case

A 32-year-old gentleman was referred to Endocrinology for evaluation of thyrotoxicosis. He has a background history of Bipolar psychosis, on long term Li (Priadel MR tablet 800 mg nocte) for last 7 years. Over previous years (Feb 2016 to March 2022), his TSH levels remained normal along with Li levels in therapeutic range. Four months ago, his thyroid profile showed suppressed TSH with raised FT4 and FT3 (Table), was started on Carbimazole 20 mg daily by GP and referred to Endocrinology for further evaluation. 2 months later, when reviewed by Endocrinology, he reported some heat intolerance, occasional palpitations, shakiness and restlessness which he co-relates to happen during anxiety episodes. There were no peripheral signs of hyperthyroidism and thyroid was not palpable. Repeated thyroid profiles showed downtrend of FT4 and FT3 to normal; however, TSH remained suppressed at <0.01mU/l after 7 weeks of treatment. He was advised to decrease Carbimazole to 10 mg daily. His anti-TPO and anti-TSH receptor antibodies came out to be negative. On further review 6

weeks later, he mentioned that he is not taking Carbimazole for last 6 weeks, despite that repeated profile showed hypothyroidism with raised TSH (13.1mU/l) and low FT4 (11.6 pmol/l). He was advised to stop Carbimazole. Thyroid uptake scan with technetium was arranged to rule out drug induced thyroiditis vs toxic adenoma. This patient likely have Li-induced transient thyroiditis, hyperthyroid phase followed by development of hypothyroidism. Should the hyperthyroid phase be treated or monitored with thyroid function testing? In Li-induced thyroiditis, regular follow up is recommended since majority develop hypothyroidism subsequently. No role for anti-thyroid drugs or RAI, thyroid function should be monitored every 4-8 weeks to confirm resolution of hyperthyroidism and to detect hypothyroidism.

| Day | Remarks |
|-----|---------------------|
| 1 | FT4 5.92 ng/dl |
| 3 | TPE- 1st cycle |
| 4 | FT4 2.47 ng/dl |
| 5 | TPE- 2nd cycle |
| 6 | FT4 2.10 ng/dl |
| 7 | Total Thyroidectomy |
| 8 | FT4 2.96 ng/dl |
| 12 | FT4 0.84 ng/dl |

DOI: 10.1530/endoabs.91.WC3

WC4

Therapeutic Plasma Exchange as a bridging therapy to total thyroidectomy in refractory thyrotoxicosis

Gayana Gajaweera¹, Dhulashiha Jegavanthan¹, Dineesha Kumarathunga^{1,2}, Charles Antonypillai¹ & Nayananjani Karunasena¹
¹National Hospital Kandy, Kandy, Sri Lanka; ²University Hospital Coventry and Warwickshire NHS Trust, Coventry, United Kingdom

Introduction

Graves thyrotoxicosis can be life-threatening if uncontrolled. Resistant thyrotoxicosis is not uncommon and may require urgent intervention. We present a case with severe refractory thyrotoxicosis which required urgent total thyroidectomy following bridging plasma exchange.

Case History

A 35-year-old male with Grave's disease presented with persistent thyrotoxic symptoms despite medical management for 10 months. Clinically he was hyperthyroid with a heart rate of 108 b.p.m and had mild thyroid eye disease. ECG revealed sinus tachycardia. The thyroid function tests with TSH of < 0.001 mIU/l with FT4 of 7.77 ng/dL (Reference 0.89-1.76). Imaging of the neck showed features of Graves thyroiditis. He was titrated up with anti-thyroid medications and while on Carbimazole 60 mg daily, Lithium carbonate 250 mg BD, Propranolol 40 mg BD, Prednisolone 30 mg daily, and Cholestyramine 4 g TDS, his FT4 was 5.92 ng/dl. Presence of persistently elevated FT4 along with a thyrotoxic state, it was decided to proceed with urgent thyroidectomy as a curative option. However, to bring down the FT4 to a safer level before the surgery, a therapeutic plasma exchange (TPE) was offered, and the surgery was performed after 2 cycles of TPE.

Discussion

Resistant thyrotoxicosis can be treated with surgery or radioactive iodine ablation. However, a euthyroid state should be achieved prior to these treatment strategies to minimize the risk of complications including thyroid storm. Therefore, in patients with refractory thyrotoxicosis with maximum tolerable medical management, a therapeutic plasma exchange (TPE) can be offered to reduce the FT4 up to a safer level. TPE is a procedure that involves exchanging a patient's plasma through an apheresis machine. It can be used in severe hyperthyroidism as it removes active thyroid hormones and thyroid receptor antibodies (1). Therefore, TPE in refractory thyrotoxicosis is an effective treatment option and a crucial bridge to the definitive treatment in challenging cases (2).

References

- Saïe C, *et al.*, Therapeutic Plasma Exchange in Refractory Hyperthyroidism. *Eur Thyroid J.* 2021 Mar;10(1):86-92.
- Tieken K, *et al.*, Therapeutic plasma exchange as a bridge to total thyroidectomy in patients with severe thyrotoxicosis. *AACE Clin Case Rep.* 2020 Sep 26;6(1): e14-18.

DOI: 10.1530/endoabs.91.WC4

WC5

Thyroid dysfunction in pregnancy- when not to treat

Anum Sheikh, Calvo Latorre Julia & Kostoula Melina
 Watford General Hospital, Watford, United Kingdom

Introduction

Thyroid dysfunction in pregnancy is not uncommon (1). Early recognition and intervention are essential to avoid any adverse pregnancy outcomes however caution must be exercised while interpreting the thyroid functions during pregnancy to avoid any unnecessary treatment.

Case report

32-year female with was referred to the combined antenatal clinic for review following an abnormal thyroid function tests during pregnancy. She had no known medical conditions and was on no regular prescribed or over the counter medications. She had a routine blood test at the GP surgery at around 8 weeks of gestation, which showed thyrotoxicosis. There was no history of recent acute illness or use of iodine contrast medium. There was no family history of thyroid dysfunction. On clinical examination, she had a mild goitre. There were no other clinical signs of hyperthyroidism and no signs of thyroid eye disease. The TSH receptor antibody tested at 8-weeks of gestation was negative (<0.3 IU/l, range 0 - 0.9). She reported ongoing emesis from the first trimester of pregnancy, which continued during the second trimester, but was settling as the pregnancy was advancing. The thyroid hormone levels normalised as the pregnancy advanced without any intervention. The thyroid hormone profile done at various times of gestation was as follows:

Conclusion

It is important to identify the transient gestational thyrotoxicosis to avoid any unnecessary treatment of abnormal thyroid functions (2). Due to the weak thyroid stimulating activity of the beta HCG (human chorionic gonadotrophin) and direct stimulation of the maternal thyroid gland by HCG, changes in thyroid functions including a low or undetectable TSH and rise in total and free t4 are not uncommon. We do not advise treating an isolated low TSH or elevated free T4 in the absence of clinical evidence of hyperthyroidism, as with our patient whose thyroid function was monitored during her pregnancy but no treatment was required.

References

- Führer D, Mann K, Feldkamp J, Krude H, Spitzweg C, Kratzsch J, *et al.* Schilddrüsenfunktionsstörungen in der Schwangerschaft. *DMW - Deutsche Medizinische Wochenschrift.* 2014 Oct 7;139(42):2148-52.
- Albaar MT, Adam JMF. Gestational transient thyrotoxicosis. *Acta Med Indones.* 2009 Apr;41(2):99-104.

| | TSH | Free t4 | Free t3 |
|-------------------|-------|---------|---------|
| Preconception | 0.23 | 16.4 | |
| 8-week gestation | <0.05 | 31.3 | 9.6 |
| 12-week gestation | <0.05 | 23.2 | 7.7 |
| 16-week gestation | <0.05 | 20.0 | 6.4 |
| 24-week gestation | <0.05 | 16.1 | 5.2 |
| 28-week gestation | <0.05 | 14.7 | 5.2 |

DOI: 10.1530/endoabs.91.WC5

WC6

A Case of Amiodarone Induced Thyrotoxicosis Type 2

Ciara Kilcoyne & Audrey Melvin

University Hospital Limerick, Limerick, Ireland

55-year-old man referred to the medical assessment unit by GP with weight loss and tachycardia. His past medical history was significant for myocarditis, long-QT syndrome, out of hospital cardiac arrest and an in-situ ICD. On examination the patient was tremulous, sweaty and tachycardic but otherwise well. An ECG demonstrated sinus tachycardia and routine blood tests were unremarkable. A clinical diagnosis of thyrotoxicosis was made and confirmed biochemically with TSH < 0.01 (0.03-4.2)mU/l and FT4 > 100 (10.5-22.8) pmol/l. The patient had no family history of thyroid dysfunction, no recent iodinated contrast, no clinical signs suggestive of Grave's disease and no goitre, lymphadenopathy or tenderness on neck examination. His medical history was significant for exposure to Amiodarone therapy, although this had been stopped approximately 12 months before his current presentation. The patient was assessed for thyroid autoimmunity, TPO antibodies < 15 (0-34)kU/l and TRAb was sent to an external lab with a reporting time of approximately 2 weeks. The patient was commenced on beta blockade for symptom control and Carbimazole. A presumed diagnosis was made of Amiodarone Induced Thyrotoxicosis (AIT), likely type-2 relating to remote amiodarone exposure. Radiological investigations were expedited to aid in the diagnosis. An ultrasound of then thyroid revealed 'Heterogenous appearance to both thyroid lobes with multiple microcystic change present suggestive of thyroiditis no significant increase in vascularity. No large discrete nodule identified'. This was followed by a pertechnetate scan of the thyroid showing 'Absent thyroid uptake. In the setting of thyrotoxicosis and the given the appearance of diffuse thyroiditis on recent ultrasound. If the patient is on amiodarone, this appearance may relate to amiodarone induced thyrotoxicosis,

most commonly type-2 in the setting of absent uptake'. The radiological findings were most in keeping with AIT type-2, specifically an absence of a nodular thyroid, reduced vascularity and absent uptake on nuclear medicine scan, as such the patient was commenced on prednisolone 40 mg daily. The patient's clinical course is outlined in table 1. TRAb was negative. The patient responded very well to therapy and remains under follow-up in the endocrine clinic.

Table 1: Clinic follow-up

| | Diagnosis | 4 weeks | 8 weeks | 16 weeks |
|------------|---|---|---|-------------------------------------|
| TSH mU/l | <0.01 | <0.01 | <0.01 | 15.9 |
| FT4 pmol/l | >100.0 | 89.9 | 20.0 | 12.9 |
| FT3 pmol/l | 18.3 | 17.3 | 4.6 | 5.1 |
| Therapy | Start | Continue | Dose reduce to | Slow taper |
| | Prednisolone 40 mg Carbimazole 40 mg | Prednisolone 40 mg Carbimazole 40 mg | Prednisolone 10 mg Carbimazole 10 mg | Prednisolone Stop Carbimazole |

DOI: 10.1530/endoabs.91.WC6

WC7

A case of confusion secondary to grave's thyrotoxicosis, missed TFT's and diagnosis on first presentation lead to patient representing with impending thyroid storm

Sushma Burri & Maria Silveira

Worthing Hospital, Worthing, United Kingdom

History: 72 yr. Female, Initially presented to A&E with new confusion and speech disturbance. NEWS of 7- RR 22, sats- 98% on RA, BP 162/107, HR-124, and T-37. AMTS- 7/10. PMH: depression, previous dysphasia, Medication: Amitriptyline, Omeprazole.

Investigations

FBC, UE, LFT, CRP, Cholesterol levels, urine dip Normal and CT head – normal. ECG – Sinus tachycardia. Observations improved and no obvious cause found for confusion patient was discharged home from A&E with safety advice given to her daughter. Readmitted to ED two days later with worsening confusion, agitation, excessive sweating.

Observations

News 5, RR 24, O2 -96% on RA, HR 132, BP 160/90, T 37.4. At this point her AMTS had deteriorated to 1/10. Examination: Warm peripheries, delirious, tremulous, no obvious Eye signs, slightly enlarged thyroid gland, no visible rash. Investigations: Confusion screen including TFT, LP. Treated empirically with IV Ceftriaxone and Acyclovir for possible encephalitis. Investigations done: Adj Ca-2.63 (2.20-2.60) Folate – 15 B12 – 680 TSH - <0.03 (0.35 - 4.94) FT4 – 40.7 (9 – 19) FT3 – 18.1 (2.6 – 5.7), CSF – Normal, Viral PCR pending, NMDA receptor antibodies negative. Endocrine review :Given the deranged TFT's, her gender and age it was suspected that she was Grave's disease, requested for TPO and TSH receptor antibodies which were later found to be high TPO Abs – 163.96 (0 – 5.9), TRAb – 51 (0 – 3.3) Treated with Carbimazole 30 mg OD, Propranolol 10 mg TDS, IV fluids. The following day patient was not eating and drinking, worsening delirium, more agitated, hallucinating and few episodes of low grade pyrexia, with one temp spike above 38. According to the criteria on the Burch and Wartofsky scoring system. She was scoring 5 for temperature, 20 for delirium, 10 for tachycardia, scoring a total of 35. Treated as impending thyroid storm/ severe thyrotoxicosis with Hydrocortisone 100 mg IV QDS, Propranolol 40 mg TDS, Propylthiouracil 100 mg QDS, IV Fluids, NG feeding. Ceftriaxone was stopped but IV acyclovir was continued until CSF PCR results were normal. In a few days delirium started to resolve, TFT's began to improve, heart rate normalised. PTU was weaned to 100 mg TDS and hydrocortisone was weaned too. On day 17 of her admission, FT3 and FT4 normalised, (TSH still <0.03, which is expected), safely discharged home with endocrine outpatient appointment. Reviewed in outpatient clinic, patient well and currently on PTU 50 mg BD with a view to wean.

Conclusion

This case highlights the importance of checking TFT's as part of confusion screening.

DOI: 10.1530/endoabs.91.WC7

WC8

A case of Graves disease with agranulocytosis secondary to carbimazole

Caoimhe Casey & Anne McGowan

Tallaght University Hospital, Dublin, Ireland

A 39-year-old female was referred to the emergency department with a sore throat, fever, myalgia and odynophagia. She had presented to her GP three months previously with palpitations, erratic mood and fatigue and had been diagnosed with hyperthyroidism. She had been started on carbimazole 20 mg od and was awaiting review in endocrinology OPD. She had no other past medical history and was a non-smoker. On examination she was tachycardic with a heart rate of 113. She had cervical lymphadenopathy and oropharyngeal exam revealed tonsillitis with exudate. Laboratory work up showed neutropenia with a total **white cell count of 0.8** (ref 4-11 x 10⁹/l) and **neutrophils of <0.1** (ref 2-7.5 x 10⁹/l). Her thyroid function tests had improved with a **TSH of <0.05mU/L** (ref 0.3-4.2mU/l) and **free thyroxine of 13.6 pmol/l** (ref 12-22 pmol/l) which had been **66.8 pmol/l** three months prior. TSH receptor antibody was positive- 14.4IU/l(ref <1.8IU/l). She was diagnosed with neutropenic sepsis and agranulocytosis secondary to carbimazole. She was treated with antibiotics and granulocyte colony stimulating factor (G-CSF) 30mu once daily as per haematology advice. Thyroid ultrasound showed 'diffuse thyroid enlargement with increased vascularity in keeping with thyroiditis' and technetium 99m pertechnetate scan showed 'high uptake of radionuclide in both lobes, appearances suggest graves'. Her white cell count returned to normal and G-CSF was stopped after 6 days. Her thyroid function tests deteriorated while she was off carbimazole:

She was commenced on lithium 200 mg bd and discharged home with close outpatient follow up to monitor thyroid function tests and lithium levels. Unfortunately, she did not attend her follow up appointments and was poorly compliant with lithium therapy. When she engaged with the service again, she had clinical and biochemical evidence of thyrotoxicosis with a **free thyroxine of 80 pmol/l** and evidence of thyroid eye disease with left eye proptosis, lid retraction and exophthalmos and mild right eye proptosis. Lithium therapy was restarted and a plan was made for definitive therapy. Surgery was preferred over radioactive iodine treatment given the presence of thyroid eye disease and the patient's plans for pregnancy in the near future. She was electively admitted prior to surgery for treatment with lugol's iodine and close monitoring of thyroid function tests. She ultimately had a successful thyroidectomy and is now well on thyroxine replacement therapy.

| Assay Roche Cobas | TSH (0.3-4.2mU/l) | FT4 (12-22 pmol/l) |
|-------------------|----------------------|-----------------------|
| 8/6/2021 | <0.05 | 20.3 |
| 10/6/2021 | <0.05 | 21.9 |
| 13/6/2021 | <0.05 | 33.5 |
| 17/6/2021 | <0.05 | 36.8 |
| 18/6/2021 | <0.05 | 41.7 |

DOI: 10.1530/endoabs.91.WC8

WC9

Management of alemtuzumab-associated Graves' disease in pregnancy

Kerrie Thackray, Shakunthala Narayanaswamy & Felicity Kaplan

East and North Herts NHS Trust, Stevenage, United Kingdom

A 31 year old female patient initially presented with a two month history of unintentional weight loss. Past medical history included multiple sclerosis, for which she had last received alemtuzumab immunotherapy five months previously. Thyroid function tests (TFTs) demonstrated hyperthyroidism, with Thyroid Stimulating Immunoglobulins (TSI) 5.71 iu/l(NR: <0.56). She was diagnosed with Graves' disease, possibly induced by alemtuzumab, and commenced on carbimazole. She was strongly advised to avoid pregnancy while hyperthyroid, with a plan to switch to propylthiouracil once stable. Concordance with carbimazole was variable over the next few months requiring frequent changes to her treatment regime, although alemtuzumab-induced thyroid dysfunction is also associated with spontaneous, bidirectional switching between hyperthyroidism and hypothyroidism. Carbimazole was gradually titrated to 15 mg daily after nine months. Six weeks later, repeat TFTs demonstrated profound hypothyroidism. She stopped carbimazole and started levothyroxine, which was titrated to 125 mg daily. Six months later, she presented in the tenth week of pregnancy. Levothyroxine was increased to 150 mg daily at booking then adjusted throughout pregnancy. TSI at 28 weeks gestation was significantly elevated at 31.60 iu/l. Serial growth scans were performed, and a decision was made to deliver her baby at 35 weeks for tailing growth and abnormal Dopplers. The baby required CPAP for 24 hours but was otherwise well. TFTs demonstrated suppressed TSH <0.02 mU/l but normal FT4 corrected for neonatal age. The baby was discharged at 3 days old and subsequent TFTs normalised. The prevalence of Graves' disease in pregnancy is estimated at 0.2%. Up to 10% of babies born to mothers with Graves' disease will develop fetal or neonatal thyrotoxicosis, particularly when TSI is significantly elevated. Alemtuzumab-induced Graves' disease is particularly associated with a rapid elevation in TSI. Pregnant women with current or previous thyrotoxicosis with raised TSI should be offered growth scans and fetal heart rate monitoring at 28, 32 and 36 weeks. Women with

hypothyroidism should increase levothyroxine dose by 25 mg on diagnosis of pregnancy with TFTs at least each trimester, aiming TSH <2.0 mIU/l. TSI should be checked at 28 weeks to allow assessment of the risk of neonatal hyperthyroidism and antenatal referral to the neonatal team. The baby should have TSI and TFTs checked on day 3-7, with repeat bloods and anti-thyroid drugs as appropriate. Those caring for women with thyroid disease and their babies should be alert to the increased risks to promote healthy outcomes for both.

DOI: 10.1530/endoabs.91.WC9

WC10

Trials and Tribulations of Management of Amiodarone-Induced Thyroiditis in A Young Patient With Heart Failure

Abigail Mula, Sarah Craus & David Coppini
Mater Dei Hospital, Msida, Malta

A 41 year old female, followed up closely by cardiology in view of grown up congenital heart disease secondary to tricuspid atresia, pulmonary stenosis and atrial septal defect in infancy, and brittle paroxysmal atrial fibrillation (AF) was noted to be progressively lethargic and anorexic. She also developed bilateral lower limb oedema and was admitted for further investigation of decompensated congestive heart failure (CHF). Overt thyrotoxicosis was found on investigation. Since the patient had been on Amiodarone for five years, a diagnosis of Amiodarone-induced thyroiditis (AIT) was made and the endocrinology team was involved. At initial assessment, the patient was noted to be anxious, emotionally labile, tremulous and had a resting sinus tachycardia. Thyroid examination also revealed a goitre. The patient's main concern was the decompensation in heart failure and the possibility of rebound atrial fibrillation off treatment. There was no past history of thyroid disease. Initial treatment included 40 mg of prednisolone (Pred) and 40 mg of carbimazole (CBZ) daily and 10 mg Propranolol three times daily. Cardiologists were also concerned regarding steroid use in view of the risk of further decompensation of CHF. Autoimmune serology and a thyroid ultrasound were done to better elucidate if AIT Type 1 (antithyroid agent responsive) or AIT Type 2 (steroid responsive) was the cause. Results are shown in table 1 below. Whereas immunology was consistent with AIT Type 1, Ultrasonography favoured AIT Type 2. The patient was therefore kept on both Carbimazole and Prednisolone with clinical response showing a slow course and therefore favouring AIT Type 1. The patient improved clinically and biochemically over a 4 month period with results shown below in table 2.

| Investigation | Result | AIT Type 1 | AIT Type 2 |
|----------------------------|-------------------------------------|------------|------------|
| Anti-TSH Receptor Antibody | 2 (0.1-11IU/l) | X | |
| Inter-Leukin 6 Antibody | Negative | X | |
| Ultrasound Thyroid | Mild goitre. Decreased vascularity. | | x |

| Weeks from diagnosis | Treatment regimen | TSH level (mIU/ml) | T4 level (pmol/l) | Free T3 (pmol/l) level |
|----------------------|---------------------------------|--------------------|-------------------|------------------------|
| 0 | - | 0.009 | 93.44 | 27.2 |
| 1 | CBZ 40 mg BD Pred 40 mg Dly | <0.008 | 121.41 | 17.7 |
| 2 | CBZ 50 mg Dly Pred 40 mg Dly | 0.008 | 132.65 | 20.2 |
| 3 | CBZ 50 mg Dly Pred 30 mg Dly | <0.008 | 133.89 | 19.4 |
| 6 | CBZ 40 mg Dly Pred 30 mg Dly | <0.008 | 62.3 | 10.8 |
| 9 | CBZ 35 mg Dly Pred 20 mg Dly | <0.008 | 40.44 | 8.4 |
| 12 | CBZ 30 mg Dly Pred 5 mg Dly | <0.008 | 19.3 | 5.6 |
| 15 | CBZ 15 mg Dly Off Pred | 0.111 | 13.32 | 5.6 |

DOI: 10.1530/endoabs.91.WC10

WC11

A case of thyrotoxicosis requiring urgent definitive therapy

Kiran Issuree & Kristien Boelaert
Queen Elizabeth Hospital, Birmingham, United Kingdom

A 25 year old lady initially presented with symptoms of palpitation, irregular menses and unintentional weight loss. She was a non-smoker with no current pregnancy plans or family history of thyroid disease. On examination, she was tachycardic and had a moderate diffuse goitre but no signs of thyroid ophthalmopathy. She was biochemically hyperthyroid (TSH <0.01 mIU/l, FT4 30.0 pmol/l, FT3 >30.7 pmol/l). Carbimazole 30 mg daily was started for likely Graves' disease, after standard advice on agranulocytosis and rash and the need for contraception. Definitive therapy with radioactive iodine and surgery were discussed and patient information leaflets provided. A clinic review was booked for her decision on definitive therapy and the TSH receptor antibody result. However, she re-presented in ED 4 weeks later with a 5-day history of sore throat, fever and rash. On examination, she was tachycardic and had a widespread erythematous rash. An urgent FBC showed new and profound neutropenia ($0.12 \times 10^9/l$). TFTs showed ongoing hyperthyroidism (TSH <0.01 mIU/l, T4 15.0 pmol/l, T3 6.9 pmol/l). Her TSH receptor antibodies were elevated at 80 IU/l. She was diagnosed with carbimazole-induced agranulocytosis and rash and underlying Graves' disease. Carbimazole was stopped immediately. Propranolol was increased from 40 to 80 mg twice daily. An urgent clinic review was booked for consideration of definitive treatment. In clinic 1 week later, her palpitations had improved. TFTs however showed worsened hyperthyroidism (TSH <0.01 mIU/l, FT4 33.8 pmol/l, FT3 >30.7 pmol/l). Her neutrophil count had improved ($0.58 \times 10^9/l$). She was counselled about urgent definitive therapy with either radioactive iodine or surgery. She opted for radioactive iodine but did not attend the appointment. After repeatedly changing her mind about radioactive iodine, she eventually declined to proceed. When she came to clinic 6 weeks later, her TFTs showed ongoing hyperthyroidism (TSH <0.01 mIU/l, FT4 30.0 pmol/l, FT3 >30.7 pmol/l). A semi-urgent total thyroidectomy was recommended. She received pre-operative preparation with potassium iodate 65 mg twice daily for 2 weeks. She then underwent a total thyroidectomy. There were no intraoperative complications. Post-operatively, her calcium and PTH levels remained within the normal range but she developed voice hoarseness. Fiberoptic nasendoscopy showed no evidence of vocal cord palsy. The voice hoarseness resolved promptly. Histology showed moderate diffuse hyperplasia, consistent with partially-treated Graves' disease and no evidence of neoplasia. Euthyroidism was restored after starting lifelong levothyroxine replacement post-operatively.

DOI: 10.1530/endoabs.91.WC11

WC12

Thyrotoxicosis, Neutropenia and Appendicitis and emergency thyroidectomy

Aiyappa Biddanda & Helen Simpson
UCLH, London, United Kingdom

36F from Hungary with a h/o Graves disease in the past which was in remission since 2017 presented to ED at UCLH with a fast heart rate and acute weight loss. Feb 2020 presented with fast heart rate and FT4 84.9, TSH < 0.01. TPO Negative, TRAB raised at 6.5. Patient was commenced on 20 mg carbimazole and 20 mg TDS propranolol, referred to endocrine clinic. Patient missed her appointment in the endocrine clinic as she was in Hungary during the pandemic. June 2020: 15 weeks pregnant and Carbimazole changed by her GP to Propyl thiouracil 50 mg BD. Reviewed in the antenatal clinic by Endocrinology who advised for her to continue PTU 50 mg and repeat TFT, TRAB and FU in Aug 2020. Nov 2020: 34 weeks missed ANC endo appointment in August returned to report stopped PTU Sept 2020. Repeat TFT in Nov 2020: TSH 0.71, FT4 9.7 TRAB neg, TPO Negative. Graves' disease in Biochemical remission repeat TFT's 6 weeks post-partum. C section 12/1/21. Nov 2021: Contracted COVID and was admitted to hospital with hypoxia. March 2022: Recovering from COVID 19 infection developed tachycardia and weight loss. TSH 0.010, FT4 21.7 FT3 6.1: commenced on antithyroid medication in Hungary as she went back to have an endocrine consultation 11/6/2022: Presented to ED follicular tonsillitis unable to eat and drink. Admitted under ENT for IV antibiotics, observation and found to be neutropenic. TSH 0.01 Free T4 48.5 WBCs 0.67 Lymphocytes 0.61 Neutrophils 0.02. Patient treated with Clarithromycin for her tonsillitis. Patient discussed. Screening tests for neutropenia sent (Hepatitis, HIV, EBV, CMV), 14/6/2022: Patient started complaining of abdominal pain, mild diarrhoea, and menstruating. D/W microbiology and Haematology for persistent neutropenia. Commenced on Neutropenic sepsis antibiotics: Ceftazidime, Teicoplanin 6 mg/kg and stat dose of Amikacin (Patient is penicillin allergic). TSH <0.01 and FT4 42.0 Neut 0.10, 15/6/2022: US abo: ureteric calculus, CT KUB: Ureteric calculus / diverticulum. Gen surgery review: possible appendicitis to continue antibiotics. To conservatively manage. Thyroid surgeon met the patient and consented for emergency thyroidectomy. Patient keen to go home to her infant. Commenced Lugols iodine 0.3 ml TDS and Daily TFT's. 20/6/22: Discharged with Lugols Iodine to return 22/6/22 for repeat TFT's. 22/6/22: TSH <0.01 FT4 16.3, Neut 7.15, WCC 13. 05/07/22: Total thyroidectomy under GA with no complications. 08/08/2022: Tingling both hands and feet. The story goes on.

DOI: 10.1530/endoabs.91.WC12

WC13**Graves' disease in pregnancy with neonatal thyrotoxicosis**

Rachel Flynn & Ayesha Siddiqi

Barts Health NHS Trust, London, United Kingdom

Case history

A 30-year-old Afrocaribbean lady with a history of Graves' thyrotoxicosis (2012) and subsequent thyroidectomy (2013) presented to the antenatal clinic in January 2020 at 9+6w gestation. Medication included levothyroxine 125 mg daily. She had a history of neonatal thyrotoxicosis in her first pregnancy in 2017 which required carbimazole therapy due to fetal tachycardia.

Investigations

At booking, thyroid function tests (TFTs) showed a TSH 6.48mU/land free T4 12.8mU/l. TSH Receptor antibodies were very high at 34.24IU/l. Her anomaly scan was normal. A CTG (cardiotocography) showed a rising fetal heart rate (FHR 150-170bpm) at 32w but the fetal US scan showed a normal thyroid gland with no goitre.

Results and treatment

The levothyroxine dose was initially increased from 125 mg OD to 150/175 mg on alternate days in the second trimester which improved her TFTs at 23w (TSH 1.73mU/l, Free T4 15.1mU/l). Due to fetal tachycardia, carbimazole 5 mg OD was added at 32+3w and plans made for twice weekly CTG monitoring. TFTs at 35w showed TSH 0.33mU/land Free T4 15 pmol/l with FHR of 140-150bpm. The patient went into spontaneous labour at 36+3w. Her infant male (2960g) was admitted to HDU with a heart rate >200bpm and tachypnoea and was treated for possible sepsis with broad spectrum antibiotics. The neonatal TFTs showed TSH <0.01mU/land Free T4 >95.7 pmol/l. TSH Receptor antibodies were elevated at 4.05 IU/l. Propranolol and carbimazole were commenced to good effect and weaned over 2 weeks. At 5 weeks, the weight was 4400g and TFTs normalised (TSH 1.18, Free T4 12.7 pmol/L; TSH receptor antibodies 0.57 IU/l). The mother stopped taking carbimazole at the time of delivery and returned to her normal levothyroxine dose.

Conclusions

Neonatal thyrotoxicosis is rare but more common with a history of maternal Graves' disease with high antibody titres requiring treatment in pregnancy TSH receptor antibodies may continue to be produced after thyroidectomy and can cross the placenta and lead to neonatal thyrotoxicosis. This is a transient disorder which ameliorates once maternal antibodies are cleared from the circulation but can have a high mortality rate if not recognised and treated promptly. In this case, despite an improved fetal heart rate and reassuring antenatal thyroid ultrasound scan, the neonate still went on to exhibit clinical and biochemical evidence of neonatal thyrotoxicosis. Thus, early measurement of TFTs from cord blood and close monitoring in the first few days of life is crucial.

DOI: 10.1530/endoabs.91.WC13

WC14**Amiodarone Induced Thyrotoxicosis**

Siobhan Pacitti

Western General Hospital, Edinburgh, United Kingdom

A 56 year old man came to the attention of the endocrine service during an admission with COVID 19. Due to persistent tachycardia he had thyroid function tests (TFTs) which showed TSH <0.01mU/land free T4 of 58 pmol/l. He had reported weight loss over the past couple of months and occasional palpitations but no other features of thyrotoxicosis. He had no personal or family history of thyroid or autoimmune disease. On examination his pulse was 90 beats per minute, had no goitre or thyroid tenderness and no signs of thyroid eye disease. In addition to COVID 19, he also had acute hepatitis and required NG feeding. His past medical history is of Marfan syndrome, aortic valve replacement, aortic repair complicated by T4 level spinal stroke, moderate LVSD, and recurrent ventricular tachycardia with an implantable cardioverter-defibrillator. Of note he had been on amiodarone for 18 years. He had undetectable thyroid receptor antibodies. He was commenced on prednisolone 40 mg once daily for presumed type two amiodarone induced thyrotoxicosis (AIT2). He was not initially commenced on carbimazole due to his acute liver dysfunction. A request for a thyroid uptake scan was rejected by radiology as he was COVID 19 positive. Amiodarone was stopped on discussion with cardiology and dronedarone was commenced. He received alendronic acid for bone protection and required three

(Abstract WC14)

| | Reference range | 13/02 | 16/02 | 23/02 | 01/03 | 15/03 | 19/04 | 07/05 |
|---------|-----------------|-------|-------|-------|-------|-------|-------|-------|
| TSH | 0.2-4.5mU/l | <0.01 | <0.01 | <0.01 | <0.01 | 0.23 | 5.3 | 2.3 |
| Free T4 | 9-21 pmol/l | 58 | 43 | 25 | 18 | 13 | 12 | 12 |
| Free T3 | 2.4-6 pmol/l | 9.1 | 5.6 | - | 3.3 | - | - | - |

weeks of gliclazide for steroid induced hyperglycaemia. TFTs improved as below and prednisolone was gradually weaned. Amiodarone has large proportion of iodine and a long half life. It can cause both hypothyroidism and thyrotoxicosis. Amiodarone induced thyrotoxicosis (AIT) can be split into type 1 AIT and type 2 AIT. Type 1 AIT is more common in those with underlying thyroid disease, is due to increased synthesis of thyroid hormones and is usually treated with anti-thyroid drugs. Type 2 AIT is caused by a direct toxic effect of amiodarone on the thyroid cells leading to thyroiditis and release of preformed thyroid hormones. It can be treated with steroids. In practice it can be difficult to distinguish between the type of AIT and some patients have a mixed type.

DOI: 10.1530/endoabs.91.WC14

WC15**Thionamide Resistant Graves: What are 2nd line options**

Hafiz Muhammad Zubair Ullah & Prakash Abraham

Aberdeen Royal Infirmary, Aberdeen, United Kingdom

Background

Conventional management for thyrotoxicosis includes anti-thyroid medications, radioactive iodine and/or surgery. However, in some cases patients are resistant to first line drugs and need second line treatment to normalize thyroid function tests (TFTs) before considering definitive therapy. We present a case of Grave's disease where patient didn't respond to first line anti-thyroid medications and required Lithium and Cholestyramine to achieve euthyroid status prior to surgery.

Case

A 29 years old lady was referred with 1 year history of tiredness, on and off loose stools and weight loss of 26 kg. She also reported getting sweaty easily, shaking of hands and palpitations. She had never smoked and was working as a support worker. On examination, she was tachycardic with heart rate of 110, had a fine tremor and a World Health Organization (WHO) grade 2 smooth goiter with an audible bruit. There were no signs of thyroid eye disease and no neck lymphadenopathy. She had significant family history of thyroid disease on her maternal side (Mother, Aunts, Uncle and Grandfather - hypothyroid). Her initial TFTs showed a fT4 34.1 pmol/l, fT3 >30 pmol/land TSH <0.01mU/l, with thyroid receptor antibodies (TRAb) level >68 IU/land anti-thyroid peroxidase (TPO) antibodies level of 1118 IU/ml. Patient was commenced on carbimazole 30 mg and propranolol for symptomatic relief. After 6 months of treatment, despite being on maximum dose of carbimazole (60 mg) and good compliance, she had fully suppressed TSH, elevated fT3 and fT4 and she remained symptomatic. Patient declined radioactive iodine due to work commitments and agreed for surgery as definitive treatment. To prepare her for surgery, she was started on Lithium and Cholestyramine which showed an improvement in her TFTs. She was also planned to receive Lugol's iodine 2 weeks before surgery.

Conclusion

Thionamide resistant thyrotoxicosis is uncommon but can be life-threatening. Surgery and/or radio-iodine remains the mainstay of treatment. This case highlights the approach and importance of considering second line treatments to achieve euthyroid status before definitive therapy.

DOI: 10.1530/endoabs.91.WC15

WC16**A case of thyrotoxic hypokalaemic periodic paralysis presenting to the emergency department**

Andrew Down & Laura Rich

Royal United Hospitals, Bath, United Kingdom

A 35 year old Asian man presented to the emergency department on several occasions with episodes of severe muscle weakness, affecting his arms and legs, to the point he was unable to walk or stand. He was found to be hypokalaemic on both occasions, at 2.3mmol/l and 3.0mmol/l respectively, and his weakness gradually improved with potassium replacement. He gave a history of two years of intermittent weakness and stiffness of the limbs which typically occurred at night or after long periods of rest. Initially they resolved spontaneously within minutes but the attacks became increasingly severe, lasting hours, to the point he was unable to mobilise. He reported a recent history of weight loss, tremor,

palpitations and significant heat intolerance. He was found to be thyrotoxic with a suppressed TSH, free T4 39.4 pmol/l and free T3 14.4 pmol/l. His TSH receptor antibodies were positive at 4.0 IU/l and the diagnosis of Grave's disease was made. He was commenced on Carbimazole 40 mg and Propanolol. Looking back at his previous results he had subclinical hyperthyroidism at the time when his symptoms of weakness first presented, but no treatment was given at that stage. Given the presentation of acute painless muscle weakness, in the presence of hypokalaemia and thyrotoxicosis, a diagnosis of thyrotoxic periodic paralysis was made. This is an extremely rare condition which is most commonly caused by Grave's disease and occurs more frequently in Asian men between the ages of 20 and 40. It is potentially life-threatening and prompt correction of hypokalaemia is

essential in the acute phase. Resolution of the attacks occurs with curative treatment of the thyrotoxicosis, either with surgery or radioiodine ablation. Our patient's thyroid function rapidly normalised and his episodes of weakness completely resolved. The Carbimazole was titrated down and his TSH fell below the normal range. This caused his symptoms of weakness to transiently return. Due to his young age and the severity of his weakness in the context of thyrotoxicosis we recommended proceeding to curative thyroidectomy. The risk of radiation induced thyroiditis causing severe paralysis was deemed to be unacceptable.

DOI: 10.1530/endoabs.91.WC16

Workshop D: Disorders of the adrenal gland

WD1**Adrenal mass and Cushing's – lessons to be learned?**

Amy Morrison

University Hospitals of Leicester, Leicester, United Kingdom

Case

A 74-year-old female presenting with central weight gain, proximal myopathy, thin skin and bruising. Clinical examination identified central obesity, round faces, dorso-cervical and supra-clavicular fat pads.

Investigations

Bloods revealed hypokalaemia (3.2mmol/l), elevated cortisol levels (> 1000nmol/l) persisted post low dose Dexamethasone suppression test, with a suppressed ACTH (< 5). Urine free cortisol 1842nmol/24hrs (0-165). CT Chest-Abdomen-Pelvis revealed a large heterogeneous left adrenal mass (5.7x3.7 cm) with no disseminated malignancy. She commenced Metyrapone whilst awaiting surgery.

Management

In July 2021 Laparoscopic left Adrenalectomy was performed. The adrenal was noted to be ragged and distorted, 70x40x38mm weighing 51g. Histology was consistent with an adrenal cortical adenoma, Weiss score 2 (confluent necrosis and capsule invasion). Hydrocortisone replacement was commenced post-operatively. Short Synacthen Test two months later revealed a flat response (Cortisol 90 to 165nmol/l), hydrocortisone was continued. Ten months post-operatively Cushingoid features recurred; bruising, facial and abdominal weight gain, with elevated cortisol (927nmol/l) after 48hrs without Prednisolone. CTCAP revealed disseminated metastatic disease; multiple nodules in the left upper quadrant at the adrenalectomy bed, adjacent to the pancreas and splenic flexure, lung (2.2 cm right lower lobe) and liver metastases. No resectable targets were identified. Metyrapone was re-commenced, she was referred to Cambridge to start Mitotane and EDP Chemotherapy (Etoposide, Doxorubicin, Cisplatin). Urine steroid profile revealed high cortisol metabolites suggestive of Cushing's recurrence. Repeat urine steroid profile in June 2022 indicated treatment with Metyrapone had improved total cortisol metabolites with a corresponding increase in androgen metabolite levels. The initial histology of the adrenalectomy was re-reviewed in light of the aggressive behaviour clinically. It was found to contain an oncocytic component (dominant) of a higher nuclear grade and more mitotically active than the clear cell component, with resulting challenging assessment of malignant potential. Worrisome features were present; fibrous bands, disruption of reticulin architecture and prominent capsular invasion. Re-review of the initial CT, highlighted a possible tiny lung deposit, suggesting potential metastatic disease prior to the initial operation. Her most recent EDP chemotherapy occurred in October and there has been a partial response. The latest round has been delayed, as she recently presented with expressive dysphasia, an acute right pontine infarct was evident on MRI. Significant hypercholesterolemia (Total Cholesterol 19, LDL 15.5mmol/l) was apparent, likely due to persistent effects of Mitotane on free fatty acid release although stopped for a few months, and Pravastatin was commenced. She is ongoing review to assess regarding the role of further Chemotherapy.

DOI: 10.1530/endoabs.91.WD1

WD2**Composite Pheochromocytoma with Adrenocortical Carcinoma - a rare coexistence**

Aysha Sarwani, Martina Morrin, Jarushka Naidoo, Odharnaith O'Brien, Kassı Skordilis, Cliona Ryan, Neal Dugal, Arnold Hill, Shari Srinivasan, Mark Sherlock & Michael O'Reilly
Beaumont Hospital, Dublin, Ireland

A 65-year-old man presenting with urinary symptoms was incidentally discovered to have an adrenal mass on imaging. Abdominal computed tomography (CT) revealed a 9.5 x 8 cm heterogenous solid right adrenal tumour with no evidence of metastatic disease. Family history included a brother who died from metastatic carcinoid and another brother who died from metastatic neuroendocrine tumour. The initial differential lay between adrenocortical carcinoma (ACC) or a pheochromocytoma. The plasma fractionated normetanephrine was elevated at 14439 pmol/l(0-1180), metanephrine 15202 pmol/l(0-510), 3-MT 415 pmol/l(0-180) led to a presumed preoperative diagnosis of pheochromocytoma. However, there was also evidence of autonomous cortisol secretion with a positive overnight dexamethasone suppression test of 209 nmol/l, a suppressed ACTH and an elevated DHEAS of 14.9 umol/l. An I-123 metaiodobenzylguanidine (MIBG) scan demonstrated heterogenous avidity in the adrenal lesion. Due to his previous surgeries, right adrenalectomy via an open right subcostal approach was opted with a possible capsule breach. Histology of the resected tumour was consistent with an 8 cm, 222g phaeochromocytoma with a PASS of 11/20 with areas of atypical mitoses, tumour stain positive for synaptophysin and chromogranin-A, S100, melan-A and inhibin, however

calretinin was negative. Ten weeks post operatively CT scan demonstrated significant disease recurrence in the tumour bed with a 9.4 x 5.2 cm in size mass with encasement of the IVC and other vessels and perinephric tumour deposits and a mass invading a segment of the liver. Plasma metanephrines were normal and the lesions were not MIBG-avid. A significant elevation in DHEAS to > 27umol/l with normal plasma metanephrine was highly suggestive of adrenocortical carcinoma. A CT guided biopsy was consistent with adrenocortical carcinoma. Histology demonstrated pleomorphic cells with mitotic rate 12/10 hpf. Immunohistochemistry was positive for adrenocortical markers for Melan A, inhibin and synaptophysin with a Ki67 proliferation 80-90%. On comparison with the previous resected specimen, the appearance was morphologically similar, although elements of medullary neoplasia were also present making this an extremely challenging histological diagnosis. He had negative genetic testing for the MEN1 gene, including DP53, AIP MEN1, CDKN1B, RET and CDC73. He was diagnosed as metastatic adrenocortical carcinoma with malignant Cushing's syndrome and commenced on mitotane and received six cycles of Cisplatin/Etoposide/Doxorubicin. His symptoms of Cushing's improved and serial imaging following the completion of chemotherapy shows an excellent response to treatment, with reduction of the tumour burden in the liver and adrenal bed.

DOI: 10.1530/endoabs.91.WD2

WD3**Uncovering the Hidden Link - A Case Report of Cushing's Syndrome Masquerading as Type 2 Diabetes**

Abigail Mula, Sarah Craus & David Coppini

Mater Dei Hospital, Msida, Malta

A 52 year-old female, newly diagnosed with Type 2 Diabetes during pre-operative assessment for cholecystectomy, was referred to Diabetes clinic. An initial trial of metformin was discontinued in view of intolerable gastrointestinal side effects and the patient was started on low dose gliclazide. The patient's main concern was her struggle to lose weight despite lifestyle measures, a seemingly common issue faced by patients with diabetes on sulphonylureas.

On further examination the patient was noted to be plethoric, with a centripetal fat distribution and interscapular fat accumulation. Proximal myopathy was also noted. Hypertension was confirmed with a blood pressure of 180/90mmHg at clinic. Given the above investigations were consistent with Cushing's syndrome, a non-contrast Computed Tomography (CT) Scan of the adrenal glands was done. This showed a 2.7 cm right adrenal nodule with an attenuation of 9 HU, compatible with an adenoma whereas the left adrenal gland was normal in size. The endocrine surgeons were subsequently involved and the patient underwent a laparoscopic right adrenalectomy three months later. In the interim she was optimised with adequate glycaemic and blood pressure control. Throughout this period the patient complained of worsening proximal myopathy, and was thus given a trial of metyrapone. At induction of surgery the patient was given 100 mg of Hydrocortisone and subsequently kept on 50 mg Hydrocortisone 6 hourly while nil by mouth. At day 2 after surgery, 9am cortisol was repeated (having omitted last evening and first morning hydrocortisone doses) in order to ensure the adenoma had been excised. A cortisol level of 62 nmol/l meant that although an appreciable difference was notable the patient will need to be surveilled closely for recurrence. Histology later confirmed an adenoma with no suspicious features. Oral hydrocortisone at a dose of 20 mg-10 mg-10 mg was started once the patient was tolerating oral intake. This was tailed down gradually with decrements of 5 mg of hydrocortisone per month. The patient is currently off antihypertensive therapy and demonstrates improved glycaemic control with a single daily dose of gliclazide.

The patient was investigated as follows:

| Investigation | Result | Reference range |
|---|-------------------|-----------------------|
| 24 hour urinary Cortisol | 938 nmol/24hrs | 57.7-806.8 nmol/24hrs |
| 9am Cortisol | 462 nmol/l | 145.4-619.4 nmol/l |
| 9am Cortisol post Overnight Dexamethasone Suppression Test (ODST) | 418 nmol/l | <50 nmol/l |
| Adrenocorticotropic Hormone (ACTH) | < 5 pg/ml | 10-48 pg/ml |

DOI: 10.1530/endoabs.91.WD3

WD4**Cushing's syndrome: keep searching, and then search for more!**

Ashutosh Kapoor, Ainesh Singh, Erika Vaineri, Rochan Agha-Jaffar, Ben Jones, Jeremy Cox, Florian Wernig, Stephen Robinson & May Al-Sahaf
Imperial College Healthcare NHS Trust, London, United Kingdom

We present the case of a 53-year-old lady who was recently diagnosed with Type 2 Diabetes, Hypertension and Dyslipidaemia. She was referred by the lipid clinic with a 3-month history of progressive facial swelling, hyperpigmentation and proximal myopathy. Clinical history and examination were highly suspicious of endogenous hypercortisolaemia. An initial overnight dexamethasone suppression test yielded an elevated morning cortisol (752 nmol/l, normal <50nmol/l). Two 24-hour urine collections revealed markedly elevated urinary free cortisol values (1917nmol/day, 1511 nmol/day). The low-dose dexamethasone suppression test demonstrated an inability of cortisol suppression (basal cortisol 606 nmol/l, Time = 48 hours 642 nmol/l), accompanied by a high ACTH (basal 48.5 ng/l, Time = 48 hours 49.5 ng/l) indicating ACTH-dependent Cushing's syndrome. Ketoconazole therapy was commenced to alleviate hypercortisolaemia, alongside anti-hypertensive and glycaemic agents. This was beneficial for blood pressure and glycaemic management. An MRI adrenal scan showed bulky adrenal glands with no discrete lesion. An MRI Pituitary showed increased size and heterogeneity of the signal at the left lateral aspect, with infundibulum deviation to the left; however, no discrete lesion or contrast-enhancing characteristics were identified. The patient underwent inferior petrosus sinus sampling which did not show a central-to-peripheral ACTH gradient, in keeping with an ectopic source of ACTH. Upon review of previous imaging performed to look for unrelated coronary artery calcification, the presence of a small 6mm lesion was noted in the Lingula of the lung. In light of the clinical, radiological, and IPSS findings, a Gallium-68 DOTATATE PET scan was performed, confirming the presence of an 8mm tracer-avid carcinoid nodule in the lingula believed to be the source of the ectopic ACTH production (not amenable to biopsy but resectable). Ketoconazole was stopped prior to surgery and the patient underwent a left VATS lingulectomy and lymphadenectomy for resection of the nodule, staged as T1a N0 PLO R0, with histology findings consistent with Carcinoid. Postoperatively, the hypercortisolaemia improved (morning cortisol of 45 nmol/l). She was provided with steroid cover and the prednisolone was weaned following surgery. She has remained stable with satisfactory blood pressure and glycaemic control: her symptomatology has additionally improved. Ectopic ACTH secretion is a rare condition which accounts for approximately 10% of ACTH-dependent Cushing cases. This case illustrates the importance of a methodical diagnostic approach in an individual with overt clinical and biochemical hypercortisolaemia and highlights the need of an MDT approach for prompt intervention.

DOI: 10.1530/endoabs.91.WD4

WD5

The impact of covid-19 infection on the diagnosis and management of adrenocortical carcinoma

Isabelle van Heeswijk, Mohamed Bakhit, Roger Stanworth & David Hughes
University Hospitals of Derby and Burton, Derby, United Kingdom

Background

Adrenocortical carcinoma (ACC) is a rare malignant tumour of the adrenal cortex with an incidence of 0.7-2.0 per million per year. The majority are steroid-producing with non-ACTH dependent hypercortisolism the most frequent biochemical abnormality. Around 10-15% of cases are picked up incidentally on abdominal imaging. Management of ACC during the covid-19 pandemic poses specific challenges. We present the case of a 69-year-old man who was found to have a massive incidental ACC and whose investigations and management were complicated by infection with covid-19.

Case

The patient had a background of heart failure, hypertension and benign prostatic hyperplasia. He was admitted with shortness of breath due to bilateral PEs. An incidental mixed attenuation adrenal lesion measuring 19 x 11 x 18 cm was identified on CTPA. On clinical examination, he was noted to have marked proximal myopathy. Initial biochemical investigations revealed hypernatraemia and hypokalaemia and baseline endocrine investigations showed a morning cortisol of 634 nmol/l with suppressed ACTH. Further work up including FDG-PET CT, 24-hour urine cortisol, urine steroid profile (USP) and overnight dexamethasone were planned. However, prior to completing these investigations, the patient was admitted with covid-19 pneumonitis, necessitating oxygen therapy and IV dexamethasone. This posed specific challenges in diagnosing clinically significant cortisol excess while on glucocorticoid treatment. Ultimately, persistently elevated cortisol levels between 600-900 nmol/l despite 6.6 mg IV dexamethasone were suggestive of autonomous cortisol secretion. USP results obtained during the admission confirmed ACC. The patient was rapidly weaned from dexamethasone and initiated on metyrapone with hydrocortisone and spironolactone. Due to his pre-existing comorbidity and the additional impact of covid pneumonitis on his performance status, he was deemed unfit for surgery and mitotane by the adrenal MDT and a palliative care approach was adopted.

Discussion

Studies in to the impact of covid-19 on ACC management and prognosis are limited. Contracting covid-19 has implications for ACC management, including

use of mitotane and chemotherapy which are both contraindicated during covid infection, as in this case. In addition, ACC and glucocorticoid excess both increase the risk of complications from covid-19 with a greater burden of metastatic disease associated with increased mortality. This case illustrates some of the challenges in managing ACC when complicated by covid-19 infection as well as the poor prognosis of patients facing this combination of disease entities.

DOI: 10.1530/endoabs.91.WD5

WD6

Unusual Presentation of Adrenocortical Cancer

Kyaw Linn Su Khin¹, Agata Juszcak¹, Cristina Ronchi^{1,2},
Kassiani Skordis³, Miriam Asia³, Max Almond³, Ben Miller³ & Myat Myat Thaw³¹University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom; ²University of Birmingham, Birmingham, United Kingdom; ³University of Birmingham NHS Foundation Trust, Birmingham, United Kingdom

Background

Adrenocortical cancer (ACC) is a very rare but aggressive tumour with annual incidence of 2 cases per million populations. Hypercalcaemia is a commonly encountered paraneoplastic manifestation of certain cancers such as lung, breast, kidney, gynaecological and neuroendocrine tumours but very rare in ACC. So far, there are only two cases of ACC and PTHrP-related hypercalcaemia reported in the literature.

Case report

32-year-old man presented with one-week history of constant vomiting, constipation, 1-stone weight loss and lethargy. He was found to have severe hypercalcaemia with corrected calcium (CCa) of 3.55mmol/l, low phosphate level of 0.54mmol/l with normal renal function on routine biochemical workup. His parathyroid hormone (PTH) was suppressed at 0.4 pmol/l and his vitamin D was 32.5nmol/l. His myeloma screening was negative, ACE, thyroid function and LDH were normal. PTHrP was elevated at 15.8pg/ml (reference <13.9). The abdominal ultrasound showed suspected right adrenal mass. CT scan confirmed a 9.4x7 cm heterogeneous right adrenal mass with no evidence of lymphadenopathy or metastases. His baseline endocrine work up showed failed overnight dexamethasone suppression test failed (cortisol 128nmol/l), normal DHEAS but slightly elevated androstenedione (6.9nmol/l), testosterone level 19.4nmol/l with normal LH, and normal plasma metanephrines. The 24 hour urinary steroid metabolomics profile was consistent with an androgen- and glucocorticoid-producing ACC. He required admissions for intravenous fluids and pamidronate treatment twice before he underwent open right adrenalectomy and histology confirmed adrenocortical carcinoma with Weiss score of 6 and Ki67 index 40%. PTH staining was negative. His calcium normalised after adrenalectomy (CCa 2.4 mmol/l). He was started on adjuvant mitotane treatment due to high proliferation index and is being followed up in our adrenal clinic for disease monitoring.

Conclusion

PTHrP-related hypercalcaemia is not commonly associated with ACC and carries a poor prognosis. In this case, staining for PTH was negative but this does not exclude that the tumour was excreting it if it was released quickly. The normalisation of calcium post-ACC resection confirmed the source of PTHrP.

References

1. Marthe Rizk-Rabin, et tal., Differential expression of Parathyroid Hormone-related Protein in Adrenocortical tumours: Autocrine/ Paracrine effects on the growth and signalling pathways in H295R cells, Cancer Epidemiology Biomarkers 2008.
2. Sven Gruber, et tal., Paraneoplastic hypercalcaemia in a PTH Producing Adrenocortical Carcinoma – a Rare and Deadly Condition, Journal of the endocrine Society.
3. S M Orland, et tal., Detection of the hypercalcaemic hormone of malignancy in an adrenal cortical carcinoma, Journal of Urology, 1986 Nov

DOI: 10.1530/endoabs.91.WD6

WD7

Hang in there; be patient!

Henna Patel, Nadia Osman & William Drake
Bart's Health Trust, London, United Kingdom

In 2009 a 39 year old gentleman presented to the Endocrine clinic with symptoms, signs and biochemistry consistent with severe glucocorticoid excess (urinary free cortisol level was significantly raised at >1380mol/24 hours, normal up to 124;

early morning cortisol levels varying between 760nmol/l and 1225nmol/l with failure of suppression on a low dose dexamethasone suppression test). An ACTH level taken at this time was 43ng/l. He underwent an MRI pituitary gland which showed a normal gland with no evidence of an adenoma. He also underwent inferior petrosal sinus sampling; this showed consistent ACTH level several minutes following CRH stimulation; confirming ectopic ACTH secretion. Cross-sectional and nuclear medicine imaging showed no evidence of an ectopic source of ACTH. He was started on a combination of metyrapone, ketoconazole and hydrocortisone, via a block and replace regimen, to manage his symptoms as discussions and decisions were made about definitive intervention. Although initially hesitant, hypercortisolaemic complications (including vertebral crush fractures, reduced mobility and difficult glycaemic control) were important in the patient agreeing to a bilateral adrenalectomy. This was performed with good outcome at the end of 2009. He was started on hydrocortisone and fludrocortisone replacement and made significant improvement in his physical symptoms. He returned to work and remains well, active on maintenance SSRI therapy for mood. Between 2010 and 2022 he had intermittent imaging, recognising the issue of radiation exposure, but no source of ACTH production was identified. In December 2022, 13 years after the original diagnosis, a Dotatate scan identified a 9mm left lower lobe lung nodule demonstrating somatostatin receptor activity. He has subsequently been referred to the thoracic surgeons for removal. Ectopic ACTH secretion accounts for around 10% of cases of ACTH-dependent Cushing's disease. The clinical features are similar to that of a pituitary source of Cushing's, but frequently more severe. Having confirmed ACTH-mediated cortisol excess, the gold standard investigation to differentiate a pituitary from an ectopic source is inferior petrosal sinus sampling before and after injection of CRH.¹ Ideally the definitive management plan would be to remove the source of ectopic ACTH however as seen in this case the identification of this ectopic source can be difficult and given debilitating symptoms of Cushing's this may be time sensitive. Bilateral adrenalectomy is an excellent treatment in this situation but efforts should continue to locate the primary source of ACTH excess.

DOI: 10.1530/endoabs.91.WD7

WD8

Can serum ACTH level be reliably interpreted in the diagnostic work-up for Cushing in adrenal incidentalomas?

Irfan Iqbal Khan^{1,2}, Abuzar Awadelkareem², Catherine Napier¹ & Yaasir Mamoojee¹

¹Royal Victoria Infirmary Hospital, Newcastle, United Kingdom; ²Darlington Memorial Hospital, Darlington, United Kingdom

Diagnostic work-up for Cushing Syndrome (CS) can be challenging and is based on clinical and biochemical assessment. Biochemical evidence of endogenous steroid excess is demonstrated through overnight dexamethasone suppression test (ODST), low dose dexamethasone suppression test and/or 24-hour urinary free cortisol estimation (UFC). Once endogenous steroid excess is confirmed, random serum ACTH measurement is key in determining the suspected source of steroid excess: ACTH-independent (adrenal cause) or ACTH-dependent Cushing (pituitary or ectopic ACTH secretion). We report a case of CS where the serum ACTH caused diagnostic confusion during work-up for adrenal incidentalomas. 55-year-old female with history of Type II diabetes mellitus, Hypertension, psychosis and Ischaemic heart disease was seen for an incidental finding of Left adrenal mass. She was on medication for ischemic heart disease, diabetes, arthritis and centrally acting drugs in the form of Quetiapine, gabapentin, Duloxetine. She was seen 5 years back at another hospital for same and discharged labelled as normal hormonal work up. She reported Ongoing weight gain, Excessive hair growth and she had Cushingoid features Flushed face, thinning of skin, abdominal striae, Central adiposity, Proximal myopathy and diabetes was poorly controlled despite been on insulin. Her Random ACTH were 13 and 17. Her cortisol didn't suppress on Low dose and high dose dexamethasone suppression test. Her urinary steroid profile was supportive of Cushing's. The reason for ACTH not being fully suppressed was unclear. We reviewed imaging in MDT and it was found that there was Left adrenal adenoma which was static in size but there was hyperplasia of right adrenal on retrospective review. DDAVP was positive with Increase in ACTH and cortisol. MRI pituitary was discussed in MDT and there was debate whether it is normal or there is small adenoma. IPSS was positive with lateralization to one side confirming pituitary Cushing. ACTH was low despite being pituitary Cushing likely due to centrally acting drugs. This leads to discussion around the Cushing's work-up in patients presenting through the adrenal incidentaloma pathway:

- Clinical assessment of pretest probability is very important
- ACTH levels and Dex suppression testing should be interpreted carefully
- We should take into consideration centrally-acting drugs
- Review CT adrenals in MDT – is the 'normal' adrenal normal looking?

DOI: 10.1530/endoabs.91.WD8

WD9

White hair and loss of eyebrows: An unusual presentation of ACC Layla Thurston, Aimee Di Marco, Michael Seckl & Florian Wernig Imperial College Healthcare NHS Trust, London, United Kingdom

A 57-year-old gentleman presented with a very sudden change in hair colour to bright white and eyebrow loss. On further questioning, he had been shaving much less and had not been getting any erections. On examination he had gynecomastia. Initial blood tests showed hypogonadotropic hypogonadism (LH 0.6 IU/l, FSH 0.1 IU/l, testosterone 1.6 nmol/l) with an otherwise normal anterior pituitary hormonal profile. Oestradiol was found to be significantly elevated at 582 pmol/l. He was investigated for a possible testicular tumour which proved negative. He went on to have MRI of his adrenal glands which elucidated a large and suspicious mass in the right retroperitoneum. CT scanning confirmed this mass, of approximately 11 cm, was most likely to be adrenal in nature with concerns of invasion of the liver, right kidney, renal vein and inferior vena cava. FDG-PET showed that the adrenal lesion was FDG avid with no evidence of other sites of disease. A provisional diagnosis of adrenocortical carcinoma (ACC) ENSAT stage II was made. The adrenal MDT reviewed a scan from three years previously which showed a 10 mm right adrenal indeterminate lesion at that time. He underwent a right open adrenalectomy for removal of the adrenal lesion. The tumour was carefully dissected out without any spillage or capsular breach. Histology showed the tumour had a high Weiss score of 8 with a mitotic count of 10/50 HPF and Ki67 proliferation index was 20-25%. The lesion showed extra-adrenal extension with vascular and perineural invasion. Post-operative oestradiol levels normalised to 182 pmol/l, and testosterone recovered to 21 nmol/l. As the risk of recurrence was high, he completed six cycles of adjuvant EDP chemotherapy (etoposide, doxorubicin and cisplatin). He was also started on mitotane post-operatively which was uptitrated to 1.5 g twice daily plus prednisolone 4 mg daily. Nine months after surgery, his oestradiol began to increase again. On a CT thorax he was found to have pulmonary nodules and underwent VATS wedge resections. Histopathology confirmed metastatic ACC and genomic testing did not identify actionable mutations. Following MDT discussion, he was commenced on sunitinib and after three months of treatment, oestradiol remained elevated and a trial of letrozole was added. He went on to have radiofrequency ablation for liver metastases with subsequent gemcitabine and capecitabine chemotherapy after further disease progression. This case illustrates the challenges of managing a case of an aggressive oestrogen-secreting metastatic ACC.

DOI: 10.1530/endoabs.91.WD9

WD10

Adrenocortical carcinoma, a rare but aggressive tumour

Maria Omer & Pallavi Hegde

Royal Liverpool and Broadgreen University Hospitals NHS Trust, Liverpool, United Kingdom

Case summary

A 40 year-old lady, who has a background of asthma, presented to emergency department with back pain radiated down to her left leg with associated foot drop. She also complained of 2 months history of weight gain, hirsutism, and menstrual disturbance. Clinical examination confirmed that she had some cushingoid features. Further assessment and investigations revealed that she had acute disc prolapse on MRI as well as an incidental finding of right adrenal gland and some indeterminate lesions in the iliac bones. Further CT-TAP confirmed that she had a large tumour in the right adrenal gland, 7.4 x 12.2 cm, highly suspicious of malignancy with multiple pleural-based intrathoracic nodules suggesting metastases. Following discussion at the adrenal MDT, further investigations such as PET CT, adrenal biopsy and secretion studies which were arranged on the back of high suspicion for adrenal cortical carcinoma (ACC). Secretion studies confirmed hyperandrogenism with high androstenedione at 25.2 nmol/l (1.0-8.5 nmol/l), testosterone level 4.0 nmol/l (<1.9 nmol/l), DHEAS >27 (0.3-12.0 umol/l). Cortisol was 728nmol/l with ACTH of 0.7 pmol/l. Rest of the biochemistry, renin and aldosterone ratio and plasma metadrenalines were unremarkable. PET scan showed high uptake in the right adrenal mass with some areas of calcification in keeping with malignancy, multiple pleural nodules bilaterally consistent with metastatic lesions and no evidence of definite FDG avid destructive bone lesion. US guided biopsy confirmed an adrenal cortical origin Systemic chemotherapy was started for ACC under Oncology service and genetic screening was organised.

Conclusion

ACC tumours are rare, but often aggressive in nature. It is important to have high index of suspicion for these lesions whenever it is relevant like in this case. ACC could be functional and cause Cushing's syndrome and/or virilization, or non-functional and could present with manifestations related to tumour growth (i.e. abdominal or flank pain). It is not uncommon for these lesions to present as

incidentaloma especially if the subtle clinical signs are overlooked in an otherwise fit and young patient like ours. This also highlights the importance of having a dedicated adrenal MDT service for these patients through which investigations and referrals to appropriate specialties could be arranged without any undue delay and timely treatment could be initiated.

DOI: 10.1530/endoabs.91.WD10

WD11

Desmopressin Test – any use in Cushing's?

Kirsty Wood & Prakash Abraham

Aberdeen Royal Infirmary, Aberdeen, United Kingdom

Identifying the cause of hypercortisolism is vital in ensuring the correct treatment plan for a patient. I present the case of a patient in whom the desmopressin test, as an adjunct to the CRH test, proved helpful in determining the cause. A 27 year old man who initially presented with weight gain, abdominal striae and sweating was admitted with low mood, anxiety and suicidal ideation. Tests showed elevated 24 hour urinary cortisol (highest 1446 nmol/24 hours), random cortisol (624 nmol/l) and ACTH (98 ng/l). Cortisol did not suppress after low dose dexamethasone suppression test (DST)(625 nmol/l). Cortisol suppressed by 60% to 259 nmol/l in high dose DST. MRI pituitary showed a 5mm adenoma and CT thorax, abdomen and pelvis was normal. He commenced on Metyrapone. There was a rise in cortisol and ACTH during CRH and desmopressin tests consistent with pituitary Cushing's disease and he proceeded to transphenoidal surgery (TSS), achieving biochemical cure with day 2 morning cortisol of 46 nmol/l.

Discussion

It is imperative to identify the cause of ACTH dependent hypercortisolism before proceeding to TSS but this can be challenging as biochemical and imaging tests have limitations. MRI fails to identify a surgical target in up to 40% of patients with Cushing's disease and may incorrectly implicate an incidentaloma. Bilateral inferior petrosal sinus sampling is more invasive, availability can be limited and success depends on surgical expertise. Methionine PET can effectively locate a corticotroph adenoma but is not yet widely available. The 2008 Endocrine Society Guideline advises confirming endogenous hypercortisolism with screening tests and then proceeding to CRH test but advised against using the desmopressin test until additional data validates it. Since then, research has established an adjunctive role of desmopressin testing in the diagnostic workup of ACTH dependent hypercortisolism. In the presented case, the combination of CRH and desmopressin tests, both consistent with pituitary Cushing's disease provided the confidence with proceeding to TSS, resulting in cure. Given the recent announcement of a shortage of hCRH in the UK, the guidance around investigating hypercortisolism will be reviewed and more data on the desmopressin test could clarify its role.

Table 1: Desmopressin test results

| Time (mins) | -15 | 0 | 15 | 30 | 45 | 60 | 90 | 120 |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Cortisol (nmol/l) | 584 | 601 | 706 | 717 | 639 | 644 | 575 | 591 |
| ACTH (ng/l)(7-56) | 88 | 96 | 158 | 133 | 113 | 104 | 93 | 86 |

DOI: 10.1530/endoabs.91.WD11

WD12

Primary bilateral macronodular adrenal hyperplasia as a cause for Cushing syndrome

Mohammed Shamsaldeen & Janki Panicker

Royal Liverpool Hospital, Liverpool, United Kingdom

Introduction

Primary bilateral macronodular adrenal hyperplasia (PBMAH) is a rare cause of Cushing's syndrome and is more often diagnosed as bilateral adrenal incidentalomas with subclinical cortisol production. It is mainly a heterogeneous disease, but familial cases have been reported. Treatment of PBMAH with overt Cushing's syndrome is usually bilateral adrenalectomy with unilateral adrenalectomy occasionally used to normalize urinary free cortisol (UFC) in patients with less severe Cushing's syndrome.

Case summary

51-year-old male, known to have migraine, hypertension, dyslipidaemia and generalized anxiety disorder for which he takes topiramate 100 mgs bd, Lisinopril od, Indapamide 2.5 mgs od, and Atorvastatin 20 mgs od. He was investigated for chest pain with CT scan which shown incidental multiple bilateral intermediate adrenal lesions (Bilateral nodular adrenal hyperplasia, right > left). Further assessment in Endocrine clinic revealed central obesity, plethoric face and

emotional lability, otherwise unremarkable history and examination. Investigations showed 24-hour urinary cortisol was 117 nmol (Normal value < 165nmol/24hours) and his urine was negative for catecholamines. Overnight Dexamethasone suppression test was unsuppressed at 370 nmol/l starting at 570 nmol/l and his ACTH was suppressed at 0.4 pmol/l (2.0 - 11.0 pmol/l). His cortisol failed to suppress with high dose Dexamethasone suppression test (day 1 cortisol 500 nmol/l, day 3 cortisol 561 nmol/l, day 5 cortisol 508 nmol/l). MRI scan of his pituitary showed a normal enhancing pituitary with no evidence of any pituitary tumour. Adrenal Venous sampling did not revealed any lateralization. Bilateral laparoscopic adrenalectomy was performed, and post-operative Hydrocortisone and fludrocortisone were started. Histology has shown Primary Bilateral Macronodular Adrenal hyperplasia (PBMAH). Furthermore, Genetic testing consist with a 'genetic diagnosis of ARMC5-related ACTH-independent macronodular adrenal hyperplasia type2' with recommendation to refer the offspring to clinical genetics as would be 50% change of inheritance.

Conclusion

A significant proportion of what is thought to be sporadic cases of bilateral macronodular adrenal hyperplasia are due to ARMC5 genetic mutations and family history is not a reliable indicator. Patients with large multinodular adrenal gland and cortisol excess may be more likely to harbour ARMC5 germline mutation and there should be a low threshold for genetic testing.

DOI: 10.1530/endoabs.91.WD12

WD13

Adrenal Cortical Carcinoma

Isuri Kurera & Sabyasachi Roy

Frimley Park Hospital, Frimley, United Kingdom

Adrenal cortical carcinoma (ACC) is extremely rare, the incidence is 0.5 - 2 cases per million populations per year. Most ACCs occur as sporadic tumours. It is more common in females and can occur at any age with a peak in fifth and sixth decades of life. We present a 45-year-old otherwise well and fit lady presented with headache, lethargy, and two stone rapid weight gain over a period of 6 months. She also had associated nocturia, insomnia, night sweats, hirsutism, and acne. Her initial clinical examination revealed new onset of hypertension 190/120 mmHg and spontaneous hypokalaemia required attendance to ambulatory care unit for intravenous potassium replacement. She had raised aldosterone at 1600, suppressed renin with low potassium of 2.5. Her overnight dexamethasone suppression test failed to suppress cortisol this was 730. Her ACTH was suppressed < 3 and a 24-hour urine cortisol was high at 729 (150-350). Her testosterone was raised at 4.5 pmol and adrenal androgens were also raised. She did not have diabetes or osteoporosis, HbA1c was 41mmol/mol. Urgent adrenal imaging revealed a 15 cm large heterogenous left adrenal mass radiologically keeping in with likely ACC. Her urine steroid profile revealed the metabolites confirming the diagnosis of ACC. Overall biochemical findings were keeping in with multiple hormones producing ACC (producing glucocorticoids, mineralocorticoids and androgens). Her completion staging CT has not confirmed any distant metastasis. She was commenced on Amlodipine, Spironolactone and Ketoconazole for preoperative optimisation. Then she underwent radical left adrenalectomy, left nephrectomy, distal pancreatectomy, and splenectomy. She had a uneventful recovery and remained on hydrocortisone replacement and was commenced on Mitotane for a planned two year course. Her initial imaging 3 months after surgery was satisfactory, however her repeat PET scan in 6 months revealed PET avid lesion in adrenal bed this was thought to be incomplete clearance rather than recurrence. MDT decision was to commence on systemic EDP chemotherapy for 6 months and repeat PET to consider redo surgery. Her latest imaging following completion EDP chemotherapy revealed complete metabolic remission. She is to continue mitotane for 2 years and to continue 3 monthly imaging. She has developed a left ovarian cyst now under surveillance and primary hypothyroidism requiring Levothyroxine replacement thought to be secondary to effects of chemotherapy. She currently also remains on Hydrocortisone replacement until she completes Mitotane thereafter short synacthen test to review her adrenal reserves.

DOI: 10.1530/endoabs.91.WD13

WD14

Life-threatening hypokalaemia heralding the diagnosis of metastatic Adrenocortical Cancer (ACC) with 11-deoxycortisol hypersecretion

Tara McDonnell¹, Cussen Leanne¹, Clare Miller¹, Carla Moran², Neil Dugal³, Mark Sherlock¹ & Michael O'Reilly¹

¹Department of Endocrinology, Beaumont Hospital, Dublin, Ireland; ²Beacon Hospital, Dublin, Ireland; ³Department of Surgery, Beaumont Hospital, Dublin, Ireland

A 51 year old presented with headaches, fatigue and generalised weakness. She had a background history of hypertension diagnosed one year prior to presentation. Initial laboratory evaluation demonstrated life-threatening hypokalaemia, potassium 0.9mmol/l(R.I. 3.5-5.3). This profound hypokalaemia required ICU admission for replacement of potassium and monitoring. Management of subsequent fluid overload necessitated a brief period of hemofiltration. During the course of evaluation a 20 cm adrenal mass was discovered with nodal, hepatic and pulmonary lesions, which were FDG avid on PET imaging. Radiology was concerning for metastatic ACC and hormonal evaluation reported elevated 11-dexocortisol (DOC) levels, 100 times higher than the upper limit of the reference. Overnight dexamethasone suppression test cortisol was 127nmol/l with low adrenal androgens DHEAS 0.4 umol/l(1.0-7.0.), DHEA 2.1nmol/l(3.1 -33), Androstenedione 1.05 nmol/l(1.39-9.77) and low testosterone <0.4nmol/l. Aldosterone was 825 pmol/l(0-1179) with renin 8.5 mIU/l. Following multidisciplinary input, open cytoreductive adrenalectomy and nephrectomy was planned. Pre-operatively hypokalaemia and hypertension were managed with oral potassium replacement, spironolactone, ramipril, amlodipine and doxazosin. Subsequent histology confirmed metastatic ACC with hepatic and nodal involvement, Weiss score 5/9, Ki67 score 20%. Her post-operative course has been complicated by decompensated heart failure aggravated by tumour related mineralocorticoid and glucocorticoid excess. Mitotane and replacement hydrocortisone have been initiated post-operatively with systemic chemotherapy planned in light of disease progression. First post-operative 11-DOC levels are suppressed. Persistent PTH-dependent hypercalcaemia has prompted genetic evaluation for MEN-1, results are awaited. This complex case highlights the complications of hormonal hypersecretion associated with ACC and the profound hypokalaemia that can result from 11-DOC hypersecretion.

DOI: 10.1530/endoabs.91.WD14

WD15

Uncovering the Rare: Managing a case of ‘Cushing’s Crisis’
Quazi Islam, Eleni Armeni, Bernard Khoo, Irinia Mladenova, Ammara Naeem, Dipesh Patel, Saroj Sahoo, Kalyan Shekhda, Ahmed Yousseif, Ashley Grossman & Efthimia Karra
Royal Free Hospital, London, United Kingdom

Introduction

Cushing’s syndrome is a rare endocrine disorder characterized by excess cortisol secretion. It can be caused by various etiologies, including ACTH-dependent and ACTH-independent forms. We report a case of a 78-year-old male who presented with severe hypertension, refractory hypokalaemia, and severe hypercortisolism, diagnosed with ACTH-dependent Cushing’s syndrome with bilateral adrenal hyperplasia.

Case Presentation

A 78-year-old male presented to emergency department with severe hypertension of 215/125 mmHg and refractory hypokalaemia of 2.4 mmol/l(Normal: 3.5 - 5.1) not normalizing after 120 mmol of IV potassium chloride replacement. Serum cortisol level was significantly elevated at 2934 nmol/l(Normal: 172 - 497), with a paired ACTH level of 250 ng/l(Normal: 7.2 - 63.3) confirming ACTH-dependent etiology. Imaging studies, including CT adrenals, MRI pituitary, CT Chest Abdomen and Pelvis, Ga68 Dotatate and FDG PET scan, failed to demonstrate an ectopic source of ACTH or a pituitary adenoma. With the clinical suspicion of Cushing’s crisis, he was immediately treated with IV Etomidate infusion to control severe hypercortisolism.

Treatment and Outcome

During admission, he developed recurrent infections including atypical pneumonia, C. diff and CoViD -19, likely due to his immunosuppressed state resulting from prolonged hypercortisolism. He was stabilized with ketoconazole, metyrapone and prednisolone as a block-and-replace regimen. Following treatment, his cortisol level gradually decreased to 162 nmol/l. He was planned for inferior petrosal sinus sampling (IPSS) to assess pituitary source of ACTH. Because of anatomical difficulties in cannulation of right jugular vein, his IPSS was unsuccessful, and the procedure was abandoned. Bilateral adrenalectomy was considered, but after achieving clinical stability on metyrapone and prednisolone as block-and-replace, this was not carried out.

Discussion

This case highlights the diagnostic and therapeutic challenges of managing ACTH-dependent Cushing’s syndrome. Imaging studies are essential to identify

the underlying cause of Cushing’s syndrome, and bilateral adrenal enlargement can be challenging to diagnose due to its rarity. The use of Etomidate infusion in the management of Cushing’s crisis has been well established in the literature in managing severe hypercortisolism by inhibiting steroidogenesis.

Conclusion

In conclusion, this case report emphasizes the importance of timely diagnosis and management of Cushing’s Crisis, which is a rare endocrine emergency. Severe hypercortisolism can lead to multiple complications, including severe hypertension, refractory hypokalaemia, high risk infection, venous thromboembolism, and GI bleed with high mortality. High index of clinical suspicion and prompt management with IV Etomidate infusion remains pivotal managing Cushing’s crisis.

DOI: 10.1530/endoabs.91.WD15

WD16

Diagnosis of Cushing’s in the presence of unilateral adrenal adenoma: not always what it seems

Xiao ying Khor¹, Waseem Majeed^{1,2} & Akheel Syed^{1,2}

¹Department of Diabetes, Endocrinology and Obesity Medicine, Salford Royal NHS Foundation Trust, Salford, United Kingdom; ²Faculty of Biology, Medicine and Health, University of Manchester, Manchester, United Kingdom

Case presentation

A 34-year-old woman was diagnosed with hypertension from the age of 26 years. She had been investigated in Canada previously and discovered to have a small left adrenal nodule, satisfactory aldosterone and renin levels, but raised urinary free cortisol levels and non-suppressed cortisol levels on overnight 1 mg dexamethasone suppression test. Upon assessment in our service, the patient reported a history of easy bruising and insomnia. Her BMI was 28.1 kg/m² but there were no overt features of hypercortisolism.

Investigations

Two sets of 9 a.m. ACTH levels were 17–20 (reference range, 0–46) ng/l with cortisol of 517–673 (200–500) nmol/l. The nadir cortisol following overnight and 48-hour low dose dexamethasone suppression tests were 318 and 285 nmol/l, respectively. Paired midnight and morning salivary cortisol levels demonstrated loss of diurnal variation. Aldosterone-renin, plasma metanephrines, androgen profile and DHEA sulfate levels were satisfactory. MRI of the adrenals confirmed a left-sided adrenal adenoma measuring 2.9 x 2.2 cm. The contralateral adrenal was not atrophied. As ACTH was unsuppressed, a dynamic MRI of the pituitary was performed which showed a 4 mm right-sided microadenoma and a central cystic lesion. Pituitary profile was otherwise normal apart from a mildly raised IGF-1 at 312 (71.2–234 ng/ml) with growth hormone nadir at <0.1 ug/l on an oral glucose tolerance test. Genetic screening for multiple endocrine neoplasia was negative. Inferior petrosal sinus (IPSS) sampling demonstrated a raised central-to-peripheral ratio consistent with Cushing’s disease, lateralising to the right side (Table 1).

Management

The patient was pre-treated with Metyrapone followed by trans-sphenoidal resection of pituitary microadenoma. Histology revealed densely granulated corticotroph adenoma with Ki-67 of < 4%. Her 6-week postoperative morning ACTH was 9 ng/l and cortisol 43 nmol/l, consistent with biochemical cure. A 3-month postoperative MRI of the pituitary showed no tumour remnant. She remains on hydrocortisone replacement but is otherwise eupituitary.

Conclusion

The presence of an adrenal adenoma in a patient with biochemically confirmed hypercortisolism suggests adrenal Cushing’s syndrome. However, the non-suppressed ACTH and non-atrophied contralateral adrenal gland were clues to the diagnosis of pituitary Cushing’s disease.

Table 1 IPSS

| Time (minutes) | Peripheral ACTH* | Right-sided ACTH | Left-sided ACTH |
|----------------------|------------------|------------------|-----------------|
| -10 | 28 | 377 | 30 |
| -5 | 30 | 400 | 33 |
| 0 – CRH administered | 32 | 363 | 28 |
| 3 | 34 | > 1250 | 50 |
| 5 | 49 | > 1250 | 77 |
| 10 | 88 | > 1250 | 121 |
| 20 | 144 | > 1250 | 160 |

*ACTH, adrenocorticotrophic hormone (ng/l)

DOI: 10.1530/endoabs.91.WD16

Workshop E: Disorders of the gonads

WE1**Infertile Couple: Spermatogenesis in Congenital Panhypopituitarism**Lydia Grixti¹ & Richard Quinton²¹Northumbria NHS Trust, Newcastle Upon Tyne, United Kingdom; ²Royal Victoria Infirmary, Newcastle Upon Tyne, United Kingdom

A 31-year-old gentleman presented to our Endocrine Services with his 20-year-old fiancée with plans for marriage and to conceive. He was diagnosed with congenital panhypopituitarism and absent pituitary stalk at the age of 4. He was started on replacement growth hormone, desmopressin, levothyroxine, hydrocortisone and testosterone, in this sequence, across the years. He underwent induction of puberty at the age of 13 years. He was noticed to have bilateral cryptorchidism that failed to descend with 6 months of hCG monotherapy and underwent successful orchidopexy at the age of 15. His fiancée was a healthy, young lady with normal reproductive hormones and tubal patency confirmed on investigation. On examination he was well virilised, had a well-developed phallus and a normal BMI. Testicular examination showed small testicular volume at 2mls on the right and 5mls on the left. He reported normal libido and erectile function. Clinic discussions were held and the possibility of passing on the congenital condition to the offspring was accepted. Following baseline investigations, he proceeded to spermatogenesis induction with subcutaneous gonadotrophin injections starting as human menopausal gonadotrophin (hMG) 150IU three times weekly and recombinant human chorionic gonadotrophin (r-hCG) 2080IU twice weekly, monitored by 3-4 monthly visits. A sperm analysis around 20 months into treatment encouragingly showed evidence of sperm although the count was low. The couple preferred to continue to try for natural fertilisation methods. Approaching the end of the third year, there was no improvement in testicular volume or sperm analysis. There was a hint of a positive pregnancy line on one occasion which faded after some days indicating the pregnancy was not successful. On starting the fourth year, they had stored sperm of sufficient quality to give them an estimated 45% chance of pregnancy with IVF. They decided to proceed with assisted fertilisation techniques like IVF with ICSI. This case highlights the workup and management of an infertile couple with known congenital combined pituitary deficiency, achieving spermatogenesis through gonadotrophin therapy, managed through outpatient appointments in secondary NHS care and fertility services.

DOI: 10.1530/endoabs.91.WE1

WE2**Clinically symptomatic hypogonadism with High SHBG of unknown aetiology and normal free testosterone in an infertile man**

Idowu Olaogun

University College London Hospital, London, United Kingdom

The relationship between male infertility and plasma testosterone level is not linear and sometimes there could be discordance in the association. This is a case of 41 year old investment banker presented with erectile dysfunction and low libido with intact morning erections referred to Endocrinology clinic after being seen by psychologist and private endocrinologist which started 3 years before for infertility. Puberty was early, normal, at around 9-10 years old age. Previous fathered a pregnancy. He has no history of testicular damage of any sort- torsion or trauma or radiotherapy or surgery. No headache, visual impairments or any pituitary hypo or hyper functioning symptoms. He had no history of androgen or anabolic steroid abuse or supplements and not on any medication. Significant alcohol intake in the past 20 units/ day. Recent abuse of MDMA and Canabinoid (once monthly) to improve sexual functions. Previously tried on testosterone which improved his symptoms but due to infertility, stopped and started on Sildenafil which is not very effective for him. Female infertility factors excluded by the fertility clinic. Examination showed a BMI of 24 with normal external genitalia and testicular volumes of 25 ml bilaterally. No eunuchoidal or mooseman pacey habitus, no gynecomastia. Investigations showed high SHBG 104- 133, morning testosterone of 27.1, free testosterone using vermuelen equation is 0.248. Normal prolactin, estradiol 120, TSH 1.29, FT4 21, prolactin 122, LH 4.9, FSH 3.8, normal LFT, ferritin 188. Semen analysis pending. This case illustrates some difficulties sometimes encountered in infertility in which the numbers are alright but subjective and other objective patient's experience is different from this. The question is what is the right explanation for the seemingly normal free testosterone level but differential symptomatology. How do we approach infertility in this patient with normal gonadotrophins and testosterone.

DOI: 10.1530/endoabs.91.WE2

WE3**Primary amenorrhea? Cause**

Sagen Zac-Varghese

East and North Herts NHS Trust, Stevenage, United Kingdom

26-year-old referred with primary amenorrhea. Described puberty aged 11 years with breast and axillary hair development. One day of a menstrual period in secondary school. She has a partner and would like to start a family.

PMHT2DM on metformin and liraglutide Undiagnosed but possible learning disability/autism Increased BMI, 57.5 kg/m²**Examination**

Increased BMI Afro-Caribbean ethnicity Normal breast development Acanthosis in axilla

Investigations Normal TV scan – normal ovaries, endometrium 3 mm FSH 3.9 U/LH 4.8 U/Oestradiol 281 pmol/l Beta HCG negative SHBG 15.8 nmol/l Prolactin 120 mU/l 17-OH progesterone < 1.6 nmol/l Testosterone 2.2 DHEA sulphate 7.7 umol/l TSH 1.53 T4 -19.5 Overnight dexamethasone suppression test – cortisol < 25 nmol/l Chromosome analysis XX Progesterone challenge - Medroxyprogesterone – withdrawal bleed Pituitary MRI – normal appearance

Impression

Possible functional amenorrhea secondary to obesity

Management

Patient referred to tertiary centre for further management of weight.

DOI: 10.1530/endoabs.91.WE3

WE4**Fertility induction in a man with congenital hypogonadotropic hypogonadism**

Nipun Lakshitha de Silva, Nikoleta Papanikolaou, Karim Meeran & Channa Jayasena

Imperial College Healthcare NHS Trust, London, United Kingdom

Background

Hypogonadotropic hypogonadism (HH) is one of the few treatable causes of male infertility; spermatogenesis induction can be achieved with gonadotrophins or pulsatile GnRH. Treatment protocols are normally long, and outcome varies according to the underlying aetiology, age of onset and history of undescended testes. Regular follow-ups are needed to assess the response and monitor for adverse effects of therapy that could make the management challenging.

Case presentation

A 39-year-old male was reviewed in the clinic for fertility management. He had normal childhood growth and development but had no secondary sexual characteristics up to his late teenage years. There was no evidence of other pituitary hormone deficiencies and the pituitary MRI had been normal. There was no history of recreational drugs including opioid or anabolic steroid use. The diagnosis of normosmic congenital HH had been made. He had been initially treated with testosterone injections. He has two children aged 13 and 8 years following successful sperm induction with gonadotrophins. Since then, he had been taking testosterone undecanoate injections every 12 weeks. His partner is 34 years old and has no fertility problems. This time he presented seeking fertility treatment. He had small-volume testes (Prader orchidometer: 6 ml) with otherwise normal secondary sexual characteristics. He occasionally smoked and was at low risk for obstructive sleep apnoea. His weight was 100 kg and his height was 190 cm (BMI: 27.7 kg/m²). Blood results revealed a raised haematocrit, testosterone, and suppressed LH and FSH (<0.1U/l) consistent with testosterone therapy. He was azoospermic. Testosterone replacement was withheld, and he was started on subcutaneous injections of human chorionic gonadotrophin 2500 IU twice weekly. Since he remained azoospermic after one year of treatment, subcutaneous menotropin 75 IU twice weekly was added. There was a spermatogenic response, but haematocrit increased again (Table 1)

Table 1 Summary of investigation results during gonadotrophin treatment

| Parameter | Reference range | Before gonadotrophins | 6 months | 12 months | 18 months |
|----------------------------------|-----------------|-----------------------|----------|-----------|-----------|
| Haematocrit | 0.39-0.5 | 0.516 | 0.501 | 0.498 | 0.535 |
| Total testosterone (nmol/l) | 10-30 | 36.1 | 22.4 | 20.6 | 24.4 |
| Sperm concentration (million/ml) | > 15 | None | None | None | <0.1 |

Conclusions

Response to gonadotrophins in male HH is variable with the need for prolonged and intensive treatment in some; yet, adverse effects could limit treatment intensification.

DOI: 10.1530/endoabs.91.WE4

WE5**Is normal not enough?**

Amna Malik & Gurmit Gill

Royal Stoke University Hospital, Stoke On Trent, United Kingdom

A 36 M seen in endocrinology clinic October 2022 with 9/12 history of reduced testicular size and hypo gonadal symptoms. He has a past medical history of suicidal ideation and urinary incontinence. On review of previous GP records from 2003 he was seen for delayed puberty, although the patient denied this in clinic. There was no history of testicular trauma or infection and he denied any history of exogenous steroid or recreational drug use. There was no significant family history. His partner did have a positive pregnancy in 2021 although miscarried this at an early gestation. The initial biochemical workup following his clinic visit revealed elevated FSH of 56.4 IU/l (RR 1.4-18.1) and LH 23.6 IU/l (RR 1.5-9.3) and testosterone of 8 nmol/l (RR 6.85-23.23). The remaining pituitary profile was unremarkable. His clinical examination and radiological USS confirmed bilaterally small testicular volume and mild varicoceles. His height in clinic was 163 cm, weight, 62 kg and BMI 23.34 kg/m². On review of the above results suggestive of primary hypogonadism he was subsequently consented for genetic chromosomal analysis. The results of this were consistent with male mosaic karyotype with 2 cell lines. 50/62 cells displayed XY chromosome analysis and 12/62 X analysis with short arm of Y chromosome. He was subsequently referred to the specialist genetic clinic to discuss the implications of the results on fertility. The questions to discuss with this case is should we consider testosterone replacement as low end of normal results and with positive symptoms. What would be the impacts on fertility for this couple and the explanation of previous positive pregnancy?

DOI: 10.1530/endoabs.91.WE5

WE6**Interesting case of Sertoli cell Injury of unknown cause with normal testosterone and ultrasound**

Kyaw Zin Hun

North West Anglia, Peterborough, United Kingdom

A 45-year-old Caucasian man with BMI of 34 presented with a few years' history of low libido and premature ejaculation. He had azoospermia in the past for infertility investigation 4 years ago with his previous relationship. His LH and FSH were high at 18 U/l (2-13 U/l) and 10 U/l (2-9 U/l) while his 9 am testosterone level was 19.2 nmol/l (10-38 nmol/l) along with normal prolactin and TSH. The testicular examination is unremarkable. His repeat semen analysis shows azoospermia and ultrasound testes is normal. There is no history of chemotherapy, radiotherapy, mumps infection, or testicular injury. His chromosomal analysis is in process. He is not planning to father a child in the future. This case demonstrates Sertoli cell injury and brings the challenges of how to investigate the causes if chromosomal analysis is normal and how to manage low libido with normal testosterone.

DOI: 10.1530/endoabs.91.WE6

WE7**High testosterone in a young man preserving his hairline**

Christo Albor

Whittington Hospital, London, United Kingdom

A 36 year old man was referred to the Endocrine clinic from his GP practice due to an incidental finding of high Testosterone (44.3 nmol/l). He is an actor who has been under a private Trichologist for a number of years, and had been on Finasteride and topical Minoxidil. Under the Trichologist he has had his Testosterone levels periodically monitored, which had been persistently elevated since at least 2018 (39-44 nmol/l). The patient was otherwise well. He has Type 1 Diabetes, Coeliac Disease, and Gilbert's Syndrome. He had normal puberty, and has normal genitalia, sexual function, arousal and ejaculation. At the time of first presenting in clinic he had stopped Finasteride for at least 3 months, but was still on Minoxidil. He had occasionally been using protein powder shakes, bought from his private members' club. He has never tried to have children but plans to soon with his wife. On examination he is of medium build, with no increased pigmentation in his creases, and no visual field deficits. Bloods from clinic

showed raised total testosterone (39.3 nmol/l) with raised SHBG (91 nmol/l), raised LH (13.7 iu/l) and FSH (21.4 iu/l), with otherwise normal pituitary function and no polycythaemia. Further bloods showed both 17OH Progesterone and Androstenedione within normal range. Mass spectrometry confirmed raised Testosterone. Calculated free Testosterone was 0.443 nmol/l, within the normal range. US testes, MRI adrenals and MRI pituitary were all reassuringly normal. The exact cause of the raised LH, FSH and total Testosterone remain unclear. The possibility of longstanding up-regulation of gonadotropins due to previous persistent reduced negative feedback from suppressed dihydrotestosterone has been considered. Current systemic levels of free testosterone have been normal due to abnormally high SHBG. Aberrations in testicular free testosterone have not been ruled out, and we are currently awaiting seminal analysis. The patient has been told that he can start trying for a baby with his wife. He has also been counselled regarding the use of Finasteride and Minoxidil. Given the patient's strong desire to preserve his hairline for his work and livelihood, he is considering his options.

DOI: 10.1530/endoabs.91.WE7

WE8**A case of non obstructive azoospermia**

P A D M Kumarathunga, Vindya Wellala, George Yovos, Puja Thadani & Harpal Randeva

University Hospital Coventry and Warwickshire NHS Trust, Coventry, United Kingdom

Introduction

Infertility is a common medical condition affecting 50 million couples worldwide and azoospermia account for around 10 % of cases of male infertility. Non-obstructive azoospermia is one of the most severe forms of male infertility and aetiology could be due to primary testicular failure, secondary testicular failure and those with incomplete or ambiguous picture of testicular failure.

Case report

A 34-year-old patient referred to endocrine clinic for further evaluation for primary subfertility. The couple was unable to conceive after 5 years of regular unprotected intercourse. He denied reduced libido or sexual dysfunction. He had uneventful childhood and pubertal development. He denied previous inguinal/testicular surgeries, testicular trauma or infections or toxic exposures and denied any history of anabolic androgen abuse. There was no family history of male infertility. He was treated for depression 4 years back but had no other illnesses. On examination his height was 168 cm with BMI of 34 and had normal adult male facial and body hair distribution with no gynecomastia. Genital examination revealed bilateral soft, small testes; 6 ml on right side and 4 ml on left side, with normal penile length. His blood investigations (table 1) revealed evidence of normo-gonadotrophic hypogonadism and MRI pituitary was within normal limits. USS testes confirmed bilaterally small testes with normal perfusion and otherwise normal epididymis. His seminal fluid analysis revealed azoospermia on two sperm samples. Subsequent evaluation revealed 46 XY karyotype, negative for complete AZF microdeletions and CFTR gene variant was not identified. He was referred to subfertility clinic and was planned for surgical sperm retrieval and IVF.

Conclusion

Patients with azoospermia needs to be evaluated for chromosomal and genetic abnormalities. However underlying aetiology and genetic mechanisms remain largely unclear. Combination of sperm extraction with *in vitro* fertilization and intra-cytoplasmic sperm injection gives these patients an opportunity to father children with the sperm retrieval rate is around 40 to 50%.

Table 1

| | |
|-----------------|-------------------------------------|
| Testosterone | 6.4 nmol/l |
| SHBG | 15.6 nmol/l |
| LH | 5 IU/l |
| FSH | 8 IU/l |
| prolactin | 198 mIU/l |
| TSH | 0.98 mIU/l |
| FT4 | 13.2 pmol/l |
| IGF1 | 25.4 nmol/l |
| HbA1c | 47 mmol/mol |
| ODST | 29 nmol/l |
| ferritin | 87 mg/l |
| Renal Functions | normal |
| Liver functions | normal |
| Semen analysis | Volume 1.5 ml Concentration 0 ml/ml |

DOI: 10.1530/endoabs.91.WE8

Workshop F: Disorders of the parathyroid glands, calcium metabolism and bone

WF1**Hypercalcaemia in granulomatous disease**

Maria Omer & Tejpal Purewal

Royal Liverpool and Broadgreen University Hospitals NHS Trust, Liverpool, United Kingdom

Introduction

Hypercalcaemia has been described in patients with granulomatous disorders. Most commonly sarcoidosis (10% of patients) and tuberculosis with three-fold increase in hypercalcaemia. It's due to production of calcidiol from calcitriol in the lung and lymph nodes that is independent of PTH. Main modalities of therapy are low-calcium diet, glucocorticoids, and treatment of the underlying disease.

The Case

A 48-year-old male, referred to endocrine team with hypercalcaemia (calcium 2.96 mmol/l). He had background of Type 2 DM, low mood and hypercholesterolemia. He was under respiratory team for suspected diagnosis of sarcoidosis for several years with suggestive x-ray and CT findings, elevated Serum ACE and recurrent anterior uveitis which has been managed by ophthalmology. No histological proof of sarcoidosis. He was on Metformin 1g bd, Simvastatin 40 mg, Sitagliptin 100 mg od, and Citalopram 40 mg od. His calcium was high at 2.96 mmol/l on routine investigations and admission was arranged. Investigations revealed impaired renal function with urea 8mmol/l, Cr 118 umol/l, and eGFR of 58 mL/min/1.73m² (>60mL/min/1.73m²). He expressed symptoms of polyuria and polydipsia, and otherwise had no significant finding on history or examinations. With hydration his Calcium dropped to 2.68 mmol/l but increased again to 2.92 after 2 days. He was commenced on prednisolone 40 mg. As a result, his calcium level normalized within 10 days

Investigations revealed

Suppressed PTH: 1.0(1.6-6.9), Vit D2: <12 nmol/l, Vit D3: 29 nmol/l with Total vit D of 29 nmol/l. Negative Myeloma screening. ACE was 183 U/l. It was noted that ACE level was high at 156 U/l on August 2020, return to normal at 48 U/l on December 2020, then increased to 183 U/l at this presentation. The patient was discharge home with steroid tapering regimen when his calcium level dropped to 2.65 with follow-up with respiratory team in the OP clinic

Conclusion

Hypercalcaemia and hypercalcauria have been described in patients with sarcoidosis and should be borne in mind in differential diagnosis. If undetected, it can cause nephrocalcinosis, renal stones, and renal failure Serum concentrations of vitamin D metabolites, 25-hydroxyvitamin D (calcidiol) and 1,25-dihydroxyvitamin D (calcitriol) should be measured if there is no obvious malignancy and PTH is not elevated. High 25(OH)D is indicative of vitamin D intoxication while increased levels of 1,25-dihydroxyvitamin D may be induced by direct intake of this metabolite, extrarenal production as in granulomatous diseases or lymphoma.

DOI: 10.1530/endoabs.91.WF1

WF2**A case of hungry bone syndrome following denosumab administration with an unfortunate outcome**Sheela Sathyanarayan, Paul Carroll, Anand Velusamy & Aisha Saqib
Guy's and St Thomas Hospital, London, United Kingdom

A 71 year old gentleman, known to have Renal Cell Carcinoma with metastasis to lung, mediastinum, spine and liver, was transferred to our services for management of T2/T3 Spinal root impingement. On admission he was noted to have severe hypercalcaemia of 3.33mmol/l, mild hypophosphatemia 0.8mmol/l and an ongoing acute kidney injury. He had appropriate initial management with intravenous fluids, and was started on dexamethasone 8 mg with PPI cover for the spinal metastasis. His imaging was reviewed in the spinal MDT and medical management and radiotherapy was advised. The patient went on to have spinal radio therapy subsequently. The patient was also prescribed Denosumab at admission which he had not yet received due to availability. With the fluids his Calcium levels had appropriately started improving. On day 4 of admission his calcium had reduced to 2.8mmol/l, while his phosphate was 0.7mmol/l. His Parathormone and vitamin D3 levels were not checked. Unfortunately, at this point he went on to receive the Denosumab. On day 10 of admission patient developed symptoms of tingling, numbness and fasciculations. He was found to be profoundly hypocalcaemic at 1.68mmol/l with characteristic corresponding ECG changes of QTc prolongation. He was then referred to Endocrinology for evaluation, and was managed with multiple Calcium Gluconate infusions, alfacalcidol, and high dose cholecalciferol in Level 2-3 care. He went on to have his Parathormone and vitamin d levels checked, which were 174ng/l and

30nmol/l respectively. His calcium levels normalised and stabilised on day 17, and his Alfacalcidol was stopped. He was switched to maintenance dose Vitamin D and oral calcium replacement. Unfortunately, the patient's general condition deteriorated significantly during the admission and he passed away. This case demonstrates a classic presentation of Hungry Bone syndrome (HBS) secondary to Denosumab administration on background of low Vitamin D and phosphate levels, post hypercalcaemia treatment. It highlights the importance of trying to determine the cause of hypercalcaemia during initial resuscitation and ensuring replete vitamin D levels prior to use of bisphosphonates or denosumab, though this might seem counterintuitive. Low prevailing vitamin D, magnesium and phosphate levels while administering these medications can precipitate large calcium shifts from the blood to the bone, hence the term 'Hungry Bone Syndrome'. HBS can cause refractory hypocalcaemia, unnecessarily prolonging hospital stay and has the potential to cause significant change in electrolyte homeostasis.

DOI: 10.1530/endoabs.91.WF2

WF3**Differentiating Primary Hyperparathyroidism from Familial Hypocalcaemic Hypercalcaemia Can Be Difficult: A Misleading Urinary Calcium to Creatinine Clearance Ratio**Edouard G Mills^{1,2}, Dimitri J Hadjiminas³, Ali Abbara^{1,2},
Preeshila Behary^{1,2,4}, Jeremy Cox⁴ & Alexander N Cominos^{1,2,4}

¹Section of Endocrinology and Investigative Medicine, Imperial College London, London, United Kingdom; ²Department of Endocrinology, Imperial College Healthcare NHS Trust, London, United Kingdom; ³Department of Breast Surgery, Imperial College Healthcare NHS Trust, London, United Kingdom; ⁴Endocrine Bone Unit, Imperial College Healthcare NHS Trust, London, United Kingdom

Case

We report a 79-year-old female who was referred to our Endocrine Bone Unit with osteoporosis, which was initially treated with Alendronate (but poorly tolerated due to dyspepsia) followed by annual Zoledronate infusions. Her bone history was significant for a proximal humeral fragility fracture 30-years previously. She was an ex-smoker, had limited dietary calcium intake, and had a brother with osteoporosis. DEXA demonstrated T scores at lumbar spine -1.8, total hip -2.0 and distal radius -2.8, corresponding to 4.6% reduction in lumbar spine BMD from the assessment two years earlier. Thoracolumbar X-rays revealed multiple silent vertebral fractures. However, serial measurements revealed persistent PTH-dependent hypercalcaemia (adjusted calcium range 2.73-2.84mmol/l, PTH 15.7-21.8 pmol/l, 25 OH vitamin D 69.1nmol/l and eGFR 79). 24-hour urinary calcium to creatinine clearance ratio (CCCR) was 0.0056, suggesting that Familial Hypocalcaemic Hypercalcaemia (FHH) should be considered. However, genetic testing for FHH did not identify known pathogenic variants of the AP2S1, GNA11 or CASR genes. Repeat 24-hour urinary CCCR was slightly higher at 0.012, raising a suspicion for Primary Hyperparathyroidism (PHPT). Parathyroid USS revealed a possible 5mm left inferior parathyroid adenoma (also noted on 4D CT), but without strong evidence of uptake on sestamibi. Renal USS demonstrated a 4mm non-obstructing renal cortical calculus of the left kidney.

Outcome

Owing to non-concordant localisation studies, she underwent a four-gland exploration of the parathyroids, with the left inferior gland removed. Post-operative histology was consistent with an adenoma, and she is now cured with corrected calcium values 2.27-2.39mmol/l. Repeat DEXA at 24-months post-parathyroidectomy has been arranged to re-assess her BMD.

Discussion

Differentiating between FHH and PHPT is essential for correct management, as FHH usually necessitates no intervention, whereas PHPT may require parathyroidectomy. Discrimination is usually based on a 24-hour urinary CCCR with values <0.01 suggestive of FHH. This is based on data highlighting that 80% of individuals with FHH will have a CCCR of <0.01, while 20% have values between 0.01-0.02 and so can overlap with PHPT. However, as noted in this case, a falsely low CCCR can be observed in PHPT with concurrent use of medications that affect calcium metabolism or renal calcium handling, such as bisphosphonates (as in our patient), lithium and thiazide diuretics, as well as vitamin D deficiency/insufficiency, low dietary calcium intake, Afro-Caribbean ethnicity, and chronic kidney disease. As shown here, a combination of clinical suspicion, biochemical testing and genetic analysis may be required to differentiate PHPT from FHH.

DOI: 10.1530/endoabs.91.WF3

WF4**Asymptomatic severe hypercalcaemia and renal impairment following vitamin-D replacement in a patient with military and CNS tuberculosis**Ananthi Anandhakrishnan^{1,2} & Kirun Gunganah^{1,2}
¹Newham University Hospital, London, United Kingdom; ²Barts Health NHS Trust, London, United Kingdom

Case history

A 49-year-old male was readmitted with asymptomatic hypercalcaemia and renal impairment following a recent admission where he was diagnosed and commenced on treatment for military tuberculosis. He was on month 6 of standard anti-tuberculous therapy (ATT) and one month off glucocorticoids commenced for CNS-involvement. High dose cholecalciferol was started on initial admission when he was found to be normocalcaemic but vitamin-D deficient, and continued. The clinical concern was of hypervitaminosis-D.

Investigations

Calcium on initial admission was 2.29mmol/l (2.2-2.6mmol/l) and serum phosphate 1.31mmol/l (0.8-1.5mmol/l) with serum 25(OH)D3 21nmol/l (> 50nmol/l). Creatinine was 30-40umol/l.

Results and treatment

Cholecalciferol was commenced at 4000 units/day on initial admission. Synacthen stimulated cortisol at 60 minutes was 526nmol/l after 16 weeks exposure to glucocorticoids, and weaning prednisolone stopped. Improved radiology and weight-gain (BMI 17.18 kg/m² from 13.19 kg/m²) suggested reduced disease-burden. The patient was discharged following 16 weeks' inpatient stay to respiratory follow-up. Calcium 2.76mmol/l, phosphate 1.4mmol/l and creatinine 70umol/l were detected on outpatient bloods after 4 months 4000units/day vitamin-d3, and one month off glucocorticoids. Vitamin-D3 was stopped, and increased oral fluids advised. Two weeks later, a serum calcium 3.67mmol/l and creatinine 123umol/l prompted readmission. Serum-ACE was 73u/l (20-70), PTH suppressed (2.2 pmol/l) and repeat serum 25(OH) D3 95nmol/l. Calcium 3.64mmol/l on day 3 despite 2-3 litres/24hrs 0.9% sodium-chloride prompted starting 30 mg prednisolone. Zoledronate was administered on day 7 due to ongoing hypercalcaemia (3.53mmol/l) and rising creatinine (158umol/l). Normocalcaemia (calcium 2.57mmol/l) and downtrending creatinine 98umol/l was seen on day 12, and the patient discharged on 15 mg prednisolone. On 15 mg prednisolone, normocalcaemia (2.34mmol/l) with improved creatinine 61umol/l was seen at 2 months. Serum 1,25-dihydroxyvitamin-D3 from the second admission returned at 149 pmol/l (55-139 pmol/l).

Discussion

Hypervitaminosis-D with hypercalcaemia occurs secondary to excess vitamin-D consumption or extrarenal 1-alpha-hydroxylase activity and is a rare but well-cited complication of tuberculosis. With the toxic effects of vitamin-D supplementation thought not to occur until 25(OH)D3 levels exceed 150 ng/mL (374nmol/l), elevated 1,25(OH)2-D3 and improved hypercalcaemia following glucocorticoids favour granulomatous hypercalcaemia in our patient. Efficacy data on the use of adjunctive vitamin-D3 supplementation to standard ATT on improved tuberculosis outcomes is conflicting. Vitamin-D deficiency is common in patients with tuberculosis however, and replacement in those deficient is reasonable. Close monitoring of serum calcium and using more conservative vitamin-D3 doses could ameliorate the dangers of hypercalcaemia seen to occur in these patients more often following supplementation.

DOI: 10.1530/endoabs.91.WF4

WF5**The approach to hypercalcaemia: a case report**Tanya Chopra & Shivshankar Seechurn
Department of Diabetes & Endocrinology, Northwick Park Hospital, London Northwest University Healthcare NHS Trust, London, United Kingdom

Introduction

Hypercalcaemia accounts for 0.6% of all acute medical admissions¹, with primary hyperparathyroidism and malignancy-associated hypercalcaemia contributing to 90% of these cases.

Case Presentation

A 67-year-old female was initially seen in neurology clinic with a 3-year history of subtle word-finding difficulties, episodic confusion, and balance problems. On further probing, she reported constipation, polyuria and polydipsia, but had no other systemic symptoms. She had a past medical history of hypertension and was on regular Ramipril, Indapamide and calcium supplements. She had no significant family history. Following the clinic appointment, routine blood tests carried out showed elevated calcium levels of 3.13mmol/l and a normal HbA1c. Given findings of symptomatic hypercalcaemia, she was admitted to hospital and commenced on intravenous fluids (0.9% sodium chloride). Her Indapamide and

calcium supplements were stopped. Investigations were carried out to determine the cause of her hypercalcaemia; phosphate levels were low (0.72mmol/l), parathyroid hormone (PTH) levels were raised (13.6 pmol/l) and Vitamin D was replete (140nmol/l). Renal function, alkaline phosphatase, magnesium, TSH, myeloma screen and serum ACE levels were normal. Her hypercalcaemia improved to below 2.8mmol/l with fluids and she was discharged from hospital with endocrine follow-up. In endocrine clinic, repeat blood tests showed an elevated calcium level greater than 2.85mmol/l and a non-suppressed PTH, with some ongoing symptoms. A 24-hour urinary calcium: creatinine clearance ratio was calculated at 0.02, confirming the diagnosis of primary hyperparathyroidism. Investigations were carried out to assess for end-organ damage; a renal tract ultrasound showed no evidence of calculi or nephrocalcinosis, but a DEXA scan revealed osteopenia of the spine. A thyroid ultrasound showed a probable right superior parathyroid adenoma which was in concordance with the Technetium (99mTc) Sestamibi (MIBI) scan. After further discussion with the patient, she was referred for consideration of a parathyroidectomy.

Conclusion

A systematic approach is key in the management of hypercalcaemia. Once primary hyperparathyroidism is confirmed, a clear explanation of the long-term consequences of excess PTH should be discussed with the patient with consideration of conservative and surgical management options. Further investigations should be carried out to assess for end-organ damage and to localise the source of elevated PTH, if surgical intervention is an option.

Reference

1. Turner, J.J.O. (2017) 'Hypercalcaemia- presentation and management', *Clinical Medicine*. Royal College of Physicians, 17(3), pp.270-273. doi:10.7861/CLINMEDICINE.17-3-270.

DOI: 10.1530/endoabs.91.WF5

WF6**COVID-19 delayed diagnosis resulting in severe hyperparathyroidism with evidence of brown tumours and parathyroid adenoma**Venkatram Subramanian^{1,2}, Hasina Bhayat¹ & Irfanulla Baig¹
¹East Lancashire NHS Foundation Trust, Blackburn, United Kingdom; ²Stockport NHS Foundation Trust, Stockport, United Kingdom

A 47-year-old female was referred and presented with generalised aches and pains and her calcium level was found to be elevated with a corresponding raised PTH level. She had previously had a parathyroid hormone level in excess of 212.000 pmol/l (The upper limit for our assay is 212 pmol/l). Interestingly, she has had a mildly elevated calcium level in 2017, rechecked in 2018 and lost to follow up until December 2021. At this juncture, she sustained a closed fracture of her metacarpal which prompted further assessment due to the nature of the report from the Xray which suggested significant osteopenia and bone resorption. Other blood tests also showed persistent hypercalcaemia, severe deficiency in Vitamin D and a high ALP in the range 2300-2400. Once admitted, due to her on going bone pain, she had multiple X-rays including that of her lumbar spine, pelvis and right knee. The common finding reported evidence of bony resorption particularly to the femoral necks bilaterally and several lucencies were noted within the femoral shafts bilaterally in keeping with brown tumours. Fortunately, no fractures were demonstrated. Additionally, a CT thorax, abdomen and pelvis was requested to rule out a malignancy and this, too, confirmed innumerable lytic lesions seen throughout the entire skeleton with no vertebral collapse and further subperiosteal resorption noted at the sacroiliac joints and pubic symphysis. These lytic lesions were thought to represent multiple brown tumours on the background of hyperparathyroidism. Furthermore, her ultrasound neck revealed a small vascular mass in the lower pole of the left thyroid lobe suspicious for parathyroid gland hyperplasia. The subsequent Tc-99 MIBI nuclear medicine scan suggested there is a solitary focus of intense tracer activity present in the lower right position at the level just immediately above the right sternoclavicular joint. Appearances are entirely consistent with an autonomous solitary parathyroid adenoma. She has had an ENT review for consideration of surgical intervention which is currently awaited. We have therefore concluded that she has Primary hyperparathyroidism caused by likely a single adenoma. She has had surgical treatment of the lesion and is now starting to recover with close monitoring from the team in the hospital.

DOI: 10.1530/endoabs.91.WF6

WF7**A case of familial hypocalcaemic hypercalcaemia**Charlotte Dewdney & Anna Dover
Royal Infirmary of Edinburgh, Edinburgh, United Kingdom

Introduction

Familial hypocalcaemic hypercalcaemia (FHH) is an autosomal dominant disorder affecting the calcium-sensing receptor (CaSR) expressed in the chief cells of the parathyroid glands and in the renal tubules. The CaSR permits the parathyroid gland to sense variations in serum calcium thus regulating parathyroid hormone (PTH) secretion; it also regulates calcium excretion in the kidneys. In FHH, loss-of-function mutations in the CaSR result in a higher serum calcium due to enhanced PTH secretion, and hypocalcaemia due to higher tubular reabsorption of calcium in the nephrons. It can sometimes be difficult to differentiate between primary hyperparathyroidism (PHPT) and FHH.

Case Presentation

A 26-year-old woman was referred to the endocrine clinic with longstanding severe asymptomatic hypercalcaemia. She has a background of emotionally unstable personality disorder (EUPD) and anorexia nervosa. Her most recent biochemistry demonstrated an adjusted calcium of 3.23mmol/l (2.2-2.6mmol/l) with normal albumin, PTH 6.1 pmol/l (1.6-6.9 pmol/l), vitamin D 27nmol/l (25-162nmol/l), and phosphate 0.7mmol/l (2.2-2.6mmol/l). A neck ultrasound was normal. A family history of hypercalcaemia was noted. Genetic blood tests confirmed a mutation in the CASR gene in keeping with autosomal dominant FHH.

Discussion

Despite usually having a benign prognosis FHH can be associated with nephrolithiasis, chondrocalcinosis and pancreatitis. Interestingly it can also be linked to behavioural disorders and this lady has EUPD. Cinacalcet is an allosteric agonist of the CaSR thus mimicking the effect of calcium and decreasing PTH, used commonly in patients with PHPT where surgery is inappropriate. There are few studies that have evaluated the efficacy of cinacalcet in FHH so it is not routinely used. Some case reports have used surgery in patients with FHH and a parathyroid adenoma identified on ultrasound. It is unclear how to manage cases such as this where the patient is asymptomatic but the calcium is very high. Consideration should be made to replacing low Vitamin D as this can contribute to a high PTH. FHH is often underdiagnosed, as it can be difficult to distinguish from PHPT. A family history of asymptomatic hypercalcaemia or unsuccessful parathyroid surgery should raise suspicion of FHH. The calcium/creatinine clearance ratio can be helpful in differentiating FHH and PHPT; it is typically < 0.01 in FHH and > 0.02 in PHPT. This case highlights the importance of a thorough history and focused genetic testing; which is the definitive diagnostic test. Making the correct diagnosis can help to prevent morbidity by avoiding unnecessary investigations and interventions such as surgery.

DOI: 10.1530/endoabs.91.WF8

WF8**Hypercalcaemia Secondary to Immobilisation, forgotten phenomenon**

Zvidzayi Busu, Michael Pierides & Azhar Farooqui
Kettering General Hospital, Corby, United Kingdom

Background

Hypercalcaemia is a commonly encountered electrolyte abnormality within the acute medical take; identification of the underlying aetiology can guide optimised care.

Case

A 23 year old male patient with a background of insulin dependent diabetes, diabetic nephropathy (chronic kidney disease stage 1) was admitted feeling acutely unwell. Clinical and bed side investigations identified he was in severe diabetes ketoacidosis. His condition prompted a prolonged hospital stay of at least six months which included three months of Intensive care unit admission. It was identified that his DKA was triggered by sepsis from dental infection which was complicated by multiple brain infarcts and disseminated intravascular coagulation. He was appropriately treated with intravenous antibiotics and fixed rate insulin infusion. In his fourth month into admission, he was noted to have raised calcium levels, values ranging from 2.8 – 3.4mmol/l, moderately raised phosphate with a low Parathyroid hormone level of 0.7 to 1.0. His vitamin D levels were normal. Urinary calcium levels were within normal ranges. CT abdomen and chest were unremarkable with no signs of malignancy. He was treated with phosphate binders (sevelamer), started on slow IV fluids. His long-term cholecalciferol was withheld. Patient also received intermittent dialysis for prerenal acute kidney injury. Despite all these interventions, he persistently had high calcium levels which was later attributed to patient's long stay in hospital whilst immobile.

Conclusion

It is vital to fully investigate for all the causes of hypercalcaemia before concluding hypercalcaemia of immobilisation. This was a complicated case in which one expects patient to develop hypocalcaemia from chronic kidney disease.

Hypercalcaemia from immobilisation is uncommon but we have to think about it in patients who have long periods of hospital stay.

DOI: 10.1530/endoabs.91.WF8

WF9**Primary hyperparathyroidism in pregnancy**

Kagabo Hirwa¹, Nishchil Patel² & Ioannis Dimitropoulos²

¹Torbay and South Devon NHS Foundation Trust, Torquay, United Kingdom; ²University Hospitals Plymouth NHS Trust, Plymouth, United Kingdom

A 30-year-old lady was initially seen in our clinic with a slight elevated corrected calcium with an elevated parathyroid hormone in March 2021. The elevated calcium [2.58mmol/l (NR: 2.10-2.55)] was first noted in 2018 when she had investigations for easy bruising, fatigue, breathlessness, and weight loss. The symptoms settled on their own and her calcium levels were monitored routinely. She was referred to our clinic when the corrected calcium had increased to 2.69mmol/l with an elevated parathyroid hormone (PTH) at 20.7 (NR: 1.5-6.9 pmol/l) and vitamin D in deficiency range. Her thyroid function tests were in normal range. She was on sertraline and antihistamines for anxiety and urticaria, respectively. She did not report any history of kidney stones and she has never had any bowel discomfort. Her blood pressure was within normal range. She did not have any significant family medical history. She was started on vitamin D3 1000 units daily, with a plan of measuring the urine calcium creatinine clearance ratio once the vitamin D is in replete range. A renal tract ultrasound and neck ultrasound were also arranged. As she was young, she was referred to clinical genetics for their input. In our clinic in June 2021; her corrected calcium had increased to 2.99mmol/l, PTH:20.8 and vitamin D level:50nmol/l. There were no calculi on the renal tract ultrasound, and she was referred to the ENT for review in consideration of parathyroidectomy. A parathyroid MIBI scan had shown an equivocal result, but the neck ultrasound had shown a 4.3 cm cystic structure which looked to be a parathyroid adenoma. In October 2021, she was seen in our combined endocrine antenatal clinic with a 7-week pregnancy. The risks of primary hyperparathyroidism in pregnancy were discussed and it was decided that she will undergo parathyroid surgery in the second trimester. In December 2021, parathyroidectomy was performed successfully at 17 weeks of pregnancy. In January 2022, her corrected calcium and PTH levels have normalized to 2.38mmol/l and 2.1 pmol/l respectively. The rest of pregnancy was uneventful, and she delivered a healthy baby at term. The results of clinical genetics were not available at the time of writing. It is important to explore fertility plans in young women with primary hyperparathyroidism, to discuss contraception before definitive cure and to remember that parathyroid surgery can be done in the second trimester.

DOI: 10.1530/endoabs.91.WF9

WF10**A challenging case of hypercalcaemia**

Laura Reid & Ganesh Arunagirinathan
Western General Hospital, Edinburgh, United Kingdom

A 66 year old woman was referred to endocrinology in January 2023 with severe hypercalcaemia of 4.7mmol/l adjusted (2.2-2.6mmol/l) and low normal PTH of 1.8 pmol/l (1.6-6.9 pmol/l). She presented with one week of cough, breathlessness and fatigue, and 3-4 days of nausea and vomiting. She had commenced Furosemide 40 mg for bloating symptoms one month prior. She had a history of breast cancer treated with mastectomy and lymph node clearance in 2019, with subsequent Letrozole (ongoing) and six monthly Zoledronic acid (last given November 2021). Other past medical history included well controlled COPD and previous TIA. Drug history included Adcal D3 (Calcium Carbonate 750 mg + Colecalciferol 200units) two tablets twice daily. Admission investigations revealed she was Influenza A positive with WCC 14 and CRP 27 mg/l. She had a severe acute kidney injury (Urea 19mmol/l, Creatinine 200umol/l - previously normal) with hypokalaemia (2.8mmol/l) and severe hypercalcaemia (4.7mmol/l). Phosphate was normal at 1.23mmol/l (0.8-1.4) and Magnesium was just above the normal range at 1.03mmol/l (0.7-1.0mmol/l). Vitamin D level was replete at 96nmol/l (50-139nmol/l). Furosemide and Adcal D3 were stopped on admission. She was initially treated with intravenous fluids with a reduction in

adjusted Calcium to 3.03mmol/l after 72 hours. As she had ongoing symptomatic hypercalcaemia over 3mmol/l, she was given Zoledronic Acid infusion on day four of admission with rapid resolution of Calcium to the normal range. Due to the low normal PTH level and history of recent breast cancer she was investigated with CT head, chest, abdomen and pelvis which showed no evidence of malignancy. Myeloma screen was negative. Further review revealed a milk rich diet and alkalosis on admission with a pH of 7.47 and elevated total bicarbonate of 43mmol/l (22-30mmol/l). Adcal D3 was discontinued and switched to Cholecalciferol. Bloods on discharge showed an appropriate rise of PTH to 5.0 pmol/l with a corresponding decline in Calcium to 2.32mmol/l. Follow up Calcium levels in the community have remained normal. We believe this case is in keeping with Milk-Alkali syndrome given the combination of hypercalcaemia, metabolic alkalosis, acute kidney injury and use of calcium supplements, likely precipitated by dehydration secondary to Influenza A infection and recent diuretics. Milk Alkali syndrome is thought to be the third most common presentation of hypercalcaemia after malignancy and primary hyperparathyroidism and should be considered in people presenting with hypercalcaemia on calcium carbonate containing supplements, especially if bicarbonate is raised in the context of renal failure.

DOI: 10.1530/endoabs.91.WF10

WF11

A rare case of atypical parathyroid tumor with atypical presentation

Aye Aye Thant & Alexander Lewis

Manchester Royal Infirmary, Manchester University Hospitals NHS Foundation Trust, Manchester, United Kingdom

Introduction

Primary hyperparathyroidism is usually caused by a parathyroid adenoma (80-85%), occasionally by primary parathyroid hyperplasia (10-15%), and rarely by atypical parathyroid tumor (APT) or carcinoma (<1%). APT reflects parathyroid neoplasm of uncertain malignant potential which poses a challenge for differential diagnosis with parathyroid carcinomas. Most patients exhibit strong symptomatology of hypercalcaemia at presentation shared with the benign causes of hyperparathyroidism. We present a rare case of atypical parathyroid tumor who presented with hypercalcaemia and end organ damage.

Case Report

33-year-old gentleman was referred to our endocrine service in 2021 for optimal management of primary hyperparathyroidism following admission for with adjusted calcium 3.29 mmol/l (2.2-2.6). Calcium reduced to 2.98 mmol/l with intravenous fluids. He had symptomatic hypercalcaemia with muscle weakness over several years leading to a fall where he had spontaneous right patella tendon rupture requiring repair in 2011 and left patella tendon repair in 2012. Clinically there were no suggestive features of syndromic hyperparathyroidism and no significant family history. He was clubbed and had muscle wasting in both lower limbs. Biochemistries revealed that serum calcium was 3.33 mmol/l, PTH was 54.7 pmol/l (1.6-6.9), phosphate was 0.52 mmol/l which were in keeping with primary hyperparathyroidism. Bone densitometry and renal ultrasound scans demonstrated osteoporosis and nephrolithiasis respectively. Parathyroid ultrasound scan showed a heterogeneous cystic mass in the left side of the neck 25x30x41 mm suggestive of a degenerative parathyroid adenoma, although the 99m Tc-MIBI scan did not detect adenoma. A 4D-CT demonstrated an intra-

thyroidal cyst but was unable to exclude this being a cystic parathyroid lesion. Cinacalcet commenced to control hypercalcaemia prior to the surgery. Subsequently, he underwent the left parathyroidectomy. There was a clear plane between the thyroid and parathyroid adenoma despite the suggestion on imaging. Histology appearances are suggestive of atypical parathyroid tumour in the new WHO 2022 classification, Ki67 < 1%. Following postoperative care, his calcium and parathyroid hormone levels normalized. Genetic testing showed heterozygosity for a CDC73 variant of uncertain clinical significance. His family was counselled for further genetic testing.

Conclusion

This case highlights some of the complications patients can experience if there are delays in diagnosis and treatment of primary hyperparathyroidism. It also demonstrates the importance of genetic testing and the potential uncertainties this can yield for patients. APT is rare and no specific guidelines for the surveillance of patients with atypical parathyroid adenomas after parathyroid surgery exist so far.

DOI: 10.1530/endoabs.91.WF11

WF12

Primary Hyperparathyroidism in Pregnancy

Vera Smout

Royal Surrey County Hospital, Guildford, United Kingdom

A 37 year old woman presented to A&E with symptoms of hyperemesis gravidarum. She was 9 weeks pregnant, in her third pregnancy. It was noted that her calcium level was 3.13mmol/l, PTH 12.1 pmol/l, vitamin D 42nmol/l. She was treated with IV fluids and discharged with endocrine follow up. The endocrine and obstetric teams arranged for an urgent review on the antenatal ward the next week. Calcium was still raised at 3mmol/l. She was admitted overnight for antiemetics and IV fluids until calcium was 2.79mmol/l. She had been recently diagnosed with likely primary hyperparathyroidism at a different hospital but had only undergone part of the necessary investigations before moving to a new area. Hypercalcaemia likely exacerbated her nausea and was itself exacerbated by the dehydration from vomiting. She required weekly blood tests and IV hydration as calcium levels rose quickly between admissions. The option of parathyroid surgery was discussed as it was difficult to maintain the calcium in a normal range with hydration alone. Ultrasound of the parathyroids showed two likely adenomas in the left inferior and right inferior parathyroid glands. The patient agreed to surgery in the second trimester. Hypercalcaemia in pregnancy is associated with complications for both the mother and the foetus. The mother can develop hyperemesis gravidarum, nephrolithiasis, osteoporosis, pancreatitis, as well as having a higher risk of pre-eclampsia. The foetal complication rate has been shown to be up to 80%, including growth restriction, preterm delivery and miscarriage. Postpartum, up to 50% of neonates have transient hypocalcaemia. If medical management is insufficient in pregnancy, parathyroid surgery can be considered and is usually performed in the second trimester due to the potential impact on organogenesis in the first trimester and risk of preterm labour in third trimester. These decisions require a multidisciplinary approach and discussion with the patient regarding risks and benefits of medical and surgical treatments.

DOI: 10.1530/endoabs.91.WF12

Workshop G: Disorders of appetite and weight

WG1**Severe insulin resistance**

Mohammad Al-Riyahi

Blackpool Teaching Hospitals, Blackpool, United Kingdom

A 46-year-old lady with background of type 2 DM with severe insulin resistance, hemochromatosis, bipolar disorder, glaucoma, diabetic neuropathy, hypertension, GERD, necrobiosis lipoidica, PCOS and hypercholesterolemia is followed up in complex type 2 diabetes clinic for severe insulin resistance. Her BMI is 25.7, she has freestyle libre with blood glucose readings around 15mmol/l 85% of the time. HbA1c 111 on June 2022, she is on humalog 265units 7 times/day and 285units at bedtime, dapagliflozin 10 mg OD, liraglutide 1.8 mg OD, metformin 1g BD. Lab tests: eGFR >90, U&E, LFTs, FBC were normal. Blood pressure in the clinic 167/103mmHg. She is checking the insulin injection sites and rotating the sites of injections. She had extensive work up at Manchester diabetes centre and Addenbrookes Hospital, however, no identified genetic syndrome to explain her severe insulin resistance could be found. She was on pioglitazone in the past with little success. Tresiba 60 units OD was added to her medications and her follow up HbA1c improved to 91 mmol/mol on October 2022. Her other medications are gabapentin 600 mg TDS, pentoxifylline 400 mg TDS, pantoprazole 40 mg BD, atorvastatin 40 mg ON, mirtazapine 45 mg ON, ramipril 10 mg OD, bendroflumethiazide 2.5 mg OD. I am curious if there is any work up or change in the management plan that can improve her diabetes control.

DOI: 10.1530/endoabs.91.WG1

WG2**Severe hyperandrogenism due to ovarian hyperthecosis in a young woman**Shafana Ahamed Sadiq¹, Neha Jeyaka¹, Giuseppe Maltese¹, Nikhil Johri¹, Mamta Joshi¹ & Steve Hyer²¹Epsom and St Helier University Hospitals NHS FT, Carshalton, United Kingdom; ²Epsom and St Helier University Hospitals NHS FT, Carshalton, United Kingdom**Case History**

Hyperandrogenism is a relatively common clinical problem. However, severe hyperandrogenism causing virilisation is rare. A 22-year-old lady with no significant past medical history, presented with oligomenorrhoea, hirsutism and male pattern hair loss over last 3 years duration. She has no acne or change in voice or clitoromegaly. She was also noted to be having high BP on clinic visit and grade 1 acanthosis nigricans.

Investigations

Her total testosterone was elevated to 5.9 nmol/l with elevated free testosterone index of 28.9 and low SHBG at 18nmol/l, normal FSH, LH and oestradiol (152 pmol/l) level. She was sub clinically hypothyroid with TSH was raised to 6.67 mU/l with normal free T4 and free T3. The 17-hydroxyprogesterone was normal (3.2 nmol/l) with normal prolactin. Trans abdominal ultrasound pelvis was normal. MRI /Pelvis revealed enlarged ovaries with thickening of the ovarian stroma and multiple small peripheral follicles. The appearances were suggestive of PCOS. This excluded any suspicious adnexal mass. CT/adrenal was normal with no evidence of soft tissue enhancement. Her HbA1c was 39 mmol/mol.

Treatment

We discussed lifestyle modification ensuring stable weight and avoiding weight gain. She was prescribed metformin to maximum tolerable dose and the combined oral contraceptive pill. We considered spironolactone at some stage in the future. We also considered BP monitoring and low salt diet to help with hypertension

Discussion

Ovarian hyperthecosis or ovarian stromal hyperplasia is a non-neoplastic functional disorder resulting from the presence of luteinized thecal cells within a hyperplastic ovarian stroma. The condition is more common in postmenopausal women than in those of reproductive age and leads to substantial clinical and laboratory alterations, principally androgenetic alopecia, progressive hirsutism, and elevated testosterone levels. Investigation should include clinical evaluation, laboratory tests, and imaging tests to differentiate between the principal diagnostic hypotheses. The gold standard for diagnosis is histopathology of the ovarian tissue which is not often possible in young women. Medical treatment with GnRH analogue and combined oral contraceptive pills usually has an excellent clinical and biochemical response resulting in suppression of testosterone levels. Treatment with long term GnRH analogue has its own side effects, worsening metabolic abnormalities. PCOS per se is closely linked to metabolic disorders such as obesity and insulin resistance which were seen in our patient too. This case highlights a rare presentation of ovarian hyperthecosis in a young woman with severe hyperandrogenism mimicking a virilising neoplasm.

DOI: 10.1530/endoabs.91.WG2

WG3**Clinical utility of GnRH analogues in female androgen excess due to severe insulin resistance**Leanne Cussen^{1,2}, Tara McDonnell^{1,2}, Clare Miller^{1,2}, Lauren Madden Doyle^{1,2} & Michael W O'Reilly^{1,2}¹Endocrinology Department, Beaumont Hospital, Dublin, Ireland;²Department of Medicine, Royal College of Surgeons in Ireland (RCSI), University of Medicine and Health Sciences, Dublin, Ireland

Lipodystrophy represents a broad spectrum of disorders, subdivided depending on aetiology (congenital or acquired) or the extent of adipose tissue absence (generalised or partial). A lack of adipose tissue results in systemic insulin resistance and ectopic fat deposition, which predisposes patients to metabolic syndrome and associated conditions such as non-alcoholic fatty liver disease and diabetes mellitus. Additionally, severe hyperinsulinaemia can generate ovarian androgen production, resulting in an incorrect diagnosis of polycystic ovary syndrome (PCOS) due to a combination of ovulatory dysfunction, androgen excess and severe polycystic ovaries on ultrasound. Juvenile dermatomyositis is a rare autoimmune inflammatory myositis that is associated with lipodystrophy. We present a case of a severe insulin resistance disorder in the setting of juvenile dermatomyositis referred to endocrinology with PCOS features. 25-year-old female diagnosed with juvenile dermatomyositis in childhood, presenting with rashes, joint pains and muscle weakness, which developed into contractures. She had a background history of steroid-induced hyperglycaemia, hypertension and recurrent calcinosis with JJ stents inserted. She was diagnosed with PCOS at age 15 and had been referred to Endocrinology by Rheumatology colleagues due to worsening symptoms of anovulation for over a year and significant hirsutism. On exam, she was a wheelchair user with severe acanthosis nigricans around her neck, axillae and antecubital fossae bilaterally. In addition, there was evidence of partial lipodystrophy affecting her arms and legs and relatively sparing her face and abdomen. Her initial investigations revealed profound insulin resistance with a HOMA insulin ratio of 41.5 based on a glucose of 5.4mmol/l, c peptide of 15.2 and insulin level of 174mu/l (> 1,000 pmol/l). There was biochemical evidence of androgen excess with elevated testosterone of 4.6nmol/l and androstenedione of 15nmol/l. At this juncture, she was commenced on Provera, which she had a partial response to and metformin and spironolactone. She underwent a gonadotropin-releasing hormone (GnRH) suppression test to confirm gonadotropin-driven ovarian hyperandrogenism and explore potentially as a therapeutic option with add back oestrogen. After administration of triptorelin 3 mg, androgens were completely suppressed, with significant clinical improvement in symptoms. She continues on maintenance GnRH therapy with add-back oestrogen and progesterone. This case highlights severe insulin resistance syndromes as a non-PCOS form of androgen excess and the clinical utility of GnRH analogues.

| | Baseline Pre-GnRH | Day 28 post-GnRH |
|-----------------------------|----------------------|---------------------|
| Androstenedione (1.39-9.77) | 17.46nmol/l | 1.4nmol/l |
| DHEAS (0.3-6.7) | 3.7umol/l | 3.7umol/l |
| SHBG (27.1-128) | 60.1 nmol/l | 39.9nmol/l |
| Testosterone (0.5-1.8) | 8.9nmol/l | <0.4nmol/l |
| FSH | 23.5U/l | 6.3U/l |
| LH | 23.4U/l | <0.1U/l |
| Oestradiol | 331 pmol/l | 198 pmol/l |

DOI: 10.1530/endoabs.91.WG3

WG4**Extreme hyperandrogenism secondary to PCOS with weight gain**

Kefah Bashir, Giridhar Tarigopula, Catherine Mitchell, Mustafa Al-Ansari, Yong Ling & Raisa Minhas

The Hillingdon Hospital, London, United Kingdom

A 45-year-old female presented with secondary amenorrhoea. Since menarche, her period has been irregular, which she initially managed with oral pills, which were discontinued in 2009. Subsequently, she does have complete secondary amenorrhoea. She has hirsutism at the age of 20. Which was initially well controlled with oral contraceptive pills but has been getting worse over the years. Ferriman-Gallwey's score was high. She also stated that her weight had been steadily increasing over the years. Her weight was 105 kg when she first visited the clinic in 2018, and it is now 112.7 kg, with a BMI of more than 40. She has schizophrenia, and she is on Risperidone and Mirtazapine, which prompted her to gain more weight. She has no family history of note, particularly no history of diabetes. She has a clinically high BMI of more than 40, and her BP 130/80. She does have extensive hirsutism, and the Ferriman-Gallwey score was 31. She also

does have acanthosis nigricans and multiple skin tags around her face, but no classical cushingoid and not virilised. She had investigations that revealed extremely high levels of testosterone was 13 nmol/l, normal DHEA, and marginally raised androstenedione making the ovarian source more likely. She had an overnight dexamethasone suppression test, the cortisol level was suppressed and the testosterone level was still high, suggesting a possible ovarian source of testosterone. She also underwent an MRI and US scans of the ovaries, both of which revealed polycystic ovaries. Other than that, no other sinister pathology was noted. Additionally, the CT adrenals were normal. We did start her on a trial of Zoladex GnRH agonist injection due to the risk of thrombosis. She was referred to the weight management team. She also referred for ovarian venous sampling to determine the source of the testosterone. Subsequently, she may require an oophorectomy. She is quite keen to take this route.

Conclusion

- PCOS is a common disorder of young women and can rarely have extreme presentation.

- This patient's case was unusual in that the presenting symptoms of severe hirsutism, and significantly elevated androgens raised concern for a non-PCOS pathology

- Approach to such patients involves suppression testing with Dexamethasone to differentiate between adrenal and ovarian sources.

- Dexamethasone suppression test was in favour of ovarian source, and MRI imaging excluded ovarian and adrenal tumour

- Certain imaging may not reveal smaller masses, and ovarian/adrenal vein sampling may be needed.

DOI: 10.1530/endoabs.91.WG4

WG5

A Case of non-diabetic hypoglycaemia: A dual diagnostic challenge

Komal Zia Rao, Jasmine Tharma, Sara Haboosh, Piya Sen Gupta, Paul Carroll & Aaisha Saqib

Guy's and St Thomas' NHS Trust, London, United Kingdom

A 47-year-old female presented to the Emergency department following an episode of loss of consciousness at home that her daughter had identified as due to hypoglycaemia (using her husband's capillary blood glucose meter 1.1mmol/l) and treated. She reported several episodes of fainting, sweating and generalised weakness over 6 months which improved after eating snacks. There was no previous history of diabetes; she had been diagnosed with Graves' disease 6 months previously, following unintentional weight loss of 7 kg over 4 months, treated with carbimazole. Her past medical history included hypertension, arthritis, functional neurological disorder and migraine. She lived with her family from which it was noted her husband and sister were on oral medications for diabetes. On clinical examination, her BMI was 24 kg/m². Pigmentation was noted on the dorsal aspect of her neck but overt acanthosis nigricans or features of insulin resistance were not found. Hourly CBG monitoring was carried out during her inpatient stay. She continued to experience recurrent spontaneous episodes of hypoglycaemia (four episodes over 24 hours). The differentials considered included insulin autoimmune syndrome (Carbimazole-associated insulin autoimmune syndrome), use of diabetes medications, insulinoma or tumour related hypoglycaemia. The investigations revealed: glucose 2.5mmol/l, insulin 1539 pmol/l(18-173 pmol/l), c-peptide 5605 pmol/l(370-1470 pmol/l), TSH: 0.01mIU/l, free T4 18.7 pmol/l, free T3 4.3 pmol/l, TSH-receptor antibody 3.42 IU/l, HbA1c 37mmol/mol, cortisol 510nmol/l. Adrenal antibodies, coeliac screen and pituitary profile were found to be within reference range. Sulphonylurea screen and Insulin antibodies were also requested. No focal abnormality was identified on MRI pancreas. Carbimazole was stopped and she was discharged with a flash glucose monitor. She was followed up in the

outpatient clinic when she reported eating every 2-3 hours to avoid hypoglycaemia. It was found that insulin antibodies were elevated in keeping with insulin autoimmune syndrome (Hirata disease); additionally, a plasma sulphonylurea screen was also positive, a source for which was not identified by the patient. On repeat testing after 9 months: sulphonylurea screen was negative, laboratory blood glucose 4.8mmol/l, insulin 60 pmol/l, c-peptide 830 pmol/l. Insulin autoimmune syndrome was considered to be in remission. Radioactive iodine was considered as the treatment of choice should she require treatment of Graves' disease.

DOI: 10.1530/endoabs.91.WG5

WG6

Post-prandial hypoglycaemia of unknown origin

Vaios Koutroukas¹, Ketan Dhatariya² & Antonia Brooke¹

¹Royal Devon and Exeter NHS Foundation Trust, Exeter, United Kingdom;

²Norfolk and Norwich University Hospitals NHS Foundation Trust, Norwich, United Kingdom

Introduction

α 19-year-old female patient with no past medical history presented with multiple collapses following exercise due to hypoglycaemia. From the history it transpired that she had had previous symptoms consistent with hypoglycaemia on multiple occasions, with no relation to fasting or food or a specific diurnal or nocturnal pattern. The two most severe episodes (requiring paramedic treatment) were in the recovery period from anaerobic exercise. Her body mass index (BMI) is 23.4 kg/m². She does not drink alcohol or take any illicit medications. Her half-brother has type 1 diabetes (T1DM) but lives away; no other family member has diabetes or known hypoglycaemia-related disease.

Investigations

Her pituitary screen, fasting gut peptides and prolonged oral glucose test (OGTT) were normal. Her 72-hr fast achieved hypoglycaemia with low insulin and C-peptide levels, excluding insulinoma. She had amino acids sent off for organic acids and this was reported as normal excluding aminoacidopathy, with a normal IgF1/IgF2 ratio and normal zinc 8 transporter, GAD and IA2 antibodies, too. Finally, genetic causes of hyperinsulinaemia (ABCC8, AKT2, CACNA1D, CREBBP, EP300, FOXA2, GCK, GLUD1, GPC3, HADH, HK1, HNF1A, HNF4A, INSR, KCNJ11, KDM6A, KMT2D, MAFA, NSD1, PFOX2B, PMM2, SLC16A1 and TRMT10A genes) were also negative. An ultrasound of her liver was of normal echogenicity and appearance. A repeat 72-hr fast to check insulin, C-peptide, insulin analogues, sulphonylurea screen, pH, lactate, pyruvate/lactate ratio when plasma glucose <2.5 mmol/l was abandoned due to influenza A within 12 hours of admission. A further 72-hr fast is planned. At this point, it was theorised her symptoms could be explained by exercise-induced hyperinsulinaemia or a genetic defect in various metabolic pathways (gluconeogenesis, ketogenesis, or fatty acid oxidation disorder). To that end, an exercise test was organised with pH, lactate, pyruvate and glucose measurements; however, the patient did not develop hypoglycaemia. A continuous glucose monitoring system with an integrated low glucose alarm (Dexcom) has shown considerable variability with some days without hypoglycaemia, and others regularly <3 mmol/l despite regular carbohydrate and sugar intake. The patient avoids anaerobic exercise for fear of hypoglycaemia, which means she cannot do lifeguarding, her main hobby.

Conclusion

This is a rare case of disabling hypoglycaemia without a confirmed cause. It highlights the merits of continuous glucose monitoring outside of diabetes and places emphasis on the need to consider additional metabolic causes; a pragmatic approach to treatment is likely to be needed.

DOI: 10.1530/endoabs.91.WG6

Workshop H: Miscellaneous endocrine and metabolic disorders

WH1**Crises Looming Large- Endocrine Dysfunction with Cancer Immunotherapy**Angel Mary Joseph, Ryan Vernon D' Costa & Tolulope Shonibare
The Mid Yorkshire Hospitals NHS Trust, Wakefield, United Kingdom**Background**

Immunotherapy with checkpoint inhibitors (CPI) (CTLA4 and PD-1 inhibitors) have significantly improved outcomes and survival rates in patients with a number of cancers. In the UK, Ipilimumab and Nivolumab are approved for the treatment of advanced malignant melanoma. These are often long term therapies and are associated with immune mediated endocrinopathies.

Case

A 70 year old male presented to the Medical Admissions Unit with a history of lethargy, nausea, postural dizziness and reduced urine output since 4 days. He had a background history of Type 2 Diabetes Mellitus (on Metformin); and Stage IV malignant melanoma of the lower back diagnosed in March 2021 and was initiated on Ipilimumab and Nivolumab combination therapy in July 2022 for progressive disease. He was a non smoker and occasionally consumed alcohol. He had no known drug allergies and denied any significant family history. On examination, he had significant orthostatic hypotension and clinical signs of hypothyroidism. Visual fields were normal on confrontation, he had no peripheral hyperpigmentation and was well virilized. Rest of his systemic examination was unremarkable. Investigations were notable for acute kidney injury with normal electrolytes, a raised TSH (40), low FT4 (< 3) and markedly reduced cortisol (11). An endocrine opinion was sought in view of severe primary hypothyroidism and low cortisol. In light of his background history, a diagnosis of CPI associated endocrine dysfunction was made. He was started on stress dose oral hydrocortisone and further initiated on levothyroxine three days after. Blood tests to screen for other endocrinopathies (LH, FSH, Testosterone, Prolactin) were requested. On follow up in the endocrine clinic, he was detected to have low free testosterone (100) with raised LH (19.3) and FSH (34.7). Prolactin was normal. He responded well to thyroxine and cortisol replacement and is due to start testosterone replacement. Stimulatory testing is planned, but is delayed due to short term tapering Prednisolone course that was initiated for hepatotoxicity associated with CPI. His CT scan 6 months post initiation of immunotherapy showed treatment response and he is planned to continue on treatment for the long term. He is also being closely follow up by the endocrine team.

Conclusion

Clinical manifestations of immune mediated endocrinopathies can be non specific and can overlap with multi-organ involvement in the acute care setting. A clinician must consider endocrine dysfunction as a possibility while managing these patients, thus preventing potential life threatening consequences when recognised early and treated appropriately.

DOI: 10.1530/endoabs.91.WH1

WH2**Post-COVID-19 male hypogonadism: an area of endocrine concern?**Nyan Lin, Anneke Graf, Purnami De Sliva, Devesh Sennik & Ellie Panteliou
Princess Alexandra Hospital, Harlow, United Kingdom

A 48-year-old gentleman, father of 3 children, was referred to our endocrinology clinic, with sexual dysfunction and hypergonadotrophic hypogonadism. He had a history of severe Coronavirus-Disease-2019(COVID-19) pneumonitis for which he received prolonged ventilatory support. Post extubation, he experienced testicular pain and swelling. A testicular ultrasound showed a left-sided hydrocele, multiloculated epididymal-cyst and a right testicular cyst. He also described new symptoms of lethargy and poor sexual function, since discharged from hospital. He had a past medical history of Type-2 Diabetes on oral agents, Polycystic-Kidney-Disease, a post-COVID-19 occipital haemorrhagic infarct and class-1 obesity. Endocrine testing revealed total testosterone:4.7nmol/l, FSH:11.7u/l, LH:6.1u/l, SHBG:8nmol/l, Free-Androgen-Index:58.7, prolactin:187mU/l, cortisol:431nmol/l, ferritin:161ug/l, PSA:0.26ug/l, HbA1c:82mmol/mol. This biochemical picture was consistent with primary hypogonadism, contrary to the profile that might have been expected in an obese man with metabolic syndrome, who had survived critical illness. Magnetic-Resonance-Imaging (MRI) of the head did not show any pituitary pathology. Transdermal testosterone was initiated and on follow-up, testosterone levels as well sexual function had improved. A number of case-reports and small studies have demonstrated the presence of male-hypogonadism in the acute phase and during recovery from COVID-19. The male reproductive system can be affected by the Severe-Acute-Respiratory-Syndrome-Coronavirus-2(SARS-CoV-2), causing COVID-19, in numerous ways. SARS-CoV-2 uses the Angiotensin-Converting-Enzyme-2(ACE-2)-receptor and Trans-Membrane-Serine protease-2(TMPS-2) to infect host cells. ACE-2 and TMPS-2 are co-expressed in the testes. The

development of hypogonadism can also be attributed to increased pro-inflammatory cytokines. Severe inflammation can disrupt the Blood-Testicular-Barrier (BTB), allowing direct damage of the seminiferous epithelium and spermatogonial stem cells. Possible effects of COVID-19 on the Hypothalamic-Pituitary-Gonadal (HPG) axis have also been proposed, with a declined testosterone:LH ratio. Small studies of patients with moderate to severe COVID-19 reported that epididymo-orchitis can be present in 10-25% of this cohort. Although this seems to be more common at the moderate to severe spectrum of Covid-19, recent studies have demonstrated that this might also be the case for patients at the milder end of the spectrum too. Virus-induced endocrine disorders, including male-hypogonadism, have been implicated in the pathogenesis, of the "post-COVID condition", as defined by the World-Health-Organisation (WHO), which can affect up to 1/3 of patients having contracted COVID-19. In the post pandemic era, concerns over the long-term sequelae of COVID-19 on the male reproductive health have been raised by a number of fertility societies, something that could also be reflected on the male-hypogonadism workload of our endocrine practice.

DOI: 10.1530/endoabs.91.WH2

WH3**Diagnosing Adrenal insufficiency**

Janine Musselwhite

East Kent Hospitals NHS Foundation Trust, Margate, Kent, United Kingdom

Patient referred to us for Short Synacthen test following, low baseline cortisol in the community, symptoms of fatigue, background history of neck pain on mild opioids, Paracetamol, codeine and Tramadol. Asthmatic on prn salbutamol inhalers. Before attending for Synacthen test patient asked to withhold inhalers and any steroid based medications. Synacthen performed at 08:30am: Pre Cortisol level: 96mmol/l/Post Synacthen administration: 388mmol/l/Inadequate response to synacthen (adequate response is >480 nmol/l at 30 mins post synacthen). ACTH: negative Medically, the patient was started on hydrocortisone, 10/5/5 but this had little effect on the original symptoms of fatigue. She was also advised to reduce her mild opioid medication, as this should have a positive effect on the adrenal glands and in time should mean we can reduce the hydrocortisone medication. Two months later the patient had a hydrocortisone day curve test, mainly because she was reporting a 1.5 stone weight gain. HDC are preformed using the Imperial college hospital guidelines, pre medication and one hour after medication.

Results

Pre levels less than 30mmol/l, 10 mg hydrocortisone given post blood test 579mmol/l/Pre lunchtime levels was 317mmol/l, 5 mg hydrocortisone given post blood test 625mmol/l/Pre late afternoon levels was 295mmol/l, 5 mg hydrocortisone given post blood test 731mmol/l/It was suggested we reduce the 4pm dosage slightly to 2.5 mg. Other than that there was no changes were made. A further two months past and the patient contacted us to say she had stopped her hydrocortisone medication as the weight gain was getting worse. She reports she did not feel any different and she also informed us she has stopped her Tramadol medication. At the point the best option was to start again with a synacthen test. Pre cortisol level: 69mmol/l/Post synacthen cortisol level: 357mmol/l/The patient was encouraged to restart hydrocortisone at a lower dosage 5 mg twice daily. We are now at present day and the plan to date is do a day curve again after a further few weeks.

DOI: 10.1530/endoabs.91.WH3

WH4**A patient with known Langerhans cell histiocytosis presents with polyuria and polydipsia**Moe Kyaw^{1,2} & Amit Banerjee¹¹St Helens and Knowsley Teaching Hospitals NHS Trust, Prescott, United Kingdom; ²Furness General Hospital, Barrow-in-Furness, United Kingdom

A 41 year old lady was referred to the endocrine clinic by her respiratory physician. She is known to have Langerhans cell histiocytosis (LCH) with lung involvement. She is having yearly follow up under respiratory team and not needing any treatment for LCH. In endocrine clinic she confirmed that she is drinking around 9 to 10 L of water / day and having quite significant polyuria. She works in Tesco. She does not have any other medical condition and not taking any regular medication. There is no history of change in body weight, lethargy, oral or genital thrush, cough or abdominal pain. Her HbA1c was 37 and Na 148 with normal eGFR. Her early morning cortisol 430. She had a water deprivation test which confirmed central diabetes insipidus (CDI). Her MRI pituitary showed hypophysitis. CT Neck, thorax, abdomen and pelvis: was unremarkable. Other autoimmune, infiltrative and infections were ruled out. Her rest of pituitary profile

was checked and it was normal. A clinical diagnosis of central diabetes insipidus secondary to LCH was made. She was started on desmopressin nasal spray. Symptoms dramatically improved with desmopressin nasal spray 5 mg in the morning and 10 mg at night. Appropriate follow up arranged in endocrine clinic to monitor her electrolytes. LCH is a rare and probably underdiagnosed disease with a wide range of presentation. Due to infiltration of the hypothalamic pituitary axis, CDI can even be the first manifestation, even before LCH is diagnosed. Therefore, LCH should be considered in the diagnostic workup of CDI.

DOI: 10.1530/endoabs.91.WH4

WH5

Transient Severe Hypothyroidism of Uncertain Aetiology

Chinaza Nwachukwu, Gul Rubab & Amutha Krishnan
Manx Centre for Diabetes, Endocrinology and Metabolism Noble's Hospital, Douglas, Isle of Man

32 year old male patient admitted to A&E with a 3 days history of confusion and generalised oedema. History from the mother revealed long standing self-neglect, poor nutrition and prolonged immobility due to abnormal painful sensation and weakness in the lower limbs. This is preceded by a post traumatic drastic change in character of the patient, with resultant agoraphobia and excess consumption of alcohol. Investigations on admission include: TSH 128 ulu/ml (0.27-4.20), T4 < 0.5 pmol/l(11.1-22.6); Hb 170g/l(135-175), WBC 10.40 x10⁹ (4-11), Neutrophils 8.14x 10⁹ (2.0-7.5); AKI- eGFR 22 (>90), creatinine 306umol/l(59-104), urea 32.7mmol/l(2.5-7.8); ALT 58U/l(10-50), bilirubin 34umol/l(0-21), GGT 313U/l(10-71); sodium 129mmol/l(133-146), magnesium 0.66mmol/l(0.7-1.0), phosphate 0.50mmol/l(0.80-1.50); Vitamin D level <7.5nmol/l(<50 depicts deficiency); albumin 34.6g/l(35-50), globulin 23g/l(19-35); normal iron studies with elevated ferritin- 1159ng/ml (30-400); TPO 9 IU/ml (0-34), thyroid receptor AB <0.3 IU/l(0.0-0.9). Thyroid ultrasound demonstrated bulky thyroid with no obvious masses or pathology identified. BMI on admission was 26. He was managed as a complex presentation of severe hypothyroidism of uncertain aetiology, confusion of unknown cause, severe bilateral pneumonia and AKI. He was commenced on levothyroxine 75micrograms. AKI and pneumonia significantly improved with treatment. He had several investigations for a possible underlying aetiology of illness and ongoing confusion, including analysis for possible Prion disease which were all negative. He made a remarkable improvement clinically and was discharged to a neurorehabilitation hospital. On follow up in endocrinology clinic, steady improvement in thyroid function was noted. Levothyroxine was discontinued. He remained euthyroid without levothyroxine and has continued to remain stable. Below is a table demonstrating the trend of thyroid function tests from admission till present:

Conclusion

This was a case of transient severe hypothyroidism of uncertain aetiology. Was this severe non-thyroidal illness as an underlying cause of severe hypothyroidism? Or Severe hypothyroidism secondary to malnutrition?

| Date | TSH (ulu/l) (0.27-4.20) | T4 (pmol/l) (11.1-22.6) | T3 (pmol/l) (3.1- 6.8) | Treatment with thyroxine |
|---------------|----------------------------|-----------------------------|----------------------------|-----------------------------|
| Sept 2021 | 128 | <0.5 | - | Started |
| Nov 2021 | 2.97 | 32.1 | 4.8 | Ongoing treatment |
| May 2022 | 1.31 | 26.6 | 4.5 | Ongoing |
| Sept 2022 | 1.09 | 23.5 | 4.6 | Stopped |
| November 2022 | 1.54 | 21.9 | 4.8 | No treatment |
| Jan 2023 | 1.70 | 21.6 | 5.4 | No treatment |

DOI: 10.1530/endoabs.91.WH5

WH6

A case of bilateral adrenal infarction of uncommon aetiology

Orighomisan Awala, Shivangi Shah & Harit Buch
Royal Wolverhampton NHS Trust, Wolverhampton, United Kingdom

Background

We present a case of a 33 year old female with a background of Turner's syndrome, adequately managed with growth hormone and oestrogen supplementation, Crohn's disease, horse shoe kidney and subclinical hypothyroidism

Case details

She presented to the emergency team with high-grade fever and right sided hemiplegia 10 days following Astra Zeneca COVID vaccination. Initial blood

tests showed mildly raised CRP of 49, thrombocytopenia with platelet count of 54 and a normal plain CT head. MRI head showed bilateral multifocal acute infarcts in MCA territory and watershed areas on the left raising a suspicion of a thromboembolic source. She was seen by multiple teams with a working diagnosis of COVID vaccine-induced thrombocytopenic thrombosis. Abdominal and pelvic CT scan was arranged on day 15 of admission on account of persistent pyrexia and raised inflammatory markers. It did not identify focal sepsis but showed ill-defined and enlarged adrenal glands. Soon after the scan she deteriorated acutely with hypotension, hyponatremia and hyperkalaemia, requiring ITU admission. She was treated for suspected acute hypocortisolism with intravenous hydrocortisone and after stabilisation she was initiated on oral hydrocortisone and fludrocortisone. A short synacthen test performed after acute illness, along with ACTH level, confirmed the diagnosis of primary hypocortisolism secondary to bilateral adrenal infarction most likely to be secondary to vaccine-induced thrombocytopenic thrombosis. Repeat CT scan showed resolution of adrenal gland enlargement. She has made moderate recovery from the cerebrovascular episode and continues to be managed with a multidisciplinary team approach in the community. She has received the standard advice regarding long-term steroid use. Oral contraceptive pills were initially stopped as a result of the recent stroke although as she experienced menopausal symptoms she was re-instated on topical HRT patches. There is no plan to withdraw steroids and retest.

Summary

Vaccine related immune thrombocytopenia and thrombosis is a syndrome that has been reported in rare cases after COVID-19 vaccination although this entity is not yet fully understood. Cerebral venous thrombosis is the most common site of thrombosis, with remaining cases affecting a range of sites such as the splanchnic system, heart, lungs, limbs and other solid organs such as adrenal glands and in many cases two or more vascular beds are involved simultaneously. This case highlights the limitation of imaging and importance of clinical signs and symptoms, high index of suspicion in the diagnosis of hypocortisolism.

DOI: 10.1530/endoabs.91.WH6

WH7

Erdheim Chester disease as a cause of Diabetes Insipidus

Soe Nyi Nyi Htet, Kagabo Hirwa & Jamie Smith
Torbay Hospital, Torquay, United Kingdom

Case Summary

A 53-year-old lady who was normally fit and well, presented with a 3 months history of polydipsia and excessive polyuria up to 13 litres a day. A water deprivation test confirmed a cranial diabetes insipidus, and she was started on desmopressin. Apart from hypothyroidism that was well controlled with levothyroxine replacement, the rest of her pituitary profile was unremarkable for a lady of her age. The rest of her investigations showed persistent increased inflammatory markers, a slightly high paraprotein and low IgA. A brain MRI showed empty sella configuration of the pituitary with a normal pituitary stalk and a normal hypothalamus. She later started suffering from headaches, pain around ears, lethargy, joint aches and skin rashes. A CT scan of her temporal bones showed a suspected osteitis in the sphenoid bone, and it was treated with multiple courses of antibiotics. A bone marrow biopsy was done to investigate the high paraprotein and it was unremarkable. A PET scan was organised to look for a cause of the persistent high inflammatory markers. This scan showed multiple avid uptakes in the different long bones, in ribs, in sacral iliac joints and in sphenoid bones. These radiological features were suggestive of Erdheim Chester disease. BRAF V600E mutation identified in the tissue biopsy of her eyelids xanthelasma lesions confirmed the diagnosis. The patient has now been started on methotrexate, but her systemic symptoms have not yet improved. A cardiac MRI did not show any cardiac involvement. Patient is now being followed locally with the input from the national histiocytosis multidisciplinary team.

Conclusion

Erdheim- Chester disease is a very rare histiocytic neoplasm (non-Langerhans cell histiocytosis) with multisystem involvement; its aetiology and pathogenesis have not yet been fully elucidated. It is a disease characterised by multisystem involvement, with the bones being the most affected organ; but other also endocrine systems, cardiovascular and central nervous systems are frequently affected. One of its common endocrine manifestations is diabetes insipidus. The diagnosis of Erdheim- Chester is challenging given its rare prevalence and the non-specificity of its symptoms; this clinical case highlights the importance of widening the scope of investigations when managing unusual clinical presentations.

DOI: 10.1530/endoabs.91.WH7

Additional Cases

CB1**Non-classical presentation of Graves' disease during the postpartal period with idiopathic intracranial hypertension (IIH): A cause or a red herring**

Idowu Olaogun

University College London Hospital, London, United Kingdom

Graves' disease relapse is a common occurrence during the postpartum period which is due to resurgence of immune system after pregnancy. In most cases, overt clinical symptoms are seen and the timing of its occurrence varies from 4 to 8 months. This is a case of a 33 year old lady referred after an MTOP with bilateral papilloedema and subsequently diagnosed with Graves relapse. She had a background of Graves' disease 7 years ago initially treated medically and had two previous relapses. Pregnancy was unplanned and eventually had Medical termination of pregnancy (MTOP) at 20 weeks of gestation for Down's syndrome on fetal scans. The Thyroid function test was monitored during the antenatal clinic and normal a month before the MTOP. She developed headache about 12 hours after the use of mifepristone which progressively worsened with associated progressive visual impairments. Of note is the rapid weight gain previously before and during the pregnancy, has gained about 20 kg in the previous 2 years. Fundoscopy revealed bilateral papilloedema and MRI showed raised intracranial pressure with no structural brain disease. She had an LP with opening pressure of 35 cm and closing pressure of 12 cm H2O. Blood subsequently showed TSH <0.01 and FT4 44 two months after which necessitated Endocrinology referral. No other discriminative features of hyperthyroidism apart from tachycardia and she was more concerned with the progressive visual loss and headache that is not controlled by simple analgesics impacting her quality of life. Literature was reviewed which confirmed previous case reports, she was advised that hyperthyroidism may be the cause of the IIH. While treatment of hyperthyroidism might work if it is responsible for the IIH, it might make it more difficult to lose weight which is the treatment for the weight gain as another possible risk factor. We therefore offered the treatment for hyperthyroidism and encouraged the Neurologists to start the treatment of IIH. She however chose not to take any of these medications but started lifestyle modification for weight loss which improved her IIH symptoms significantly and after 12 weeks, she started a low dose of PTU. This case illustrates the dilemma faced when thyrotoxicosis presents with non classical signs and symptoms and in this case, hyperthyroidism co-existed with other risks factors for IIH and it was difficult to know the risk factor responsible initially. However, the dominant risks was not the thyrotoxicosis but excessive weight gain.

DOI: 10.1530/endoabs.91.CB1

CB2**Subclinical hyperthyroidism in pregnancy**

David Hope

Imperial College, London, United Kingdom

33 year old female who is 5 months pregnant, referred to Endocrinology clinic with TFT's in keeping with sub clinical hyperthyroidism. Previously also had thyroid USS showing large 5 cm nodules both lobes, both indeterminate in appearance (U3) which preceded pregnancy. Symptomatic with sweating and palpitations. No family history of thyroid disease and no 'red flag' symptoms. Clinical examination showed palpable thyroid nodules with no evidence of thyrotoxicosis. TSH 0.09mu/l, t4 and t3 within normal range. Discussed further investigation for both nodules and best management for SCHyperthyroidism in pregnancy. This patient is awaiting a further US thyroid +- FNA.

DOI: 10.1530/endoabs.91.CB2

CB3**A case of Graves' disease relapse with high immunologic activity and recurrent refractory course precipitated by poor drug compliance - influence of carbimazole compliance on immunogenic activity**

Idowu Olaogun

University College London Hospital, London, United Kingdom

Graves' disease is a very common cause of thyrotoxicosis and it runs a relapsing remitting course due to varying immunogenicity of the pathogenic

autoantibodies. Medical treatment is the preferred means of treatment by patients especially in the uncomplicated and non relapsing cases. Few studies have established the additional benefit of thionamides on immunogenic characteristics in Graves's disease. This is a case of a 30 year old lady diagnosed with Graves' disease 10 years ago during the puerperium and treated medically in India for 6 months. She had a relapse 4 years after initial treatment when she was referred to our thyroid clinic with weight loss, tremor and palpitations. On examination, she had diffuse goitre with no orbitopathy and high TRAb of 97.8 with FT4 of 67.1. She initially opted for medical therapy after discussing risks of further relapses and in the course of treatment, noticed fluctuating course while on carbimazole in terms of the TFT and TRAb levels. We reiterated the need for compliance and need for definitive treatment due to inability to achieve remission while on medical therapy. She eventually opted for thyroidectomy (as she had small children at home). Due to the very poor control, the surgery was delayed and eventually when she was scheduled 3 years ago, she cancelled it with no documented reasons and continued on medical treatment. Her FT4 in the last six years has ranged between 35.4 and > 100 (normal range 12-22) with suppressed TSH <0.01 (normal 1-5) and TRAb 12.4 and > 100. She has had several episodes of severe thyrotoxicosis with unrecordable high FT4 above 100 and high immunologic activity TRAb above 100 while on standard dose of carbimazole. However, during hospital admissions, she had reasonable response to high dose Carbimazole and prednisolone which confirmed poor drug compliance. The cause of her non compliance may be related to fatigue (long term medical treatment for which she was not insightful), no underlined psychopathology. Despite reiterating the needs for compliance and clarifying complications of poorly controlled thyrotoxicosis, she is still having unsteady TFT and persistently unrecordable high TRAb. This case illustrate the vicious cycle of poor drug compliance leading to upsurge of immunogenicity which continued to trigger recurrent refractory Graves' disease leading to multiple hospital admissions- which suggests the possible benefits of carbimazole on immunogenicity.

DOI: 10.1530/endoabs.91.CB3

CB4**Amiodarone-Induced Thyrotoxicosis: Case Report**

Chinedu Anizor & Jesse Kumar

Maidstone Hospital, Hermitage Lane, Maidstone, Kent, United Kingdom

Introduction

Amiodarone is a widely used antiarrhythmic drug for refractory atrial or ventricular tachyarrhythmias. Amiodarone-induced thyrotoxicosis (AIT) occurs in up to 6% of patients taking this medication in iodine-sufficient areas of the world and in up to 10% in iodine deficient areas. AIT is of two types: type 1 is a form of iodine-induced hyperthyroidism whereas type 2 is a drug-induced destructive thyroiditis. Type 1 AIT tends to occur in patients with underlying thyroid autonomy in a nodular goitre, or Graves' disease, while type 2 AIT appears because of direct damage or induction of apoptosis in thyrocytes by amiodarone.

Case report

A 68-year-old man presented to our emergency department with worsening palpitations and shortness of breath. He was known to have a paroxysmal atrial fibrillation and had been on Amiodarone for about two years. Amiodarone was discontinued about a month prior to presentation when his thyroid function test results were found to be abnormal. He denied previous personal or familiar history of thyroid dysfunction. On examination, he was tachycardic with a heart rate of 150 bpm. An ECG showed in was in a fast atrial fibrillation. Thyroid function tests showed a TSH <0.02 µU/l, FT3 9.1 pmol/l, FT4 71.0 pmol/l. Given the previous medical history of amiodarone use, a diagnosis of amiodarone-induced thyrotoxicosis was made. He was started on bisoprolol by the Cardiologist for rate control. He was then started on Carbimazole 40 mg mg and 30 mg of prednisolone daily. An iodine uptake scan was not performed as patient had already been started on carbimazole. His TSH-receptor antibody result came later to be < 0.3IU/l. We stopped carbimazole as this was likely a Type 2 AIT, while he continued prednisolone. Prednisolone was gradually tapered and stopped over the next three months while monitoring his thyroid function. About four months post-steroid cessation, biochemical re-evaluation showed TSH 16.2 µU/ml and FT4 11.4 pmol/land similar picture persisted on a repeat follow up sample. He was then started on Levothyroxine replacement. He is presently under endocrine follow

Conclusion

This case highlights the effects of Amiodarone on the thyroid gland and demonstrates the possible spontaneous evolution of amiodarone induced thyrotoxicosis into hypothyroidism.

DOI: 10.1530/endoabs.91.CB4

CB5

Thyrotoxic crisis presenting with hypoglycaemia, pancytopenia and intrahepatic cholestasis

Kavinga Gamage^{1,2}, Sivatharshya Pathmanathan² & Manilka Sumanatilleke²

¹Royal Alexandra Hospital, Paisley, United Kingdom; ²National Hospital of Sri Lanka, Colombo, United Kingdom

Background

Thyrotoxic crisis is a rare and life threatening condition requiring urgent medical intervention. Intrahepatic cholestasis, hypoglycaemia and pancytopenia are known but uncommon presentations in thyrotoxic crisis.

Case presentation

A 71 year old Sri Lankan female with a background history of diabetes presented to a tertiary care centre with severe hypoglycaemic episodes despite being off oral hypoglycaemic agents, weight loss of 6 kg, palpitations and breathlessness over the preceding 3 months. She was a thin built lady with a BMI of 18.5 kgm⁻², temperature 99°F. She appeared breathless on presentation with mild agitation. There was pallor, icterus, fine tremors, ankle oedema and evidence of hyperhidrosis. Jugular venous pressure was elevated. She had a non tender multinodular goitre, and pretibial myxoedema. Features of dysthyroid eye disease were absent. Her pulse was irregularly irregular at a rate of 120/min, a soft ejection systolic murmur was noted at the pulmonary region. There were bibasal crackles. Electrocardiogram (ECG) confirmed the presence of atrial fibrillation. FT4 was elevated 6.4 ng/dL (0.89-1.76) with suppressed TSH 0.008mIU/l(0.55-4.78) suggestive of thyrotoxicosis. There was pancytopenia in the full blood count (white cells 3.2x10³ /ul, haemoglobin 6.8g/dl, platelets 78,000/ul). Liver enzymes were normal (AST of 44U/dl, ALT of 22U/dl), however conjugated hyperbilirubinemia was noted (total bilirubin 2.8 mg/dL(0.1-1.2 mg/dl), direct 1.0 mg/dL(<0.3 mg/dl). ALP was 220 IU/dL(44-147IU/dl), and gamma GT levels 193U/l(5-40U/l). Ultrasound scan of the abdomen revealed the presence of congestive hepatopathy and absent intra or extrahepatic bile duct dilatation. HbA1c was 4.4%. Fasting blood sugar was 56.8 mg/dL and premeal capillary blood sugar monitoring varied from 66-80 mg/dl. Renal functions were normal. Ejection fraction was 60% in echocardiogram. Chest X-ray showed bilateral lung congestion without cardiomegaly. Ultrasound scan of the neck demonstrated a multinodular goitre with increased vascularity, without retrosternal extension. Burch-Watofsky score was 60 suggesting thyrotoxic crisis. She was initially bridged with lithium carbonate, Lugols iodine and cholestyramine due to the presence of hyperbilirubinaemia, but due to suspected Lithium toxicity Lithium had to be withheld after 1 week. Thereafter she was started on propylthiouracil which resulted in rapid improvement of thyroid function tests as well as pancytopenia and the intrahepatic cholestasis. She additionally required blood transfusions and diuretics to improve her symptoms.

Conclusion

Cholestasis, hypoglycaemia and pancytopenia are rare complications of thyrotoxicosis. Thionamides are a safe option of treatment with careful monitoring of blood counts and liver functions.

DOI: 10.1530/endoabs.91.CB5

CB6

Type 2 Amiodarone-induced Thyrotoxicosis

Kyle Cilia

Mater Dei Hospital, Msida, Malta

A 72-year-old man with a past medical history of hypertension, atrial fibrillation and ischemic heart disease presented to cardiology outpatients for his routine visit. His regular medications included atorvastatin 80 mg daily, enalapril 5 mg daily, amlodipine 5 mg daily, aspirin 75 mg daily and amiodarone 200 mg daily. Endocrinologists were involved after noticing abnormal thyroid function tests (TFTs) on his routine check. TFTs showed a suppressed thyroid stimulating hormone (TSH) at a level of 0.019µIU/ml (reference range 0.3-3) and elevated free thyroxine (T4) and triiodothyronine (T3) at a level of 47.58 pmol/l(11-18) and 7 pmol/l(3.5-6.5) respectively. Previous TFTs over the years were always normal. The patient was completely asymptomatic and denied any recent illness or neck pain or swelling. He has no family history of thyroid disorders and was a non-smoker. Physical examination was unremarkable with a resting heart rate of 80 beats per minute, irregularly irregular. A diagnosis of amiodarone-induced hyperthyroidism (AIT) was made. He was initially started on carbimazole (CBZ) 20 mg daily and prednisolone 20 mg daily. Amiodarone was stopped and atenolol at a dose of 12.5 mg daily was started after discussion with his caring cardiologist. TSH receptor antibodies came back negative and an ultrasound doppler of the thyroid gland showed a normal size gland with reduced vascularity. A diagnosis of type 2 AIT was made. Patient was reviewed after 3 weeks of treatment. He

remained clinically well. Biochemically there was a slight decrease in T4, down to 36.49 pmol/l and T3 down to 6.2 pmol/l. TSH suppressed at 0.008µIU/ml. CBZ was stopped and kept on the same dose of prednisolone. After 7 weeks of treatment, there was worsening in his TFTs, with T4 level of 52.18 pmol/l and T3 of 9.4 pmol/l. Prednisolone was increased to 30 mg daily and kept off CBZ. After 16 weeks of treatment, T4 came down to 26.77 pmol/l and T3 to 6.9 pmol/l, with TSH still suppressed at 0.008µIU/ml. During this visit, prednisolone was decreased to 20 mg daily. TFTs continued to improve gradually and became euthyroid after 5 months of treatment (TSH 0.382µIU/ml, T4 14.43 pmol/l & T3 4.9 pmol/l, currently on prednisolone 5 mg daily). A morning serum cortisol was taken more than 24 hours after his last dose of prednisolone and showed normal adrenal response with a cortisol level of 511nmol/l. Prednisolone was stopped completely after a total of 26 weeks of treatment. During follow-up visits the patient remained well and TFTs remained within range.

DOI: 10.1530/endoabs.91.CB6

CB7

Hyperthyroidism in a women of child bearing age

Aashutosh Patil

Royal Bolton Hospital, Bolton, United Kingdom

Patient a 30 year old female was referred to Endocrinology from ED. Patient had presented to ED with palpitations and anxiety. Was having these symptoms for last month and had no other medical illness, not on any regular medications. In ED had ECG done which showed sinus tachycardia, had Bloods done which showed picture of Hyperthyroidism so was referred to Endocrinology. She was started on oral propranolol for symptomatic relief and the TRAB antibodies, TPO antibodies were requested. On examination she had no evidence of Thyroid eye disease and goiter. She was seen later in Clinic after repeating her TFTs in week time to exclude thyroiditis. The TFT showed similar picture as on presentation to ED, The TRAB antibodies were positive and diagnosis of Auto immune thyroid disease was made. She was treated with ATD (Carbimazole) and during counselling was warned about the side effects of ATD as agranulocytosis. The dose of ATD was titrated and the patient was on ATD for 2 years. After the period of 2 years she was given a trial off ATD after explaining the risk of relapse around 50%. Unfortunately she had a relapse of her condition and she was considered for definitive management. In her case she was referred for RAI therapy. She was warned about the precautions to be taken and the risks involved. She decided to proceed with RAI. She was warned about pregnancy and was advised to be on contraceptives for 6 months post RAI. She went ahead with RAI after confirming negative pregnancy test. She was restarted on ATD after the RAI as per guidelines and the dose of ATD was titrated and stopped after 3 months. During the surveillance of her TFTs after stopping the ATD there was a relapse of her condition which was managed with restarting the ATD. She is currently being counselled for the second trial of treatment with RAI or lifelong ATD treatment. Discussion points

-Etiology of Hyperthyroidism as Autoimmune / Thyroiditis -various etiologies/ Multi nodular goiter.

-Importance of counselling about pregnancy and precautions before and after RAI for treatment of Autoimmune thyroid disease.

DOI: 10.1530/endoabs.91.CB7

CB8

Amiodarone; A tale of 2 thyroiditis

Aisha Irfan

East and North Hertfordshire NHS Trust, Lister Hospital, Stevenage, United Kingdom

2 cases of Amiodarone induced thyroiditis. 1. 60 years old gentleman on haemodialysis, secondary to diabetes related kidney failure, on Insulin for diabetes, also on treatment for active pulmonary tuberculosis and on amiodarone for non-sustained VTs for one year and had left ventricular systolic dysfunction. He went into atrial fibrillation during a dialysis session and his thyroid function tests were done along with other blood tests. He was discussed with cardiology who advised to stop amiodarone and switch to bisoprolol. His TFTs were.

- TSH 0.16 mU/l (0.27-4.2)
- T4 37.6 pmol/l (12-22)
- T3 2.8 pmol/l (3.1-6.8)

At this point he was referred to endocrine team. Clinically there was no thyroid swelling or peripheral signs of hyperthyroidism. The patient was started on carbimazole and tapering dose of prednisolone as the type of AIT was not known,

thyroid antibodies, thyroid ultrasound scan and Tc thyroid uptake scan was requested. The Thyroid antibodies came back negative, carbimazole dose was reduced and tapering dose of steroids was continued. Thyroid ultrasound came back as normal, Tc Thyroid scan showed homogeneous uptake, and the latest TFTs were normal. 2. 70 years old lady admitted with a fall. Background history of pulmonary embolism, atrial fibrillation, previous multiple cardioversions, anxiety and depression, hypertension and osteoarthritis. Medications included rivaroxaban and amiodarone for 5 years. She was referred to the endocrine team for abnormal thyroid function tests. T4 > 100 pmol/l and TSH < 0.02 mU/l. On examination, she had a normal thyroid and no signs of hyperthyroidism. Cardiology advised to switch amiodarone to bisoprolol. She was started on 40 mg of carbimazole and a tapering dose of steroids. Thyroid antibodies, thyroid ultrasound, and Tc thyroid uptake scan were requested. Thyroid stimulating Immunoglobulins were 0.95 iu/l (< 0.56), ultrasound neck showed: mildly enlarged multinodular goiter, background chronic thyroiditis, several benign U2 nodules. Thyroid uptake scan showed, no uptake in the neck, however, this was done after being on carbimazole. The serial thyroid functions showed improvement.

DOI: 10.1530/endoabs.91.CB8

CB9

A case of Thyroid Hormones resistance causing symptoms in a young woman

Atif Nizami, Asra Khan & Khwaja Nizamuddin
Royal Blackburn Hospital, Blackburn, United Kingdom

This case reports describes a 26-year-old presented with having regular shakes, including tremulous arms, feeling hot and cold, mood swings, increased sweating, constantly feeling hungry, being itching all the time and having stomach-ache. She felt easily bloated with certain types of food. She was investigated and found to have thyroid hormone dysfunction. Symptoms were suggestive of Thyrotoxicosis with Biochemical evidence of Thyrotoxicosis. She had further investigations including genetic studies which confirmed resistance to thyroid hormone. TSH Secreting adenoma is a differential but due pattern of inheritance with positive family history in the first degree relative (father RTH) investigations to differentiate between the two won't be needed and genetic test could be more cost effective. TSH 1.1 mU/l (0.30-6.00) Normal since 2011 FreeT4 26.6 pmol/l (10.4-24.5) Fluctuating between high and normal since 2011 but persistent High Since 2021 FreeT3 6.2 pmol/l (3.0-7.1) but in 2020 high twice 7.8 & 7.6 pmol/l CRP < 5 ESR 5 mm/hr Genetic Testing: heterozygous familial THRβ pathogenic variant RTH is autosomal dominant defect in 1 of the 2-thyroid hormone receptors, resulting in decreased end organ responsiveness/sensitivity to thyroid hormones. THR can be classified based on tissue resistance into pituitary, peripheral or generalized (both pituitary and peripheral) types. Mutations in the TR-beta gene, cell membrane transporter and genes controlling intracellular metabolism of thyroid hormone have been implicated in 85% of cases. It is characterized by elevated Thyroid Hormone Levels but the thyroid stimulating hormone (TSH) level is not suppressed, or not completely suppressed as would be expected. Many a times RTH can be mismanaged as hyper/hypothyroidism or there can be a delay in diagnosis due to lack of proper history and investigations. The diagnosis helps in appropriate treatment approach for the patient and genetic counselling of the family.

DOI: 10.1530/endoabs.91.CB9

CB10

Relapse of Graves' Disease

Arlène Gatt & Sandro Vella
Mater Dei Hospital, Msida, Malta

A 23-year-old female presented with a three-month history of palpitations, tremors and recent anxiety. This was associated with hot flushes in the morning, heat intolerance and increase in appetite. Otherwise, bowel habits were normal and the patient suffered from long-standing menorrhagia with regular menstrual cycles. She denied a recent viral illness, neck pain or swelling, dysphagia, shortness of breath or dysphonia. She denied thyroid eye disease symptoms. She denied a past history of radiation or family history of thyroid cancer. The patient had no other medical or surgical history and denied smoking or alcohol intake. On examination, the patient appeared clinically hyperthyroid with an evident tremor

of the out-stretched hands, sinus tachycardia and a palpable goitre, however there was no associated lymphadenopathy, thyroid bruits or thyroid eye signs.

Complete blood count and Liver Function Tests were normal at baseline. Ultrasound of the Neck and Thyroid showed a swollen and hyperaemic thyroid gland. The parenchyma was diffusely inhomogeneous in echotexture and mostly hypo-echoic with overall increase in Doppler signal in-keeping with Graves' Disease. Seven years ago, the patient presented to her paediatric endocrinologist with fever, pharyngitis and thyrotoxic thyroid function tests. She was diagnosed with acute Epstein-Barr virus confirmed on PCR and treated conservatively. Anti-TSH Receptor Antibody and anti-TPO Antibody were negative and US Neck/Thyroid was in-keeping with a subacute thyroiditis. However, on-being reviewed more than one month after the viral infection, the patient remained clinically hyperthyroid, retained thyrotoxic thyroid function tests and was presumed to have Graves' Disease. She was therefore started on Carbimazole 5 mg 8-hourly and titrated down over the span of a year. The patient was started on Propranolol 10 mg 8-hourly and Carbimazole 20 mg 12-hourly, and advised to start contraception. Risks of becoming pregnant while on Carbimazole and in the current thyrotoxic phase explained. Side effects of Carbimazole, including agranulocytosis and hepatitis, were also explained. She was counselled on radioactive iodine therapy (RAIT) vs total thyroidectomy as a form of definitive treatment as this was a relapse of Graves'. Risks and benefits of both were explained and patient chose to undergo RAIT once euthyroid on Carbimazole. Thyroid function tests were repeated every 6 weeks and Carbimazole down-titrated accordingly.

| Test | Result | Reference Range |
|----------------------------------|--------|------------------|
| Thyroid Stimulating Hormone | <0.008 | 0.3-3 mIU/ml |
| Free Thyroxine | 57.56 | 11.9-20.3 pmol/l |
| Free T3 | >30.8 | 3.5-6.5 pmol/l |
| TSH Receptor Antibody | 5.2 | 0.1-1.0 IU/l |
| Anti-Thyroid Peroxidase Antibody | 436 | 0.0-50.0 IU/ml |

DOI: 10.1530/endoabs.91.CB10

CB11

Late Onset Amiodarone Induced Thyrotoxicosis

Delanos Bramble, Sawsan Hamdan & Sherif Ghieth
University Hospitals Plymouth, Plymouth, United Kingdom

A 60-year-old engineer was reviewed in the Endocrinology clinic on 07/05/2021. He reported weight loss, palpitations, disturbed sleep, and fatigue over the previous four (4) months. He denied any neck pain or swelling. There were no symptoms consistent with thyroid eye disease. He had no pre-existing history of thyroid disease. TFT's in March 2021 confirmed primary hyperthyroidism (TSH < 0.004 (0.35- 4.94 mIU/l), FT4 19.8 (9-19 pmol/l), FT3 7.4 (2.9- 4.9 pmol/l). Anti-TSH receptor antibodies 0.43 (0-2 IU/l) and TPO antibodies were negative. His GP had started carbimazole 20 mg once daily at the end of March 2021 after discussion with the Endocrinology team. A thyroid uptake scan was requested to rule out toxic nodular disease. There was a long delay in obtaining the uptake scan but eventually he received an appointment from the nuclear medicine team approximately 5 months after the clinic appointment. In preparation for the scan his carbimazole was discontinued (September 2021) and serial repeat TFT's revealed that his thyroid function had completely normalised despite remaining off carbimazole. Hence, he received a total of six (6) months of carbimazole treatment. The nuclear medicine team decided against proceeding with the scan as the diagnostic yield would be low. A thyroid ultrasound scan was normal, revealing no evidence of nodular thyroid disease. He had a history of atrial fibrillation and had been treated with amiodarone 200 mg once daily for approximately 15 months (13/03/2018 – 01/07/2019). He underwent successful DC cardioversion during this time, but there was recurrence of his atrial fibrillation when he developed thyrotoxicosis. He had normal TFT's during treatment with amiodarone and one (1) year after stopping the drug. Amiodarone had been discontinued eighteen (18) months prior to presentation with thyrotoxicosis. At follow up he remained clinically and biochemically euthyroid, off antithyroid medication. A diagnosis of late onset Amiodarone Induced Thyrotoxicosis (AIT) was considered. He had not been treated with steroids.

Discussion

Amiodarone is an effective anti-arrhythmic drug with recognised toxic effects. There are case reports describing the onset of hyperthyroidism long after the discontinuation of amiodarone. This case highlights the need to consider the diagnosis of AIT in patients previously treated with this drug.

DOI: 10.1530/endoabs.91.CB11

CB12**Graves' Disease and Cerebral Vasculopathy**

Kasi Subbiah¹, Samundeeshwari Perumal² & Jacqueline Gilbert¹
¹King's College Hospital, London, United Kingdom; ²University of Medicine and Pharmacy "Grigore T. Popa", Iași, Romania

A 20-year-old lady of Vietnamese origin presented with increasing frequency of headaches and worsening right sided weakness over 4 days. There was no other significant past medical illness, and she was not on any regular medication. She was not a smoker, and there was a history of thyrotoxicosis in her mother. Her heart rate was 110 beats per minute, and she was in sinus rhythm. On examination there was right sided weakness (MRC grade 4/5), expressive dysphasia, tremor of her extended fingers and smooth thyromegaly. CT angiogram showed smooth moderate narrowing throughout the course of the left internal carotid artery (ICA) and narrowing of the intracranial right ICA, right MCA and ACA. MRI showed ischaemic changes involving the left ICA territory. She was started on dual anti-platelets. Subsequent investigations revealed the following: FT3 41.7 pmol/l(3.1-6.8), FT4 >100 pmol/l(11-21.2) and TSH suppressed, TSH receptor antibody: 16.1 U/l(0-1.75), anti-TPO ab: 110 IU/ml (0-35). She was commenced on Carbimazole 40 mg once daily and Propranolol 80 mg three times a day (which was later switched to Verapamil to address any potential cerebral vasospasm). Repeat CT angiogram done 5 days later, for worsening right sided weakness (MRC grade 0/5) showed worsening changes affecting the proximal major intracranial vessels with complete occlusion of the distal left ICA. An extensive vasculitis and thrombophilia screen did not reveal any abnormalities. An FDG PET-CT and MRA to assess extra-cranial vasculature did not show any evidence of large vessel vasculitis. Upper and lower limb arterial duplex study revealed triphasic waveforms throughout. CSF biochemistry and microbiology were unremarkable. There was no surgical target or indication for vascular bypass and medical treatment was advised. Differentials include Graves' disease associated cerebral vasculopathy and Moyamoya syndrome, both of which are uncommon. She exhibited a limited response to Carbimazole and therefore switched to Propylthiouracil 200 mg four times a day. She received 3 doses of intravenous methylprednisolone 1000 mg and then was switched to oral prednisolone 50 mg titrating down by 5 mg weekly to a maintenance dose of 10 mg daily and was started on Methotrexate 15 mg subcutaneous weekly to be continued for 1 year. At the time of discharge, the weakness and expressive dysphasia had considerably improved. FT4 was 40.7 pmol/l, FT3 9.1 pmol/l and TSH remained suppressed. Benefits of long-term immunosuppression are still unclear, with any treatment likely to prevent further stenosis rather than reverse changes already present.

DOI: 10.1530/endoabs.91.CB12

CB13**Persistent Hyperthyroidism Secondary to Ectopic Autonomous Thyroid Tissue**

Kasi Subbiah, Samira Khalilova, Sheela Sathyanarayan & Georgios Dimitriadis
 King's College Hospital, London, United Kingdom

A 28 year old lady presented with a 4 month history of anxiety, palpitations, weight loss and a pressure sensation in the neck. On examination she had fine tremor of her outstretched fingers and no palpable goitre with a regular heart rate. FT4 was 22 pmol/l(10.3-24.5), FT3 7.9 pmol/l(3.5-6.5), TSH 0.02 mIU/l(0.3-5.5), TSH receptor antibodies (TRAb) <0.9 U/l(0-1.75) and TPO antibodies <4 IU/ml (0-35). She was started on Carbimazole 20 mg daily and after being well controlled this was eventually weaned off. She was again referred with clinical and biochemical thyrotoxicosis when 34 weeks pregnant and was treated medically with low dose thionamides. TRAb's were again undetectable and delivery was uneventful. Anticipating the next planned pregnancy, she was referred for thyroidectomy. Histology showed hyperplastic thyroid follicles consistent with Graves' disease. Post-surgery she continued to be thyrotoxic on 150 mg of L-thyroxine. She was again referred at 26 weeks gestation with biochemical thyrotoxicosis after having stopped L-thyroxine for 2 weeks, with a suspicion of relapsed Graves' disease secondary to remnant tissue. TRAbs were again undetectable and there was detectable thyroglobulin 29.8 mg/l(0-40). She was restarted on Carbimazole and thyroid ultrasound showed two possible areas of focal thyroid remnant tissue. Pregnancy was again uneventful. Prior to revision neck surgery, a Tc99 uptake scan showed an ectopic large focus of tracer concentration in the left mediastinum with an uptake of 3.5% (Normal <3%) and at this point an older Tc99 scan from eight years ago which was unavailable to the endocrine team initially, was revisited and demonstrated a toxic right thyroid nodule with suppression elsewhere in the thyroid and a retrosternal focus of uptake. CT showed a rounded soft-tissue density mass in the anterior mediastinum measuring 4 x 6.5 cm. Her case was discussed in the southeast London Network

thyroid MDM. The consensus was that this is more likely in keeping with seronegative Graves' disease and either high dose radioactive iodine therapy or thoracic surgery was advised. The ectopic mediastinal autonomous thyroid tissue was successfully removed with thoracotomy as per patient's wish. Histology showed nodular hyperplastic thyroid tissue.

Discussion

The coexistence of both Graves' disease and toxic nodules (Marine-Lenhart syndrome) is uncommon. It is even rarer to see ectopic thyroid tissue in this setting. The diagnosis was further complicated by Graves' disease being TRAb negative.

DOI: 10.1530/endoabs.91.CB13

CB14**Familial dysalbuminemic hyperthyroxinemia (FDH)**

Mohammed Shamsaldeen & Janki Panicker
 Royal Liverpool Hospital, Liverpool, United Kingdom

Introduction

Familial dysalbuminemic hyperthyroxinemia (FDH) is a familial autosomal dominant condition that was first reported in 1979. It is caused by a mutant albumin molecule with an increased affinity for serum thyroxine (T4), despite the serum albumin level being normal. FDH causes increase in total T4 and T3 level with normal TSH level. As FDH patients are clinically euthyroid and asymptomatic, they do not require treatment.

Case report

68-year-old female, with no past medical history first seen in 2015 in the clinic following referral from the general practitioner with abnormal Thyroid function test (Normal TSH (3.9mU/l) with elevated T4 (24.9 pmol/l) and T3 (6.5 pmol/l)). There were not any symptoms to suggest hyperthyroidism at that point apart from change in bowel habit and occasional palpitations. There was no headaches or visual disturbances, no family history of thyroid illness and bed side examination was normal. Initial works up was design to exclude or confirm TSH secreting pituitary adenoma (TSHoma) and thyroid hormone resistant. Hence, she underwent whole pituitary profile hormone check (Prolactin 151mU/l, LH 21.5U/l, FSH 32.5U/l, Testosterone 1.0nmol/l, IGF-1 11nmol/l), TRH test, alpha subunit (0.51 IU/l) and thyroxine binding protein which all came back within normal range. Different lab has been used to check for assay interference which had the similar result. Then suspicion of FDH has been raised for which bloods sent to Addenbrooke's hospital, Cambridge to check TFT via different method which confirms the diagnosis of FDH. Furthermore, genetic test was conducted using fluorescent sequencing analysis of exon 7 of the albumin (ALB) gene using Mutation Surveyor with the result showed 'This patient is heterozygous for the common c.725G>A p.(Arg242His) pathogenic variant in the ALB gene, which is known to cause elevated serum thyroxine levels associated with autosomal dominant FDH' with the recommendation of no further TFT or genetic testing needed as finding explain the abnormal TFT.

Discussion

FDH is cause of discordant TFT due to interference in FT4 assays and can be diagnosed by assessing gene variants in the albumin (ALB) gene. R218H, R218P, R222I, and R218S variants have been described. Diagnosis of FDH prevent unnecessary investigation and treatment. Consider discussing referral of family member for genetic testing as 50% risk of inheritance to children.

DOI: 10.1530/endoabs.91.CB14

CB15**Thymic hyperplasia in Grave's Disease – a not so uncommon occurrence****Herpreet Chagger**

University Hospital of Coventry and Warwickshire, Coventry, United Kingdom

Thymic hyperplasia (TH) in Grave's Disease (GD) is not uncommon. It was first described in 1914 by William Halstead, however incidence has been difficult to establish as most patients remain asymptomatic from the TH and do not routinely undergo chest imaging when managing GD. We present a 49-year-old female with a background of rheumatoid arthritis and hypothyroidism, who presented to Rheumatology with proximal and distal muscle weakness, absent reflexes and weight loss. MRI scan reported widespread myositis in the thigh muscles, and EMG confirmed myopathy for all muscle groups. CT TAP was performed to investigate for malignancy and revealed a thymic mass measuring 2.3x2.6x5 cm and an enlarged thyroid. A PET scan was performed to rule-out metastatic disease

from a possible thymoma, which reported increased diffuse uptake in a nodular enlarged thymus and multinodular goitre, metabolically active bilateral pelvic external iliac lymph nodes and marked atrophy of the quadriceps bilaterally. Following Lung MDT, thymectomy was recommended as early-stage cancer or thymoma could not be excluded. Meanwhile, the patient was found to be biochemically hyperthyroid and referred for an endocrinology opinion. She diagnosed with autoimmune hypothyroidism in 2014, and on inspection of thyroid function trend, developed hyperthyroidism in 2018. She was started on levothyroxine 6 months prior but unable to recall why. She reported tiredness, unintentional weight loss but denied palpitations, tremors, diarrhoea or constipation. She had noticed growth of her goitre since starting levothyroxine, but denied difficulty swallowing, breathing or pressure symptoms. There was no family history of thyroid dysfunction. Examination revealed a euthyroid appearance, pulse 60 beats per minute, a diffusely enlarged non-tender goitre with no lymphadenopathy, tremor or thyroid eye disease. Biochemistry confirmed a suppressed TSH, free T4 32.0 pmol/l(11.5-22.7 pmol/l); free T3 17.1 pmol/l(3.5-6.5 pmol/l); thyrotropin receptors antibodies (TRAb) 38.8 U/l(< 1.0), and thyroid peroxidase antibodies >1300kIU/l(<61). Despite stopping levothyroxine therapy, the patient remained hyperthyroid, and carbimazole was started. Surgery was halted in view of the likely possibility of TH secondary to GD. Multiple studies describe regression of TH with treatment of hyperthyroidism. If the thymic mass is non-cystic and homogenous, with no calcification or invasion of surrounding structures, TH is likely in the presence of GD. Anti-thyroid treatment should be started for at least 6 months before a follow-up CT is performed. If there is less than 50% regression, a biopsy or thymectomy should be considered to rule out malignancy. Our patient awaits repeat thoracic imaging. DOI: 10.1530/endoabs.91.CB15

CB16

Abstract Withdrawn

DOI: 10.1530/endoabs.91.CB16

CB17

Thyrotoxicosis presenting as Stroke

Soo Yee Phang

Wrexham Maelor Hospital, Wrexham, United Kingdom

We have been seeing an 82 year old lady in endocrine clinic since 2017. She was initially admitted via ED in September 2017 with sudden onset confusion and left sided weakness. MRI confirmed ischaemic stroke with evidence of an acute right sided posterior cerebral artery infarct affecting right occipital and superior cerebellar regions. She was also noted to be in atrial fibrillation, and was also found to have significant thyrotoxicosis with a suppressed TSH, FT4 60, FT3 30. There was no palpable goitre and no clinical evidence of thyroid eye disease. However she was strongly positive for both TSH receptor and anti-TPO antibodies, consistent with a diagnosis of Graves' disease. Carotid dopplers normal. She had a sister with hypothyroidism, otherwise no known family history. Initially treated with aspirin, bisoprolol, atorvastatin and carbimazole 40 mg daily; aspirin was subsequently switched to warfarin and she was discharged after 2 weeks, having made good progress clinically. Subsequently carbimazole was gradually titrated down based on TFT and she was able to stop carbimazole in May 2019. Diagnosed with transitional cell carcinoma of the bladder in May 2020, but has otherwise remained well. She remained euthyroid off treatment until TFT in July 2020 showed evidence of relapse with a TSH of 0.03, FT4 19.4, FT3 6.7. She was then restarted on carbimazole, which she has tolerated well, and dose again adjusted based on TFT. She was well and euthyroid when last reviewed in December 2022 on carbimazole 5 mg alternate days. In summary this lady presented with ischaemic stroke, likely due to AF, in turn likely related to thyrotoxicosis.

DOI: 10.1530/endoabs.91.CB17

CB18

Grave's Disease

Hamza Khan

Aintree University Hospital, Liverpool, United Kingdom

A 29 year old lady with a background Hx of asthma came to the Ambulatory clinic with palpitations in the mid of Dec 2022. She was found to have an elevated heart rate of 120/min, regular and EKG showed Sinus Tachycardia. BP was Normal and weight was stable. She was also complaining of loose Bowls for the last few months. She denied any eye signs. She was a smoker and was not pregnant (She was not planning pregnancy in the near future). Her Bloods were Normal with stable U&E and CBC. However she had a fully suppressed TSH with TSH <0.01 and free T4 87 and T3 was raised at 35. Given these findings Endocrinology was called and we advised TRab levels which were raised at 19. O/E- She was not tremulous, vitals as mentioned above and smooth Goitre on palpation. She was started on Carbimazole and referred to Thyroid Clinic for a followup with repeat bloods in about 6-8 weeks. The Impression was GRAVE'S DISEASE. She also had a Halter which showed that she was sinus tact with nocturnal AV block (Mobitz type 2). This was discussed with Cardiology who advised no Rx, and as they regarded these findings as Normal for a young person. DOI: 10.1530/endoabs.91.CB18

CB19

A case of Amiodarone induced thyrotoxicosis Type 1

Huma Humayun Khan

Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom

Introduction

Amiodarone, a drug with high iodine content, is commonly associated with thyroid dysfunction. There are two well-recognized forms of amiodarone induced thyrotoxicosis. Thyrotoxicosis due to iodine excess leading to increased thyroid hormone synthesis is referred to as Amiodarone induced thyrotoxicosis type 1 (AIT type 1) whilst thyrotoxicosis due to direct toxic effect (thyroiditis) is known as amiodarone induced thyrotoxicosis Type 2 (AIT type 2). The aim in both is to achieve euthyroidism, achieved by thionamides in AIT type 1 and glucocorticoid in AIT Type 2. Mixed or uncertain cases are treated with combination trial of both. The table from European thyroid association guideline highlights comparison.

Case

A 70-year-old male, with background of hypertension and atrial fibrillation, presents with 6-week history of palpitation, 1.5 stone weight loss and syncope. He has been on amiodarone since 14 years, with previous failed cardioversions. Thyroid function tests on presentation showed thyrotoxicosis TSH: < 0.01 munit/l, T4: 64.35 pmol/l, T3: 17.2 pmol/l. All historic TFT were normal. TRAB was < 0.4 IU/l, TPO < 35IU/ml. He also had exertional dyspnoea and was in decompensated heart failure with bilateral limb edema. He was noted to have goitre but no thyroid eye disease. He was initiated on carbimazole 40 mg od. He proceeded to have a doppler ultrasound scan which showed increased vascularity indicating AIT 1. He was reviewed by cardiology team who stopped amiodarone and echocardiogram showed EF >55%. His TFT slowly improved within 2 weeks of initiation of carbimazole, TSH <0.01 munit/l, T4 50.2 pmol/l, T3: 9.4pmol/l. His case was discussed in MDT and the plan is to offer definitive treatment once euthyroidism achieved.

Discussion

The above case is unique as the presentation is 14 years post initiation of amiodarone with no underlying autoimmune thyroid dysfunction. Normally the effect of amiodarone on thyroid is seen as early as few weeks post-initiation and up to several months post-discontinuation due to long half-life. There was also reluctance in initiating combined therapy with prednisolone due to concern of worsening heart failure with fluid retention. Doppler ultrasound proved the most useful diagnostic aid.

| | AIT Type 1 | AIT Type 2 |
|---|-------------------------|-----------------------|
| Colour flow doppler sonography | Increased vascularity | Decreased vascularity |
| Thyroid Radio iodine uptake | High/normal/low | Low |
| Thyroid antibodies | Yes | No |
| Goitre | Usually, present | Usually absent |
| Onset time after starting amiodarone | Short | Long |
| Spontaneous remission | No | Possible |
| Subsequent hypothyroidism | No | Possible |
| First line medical treatment | Anti-thyroid medication | Glucocorticoids |
| Subsequent definitive treatment | Generally, yes | No |

DOI: 10.1530/endoabs.91.CB19

CB20**Stimulating and Blocking Thyroid-Stimulating Hormone (TSH) Receptor Autoantibodies from Patients with Graves' Disease**
May Thin Khine
University Hospital Birmingham, Birmingham, United Kingdom

Background

Autoimmune thyroid conditions such as Hashimoto's thyroiditis and Graves' disease are more common in women than men. Both conditions are characterized by symptoms and signs on the opposite spectrum of the scale. Although cases of conversion from hyperthyroidism to hypothyroidism are often encountered in clinical practice, the exact incidence of this conversion is not known -it is possible that such conversion may be due to development of blocking and stimulating antibodies. Treatment is straightforward with anti-thyroid medications once the diagnosis is suspected and confirmed. It is important to get the correct diagnosis to be able to treat such patients appropriately

Case Presentation

A 57-year-old man was referred with complaining of feeling hot and sweaty with palpitation and found to be thyrotoxicosis. He was then treated for thyrotoxicosis with ATD but found to have positive antibodies so diagnosis of graves' disease was made. He was then developed the symptoms of hypothyroidism while on the lowest maintenance dose of ATD. He was then found to be overt hypothyroidism which needs a period of replacement treatment. He then redeveloped the over active symptoms causing thyrotoxicosis pictures again. He completed the 18 months of ATD treatment with biochemical resolution of euthyroid status but then he developed severe thyroid eye disease. He eventually planned for total thyroidectomy for his Graves' disease and ongoing ophthalmology input

Conclusions

Although Graves' thyrotoxicosis is common thyroid manifestation in day-to-day thyroid clinic, it is important to be aware of the nature of TRABs can be switching from stimulating to blocking activities and it makes the case to be challenging to manage in order to avoid the over hyper or hypothyroidism.

DOI: 10.1530/endoabs.91.CB20

CB21**The Swinging Sixties: Drug-fueled Highs and Lows**

Xiao Ying Khor & Akheel Syed

Department of Diabetes, Endocrinology and Obesity Medicine, Salford Royal NHS Foundation Trust, Salford, United Kingdom

A man in his sixties, with no previous history of thyroid dysfunction (Table 1), was commenced on Amiodarone for atrial fibrillation at the age of 64 years. 24 months after starting on Amiodarone, the patient was found to have a low TSH with markedly elevated fT4 but normal free T3 (fT3). He was asymptomatic, there was no goitre, thyroperoxidase and TSH-receptor antibodies were negative. The thyroid dysfunction was managed by non-interventional observation with gradual resolution (Table 2).

Table 1 Thyroid function tests (TFTs) prior to commencement of Amiodarone

| Age | TSH (0.35-5.50 mU/l) | fT4 (10-20 pmol/l) |
|------|----------------------|--------------------|
| 58½ | 2.7 | 9.5 |
| 62¾ | 2.5 | 21.0 |
| 64•0 | 3.4 | |

Table 2 Clinical course of TFTs following commencement of Amiodarone

| Age | TSH (0.35-5.50 mU/l) | fT4 (10-20 pmol/l) | fT3 (3.5-6.5 pmol/l) |
|------|----------------------|--------------------|----------------------|
| 65¾ | 0.03 | 38.7 | 5.6 |
| 65¾ | 0.02 | 47.4 | |
| 66•0 | 0.5 | 23.3 | 3.4 |
| 66½ | 0.4 | 22.2 | |
| 67•0 | 3.3 | 27.4 | |
| 67¾ | 4.7 | | |
| 68¾ | 4.4 | | |

Intriguingly, his TSH has now risen above the upper limit of normal with mildly elevated fT4 (Table 3). To exclude assay interference, thyroid function was rechecked on a different laboratory platform (Table 4).

Table 3 Current TFTs

| Age | TSH (0.35-5.50 mU/l) | fT4 (10-20 pmol/l) | fT3 (3.5-6.5 pmol/l) |
|------|----------------------|--------------------|----------------------|
| 69½ | 6.2 | 25.1 | |
| 69¾ | 4.9 | | |
| 70.0 | 8.1 | 24.8 | 4.2 |

Table 4 TFTs checked on a different laboratory platform

| Age | TSH (0.35-4.94mU/l) | fT4 (9.0-19.0 pmol/l) | fT3 (2.43-6.01 pmol/l) |
|------|---------------------|-----------------------|------------------------|
| 70.0 | 6.04 | 18.4 | 3.18 |

An ultrasound scan of the thyroid revealed a slightly bulky thyroid gland with mild heterogeneity and no increased vascularity, suggestive of chronic or subacute thyroiditis.

Points for discussion

- Amiodarone-induced thyroid dysfunction?
- Laboratory assay interference?
- Other thoughts?

DOI: 10.1530/endoabs.91.CB21

CB22**Recurrence of Graves' disease in remnant Thyroid Tissue after Total Thyroidectomy**

Amna Zeeshan & Isra Ahmed Mohamed

Cambridge University Hospital, Cambridge, United Kingdom

Case Report

We reported a case of 54 year old lady who presented with symptomatic hyperthyroidism 11 years after total Thyroidectomy. She remained well controlled on average 100 mg of Levothyroxine until presented with persistently suppressed TSH despite weaning off and later withdrawal of levothyroxine (T4 16 pmol/land TSH <0.03 pmol/l) and elevated Thyroid Stimulating Antibodies (TSI) (> 40 iu/l). Her Thyroid ultrasonography showed remnants of thyroid tissue in the thyroid surgical bed. Perchnetate scintigraphy showed multiple foci of active thyroid tissue; 13 mm nodule anterior to thyroid cartilage, 5 mm right paratracheal nodule and 2 small left thyroid nodules. Her Fine needle aspiration confirmed benign thyroid Tissue (Thy2). She also developed mild Thyroid eye Disease managed with eye drops and selenium 200 mg. She was commenced on carbimazole 10 mg once a day. Although surgery will be challenging, she has been referred to surgeons for consideration of removal of remnant thyroid tissues. Radioactive Iodine Treatment is best definitive treatment option as MRI Orbit did not show any active thyroid eye disease but she will likely need steroid cover to prevent progression of Thyroid eye symptoms.

Discussion

Graves' Disease is an autoimmune condition characterize by production of auto antibodies against thyroid-stimulating hormone receptor (TRAb). Total Thyroidectomy removes target tissue for TRAb and controls hyperthyroidism. Surgical Thyroid resection reduces TRAb levels in variable degrees. The median half-life of TRAb has been estimated 93.5 days after total thyroidectomy in patients without Graves Ophthalmopathy(GO)or smoking and 357.4 days in patients with GO and smoking .

Conclusion

This case therefore demonstrates recurrence of thyrotoxicosis in remnant thyroid tissue stimulated by TRAb presenting years after Total Thyroidectomy.

DOI: 10.1530/endoabs.91.CB22

CB23**A story of resistance: When Graves' disease isn't just Graves' disease**

Aisha Aslam & Alexander Lewis

Manchester Royal Infirmary, Manchester, United Kingdom

A 32-year-old female was referred with abnormal thyroid function tests after investigation for nonspecific joint symptoms and exhaustion in 2010. Initial biochemistry showed TSH 0.03 mU/l(0.2-5), Free T4 75 pmol/l(9-24). At her endocrine appointment she reported loose stools, tremors, exertional dyspnea and a peculiar sensation in neck in keeping with thyrotoxicosis. Since puberty, she had problems acquiring weight. Repeat thyroid function demonstrated TSH <0.01 mU/land Free T4 97.6 pmol/l. Carbimazole was initiated alongside propranolol and she felt marginally better after taking the prescription for a few days, so she stopped taking it and ceased follow up. Due to several unsuccessful appointments, she was discharged from the service. She returned to the service eight years later with the same symptoms. She was now experiencing ophthalmic issues. TSH was 1.2 mu/land Free T4 was 35.4 pmol/l. Thyroid peroxidase antibodies and TSH Receptor antibodies were positive in keeping with autoimmune thyroid disease. Thyroid US was normal. There was a family history of thyroid disorders, with her mother and maternal grandmother having thyroidectomy. Two of her children had type 1 diabetes and one was reported to have a thyroid problem. Carbimazole and propranolol were prescribed for Graves' disease. Despite significant carbimazole

does her symptoms persisted. She switched to propylthiouracil after believing she had issues with carbimazole but later reported varied compliance. She represented in 2022 with palpitations, hot flushes, tremor, insomnia, amenorrhoea and altered bowel habit, predominantly diarrhoea. She had continued propranolol but was intermittently taking propylthiouracil. She reported dry, gritty eyes but clinical activity score was 0/7. Smoking cessation and eye lubricants were advised. Investigations revealed TSH 0.64 mU/L, Free T4 37.0 pmol/L. This pattern had persisted over several years and TSH hadn't been suppressed since initial presentation. History was in keeping with Graves' disease but underlying thyroid hormone resistance was also suspected. Propylthiouracil was ceased and symptoms were managed with titration of propranolol. Subsequent testing confirmed a pathogenic missense mutation in TRHB gene.

Conclusion

Graves' disease is common and strong family history alongside positive antibody titres and clinical features are supportive of the diagnosis. Variable compliance with medications can make interpretation of results difficult but careful assessment of trends and spotting anomalies is vital to ensure alternate diagnoses aren't missed, particularly when dual pathologies can co-exist. Thyroid hormone resistance is rare and treatment revolves around symptomatic management.

DOI: 10.1530/endoabs.91.CB23

CB24

Acute decompensated heart failure in a patient with longstanding uncontrolled Graves' thyrotoxicosis

Ananthi Anandhakrishnan^{1,2} & Kirun Gunganah^{1,2}

¹Newham University Hospital, London, United Kingdom; ²Barts Health NHS Trust, London, United Kingdom

Case history

A 69-year-old female was referred acutely from the community with 4 weeks of progressive breathlessness. Initially exertional, she was now also breathless at rest with orthopnoea and paroxysmal nocturnal dyspnoea. She had a background of antibody-positive thyrotoxicosis diagnosed 33 years ago, managed solely in primary care on carbimazole 20 mg, with good compliance. On examination, she was dyspnoeic with an irregularly-irregular tachycardia and fine tremor to the outstretched hands. There was no ophthalmoplegia or palpable goitre. She had fine bibasal crackles with mild bilateral pitting oedema. She reported 10 kg of unintentional weight loss with anorexia over 6 months (BMI 18.5 kg/m²) and 3 months of intermittent palpitations and heat intolerance. Review of community records revealed a suppressed TSH for at least 20 years. The patient reported symptoms of recurrent relapsing thyrotoxicosis. The clinical concern was of acute high-output heart failure on the background of longstanding uncontrolled Graves'. She was admitted for further investigation and management.

Investigations

Admission ECG showed left bundle branch block and atrial fibrillation with rapid ventricular response. Serial troponins were mildly elevated but down-trending (49ng/l to 31ng/l). Pulmonary congestion was seen on chest X-ray. TSH was <0.01mU/L, fT4 >100.0 pmol/L, TSH-receptor-antibody 4.03IU/L and thyroperoxidase-antibody 344kunits/l. There was an iron-deficiency anaemia (Hb 100) and no electrolyte abnormalities.

Results and treatment

Carbimazole was up-titrated to 60 mg and she started cholestyramine 1g twice daily, propranolol 40 mg 8-hourly and oral anticoagulation. fT4 fell to 53.9 pmol/l in 96 hours and rate-control was achieved. N-terminal BNP was elevated (5530ng/l). An echocardiogram reported impaired left-ventricular systolic function (35-40%) with a dilated left-atrium, and pulmonary-arterial hypertension (PASP 33mmHg). Biventricular size was normal. She was discussed with cardiology and heart failure secondary to thyrotoxicosis was thought likely. She was diuresed, propranolol switched to bisoprolol, and ramipril up-titrated. At one month, the patient was clinically euthyroid with improved breathlessness and peripheral oedema, but ongoing thyrotoxicosis (fT4 15.9, TSH <0.01) prompted discussions surrounding definitive management.

Discussion

Heart failure in the context of thyrotoxicosis is a spectrum ranging from acute rate-related high-output failure, to congestive cardiac failure and dilated-cardiomyopathy secondary to chronic exposure to a hyperdynamic circulation. The symptom burden of Graves' thyrotoxicosis usually prompts clinical presentation and thus rapid achievement of disease control. As such, congestive cardiac failure as seen in our patient, is rare. Management focuses on reducing the risk of acute cardiovascular complications and cardio-prognostication, alongside achieving the euthyroid state that can lead to restored cardiac function.

DOI: 10.1530/endoabs.91.CB24

CB25

Thyrotoxicosis

Kavitha Dhevi Krishnasamy Ganapathy & Ansu Basu
City Hospitals, Birmingham, United Kingdom

38 year female presented to the endocrine clinic with palpitations. On further questioning she reported weight loss, diarrhoea but normal menstrual cycles. She was diagnosed in September 2022 with thyrotoxicosis in a country outside UK and was commenced on carbimazole 20 mg once daily. Blood investigations in September 2022- TSH 0.02 serum FT4 31.0 FT3 8.17). Bloods repeated by GP 4 months later after arrival in UK, showed the following: Serum TSH 23.45, serum T4 1.20, serum T3 1.82. GP stopped Carbimazole after viewing the bloods results. Two months after stopping Carbimazole, she represented with palpitations. She never smoked. Blood tests in January 2023 showed TSH <0.01 FT4 43 FT3 >30.7 TSH receptor antibodies 28.90. On examination, she had tremor and there was a large goitre with no palpable nodules nor bruit. Proptosis with lid swelling was evident on eye examination. She was restarted on carbimazole 30 mg od and propranolol 40 mg bd. Referral was made to thyroid eye clinic. Radio iodine treatment couldn't be offered due to thyroid eye disease. Surgery was discussed given the large goitre and significantly elevated TSH receptor antibodies. This reiterates the need to monitor thyroid function after initiating treatment for Graves disease. In this case, abruptly stopping the treatment before completion of the recommended course has resulted in re-presentation with Graves. Another important aspect is discussion about use of contraception, pregnancy and warning regarding the side effects of thionamides. This lady was not aware of the teratogenic effects (treatment commenced outside UK) or has not been advised to get pregnant whilst on thionamides (the patient was actively trying to get pregnant). This case illustrates the importance of not just diagnosing a condition, but providing appropriate advice and monitoring to guide the therapy in order to achieve effective control of the disease.

DOI: 10.1530/endoabs.91.CB25

CB26

Amiodarone induced thyrotoxicosis

Syeda Salari
UHBW, Bristol, United Kingdom

50yrs old male with AF diagnosed in 2018. Had a failed ablation. Started on amiodarone from June 2021 to July 2022 that was stopped and started on diltiazem for rate control. No history of previous thyroid disease or family history of thyroid no goiter. GP picked up thyrotoxicosis in August 2022 in bloods, started him on carbimazole and referred to endocrine. In terms of thyroid there was weight loss, tremulousness and sob. TRAB was negative. Prednisolone started given history of amiodarone intake for a long time and probable diagnosis of amiodarone induced thyrotoxicosis was made and patient was started on prednisolone 40 mg on the top of carbimazole 40 mg. He responded well to steroids that supported type 2 AID. USS doppler was inconclusive. TFTs continue to improve after steroids so the carbimazole was weaned slowly to 30 and 20 mg. However, the TFTs began to deteriorate with carbimazole of 20 mg. As a result, the plan for thyroidectomy after discussing with patient was made with sodium perchlorate before surgery to control thyrotoxicosis. Unfortunately, TFTs didn't improve much on sodium perchlorate hence plasmapheresis was considered as the next option to control tfts. After two sessions of plasmapheresis his tsh and fT4 for the first time normalized. A total thyroidectomy was performed. Steroids weaned down slowly. SST was performed before completely stopping the steroids to ensure no adrenal insufficiency. And now pt is on levothyroxine and symptomatically much better. Started on bone protection given on high dose steroids for a long period of time. Plan for Dexa scan.

DOI: 10.1530/endoabs.91.CB26

CB27

Iatrogenic Graves' disease - A case of severe Graves' disease and Graves' orbitopathy occurring after radioiodine therapy for toxic nodular goitre

Japhet Olaremi
Queen Elizabeth Hospital, Gateshead, Gateshead, United Kingdom

Radio-active iodine (RAI) therapy is effective in managing hyperthyroidism due to solitary toxic thyroid nodule, in which 90% efficacy is observed. The most common side effects of RAI include hypothyroidism, transient neck pain and dry mouth and eyes. Occasionally, transient worsening of hyperthyroidism or the development of

new-onset Graves' orbitopathy (GO) has been reported in patients with GD after RAI therapy. However, there is scant literature regarding the risk of developing new Graves' disease following RAI. We report a case of a patient who was treated with RAI for mild hyperthyroidism due to solitary toxic thyroid nodule who developed severe hyperthyroidism and GO. A 38-year-old male patient was incidentally noted to have mild T3 toxicosis due to a solitary toxic thyroid nodule, based on negative TRAb and TPOAb levels and characteristic increased uptake on 99m-technetium scan and corresponding nodule on thyroid ultrasound. He had no family history of thyroid disorder and was a non-smoker. After discussion and obtaining written consent, and as per NICE guidelines, he received treatment with RAI 400MBq. About six weeks after his therapy, he complained of unexplained weight loss, palpitations, frequent stools and eye irritation. He was noted to be clinically and biochemically thyrotoxic (TSH of <0.01, FT4 64 pmol/l, FT3 24.5 pmol/l) with raised TRAb levels of 27.5 U/l (reference range <1.8). He had evidence of inflammation in both eyes (clinical activity score or CAS of 1). He was commenced on propranolol, carbimazole, eye-lubricants, selenium and was reviewed regularly in clinic. Over the next few weeks, his thyroid hormones normalised but there was worsening of TRAb levels (72 U/l) and severity of GO (CAS of 4). Due to marked peri-orbital oedema, an urgent MRI of orbits was performed that demonstrated severe oedema and peri-orbital inflammation but no compression of the optic nerves. He was commenced on weekly intravenous methylprednisolone and his thyroid function remains stable on 'block and replacement doses' of carbimazole and levothyroxine. The GO is gradually responding to steroid therapy and the CAS score is now ranging between 2-3.

Conclusion

There are few reported cases of radioiodine induced de novo Graves' disease in the literature. This case highlights the dual importance of clinicians being aware of and informing patients that RAI may induce Graves' disease in a small group of patients. The exact mechanisms of how RAI leads to Graves' disease are not well elucidated but may involve leakage of thyroid antigenic material following RAI treatment.

DOI: 10.1530/endoabs.91.CB27

CB28

Thyroid function and Self Help

Stathis Bonanos, Karen Mullan, Steven J Hunter & Helen Wallace
Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast, United Kingdom

A 60 year old nurse presented to the emergency department with palpitations, itchy skin, shortness of breath, diarrhoea, insomnia, weight loss and feeling hot/clammy. She felt her symptoms were in keeping with the menopause although she had been amenorrhoeic for six years. Thyroid function tests revealed fT4 73 pmol/land TSH <0.01 mIU/l having been normal six months previously. She was started on carbimazole 40 mg/day and was seen urgently in clinic. She reported to feeling unwell for the past few years and had taken Spirulina, krill oil, Ashwaganda, 'Iodine', Probiotics, Vitamin D, Vitamin K and magnesium. At clinic she was clinically thyrotoxic with fT4 > 100 pmol/l. TRAb and TPO Abs were negative. Carbimazole was titrated to 80 mg/day with ongoing urgent review. Ultrasound showed a normal appearance. An iodine uptake scan demonstrated very low uptake at 0.1% (n = 6-18%). On further questioning she reported taking Lugol's iodine, 'a few drops every so often' from a bottle that her daughter had purchased from Amazon. The duration of ingestion was about six months. She was initially sceptical of stopping her supplements but agreed to do so and carbimazole was reduced to stop. Repeat function tests off all treatment and supplements normalised with fT4 12.1 pmol/land TSH 3.18 mIU/l. While Ashwaganda is an evergreen shrub thought not to contain iodine, the supplements Spirulina (blue-green algae) and Krill oil (derived from crustaceans) are thought to do so. The most problematic supplement however is Lugol's iodine which is a mixture of iodine and potassium iodide. Amazon sells 2-5% solution preparations. For example the 5% solution contains 6.3 mg per concentrated drop whilst daily requirements are ~ 150mg/day. The case illustrates the challenges of the self-help movement and the Amazon world in the peri-Covid era.

DOI: 10.1530/endoabs.91.CB28

CB29

A case of persistent grade II subclinical hyperthyroidism without any overt complications

Shahzad Akbar, Muhammad Taqi & Shiva Mongolu
Hull University Teaching Hospitals NHS Trust, Hull, United Kingdom

Introduction

Hyperthyroidism is a pathological state characterized by increased synthesis and secretion of thyroid hormones (thyroxine (T4) and triiodothyronine (T3)) by the

thyroid gland. Subclinical hyperthyroidism – a milder form – is defined as a low or suppressed TSH (<0.4 mIU/l), but serum free T4 (FT4) and free T3 (FT3) within the reference interval.

Case

76 years old lady seen in endocrine clinic. She was referred by GP because of concerns regarding subclinical hyperthyroidism. She has background history of COPD, Psoriasis, and Osteoarthritis. Her usual medications included Salbutamol inhaler, Fostair inhaler and Otezla (Aprimelast-for psoriasis). She has been having periodic bloods with the GP and found out to have subclinical hyperthyroidism. On assessment in the clinic patient has mentioned that she is generally lethargic and tired. There has been no change in her weight. She has occasional palpitations that mainly occur during the night. There was no history to suggest of fractures or low trauma fractures. She mentioned that she was previously diagnosed as having hypothyroidism and was on Levothyroxine tablets. She stopped taking those tablets 10 years ago. On clinical examination there were no signs of thyroid disease and no thyroid enlargement. Her heart sounds were normal to auscultations and there were no tremors too. She had been feeling unwell from psoriasis recently but there were no features of hyperthyroidism on history and clinical examination. TPO Antibodies were negative. Her Thyroid Receptor antibodies have been sent and awaiting results. She was started on low dose. Bloods for central hypothyroidism were done and were normal too. Considering that she has grade II subclinical hyperthyroidism, her age and potential complications, she has now been started on low dose Carbimazole 5 mg per day and will be followed up in clinic in due course for further review plus consideration of radioactive iodine if needed.

On review of her bloods

| Year | 03/2023 | 16/01/23 | 30/11/2022 | 21/6/2018 | 02/11/2016 | |
|------|---------|----------|------------|-----------|------------|--------|
| TSH | <0.02 | <0.02 | <0.02 | 0.05 | 0.07 | mIU/l |
| T4 | 13 | 14 | 15 | 9.5 | 11 | Pmol/l |
| T3 | 5.6 | | | | | Pmol/l |

Discussion

Treating subclinical hyperthyroidism is an open question amongst the endocrinologists. However, individualised treatment is necessary and the aim of the treatment is to restore thyroid state and avoid complications.

DOI: 10.1530/endoabs.91.CB29

CB30

A presentation of Graves' thyrotoxicosis

Abdur-Raouf Sheikh
South Warwickshire University NHS Foundation Trust, Warwick, United Kingdom

A female patient in her early forties was referred to the endocrine clinic. She initially presented to her general practitioner with symptoms of leg cramps and feeling lethargic. As part of initial investigation, thyroid function tests were performed which revealed Free T4 >100 pmol/l with a TSH suppressed <0.02mU/l. She was promptly commenced on carbimazole for thyrotoxicosis. On retrospective questioning, there was history of weight loss greater than one stone, over the last twelve months. There was also increased appetite, and increased frequency of bowel movements. There was no changes noted in menstruation which remained regular. There was history of occasional palpitations. No mood changes were noted and neither any change in vision or diplopia. Interestingly, there was maternal family history thyrotoxicosis requiring thyroidectomy. Her work pattern consisted of long shifts in the healthcare sector and she was a non-smoker. On examination, the patient was normotensive, with regular pulse and normal heart rate. The thyroid gland was moderately enlarged and no bruit was present. There was no pretibial myxoedema and examination of the eyes showed full eye movement with no diplopia. There was slight proptosis with lid-lag observed particularly on upward movement of the eyes, but no lid retraction. There was no periorbital oedema. Subsequent blood test for TSH receptor antibodies was elevated at 11.8 U/l, thus confirming a diagnosis of Graves' thyrotoxicosis. She was also commenced on propranolol for relief of adrenergic symptoms. Following four months of treatment with carbimazole and propranolol her symptoms were much improved and there was biochemical improvement with Free T3 and T4 within normal limits.

Conclusion

This report describes a case of thyrotoxicosis due to Graves' disease which had excellent response to anti-thyroid medication with resolution of symptoms and euthyroid biochemistry.

DOI: 10.1530/endoabs.91.CB30

CB31**Graves' disease in ITU- Thyroid Storm vs Thyrotoxicosis**

Vikram Ajit Rajan Thirupathirajan, Sawzan Hamdan, Delanos Bramble, Nishchil Patel & Ioannis Dimitropoulos
University Hospital Plymouth NHS Trust, Plymouth, United Kingdom

A 28-year-old female presented to ED with one week history of flu-like symptoms, palpitations, increasing breathlessness, and productive cough with copious sputum, of two days duration. There was h/o some weight loss over the last year, with episodic palpitations over the last 8-10 years that increased in frequency over the last one year. She had a family history of hyperthyroidism paternally and maternally. On examination, there was mild lid-lag and proptosis. She was tachypnoeic, tachycardic and had a low SO_2 of 70% on room air. There were widespread bilateral crackles on lung auscultation. Routine blood tests showed an infective picture with an elevated CRP and White Cell Count. She tested positive for influenza A and Haemophilus influenzae. CT thorax confirmed pneumonitis. She was admitted to ITU and was managed with non-invasive ventilation, nebulisers, IV antibiotics, IV hydrocortisone and fluids. In ITU, her TFTs were deranged, with TSH - <0.004 mIU/L (0.35-4.94 mIU/L), free T3 - 21.5 pmol/L (2.9-4.9 pmol/L), and free thyroxine - 47.7 pmol/L (9-19 pmol/L). Anti-TSH receptor and TPO antibodies were positive. She was given propylthiouracil (PTU) and IV hydrocortisone. Whilst this improved the TFTs, she developed neutropenia - $0.0 \times 10^9/l$ ($1.7-6.2 \times 10^9/l$). PTU was stopped and after the neutropenia resolved, carbimazole was commenced. At this point, the patient improved clinically from an infection point of view. However, she subsequently developed neutropenia on carbimazole too - $0.6 \times 10^9/l$. She was therefore posted for thyroidectomy and received seven days of Lugol's iodine prior to this. This was an interesting case as there was debate about whether this lady had long-term undiagnosed thyrotoxicosis from Grave's disease contributing to severe infection, or a thyroid storm. Thyroid storm is a clinical diagnosis, and use of the Burch-Wartofsky Point Scale can help. For our patient, there were various positive signs to suggest thyroid storm, such as a tachyarrhythmia, breathlessness, and productive cough. However, on review, it was determined that these clinical signs were likely due to her severe pneumonia alone. In addition to this and her past history of thyrotoxicosis symptoms, it was concluded that our patient presented with pneumonitis, on a background long standing thyrotoxicosis from untreated Graves' disease that was diagnosed in this admission, which may have exacerbated her infection and symptoms.

DOI: 10.1530/endoabs.91.CB31

CB32**Medical and surgical management of thyrotoxicosis**

Beenish Zaki & Paul Carroll
Guy's & St Thomas Hospital, London, United Kingdom

A 25-year lady was referred to GSTT for further management of thyrotoxicosis as she had relocated to London. The patient developed thyrotoxicosis during her pregnancy at the age of 23. During her pregnancy, she had significant weight loss. Her thyroid function test in September 2020 showed TSH 0.04 mU/l with FT4 of 24.1 pmol/L and TSH receptor antibody of 1.35 U/l. Hence she was started on propylthiouracil (PTU) during pregnancy. PTU was titrated down based on biochemical response. However, she relapsed in the post-partum period in April 2021. Her TSH <0.01 mU/l with FT4 of 41.5 pmol/L. Carbimazole was initiated at 40 mg per day. However, she developed swelling of her joints, thought to be carbimazole-related, and PTU was restarted. Nausea and vomiting were problematic, and therefore PTU was discontinued promptly. On review at GSTT in March 2022, she was found to have clinical features of thyrotoxicosis, with a body weight of 44 kg. There was a smooth goitre and no thyroid eye disease. Her thyroid function test showed TSH <0.01 mU/l, FT4 of 77.0 pmol/L, FT3 of 28.2 pmol/L, TSH receptor antibodies at 8.22 IU/l, TPO antibodies at 175 U/ml US examination: Heterogeneous hypervascular thyroid gland. No suspicious discrete nodules are identified. As it was uncertain whether PTU had resulted in adverse effects, PTU 150 mg TDS was re-initiated. She complained of ongoing palpitation and was started on beta-blocker. However, she had an allergic reaction following the commencement of the beta-blocker. Hence her medications were stopped, and she was offered surgery as a definitive treatment option for her thyrotoxicosis. As she remained thyrotoxic before surgery, she was pre-operatively started on Lugol's Iodine at a dose of ten drops TDS. This was commenced ten days before surgery to prevent thyroid storm. The patient had thyroid surgery on the 13th of June, 2022. The histopathological examination of the thyroid specimen demonstrated no evidence of malignancy. There were features consistent with treated Graves' thyrotoxicosis.

Post-Surgery

June 2022 showed satisfactorily corrected calcium of 2.18 mmol/l with PTH 9 nanograms/L and TSH controlled at 0.5 mU/l.

DOI: 10.1530/endoabs.91.CB32

CB33**Management of thyrotoxicosis complicated by neutropenia**

Beenish Zaki & Anand Velusamy
Guy's and St. Thomas Hospital, London, United Kingdom

A 40-year-old female was referred for further management of thyrotoxicosis to GSTT. She worked as a nanny and had Graves' thyrotoxicosis since October 2019. Her presenting symptoms were weight gain, hair loss, insomnia, and increasing anxiety. She had a large palpable goitre on examination with no eye disease. Ultrasound of the thyroid showed a diffusely enlarged thyroid with a normal echotexture, reflectivity and vascular flow. Benign subcentimeter nodules were seen in each lobe, consistent with U2 nodules. No retrosternal extension was seen. ECG: Rate-controlled AF She was started on Carbimazole 60 mg OD in November 2019. This was tapered to 40 mg OD as the patient suffered from flu-like symptoms. However, due to ongoing thyrotoxicosis, it was subsequently increased to 60 mg OD. She became pregnant in April 2020 and was started on PTU 300 mg. The patient medically terminated the pregnancy in September 2020. She had to be restarted on Carbimazole 40 mg due to an isolated increase in alkaline phosphate. In September 2021, she developed coryzal symptoms and stopped carbimazole. Carbimazole was again restarted at the lower dose of 20 mg OD which continued till August 2022. She stopped her treatment in August 2022 because she disagreed with the management plan of her local endocrinology team and was referred to GSTT. At GSTT, she was started on PTU 50 mg BD after reporting an adverse reaction to Carbimazole. In February 2023, she developed severe neutropenia with PTU, so the anti-thyroid medications had to be discontinued. She also received three doses of G-CSF. She is now awaiting a thyroidectomy.

Blood test results

| Dates | Nov 2019 | Sep 2020 | Sep 2021 | Oct 2022 | Feb 2023 |
|-------------|----------|----------|----------|----------|----------|
| Neutrophil | - | 1.5 | 1.4 | 1.4 | 0.7 |
| Platelets | - | 218 | 235 | 183 | 229 |
| TSH (mU/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| T3 (pmol/l) | 25.1 | 48.2 | 25.5 | 19.8 | 13.9 |
| T4 (pmol/l) | 32.4 | 89.7 | 46.3 | 36.6 | 27.1 |
| Alk Phos | - | 344 | 280 | 169 | 156 |

DOI: 10.1530/endoabs.91.CB33

CB34**Immunotherapy induced Thyrotoxicosis and adrenal insufficiency**

Abuzar Awadelkareem, Irfan Khan, Thanda Hnin, Nitin Shekar, Muhammad Asam & Sanjana Masinghe
CDDFT, Darlington, United Kingdom

Introduction

Immune-checkpoint inhibitors are used in patients with advanced cancers. They are associated with a wide array of side effects known as immune-related adverse events (irAEs). These can affect skin, gastrointestinal tract, multiple endocrine glands, liver and other systems. We report a 69-year-old male with a past medical history of Chronic Obstructive Pulmonary Disease and Lung cancer who was referred by the oncology team with a clinical and biochemical picture of thyrotoxicosis (TSH <0.5 , T4 38). His symptoms started 3 weeks following the second cycle of immunotherapy in the form of palpitation, tiredness, loss of weight and hand tremors. His thyroid function spontaneously recovered but he was having ongoing tiredness and feeling unwell and dizzy when reviewed in clinic, hence, further blood tests including random cortisol were arranged and the result of cortisol was 27, subsequently, a short Synacthen test was performed and the result as follows; baseline cortisol was 106 and after 30 minutes it was 336. Rest of pituitary hormones were unremarkable. He started him on steroids replacement and planned to repeat the short Synacthen test in 3 months. The patient's symptoms did improve significantly following the steroids use.

Learning points:

1. Immunotherapy induced adrenal insufficiency is rare and needs a high index of suspicion to diagnose.

2. When reviewing a patient following immunotherapy, It is important to think of other autoimmune endocrine problems when the patient has one especially if the patient's symptoms have not improved with treatment.

DOI: 10.1530/endoabs.91.CB34

CB35

A Case of Thyrotoxicosis refractory to medical management

Venkatram Subramanian & Richard Bell
Stepping Hill Hospital, Stockport, United Kingdom

38 year old lady with history of thyrotoxicosis managed since 2012. She works as a bus driver and is a single mother. She had no evidence of thyroid eye disease and her clinical activity score was 0. She has a smooth goitre which is non compressive. She was previously treated with propylthiouracil and she went into remission but then she relapsed in 2018. She has been on treatment but due to being a single mother and also her work schedules, she struggles with her medications leading to her missing many of her doses. She has been admitted on a few occasions to hospital but never fulfilled criteria for thyroid storm. Clinically she still has symptoms consistent with thyrotoxicosis and is now being worked up for Thyroidectomy. She was given a choice for Radioiodine therapy but refused due to having young children and being a single mother thereby being unable to stay away from them for a prolonged period as advised by the Nuclear medicine department. Coincidentally, she has also had multiple episodes where her medications were temporarily ceased due to suspected lymphopenia but has never had formal agranulocytosis. Her lymphocytes were low but her neutrophils have never reached below the defined neutropenic range. We have discussed in detail with the General practice surgery to ensure she does not end up having her medications stopped. She is not keen on Propylthiouracil as well due to the shift working pattern as this was tried previously but while she was pregnant. We are currently awaiting a date for her surgery and until this happens, we will continue to manage her medically as best as possible.

DOI: 10.1530/endoabs.91.CB35

CB36

Hashitoxicosis in A Young Patient: Uncommon Presentation of Autoimmune Thyroid Disease

Mudassir Ali & Kamal Aboughlila
University Hospital North Durham, Durham, United Kingdom

A 39-year-old lady with background history of autoimmune hypothyroidism diagnosed over 10 years ago, established on Levothyroxine 100 mg once daily, was referred by the GP with unusual sweating, palpitations, tiredness, anxiety, tremors and weight loss of around one stone over last few months. The thyroid function tests were suggestive of thyrotoxicosis with TSH of less than 0.05 mu/land FT4 60 pmol/l, hence the dose of levothyroxine was gradually reduced and ultimately stopped. Despite all this she remained symptomatic. She was commenced on Carbimazole 20 mg once daily and Propranolol 40 mg thrice daily. Her symptoms gradually improved. On examination there was no goitre or signs of thyroid eye disease. She had family history of thyroid disease. The thyroid uptake scan and the TRAb result which was available later (raised at 24 U/l) confirmed autoimmune Graves' disease. She had radioactive iodine therapy (530 MBq), following which she developed of thyroiditis with thyroid gland swelling and painful swallowing. She was started on tab Prednisolone 30 mg once daily for five days which improved her symptoms. When she was reviewed again after five weeks, the TFTs were suggestive of hypothyroidism (TSH of 131.5 mu/l, FT4 less than 1 pmol/land FT3 1.6 pmo/l), hence she was started on tab Levothyroxine 100 mg once daily. She was closely monitored with repeat TFTs and over a period of 4-6 weeks her TFTs improved significantly (TSH 1.69 mu/l, FT3 4.5 and FT4 19 pmol/lrespectively). She still complained of tiredness and low energy levels, hence vitamin D level was done which was very low and she was started on replacement. We explained to her that around 10% of patients with hypothyroidism still have symptoms of feeling tired and lethargic despite achieving target range of FT4, FT3 and TSH level. For completion purpose she was referred to rheumatologist to look into the possibility of fibromyalgia causing her symptoms.

Conclusion

This case highlights the fact that occasionally patients labelled with diagnosis of hypothyroidism may actually have blocking thyroid antibodies, and later they

may present as thyrotoxicosis when producing stimulating antibodies. Hence physician or GP need to be aware of this switching antibodies in Graves' disease to manage the patient properly and prevent any thyrotoxicosis related complications. Such cases are clinically challenging hence block and replace regimen is ideal until definitive treatment is done.

DOI: 10.1530/endoabs.91.CB36

CB37

A case of severe hypothyroidism in an elderly patient with Hashimoto's Disease

Margaret White
NHS, Dundee, United Kingdom

85 yo presenting with collapse, found to be hypothermic, bradycardic, hypotensive and hypoglycaemic, decreased GCS, on admission. TSH 135, T4 unrecordable. Prescribed IV liothyronine and hydrocortisone as per guidelines. Managed in Medical HDU. Careful management of hypothermia to avoid vasodilation and hypotension- blankets rather than active warming. Close management of blood sugars for hypoglycaemia. Pt responded well to therapy. Oral levothyroxine started once pt alert and swallowing. The trigger was thought to be non compliance with medication.

DOI: 10.1530/endoabs.91.CB37

CB38

A Rare Occurrence of Solitary Pheochromocytoma in an Adolescent Presenting with Cholestatic Liver Derangement

Prethivan Pillai Gopalakrishnan¹, Yong Ming¹ & Serena Sert Khim Khoo²
¹Lahad Datu General Hospital, Sabah, Malaysia; ²Queen Elizabeth II General Hospital, Sabah, Malaysia

A 16-year-old male, previously well, presented with 3 days history of non-specific body ache and headache. His blood pressure was 194/127mmHg, heart rate 115 beats/minute but had normal examination findings otherwise. His BP was high throughout his admission and his BMI was 20 kg/m². Drug history was unremarkable. We noted he had transaminitis with predominantly elevated alkaline phosphatase (ALP). His ALP was 397U/l(40-105 U/l), Alanine transaminase (ALT) 124U/l(0-50 U/l), Aspartate transaminase (AST) 140U/l(1-50 U/l) and total bilirubin 21umol/l (<20 umol/l) Hepatitis screening was normal and abdominal ultrasound revealed right suprarenal mass with normal liver and biliary findings. CT Neck, Thorax and Abdomen showed a suprarenal mass with peripheral enhancement and central hypodense cystic component, measuring 5.5 x 4.6 x 5.7 cm with a plain attenuation of +22 HU, absolute washout of 23% and relative washout of 9%. Low dose dexamethasone suppression test showed suppressed cortisol and 24 Hour urine metanephrines revealed elevated levels of Normetanephrine: 56.50 umol/day (0.50 - 2.49 umol/day) and 3-Methoxytyramine: 4.20 umol/day (0.10 - 1.79 umol/day). The diagnosis of pheochromocytoma was made and he was started on alpha then subsequently beta blockade with high salt diet. Interestingly we noted his cholestasis resolved in 4 weeks after starting on antihypertensives. Surgery was delayed for 2 months due to socioeconomic constraints. Post surgery, histopathological examination revealed findings consistent with pheochromocytoma with no evidence of necrosis. It is reported this is likely due to effects of excessive interleukin-6 (IL-6). Catecholamines can increase IL-6 production which is shown to cause intrahepatic cholestasis. Besides, it is also shown alpha adrenergic receptors have significant influence in the increased expression and secretion of IL-6. Hence alpha blockade may reduce IL6 secretion. However, reports vary on when IL-6 reduces in patients with pheochromocytoma. Some case reports have shown that it reduces with alpha and beta adrenergic blockade and hence the improvement in liver injury. Others have shown IL-6 level normalised only after adrenalectomy. This difference could be due to severity of adrenal tumour necrosis as it is postulated the bigger the necrosis, the higher the IL-6 production. This may possibly explain why our patient's liver function test normalised after commencing antihypertensives as there was no evidence of tumour necrosis on either CT scan or HPE examination. Hence early pharmacological treatment and definitive surgery should be instituted as soon as possible once the diagnosis is confirmed.

DOI: 10.1530/endoabs.91.CB38

CB39**Case of Adrenocortical Tumour**

Sangita Sharma
NHS Trust, London, United Kingdom

Background

Mrs X had experienced severe right sided abdominal pain. Brought to hospital by ambulance from the residential home. In Accident and Emergency, she was confused and the accuracy of her history was difficult to confirm. Mrs X had a CT abdomen and pelvis with contrast. This had reported a 3.8 cm enhancing, well defined left adrenal mass, this needed to be assessed with adrenal protocol CT. Referred to Nurse-Led Adrenal Incidentaloma clinic for investigations.

Past Medical History

History of falls Newly diagnosed hypertension Current Medication: Nitrofurantoin 100 mg MR 1 BD Codeine 15 mg 1-2 up to 4 x daily as required Paracetamol Newly Commenced on Amlodipine in view of elevated BP

Seen by Nurse Practitioner in clinic:

Mrs X had attended clinic by transport, accompanied by her carer. She was broadly well in herself. Has poor mobility uses walking stick. She is not obese. BP in clinic was elevated 188/91 decreased to 154/85 after resting. In residential home, BP ranging 150/76 to 164/85.

Investigations following clinic appointment**1. Plasma renin aldosterone measurement:**

Aldosterone renin ratio = 463 pmol/l, Renin: 0.3 nmol/L/hr

1. Plasma metanephrines (after being in the recumbent position for 30 minutes)

Plasma metadrenaline: 156 pmol/l(0-511)

Plasma Normetadrenaline: 346 pmol/l(0-1180)

Plasma 3-Methoxytyramine: <75 pmol/l(0-180)

1. Urine free cortisol measurement.

This had demonstrated a raised 24hr urine free cortisol levels significantly elevated at 618 (1-124)

1. Overnight dexamethasone suppression test-

Result was 81 nmol/l, non-suppressed level.

1. low dose dexamethasone suppression test [LDSST]-

Baseline cortisol day 1: 661 nmol/l

Day 2 48hr: 78 nmol/l, non-suppressed level

ACTH: 12.9 ng/l(7-63)

CT Adrenal with contrast-

Left adrenal lesion in keeping with a benign adrenal adenoma.

Adrenal MDT Mrs X case was discussed amongst our MDT and this will be investigated further at a tertiary centre.

The new working diagnosis

Discussion

Interestingly, this patient does not have cushingoid features and she is not obese. It has been difficult to interpret the ACTH level given that it is not fully suppressed. One may even consider a case of ectopic ACTH. Making a diagnosis may not always be straight forward. However, given the ACTH is low, cortisol levels are not suppressed, and she has an adrenal adenoma this may be in keeping with a diagnosis of adrenal incidentaloma.

DOI: 10.1530/endoabs.91.CB39

CB40**Adrenocortical Carcinoma Presenting with flank pain: A Case Report**

Mili Dhar

King's College Hospital, London, United Kingdom

A 52-year-old female presented with acute left flank pain after experiencing intermittent pain, weight gain, mood disturbances and hirsutism for six months. A CT scan of the abdomen and pelvis revealed a large heterogeneous 10x7x15 cm mass in the left adrenal gland with local invasion. The patient had a past medical history of right invasive ductal carcinoma and had undergone a wide local excision. She was referred to the Endocrine team.

Biochemical Investigations:

The initial biochemical investigations revealed unsuppressed cortisol levels on ONDST and elevated serum androgens.

Pre-operative Biochemical tests:

| Test | Normal range |
|--|--------------|
| Overnight dexamethasone suppression test | <50 |
| Cortisol 217 nmol/l | |
| Serum Androgens: | |
| 17-Hydroxyprogesterone | (0.0-5.0) |
| 2.0 nmol/l | |
| Androstenedione | (1.1-7.7) |
| 9.1 µmol/l | |
| DHEAS | (0.9-11.6) |
| 15.7 µmol/l | |
| Serum Testosterone | |

| | |
|----------------------|------------|
| 7.4 nmol/l | (0.5-1.9) |
| Free Androgen Index | |
| 29.6% | (0.2-3.6%) |
| SHBG | |
| 25 nmol/l | (27.1-128) |
| Plasma metanephrines | |
| Normal | |

The patient's urine steroid profile (USP) exhibited a relative increase in androstenedione/testosterone metabolites androsterone, aetiocholanolone, DHA, the DH metabolite androstenediol-17β (1010 µg/l) and the 17-hydroxypregnenolone metabolite pregnetriol (1719 µg/l). There was a modest elevation of adrenocortical carcinoma (ACC) specific marker tetrahydro-11-deoxycortisol (196 µg/l). These findings were considered pathological in post-menopausal women and suggestive of adrenocortical carcinoma (ACC).

Staging and Treatment:

As part of tumour staging, an FDG-PET scan was performed, which showed an intensely FDG-avid left adrenal mass consistent with a primary adrenal malignancy. There was no evidence of distant metastasis. Following discussion in the Adrenal Multidisciplinary meeting (MDT), the patient underwent a left oncological adrenalectomy. The surgery was complicated by haemorrhage due to left kidney blood vessels infiltrating the mass, and part of mesocolon and left kidney were attached to the mass, requiring resection. She was commenced on hydrocortisone 10 mg twice daily post-operatively. Histology confirmed ACC with a Ki67 of 80-90%. A genetic panel was completed, which came back negative for Li Fraumeni syndrome.

Post-operative Biochemical Investigations:

Following surgery, repeat biochemical assessment revealed undetectable DHEAs and androgen metabolites. Repeat USP showed previous androgen metabolite levels were low (and appropriate for age), whilst DHA metabolites and 17-hydroxypregnenolone metabolite pregnetriol were not detected.

Post-operative Biochemical tests:**Serum Androgens:**

| | |
|------------------------|-------------|
| 17-Hydroxyprogesterone | (0.0-5.0) |
| 1.8 nmol/l | |
| Androstenedione | (1.1 – 7.7) |
| 2.3 µmol/l | |
| DHEAS | (0.9-11.6) |
| 1 µmol/l | |
| Serum Testosterone | (0.5-1.9) |
| <0.4 nmol/l | |
| SHBG | (27.1-128) |
| 32.3 nmol/l | |

She has been initiated on mitotane as part of adjuvant chemotherapy. She is remains under surveillance with USP every 3-6 months.

DOI: 10.1530/endoabs.91.CB40

CB41**Oncocytic Adrenocortical Carcinoma - a rare variant**

Nang Poe Poe Han Htwe¹, Afroze Abbas¹, Sheila Fraser² & Alan Anthony³

¹Leeds Centre for Diabetes and Endocrinology, Leeds Teaching Hospitals Trust, Leeds, United Kingdom; ²Leeds Centre for Endocrine and Thyroid Surgery, Leeds Teaching Hospitals Trust, Leeds, United Kingdom; ³Leeds Cancer Centre, Leeds, United Kingdom

A 59-year-old male patient, who is fit and well, presented with abdominal discomfort, night sweats, back pain and lower urinary tract symptoms. The CT scan, organised by the GP, demonstrated a 17 cm heterogenous mass with central necrosis and scattered calcification in right side of abdomen, possibly right adrenal origin or liver or kidney. He was referred to Adrenal MDT. Baseline functional testing showed unsuppressed cortisol level in an overnight dexamethasone, high DHEA sulphate level and low ACTH. He does not have any features of hypercortisolism.

| Blood test | Result |
|--|-----------------------------|
| Overnight dexamethasone suppression test | 406 nmol/l(<50) |
| 24-hour urine cortisol | 94 nmol/24 hours (10 - 147) |
| ACTH | 7 ng/l(<47) |
| Renin | 0.6 nmol/L/h (0.5 - 3.5) |
| Aldosterone | 88 pmol/l(100 – 850) |
| Plasma metanephrines | 119 pmol/l(0 – 1180) |
| Plasma normetanephrines | 384 pmol/l(0 – 510) |
| 17 OH progesterone | 3.5 nmol/l(<5.0) |
| DHEAS | >27.1 umol/l(1.0 - 8.0) |
| Androstenedione | 4.5 nmol/l(1.3 - 5.8) |
| FSH | 3.1 IU/l(1.4 - 18.1) |
| LH | 5.5 IU/l(1.5 - 9.3) |
| Oestradiol | 115 pmol/l(28 – 156) |
| Testosterone | 15.8 nmol/l(8.0 - 30.0) |
| SHBG | 52.00 nmol/l(14.55 - 113.3) |

PET CT scan showed large right suprarenal mass with intense FDG activity and necrosis, compatible with an adrenocortical carcinoma and no FDG avid metastatic disease demonstrated. He was planned for adrenalectomy. He did not need medical therapy for hypercortisolism prior to surgery as he was completely asymptomatic and blood pressure was well controlled. He underwent an open right adrenalectomy with no immediate complications. The histopathology showed oncocytic adrenal cortical carcinoma with vascular invasion. PT2 pNx (TNMv8), no capsular invasion, Ki 67 8.7%. He was started on hydrocortisone tablets post-surgery. Short synacthen test 6 weeks post-surgery showed an adequate cortisol response. He was reviewed in Oncology clinic in view of histopathology finding. After discussion with Histopathology for tumour grading, it was regarded as very low grade by Helsinki scoring system (Helsinki score 13) and no adjuvant therapy is needed. He will be closely monitor with surveillance CT scans. He remains well and is waiting for the surveillance CT scan. Further plan from Endocrinology includes testing of 9 am cortisol off morning hydrocortisone to assess his adrenal axis. Oncocytic variant is a rare subtype of adrenocortical cancer and there is less guidance available for post operative period care. Helsinki scoring system is used for prognosis and a score more than 17 is associated with adverse prognosis.

DOI: 10.1530/endoabs.91.CB41

CB42

A case of Pheochromocytoma crisis precipitated by biliary sepsis
Nihad Elsayed Mohamed Ali
Barnsley Hospital NHS Foundation Trust, Barnsley, United Kingdom

Background

Pheochromocytoma is a rare tumour that arise from chromaffin cells in the adrenal medulla and produces signs and symptoms due to excessive catecholamine secretion from tumour. Presenting symptoms can vary but often they classically present with headaches, sweating and palpitations in the setting of paroxysmal hypertension. Pheochromocytoma crisis results from the sudden release of large quantities of catecholamines and leads to progressive multiple organ dysfunction. Case presentation

54 years old gentleman with a history of pheochromocytoma not for surgical resection as high anaesthetics risk, obesity, IHD, CABG, DM type2, toes amputations bilaterally and PVD. Presented with biliary sepsis precipitating pheochromocytoma crisis. The patient admitted to ED with right upper quadrant abdominal pain, jaundice, vomiting and pyrexia. Reported two weeks history of excessive thirst, passing large volume of urine, palpitations and sweating. Vital signs were stable on admission, laboratory Investigations revealed deranged LFTs, raised CRP, WCC and normal blood gases with lactate of 2. Treated as acute cholecystitis with IV antibiotics. On arrival to acute medical unit, became severely unwell, Persistent pyrexia (temperature 40), hypertensive crisis (BP 270/140), sinus tachycardia (HR 140) and hyperglycaemic (BM 33). On assessment he was dehydrated, flushed and sweaty. Repeated ABG showed acidosis, ketones were normal and lactate increased to 10. Management was guided by medical registrar and intensive care team, treated with multimodality therapy including excessive IV fluids, alpha-blockers (Phenoxybenzamine and Doxazocin) and variable rate intravenous insulin infusion. Good respond to adequate fluid resuscitation and alpha adrenergic blockade, patient was stabilized and BP regains to normal range. Blood glucose levels improved, vomiting settled and he was able to eat and drink therefore the insulin infusion stopped and restarted on his regular insulin regimen. The Patient improved significantly and discharged home after 5 days.

Conclusion

Pheochromocytoma crisis is a life-threatening medical emergency that necessitates cross-disciplinary expertise and management to ensure the best clinical outcome. If crisis is suspected, an α -blocker treatment with adequate fluid replacement therapy should be initiated as soon as possible. Good history taking and assessment on admission is crucial as if a known diagnosis of pheochromocytoma is overlooked or treatment delayed the consequences could be catastrophic or even fatal; however, prognosis is usually very good if treated appropriately. This case highlights challenges with Pheochromocytoma management when patients are not fit for surgical intervention.

DOI: 10.1530/endoabs.91.CB42

CB43

Cushing's Syndrome of Unknown Aetiology

Wutyee Win

Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom

72 year old male has an incidental left adrenal lesion which was picked up by the ultrasound scan in 2014 for the flank pain. His medical background includes type2 Diabetes-Mellitus, hypertension, aortic stenosis, hypogonadotropic hypogonadism, well controlled asthma and sleep apnoea using CPAP. His Adrenal CT (late 2014) has shown pre-contrast of 4HU, portal-phase 20HU, and delayed-phase-18HU. His MRI adrenals showed fat rich left side 3 cm adrenal adenoma with stable appearances over a 13 month period. His biochemical profile is interesting as it showed probable hypercortisolism with the background of Type2 Diabetes-Mellitus. Clinically, he has central obesity, no striae in abdomen with BMI of 37. His serial 24 hour UFCs were showing variable results from 66 to 258nmol/24hour (Ref-0- 146nmol/24 hour). His ACTH levels were between 7-23 ng/l(Ref <50ng/l). His late night salivary cortisol levels were between 0.9-15nmol/l (Ref 20:00-22:00 <8nmol/l, 22:00-23:59 <4.3nmol/l. He failed OSDT with cortisol level of 126nmol/l and LDDST with cortisol level of 73, 105 and 113nmol/l respectively on three occasions. The cortisol day profile showed 9am-443, 11am-440, 1pm-366, 3pm-337, 5pm-276, 7pm-267, 9pm-261, midnight (awake)-204 and 224 (units-nmol/l). His recent tests showed testosterone level of 6.8nmol/l, LH-3.5mU/l, FSH-1.6mU/l, TSH-2.79mU/l, IGF-1 30.3mU/l, prolactin-96mU/l, DHEA 1.1umol/l, HbA1c 68mmol/mol and normal electrolytes. His HbA1c has deteriorated over the years. All his biochemical tests showed a likelihood of cortisol excess. As it is favouring to ACTH dependent, CT TAP was done but no show of ectopic tumours. Interestingly, the patient's MRI pituitary showed a three millimetre left sided pituitary micro-adenoma. His blood pressure is controlled with Lisinopril and furosemide. He has a normal bone density scan result. This patient remains clinically well during the COVID period and he was followed up with a telephone appointment. His results continue to show a picture of mild hypercortisolism. The underlying cause for his Cushing Syndrome has not been identified. Adrenal autonomy was initially considered a possible aetiology after the identification of the left adrenal adenoma. However, the more recent ACTH levels would raise the possibility of a pituitary (or ectopic) origin. At this moment, we planned for him to optimise his diabetes control and repeat UFCs, late-night salivary cortisol and the day cortisol profile. This will be followed by CRH stimulation test if the above test results continue to show hypercortisolemia. The aetiology of cortisol excess remains unclear till the last clinic appointment.

DOI: 10.1530/endoabs.91.CB43

CB44

Severe Cushing's Syndrome in a 24 year old female

Gordon Sloan^{1,2}, Ruth Macinerney¹, Anita Pillai¹, Robert Robinson¹, Shilpa Pallai¹ & Ibrahim Shahbuddin¹

¹Chesterfield Royal Hospital, Chesterfield, United Kingdom; ²University of Sheffield, Sheffield, United Kingdom

A 24 year old female presented to her general practitioner with general malaise. She had a genetic diagnosis of hereditary non-polyposis colorectal cancer (Lynch syndrome), with no colonic lesions detected on screening. Routine biochemistry revealed a potassium of 2.1mmol/l, requiring admission for urgent investigation and intravenous replacement. Further clinical assessment found a past history of severe acute thoracic back pain (3-months prior to presentation), weight gain and muscle weakness. Clinical examination revealed clear Cushing's syndrome, including: thinning of the skin, Cushingoid facies, proximal muscle weakness and hypertension (>180/110mmHg). Her inpatient investigations revealed a basal cortisol of >1,000nmol/l, which was not suppressed with an overnight dexamethasone test, and a fully suppressed ACTH. A thoracic spinal x-ray also diagnosed vertebral fractures. In addition to potassium replacement, upon confirmation of hypercortisolaemia the patient was treated with metyrapone, co-trimoxazole (prophylactic dose), antihypertensives and chemical thromboprophylaxis. The patient underwent multiple imaging modalities of the body, including MRI, CT and PET. She was diagnosed with a left adrenocortical cancer (~8 cm). Her metyrapone was titrated to attempt to control her hypercortisolaemia and she was referred for surgery.

DOI: 10.1530/endoabs.91.CB44

CB45

Ectopic ACTH Dependent Cushing's Syndrome

Shaikh Sadaf

Aneurin Bevan University Health Board, Wales, United Kingdom

History

57yrs old gentleman presented with c/o-Shortness of breath confusion weakness Tired Having poor appetite Poor mobility generally unwell.

P/M/H

Diagnosed with Medullary Thyroid Carcinoma as a part of MEN2A at the age of 32 yrs had a thyroidectomy and lymph node clearance in 1997 followed by a few months later by sternotomy and mediastinal node resection. Bony metastasis. Residual Horner's syndrome. Developed Renal, liver and Bone metastasis with a mass in the lung with a mild Left sided Pleural Effusion Received Chemotherapy and 6 cycles of Radiotherapy 1st April 2019; Calcitonin 54,500 ng/l. CEA 472 mg/l. Plasma metanephrines and parathyroid hormone normal. Calcitonin 73,000 ng/l/October 2019; Calcitonin 75,000 ng/l/July 2020

Investigations-CT Thorax, Abd and Pelvis

15/11/2022 CTAP-Large Pleural effusion. There is a large left pleural effusion encasing the lung, which has developed since August 2021. In addition, there is a mass encasing the arch of the aorta extending in a pretracheal position and related to the left hilum extending into the left upper lobe. Left adrenal mass likely as a result of metastatic medullary thyroid cancer

Case Management during Hospitalisation

Admitted with shortness of breath and confusion on 15/11/2022 secondary to left sided pleural effusion. Effusion was drained and talc pleurodesis was performed. Pleural effusion was transudate with no malignant cells and was likely secondary to ongoing malignancy. Incidentally was found to have hypokalaemia and hypocalcaemia on admission. Was on furosemide for his chronic pericardial effusion. Electrolytes replacement were refractory to IV replacement and serum cortisol levels were high raising suspicion of ectopic ACTH. Psychosis noted. Was admitted in ITU for refractory hypokalaemia, hypocalcaemia and hypomagnesaemia. Free cortisol [Urine] 11392 nmol/Free cortisol output [24hr urine] 27364 nmol/24h H < 146

Treatment

Furosemide was replaced by Spironolactone to minimise renal losses. Metyrapone was started and dose was titrated up without any complications 500 mg TDS aiming cortisol of 300-500. Electrolytes were corrected. Cortisol levels dropped. Also the chronic diarrhoea was due to calcitonin producing tumor was controlled with loperamide and cholestyramine.

Block and Replace Regimen- Ketoconazole 400 mg TDS (inc from 200 mg TDS on 10/1/23), Metyrapone 5 caps TDS (inc from 4 caps 10/1/23); Spironolactone 100 mg OD, Dexamethasone 500mg BD.

Diagnoses

1. MEN 2A syndrome (634 mutation).
2. Metastatic medullary thyroid cancer with extensive bone metastases
3. Ectopic ACTH Dependent Cushing's Syndrome

Definitive Management-

Scheduled for bilateral Adrenalectomy

Genetics-His father-carrier, sister-positive MEN2A, Sister's son-MEN2A, his daughter-positive MEN2A,

DOI: 10.1530/endoabs.91.CB45

CB46

A case of Adrenal Hypercortisolism: A timeline

Dooshyant Tulji, Gul Bano & Christina Triantafyllou
St George's Hospital, London, United Kingdom

A 69 year old lady was initially seen in clinic in August 2020 for a right adrenal incidentaloma which was discovered after she had a CT abdomen for diverticulitis related symptoms. She subsequently had a dedicated CT Adrenal in January 2019 before she was seen in clinic which showed a 25 x 32 mm right adrenal adenoma labelled as lipid poor with an absolute & relative washout of 67% and 47% respectively. Her past medical history included hypertension and anxiety disorder. On clinical examination, she didn't have any features of cortisol excess though she had a raised BMI of 31.99. An interval scan was organised which was stable. An overnight dexamethasone suppression test showed failed suppression with a Cortisol level of 175. 24 hr Urine Metanephrines was normal as was Aldosterone to Renin Ratio prior to which her Bisoprolol and Candesartan were switched to Doxazosin for 2 weeks. She then had a low dose dexamethasone suppression + CRH test. Baseline Cortisol was 379 and ACTH 10. At the end of the test, her cortisol still failed to suppress at 180 with an ACTH level of < 3. Post CRH injection, repeat samples for cortisol & ACTH were taken at 15 and 30 mins. The cortisol levels came back at 184 and 171 and ACTH 3 and 4 at time 15 and 30 minutes respectively suggesting ACTH independent Cushing Disease. Her case was discussed at the Endocrine MDT and she went on to have a right laparoscopic subtotal adrenalectomy in August 2022. The delay was because she was referred to the drug alcohol liaison team for excess alcohol intake & her liver function tests improved dramatically as she cut down on her intake. The surgery was uneventful and she was started on IV hydrocortisone post op day 1 which was switched to 20/10/10 when she was more stable and eating and drinking. She was reviewed in clinic after 2 months and she was advised to wean down her hydrocortisone progressively over the next 10 weeks until she was on 10 mg OD. A histopathology report in the meantime confirmed an adrenocortical adenoma.

An early morning cortisol done on 27/01/23 showed evidence of adequate cortisol production at 383 & her steroids were weaned down further until she was on 5 mg OD before discontinuing completely. She also has been booked for a DEXA scan & will be reviewed further in clinic.

DOI: 10.1530/endoabs.91.CB46

CB47

ACTH-dependent Cushing with low ACTH levels: a diagnostic conundrum

Razan Ali Rashid, Catherine Napier, Simon Pearce & Yaasir Mamoojee
The Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle Upon Tyne, United Kingdom

Background

Diagnostic work-up for Cushing Syndrome (CS) can be challenging and is based on clinical and biochemical assessments. Biochemical evidence of endogenous steroid excess is demonstrated through overnight dexamethasone suppression test (ODST), low dose dexamethasone suppression test and/or 24-hour urinary free cortisol estimation (UFC). Once endogenous steroid excess is confirmed, random serum ACTH measurement is key in determining the suspected source of steroid excess: ACTH-independent (adrenal cause) or ACTH-dependent Cushing (pituitary or ectopic ACTH secretion). We report a cases of ACTH-dependent CS where the serum ACTH level remains persistently low.

Case report

A 55-year-old female patient was referred with a 3 cm left adrenal adenoma, first discovered 8 years prior. She had type 2 diabetes, hypertension and a history of psychosis. Her other comorbidities included chronic obstructive lung disease, ischaemic heart disease, valvular heart disease, obstructive sleep apnoea and rheumatoid arthritis. She was on a number of regular medications including centrally acting agents for pain control and antipsychotic agents. She displayed Cushingoid features on examination and her random serum ACTH levels ranged between 7 and 17 ng/l(NR <42). She failed her overnight dexamethasone suppression test (ODST) with a serum cortisol level of 107 nmol/l/post-dexamethasone and her Low Dose Dexamethasone Suppression Test was also positive. Although her 24-hour urine free cortisol estimation was normal, her untimed urine steroid profile demonstrated relatively increased proportions of cortisol metabolites in the direction of Cushing's. A peripheral desmopressin test (IV desmopressin 10 µg) was positive with an ACTH increase of 85% and a serum cortisol increase of 40%. Her pituitary MRI did not reveal a discrete adenoma. She underwent Inferior Petrosal Sinus Sampling which confirmed a pituitary source of ACTH excess (ACTH IPSS: peripheral >3). Given her adverse anaesthetic risk profile she is currently being managed on medical therapy with metyrapone and fluconazole therapy.

Conclusion

Diagnosis of ACTH dependent Cushing's in patients presenting through the adrenal incidentaloma pathway can be challenging, especially in the presence of suppressed serum ACTH levels from centrally acting medications. The presence of Cushingoid features and radiological suggestion of a hyperplastic-looking contralateral adrenal gland should trigger investigations for ACTH-dependent CS in those with proven hypercortisolism. A multidisciplinary approach to investigation and interpretation is advised.

DOI: 10.1530/endoabs.91.CB47

CB48

Hunting for the source of ACTH

Lisa Yang & Florian Wernig
Imperial Healthcare NHS Trust, London, United Kingdom

A 64 year old female presented to A&E with a 3 month history of general decline, low mood and 8 kg weight loss. On examination there was facial plethora, thin skin with generalised bruising and peripheral oedema. Initial blood tests showed raised inflammatory markers, low potassium (2.6 mmol/l) and deranged liver function tests. A CT chest/abdomen/pelvis found a 2 cm lesion in the left lung with extensive liver metastases but no nodal deposits in the abdomen so this was felt to be a lung primary with liver metastases. A liver biopsy showed grade 2 neuroendocrine tumour (NET) with Ki67 3-5%. In the interim the patient went to Germany where she was started on chemotherapy. The patient returned to the UK one month later and presented to A&E with general malaise. She was found to be profoundly hypokalaemic with worsening liver function. A pituitary profile showed secondary hypothyroidism, hyperprolactinaemia and hypogonadotropic hypogonadism. She had a raised ACTH with 9am cortisol of 1350 nmol/l/which

did not suppress on dexamethasone testing. 24 hr urine free cortisol was also raised at 1730 nmol/l. MRI pituitary showed a 11mm mass closely associated with the infundibulum and elevating the chiasm but appeared to be separate from pituitary gland. After discussion in pituitary and NET MDT meetings, she was started on prophylactic rivaroxaban, lanreotide and metyrapone. Functional imaging was carried out which showed that the lung lesion was FDG positive but did not take up Gallium which is unusual for a NET. Two attempts at lung biopsy were unsuccessful and the patient was deemed to be too frail for inferior petrosal sinus sampling. The decision was made to go ahead with medical management to stabilise the patient without confirmation of source of ACTH. She was commenced on metyrapone but was unable to normalise cortisol as she could not tolerate higher doses of metyrapone. An application was approved to use the novel agent Osilodrostat on compassionate grounds. This led to a marked reduction in cortisol levels and she was quickly established on a block and replace regime. She has remained well on osilodrostat therapy for 6 months and has been able to tolerate several cycles of chemotherapy with good effect. We have been monitoring her pituitary lesion which has marginally increased in size and further review in pituitary MDT have concluded that it is most likely to be a pituitary metastasis.

DOI: 10.1530/endoabs.91.CB48

CB49**Cushing's Disease during the COVID Lockdown**

Michael Gilroy

Torbay and South Devon NHS Foundation Trust, Torquay, United Kingdom

A 36-year-old female was referred to Endocrinology by her GP in August 2019 with polycythaemia, obesity, hypertension, type 2 diabetes, asthma, right shoulder and bilateral ankle pain [on 6-monthly steroid injections], easy bruising, hirsutism, PCOS and raised testosterone. Haematology had excluded likely causes of polycythaemia [JAK 2 negative]. The GP noted previous review by Endocrinology in another hospital [December 2012] regarding possible PCOS but was lost to follow up after one appointment. Clinic enquiry established daily face shaving and frequent waxing. Menarche at 17 years old. Current periods were very irregular. Examination noted fine pigmented stretch marks, a supraclavicular

| | | | |
|---|--|------------------------|------------------------|
| | 2019-2020 | 2012 | |
| Weight | 143.8 kg | 122.4 kg | |
| BMI | 49.7 kg/m ² | 40.4 kg/m ² | |
| BP | 166/97 | 122/86 | |
| Fasting Blood Glucose | | 4.7mmol/l | |
| Hba1c | 71mmol/mol | | |
| Testosterone | 4.03nmol/l | 2.5nmol/l | [0.2–1.65nmol/L] |
| Testosterone (LC/MS/MS) | 1.8nmol/l | | [0.1–0.9nmol/L] |
| Free androgen index (LC/MS/MS) | 12.7% | | High. Interference? |
| SHBG | 14.2nmol/l | | [32.4–128] |
| LH | 14.3 IU/l | | |
| FSH | 6.4 IU/l | | |
| Prolactin | 231mu/l | | [102–496] |
| Oestradiol | 132 pmol/l | | |
| 17-OHP | 0.5nmol/l | | [0.4–3.6nmol/L] |
| Androstenedione | 4.6nmol/l | | [1.2–6nmol/L] |
| DHEA | 22.0umol/l | | [2–11.1umol/L] |
| Further Investigation | | | |
| Cortisol [ODST] | 497nmol/l | | [< 50nmol/L] |
| 24h Urine cortisol | 741nmol/24h | | [0–130nmol/24h] |
| Midnight Salivary Cortisol | 14.6 and 16.7 | | [< 4.3nmol/L] |
| Low dose Dexamethasone suppression test | 214nmol/l | | |
| Cortisol | | | |
| ACTH - Pre-Op | 101ng/l | | [0–46ng/L] |
| MRI pituitary | A 12x12 by 8mm adenoma is located in the right side of the pituitary fossa displacing the normal pituitary to the left with associated displacement of the pituitary stalk to the left. No significant suprasellar extension. No involvement of the cavernous sinus. | | |
| Petrosal vein sampling | | | |
| Time | Left IPS ACTH (ng/l) | Right IPS ACTH (ng/l) | Peripheral ACTH (ng/l) |
| -5 | 2190 | 93 | 59 |
| 0 | 1804 | 126 | 55 |
| 3 | 10866 | 6270 | 75 |
| 5 | 8175 | 4360 | 97 |
| 10 | 6657 | 2031 | 122 |
| 15 | 6690 | 1468 | 130 |
| | | | Cortisol (nmol/l) |
| | | | 206 |
| | | | 213 |
| | | | 202 |
| | | | 201 |
| | | | 253 |
| | | | 348 |

fat pad, acanthosis, seborrheic dermatitis and recent leg swelling. Investigations as per table. Surgery was delayed due to the COVID pandemic Lockdown. Diabetes, hypertension and weight were actively managed. Metyrapone was used pre-operatively and the patient was advised to shield. Partial apoplexy of the ACTH secreting pituitary adenoma occurred just before elective transphenoidal surgery. Post surgery nausea and vomiting were troublesome symptoms for an extended period. Post-operative ACTH deficiency was confirmed and the patient remains on hydrocortisone; Weight has reduced by over 60 kg; Hypertension and T2DM are in remission; On last review she was pregnant and was promptly referred to the combined endocrine/antenatal clinic.

DOI: 10.1530/endoabs.91.CB49

CB50**Cushing's syndrome due to ectopic ACTH secretion**Muhammad Faheem, Gaurav Malhotra & Umaira Aziz
Basildon University Hospital, Basildon, United Kingdom

Ectopic ACTH is an infrequent cause of Cushing's syndrome which can be severe in its presentation and needs immediate management in order to prevent the complications associated with severe hypercortisolism. This case of ectopic ACTH secretion is being reported who presented clinically as Cushing's syndrome and later diagnosed to have small cell carcinoma of lung. A 62-year-old previously normally fit and well lady presented with 1-month history of feeling unwell, lethargy and weight gain. She was found to have new diagnosis of hypertension (BP 160/110 mm hg), hypokalemia (2.9 mmol/l), metabolic alkalosis (Bicarbonate 30 mmol/l and PH 7.50) and mild Cushingoid facies (Fascial plethora, mild thinning of skin and bruises over legs and proximal myopathy). She had no past medical history and was not on any regular medications or steroids. She was a smoker but had no history of cough, hemoptysis, weight loss and chest pain. She had further investigations for relatively acute presentation of Cushing's syndrome. Her Overnight dexamethasone and low dose dexamethasone suppression tests revealed unsuppressed cortisol. Her ACTH levels were markedly raised. Radiograph of chest revealed left hilar mass which was followed by CT scan chest abdomen and pelvis which revealed left hilar lymphadenopathy and bilateral adrenal hyperplasia. Cortisol day curve showed blunted response. She also had aldosterone renin ratio, plasma metanephrines and MRI pituitary done which were normal. Her Blood glucose and HBA1c were normal. She was managed with IV potassium chloride infusion, anti-hypertensive and potassium sparing diuretics and heparin for prophylaxis. She was subsequently referred to tertiary care hospital for management. She was also started on metyrapone for high burden of cortisol. She had PET Ct scan and EUS guided biopsy of hilar lymph node confirmed small cell carcinoma of lung. She was discussed in oncology MDT and was started on chemotherapy and radiotherapy for lung cancer. Ectopic ACTH related Cushing's syndrome though rare; however, it should be taken as endocrine emergency as it is usually associated with severe complications of hypercortisolism. It should be urgently evaluated with diagnostic tests for Cushing's and to localize the ectopic source of ACTH secretion. The strategies to manage these cases are the treatment of source of ACTH and to manage Hypercortisolism and the complications associated with it, including hypertension, hypokalemia, thromboembolic prevention, and prevention of opportunistic infections especially P. Jirovecii. Furthermore, these patients should be managed under multidisciplinary settings.

DOI: 10.1530/endoabs.91.CB50

CB51**A case of Cushing's secondary to ectopic ACTH secreting neuroendocrine tumour**

Shaïma Osman

Harrogate District Hospital, Harrogate, United Kingdom

A retired 73 year old teacher, who had 2 sons and lived independently alone and stayed active playing tennis 3 times per week. She is an ex-smoker and drinks alcohol occasionally. Past medical history: right breast cancer T1N0 post wide local excision/radiotherapy in remission, type 2 diabetes on Linagliptin. Large cell neuroendocrine tumour of the lung with liver metastasis, on palliative chemotherapy with Octreotide injections. Admitted with generalised body weakness started after chemotherapy. Her symptoms were progressive, with fatigue, muscle weakness and frequent falls. O/E: spontaneous skin bruising, Facial hair growth and infra orbital puffiness. Raised BP with no previous hypertension and uncontrolled blood glucose necessitating insulin. Neurological examination showed generalised muscle wasting with lower limbs weakness

proximal more than distal. She had no sensory or cerebellar signs. She needed a walking stick and the assistance of 1 to mobilise and had low mood. Examination otherwise unremarkable.

Work up:

- HB 132g/dl, WBC 10.7 x 10⁹/l, PLT 264 10⁹/l,
- CA 2.25 mg/dl, ALBUMIN 26g/dl, CRP 10, BILIRUBIN 50 mg/dl, ALT 68u/l, ALP 631u/l,
- K 3mmol/l, NA 142mmol/l, HCO₃-32mmol/l, CK 68units/l,
- CORTISOL 1388, TSH 1.5, VITAMIN D <20, HBA1C 71

Neurologist investigations:

- MRI Brain- no abnormality
- MRI whole spine: no metastatic spinal cord compression. acute osteoporotic fractures T4 and L1
- Nerve conduction study: no sensory or motor polyneuropathy or myopathy. No evidence of motor neuron disease.
- Paraneoplastic antibodies screen was negative.

Endocrinology assessment showed no typical cushingoid appearance, however the possibility needed to be ruled out. Overnight dexamethasone suppression test which failed to suppress her cortisol suggesting excessive secretion, her serum cortisol was 784. Her 24hr urine cortisol was >1790nmol/d, ACTH 141pg/ml. Treatment plan: Metyrapone tds started. 1 week later a 5-point cortisol curve was done to assess treatment response, it showed serum cortisol of 1097, 889, 1073, 902 and 933. Metyrapone was increased to 1g tds a repeat 5-point cortisol curve showed serum cortisol of 575, 441,449,487 and 346. Patient readmitted with hypoglycaemia and progressive weakness, insulin stopped and is being assessed currently for possibility of concomitant neurological dysfunction in view of ongoing muscle weakness. She underwent muscle biopsy to exclude Lambert Eaton myasthenic syndrome as an additional paraneoplastic phenomenon in this case.

DOI: 10.1530/endoabs.91.CB51

CB52

Cyclical Cushing's disease – challenges in diagnosis and management

Natasha Sawhney & Prakash Abraham
Aberdeen Royal Infirmary, Aberdeen, United Kingdom

Background

The case is a 64 year old patient referred by the GP who noticed she looked 'cushingoid'. She gave an approximately 4 year history of a change in facial complexion, central weight gain, unsteadiness and poor wound healing. There was a history of depression, essential hypertension and previous back surgery. On examination she was plethoric, had pedal oedema, thin skin and central obesity (BMI 32).

Investigations

Initial overnight dexamethasone suppression test (DST) did not suppress cortisol (500nmol/l). Two 24 hour urine free cortisol (24UFC) tests were raised at 439 and 346nmol/24hours (55-284), confirming the diagnosis of Cushing's syndrome. Pituitary profile showed normal IGF-1, prolactin, post-menopausal gonadotrophins and hypothyroidism. Repeat low dose DST gave a similarly high cortisol level of 527nmol/l. High dose DST again failed to fully suppress, with cortisol 118nmol/land ACTH 34ng/l, suggesting either a pituitary or an ectopic source. Corticotrophin releasing hormone test was suggestive of pituitary rather than ectopic disease, with ACTH ranging 28 to 47ng/land cortisol ranging 365 to 698nmol/l. MRI pituitary gland suggested a possible 3mm pituitary adenoma. A plan was made for a methionine PET scan prior to surgery. One year following presentation however, 24UFC was normal at 236nmol/l, and symptoms had improved. A diagnosis of cyclical Cushing's disease was made. Following biochemical recurrence in 2021, the patient declined the option of either pituitary or adrenal surgery and has opted to 'watch and wait'. Her preference would be for block and replace with metyrapone if symptoms recur.

Summary

This case highlights the complexities in diagnosing Cushing's disease and is a reminder of the possibility of cyclical Cushing's, which further increases the difficulty in diagnosis and management. Daily, sequential assessment of urine or

Table 1. Monitoring of cortical excess.

| | 14/12/19 | 15/12/19 | 3/2/20 | 30/6/21 | 6/7/21 | 8/9/21 | 26/1/22 | 10/11/22 | 2/2/23 |
|--|----------|----------|--------|--|--------|--------|---------|----------|--------|
| 24hr urine free cortisol (55-248nmol/24 hours) | 439 | 346 | 236 | | 186 | 505 | | | 257 |
| | | | | Laboratory value changed to 0-164nmol/24 hours | | | | | |
| ACTH (7-56ng/l) | 127 | | 116 | 316 | | | 71 | 112 | |
| Urine free cortisol/ creatinine ratio nmol/mmol (0-39.9) | | | | | | 5.9 | 10.2 | 110.5 | |

salivary cortisol has been suggested to aid the diagnosis however this can be impractical for some patients. Locating the source of cortisol excess needs to be performed when the patient is symptomatic. Treatment options remain the same as for non-cyclical Cushing's disease once the source is located.

DOI: 10.1530/endoabs.91.CB52

CB53

Co-existence of an adrenal mass and Cushing's disease: a diagnostic challenge

Balqees Al Radhi¹, Yaasir Mamoojee² & Ahmed Al-Sharefi¹
¹South Tyne Side Hospital, Newcastle Upon Tyne, United Kingdom; ²The Royal Victoria Infirmary, Newcastle Upon Tyne, United Kingdom

Introduction

Adrenal tumors are commonly discovered incidentally on cross-sectional abdominal imaging. The incidence of adrenal tumors increased 10-fold in the past 2 decades, with most diagnosed in older adults. In any patient with a newly discovered adrenal mass, determining whether it is functioning adenoma or non-functioning and identifying whether it is ACTH dependent or not is crucial to avoid missing the real underlying pathology.

Clinical case

A 40 years old female was referred to Endocrinology team by surgeons after having assessment for incisional hernia around the umbilical area and was found to have an incidental right adrenal adenoma of 4 cm size. She has past medical history of polycystic ovaries and reported excessive hair growth, acne and weight gain { 133 Kg }. Her pre clinic screening investigations showed normal urinary cortisol and normal baseline ACTH but with significantly raised Androgens. Her Testosterone and DHEAS levels were reducing with dexamethasone suppression test but post Dexamethasone cortisol was 71 nmol/lconfirming cortisol excess. Subsequent clinical examination and further assessment confirmed the presence of Cushing's disease and currently she is awaiting pituitary surgery

Outcome

In presence of large adrenal mass, it is important not to miss a co-existence of pituitary dependent Cushion's disease. The utilisation of urine cortisol and ACTH as a screening for autonomous cortisol secretion in adrenal mass work up can be falsely reassuring and a high index of suspicion is needed especially in symptomatic patients

DOI: 10.1530/endoabs.91.CB53

CB54

Complexities in the diagnosing of Cushing's syndrome

Vindya Wellala, Rao Ranganatha, Dineesha Kumarathunga, Puja Thadani & Giovos Georgios
University Hospital Coventry and Warwickshire, Coventry, United Kingdom

Diagnosis of Cushing's syndrome is challenging in the absence of cardinal features. But still, they have the same metabolic risk due to the presence of biochemical hypercortisolism. A 35-year lady was referred to the tertiary care endocrine unit following an incidental finding of high cortisol levels while on treatment for covid in 2021. She also had some weight gain, slow healing of wounds, and easy bruising. She did not have any features of hyperandrogenism and hypertension, or diabetes. Her periods were regular. On examination, BMI was 21.4 kgm-3, and blood pressure 142/90 mmHg. There were no cushingoid facies, no dorso-cervical or supraclavicular fat deposition, no abdominal striae, no proximal muscle weakness, and no hirsutism or clitoromegaly. Investigations found to have Basal cortisol -1218nmol/l, ODST (overnight)-437 nmol/l, ODST(low dose , 48 hr)- 455 nmol/l, Mid night salivary cortisol-5.5nmol/L(<

3.2nmol/l), ACTH level <5ng/l. The Dexamethasone CRH test fail to suppress cortisol levels and ACTH < 5ng/l CT scan adrenal showed a 26 mm right adrenal lesion with washout characteristics consistent with an adenoma. Normal left adrenal. Pre-contrast washout was 33HU, 60s post-contrast washout 80 HU and 15 min post-contrast washout was 35HU. Absolute washout was 96 % consistent with adenoma. The patient has successful surgery led to the resolution of hypercortisolism and symptoms. This case highlights the challenges in the diagnosis of Cushing's in the absence of cardinal features. This problem occurs because there is an increasing global prevalence of obesity and diabetes, and the increasing use of exogenous glucocorticoids, leads to pseudo Cushings. And there is uncertainty about the best screening test for Cushing's and how to individualize the choice of tests to prevent false positives. There is difficulty in identifying pathologic hypercortisolism in certain conditions: when it is extremely mild or cyclic. These difficulties are mitigated in part by the availability of assays for synthetic glucocorticoids, an increased understanding of the caveats and confounding factors that can cause false-positive and false-negative tests, and an increased understanding of the physiologic underpinning of pseudo-Cushings.

Urine-free cortisol excretion for 24 hours.

| | |
|------------|-----------|
| 1st sample | 85(110) |
| 2nd sample | 229(110) |
| 3rd sample | 1063(110) |

| Time | cortisol(nmol/l) | ACTH(ng/l) |
|--------|------------------|------------|
| 0min | 418 | <5 |
| 15min | 440 | <5 |
| 30min | 402 | <5 |
| 45min | 371 | <5 |
| 60min | 355 | <5 |
| 90min | 353 | <5 |
| 120min | 344 | <5 |

DOI: 10.1530/endoabs.91.CB54

CB55

A complex case of Cushing's disease from an evasive source

Nosheen Sattar & Miguel Debono

Sheffield Teaching Hospitals, Sheffield, United Kingdom

Diagnosis of Cushing's disease can be a difficult and lengthy process with repeated and dynamic testing required to ensure the correct diagnosis is made prior to invasive intervention such as surgery. This case demonstrates that even with meticulous investigation the underlying cause of the disease can still be evasive. A 43-year-old female presented with a history of hypertension since age 20, managed with Amlodipine (10 mg) and Ramipril (10 mg). She was investigated for secondary causes and an overnight Dexamethasone Suppression Test (DST) revealed a raised cortisol of 168nmol/l which was supported by a 24-hour urinary free cortisol result of 398nmol/24hour (normal < 199nmol/24hour). A low dose DST found baseline cortisol 320nmol/l with ACTH 40ng/l with cortisol falling to 95nmol/l at 48 hours. The remainder of her pituitary function testing was normal. An MRI pituitary noted a 10x13mm enhancing lesion in keeping with a right sided pituitary macroadenoma. On review at the tertiary centre she presented with lethargy and decreased motivation and was noted to have facial plethora and fullness with central adiposity and thin skin. She was felt to have ACTH dependant Cushing's syndrome with a proven pituitary macroadenoma which was the probable source. Further confirmatory testing for Cushing's disease was carried out with a CRH test finding a tripling of ACTH at 30minutes (41ng/l- 122ng/l), and an almost doubling of cortisol at 45minutes (454nmol/l- 771nmol/l). A CT-CAP showed no other potential sources of ectopic ACTH. The patient was commenced on Metyrapone (250 mg BD) and VTE prophylaxis with low molecular weight heparin pending surgery. Following trans-sphenoidal surgery, histology found the adenoma to be a Gonadotrophinoma. Macroscopically no other lesions had been seen in the pituitary gland. Post-surgery the patient remained symptomatic, with a cortisol of 329nmol/l post overnight DST (ACTH 42ng/l). Inferior Petrosal Sinus Sampling (IPSS) with CRH stimulation revealed a baseline peripheral ACTH of 39ng/l (157ng/l at 15minutes), right sided IPSS ACTH at baseline 984ng/l (1650ng/l at 15minutes) and left sided IPSS ACTH at baseline 558ng/l rising at 5minutes to > 2000ng/l (greater than upper limit of detection thereafter). This indicates Cushing's disease possibly from a left sided pituitary adenoma. A repeat MRI pituitary has found 2 areas of reduced enhancement which could be residual or another adenoma. The patient remains on Metyrapone, and Apixaban for VTE prophylaxis and is awaiting a Methionine PET scan and genetic testing for MEN1.

DOI: 10.1530/endoabs.91.CB55

CB56

A journey through Cushing's Syndrome – "From Discovery till Recovery"

Sadia Zafar, Ridhi Bhagi & Sharmistha Roy Chowdhury
Princess of Wales Hospital, Bridgend, United Kingdom

Background

Cushing's syndrome (10-15/million people diagnosed/year) is quite rare with Cushing's disease accounting for >70% of cases in adults. Spinal epidural lipomatosis (SEL) secondary to endogenous Cushing's syndrome is even more rare condition (8 reported cases so far) of which 3 cases are secondary to Cushing's disease. Here, we highlight a case of ACTH-dependent Cushing disease with resultant spinal epidural lipomatosis (SEL) that was treated with complete hypophysectomy leading to post-operative cranial Diabetes Insipidus.

Case

A 36-years old gentleman, background of asthma and ETOH abuse presented with sudden onset palpitations. He appeared cushingoid with moon face, facial plethora, central adiposity and purple abdominal striae and was referred to Endocrinology.

Investigations

Unsuppressed cortisol: 466nmol/l post 1 mg overnight dexamethasone suppression test and 24hours urinary cortisol concentration was raised (928nmol/day). LDDST failed to suppress serum cortisol and confirmed Cushing's Syndrome (CS). Unsuppressed random ACTH level: 190ng/l indicated ACTH dependent CS. MRI pituitary, rest of pituitary profile and CT adrenal was normal. Inferior Petrosal Sinus Sampling (IPSS) revealed central source with left sided gradient.

Management

He was commenced on block and replace therapy initially: metyrapone 250 mg TDS and dexamethasone 0.25 mg BD. During investigation, he developed lower limb weakness worsening over 4-5 weeks with no bowel/bladder symptoms. Being wheel-chair bound, he had features of thoracic myelopathy with grade 3/5 power, hyper-reflexia and clonus bilaterally. Sensations were reduced below T10-T11 level with intact perianal sensation. MRI spine demonstrated diffuse excessive epidural fatty tissue posteriorly over his thoracic cord with spondylodiscitis at T11-T12. Generalised narrowing of thecal dimension, old superior end plate compression fracture at T11 and significant cord compression in thoracic spine was noted. Diagnosis was paraparesis secondary to Spinal Epidural Lipomatosis (SEL). Spinal MDT suggested treating conservatively with optimization of his Cushing disease, weight-bearing exercises and DLSSO brace. Trans-sphenoidal complete hypophysectomy was performed as curative procedure. Post operatively he developed polyuria (8litres/day) and was commenced on DDAVP (Desmopressin 50 mg BD-100 mg BD) along with Hydrocortisone 20 mg/10 mg and thyroxine 50 mg OD. Currently he has post-operative pan hypopituitarism with cranial diabetes insipidus.

Conclusion

Early diagnosis and management of Cushing syndrome is imperative to prevent long term metabolic complications leading to increased morbidity and mortality. Spinal epidural lipomatosis is a very rare complication of Cushing syndrome and early optimization of Cushing syndrome remains vital to reduce neurological sequelae in these rare cases.

DOI: 10.1530/endoabs.91.CB56

CB57

Can serum ACTH level be reliably interpreted in the diagnostic work-up for Cushing in adrenal incidentalomas?

Mudassir Ali, Jason Ramsingh & Yaasir Mamoojee

Royal Victoria Infirmary, Newcastle, United Kingdom

Background

Diagnostic work-up for Cushing Syndrome (CS) can be challenging and is based on clinical and biochemical assessments. Biochemical evidence of endogenous steroid excess is demonstrated through overnight dexamethasone suppression test (ODST), low dose dexamethasone suppression test and/or 24-hour urinary free cortisol estimation (UFC). Once endogenous steroid excess is confirmed, random serum ACTH measurement is key in determining the suspected source of steroid excess: ACTH-independent (adrenal cause) or ACTH-dependent Cushing (pituitary or ectopic ACTH secretion). We report a case of CS where the serum ACTH caused diagnostic confusion during work-up for an adrenal incidentaloma.

Case report

A 42-year-old female was referred with a 2.6 cm left adrenal adenoma, discovered on CTPA when she presented with bilateral massive pulmonary embolisms necessitating thrombolysis. She had a history of anxiety and was newly diagnosed with type 2 diabetes. Her BMI was 38 kg/cm² and she displayed Cushingoid features on clinical examination. Random serum ACTH levels ranged from 5 to

23 ng/l (NR <63). She failed her Overnight Dexamethasone Suppression Test and Low Dose Dexamethasone Suppression Test with a post-dexamethasone serum cortisol level of 69 nmol/l and 75 nmol/l respectively. Her 24-hr UFC was normal. She had a blunted ACTH (ranging from 6 to 11 ng/l) and cortisol (ranging from 234 to 399 nmol/l) response on peripheral desmopressin test (IV desmopressin 10 µg). Her pituitary MRI did not reveal any lesion and the right adrenal gland on her CT appeared normal. Given the diagnostic biochemical uncertainty on whether she has ACTH dependent or independent hypercortisolaemia, the patient agreed to a pragmatic suggestion to undergo unilateral left adrenalectomy in the first instance, with the caveat that hypercortisolaemia may persist post-operatively. On day 2 post-adrenalectomy she passed her Synacthen test with a peak serum cortisol of 522 nmol/l. Subsequent assessment of her steroid dynamics did not reveal any steroid excess and the histology of the resected adrenal gland demonstrated an adenoma with atrophy of zona fasciculata.

Conclusion

Variable serum ACTH levels can cause diagnostic confusion in some cases of CS, especially in cases of cyclical Cushing's. A robust clinical work-up, encompassing investigations for both pituitary and adrenal source of steroid excess, and a multi-disciplinary approach to interpretation of diagnostic tests and imaging is thus indicated in such cases.

DOI: 10.1530/endoabs.91.CB57

CB58

Hypercalcaemia in a young female patient

Jovanna Tsoutsouki, Matthew North, Daniel Tebbs, Goerge Tharakan, Preeshila Behary, Jeremy Cox & Alexander N Comminos
Imperial College Healthcare NHS Trust, London, United Kingdom

A 35 year old lady presented with a one week history of back pain, myalgia, fatigue, epigastric pain, and persistent vomiting. She reported a four week history of reduced appetite and 4 kg weight loss. She had recently recovered from an uncomplicated COVID-19 infection. Past medical history included a previous eating disorder (anorexia and bulimia), and subsequent chronic gastritis. Drug history included Omeprazole 20 mg daily, Laxido 2 sachets daily and antacids (Rennies 4-8 tablets daily for the last 15 years). Physical examination revealed generalised abdominal and mild bilateral flank tenderness and no peripheral lymphadenopathy. Significant investigation findings included an adjusted Calcium 4.19 mmol/l (previously normal) [ref. 2.2-2.6], K⁺ 2.9 mmol/l [ref. 3.5-5.3], Creatinine 535 µmol/l (baseline 80 µmol/l) [ref. 55-110]. The urine dip was negative for hCG, blood and nitrites. ECG on admission showed a shortened QTc and bradycardia. A renal tract ultrasound was unremarkable and a Chest X-Ray did not suggest a granulomatous or neoplastic disease. Further investigations revealed a suppressed PTH (1.1 pmol/l) [ref. 1.6-7.2], with normal 25(OH)D (86.8 nmol/l) [ref. 50-150] and metabolic alkalosis (pH 7.47 [ref. 7.35-7.45], Bicarbonate 45 mmol/l [ref. 22-29]). Serum electrophoresis and serum ACE were normal. There was a low suspicion for PTHrP driven-hypercalcaemia due to a malignancy given the short duration of symptoms and examination findings. The patient was successfully managed for acute hypercalcaemia and pre-renal acute kidney injury, with aggressive intravenous fluid resuscitation. The severe hypercalcaemia was attributed to Milk-Alkali syndrome secondary to excessive prolonged calcium carbonate use and the calcium carbonate (Rennie) tablets were stopped. Adjusted calcium (2.41 mmol/l) and creatinine (86 µmol/l) promptly normalized and remained so on follow up. This interesting case acts as a reminder of the non-specific presentation of hypercalcaemia, highlights the importance of a detailed enquiry about over-the-counter medications when taking a drug history, and demonstrates an infrequent cause of PTH-independent hypercalcaemia. Milk-Alkali syndrome should be considered as a potential cause of hypercalcaemia, when sinister differentials for non-PTH driven hypercalcaemia have been excluded, and in the presence of the triad of hypercalcaemia, metabolic alkalosis and acute kidney injury, associated with the ingestion of large amounts of calcium and absorbable alkali. In this case, it is possible that concurrent chronic laxative use contributed to the electrolyte disturbances and metabolic alkalosis, and along with the recent COVID-19 infection could have precipitated the onset of Milk-Alkali syndrome.

DOI: 10.1530/endoabs.91.CB58

CB59

An interesting case of severe symptomatic hypercalcaemia – primary hyperparathyroidism, tertiary hyperparathyroidism or PTH carcinoma until proven otherwise?

Christina Triantafyllou, Dooshyant Tulsi & Gul Bano
St George's Hospital, London, United Kingdom

A 79-year-old female was admitted with general decline, polydipsia, polyuria, decreased appetite and constipation. Her family reported mobility decline over past six months and confusion over past few days with weight loss. She had hypertension on Amlodipine and renal impairment was only detected when she recently moved to UK from Jamaica. An incidental finding of hypercalcaemia was found with an adjusted calcium of 3.03, PTH 79.8, vitamin D 33 and phosphate 0.41. The initial impression was tertiary hyperparathyroidism secondary to chronic kidney disease. This was managed with intravenous hydration and furosemide aiming for a urinary output of 100-150mls/hour. Her low eGFR of 17 was a contraindication for bisphosphonates treatment. Her Vitamin D was replaced & her calcium improved with hydration but rose up to 3.15 a week later with a marked increase in PTH level to 172. She was reviewed by Endocrine team, and patient had a 3 cm right sided neck mass felt on palpation. She had a high urine calcium: creatinine ratio of 0.71 with normal thyroid function tests, serum ACE and negative myeloma screening. A Neck USS showed a well-defined 2.9 cm right thyroid lobe U3 nodule and 2.4 cm left sided lesion likely to be parathyroid in origin while a SESTAMIBI scan suggested a left sided parathyroid adenoma and intense uptake in the right thyroid lobe. FNA performed revealed right thyroid oncocyctic neoplasm with microfollicles, Thy3f. The left nodule was consistent with parathyroid lesion. Her calcium increased again despite satisfactory hydration and furosemide. She was thus commenced on Prednisolone with PPI cover alongside intravenous hydration. Cinacalcet was subsequently started following SESTAMIBI with good response, with her Calcium level going down to 2.70 & staying within the normal range. She was discussed at the Endocrine MDT, total thyroidectomy with level 6 dissection on the left was planned with a suspicion of parathyroid cancer. Histology pending, to discuss results. Points for discussion: Parathyroid carcinoma despite being a rare endocrine malignancy and an uncommon cause of PTH-dependent hypercalcaemia needs to be considered in the setting of refractory hypercalcaemia and very high PTH levels. It is difficult to distinguish between atypical parathyroid adenomas and parathyroid carcinomas and surgery is indicated for tissue diagnosis. Treatment of hypercalcaemia and role of glucocorticoids; prednisolone is very effective acting within 2-4 days. Bisphosphonate use is limited in patients with renal impairment. Calcimimetics can be used if poor response to other treatments.

DOI: 10.1530/endoabs.91.CB59

CB60

Familial Hypocalcaemic Hypercalcaemia: the importance of taking detailed family history when assessing patients

Petra Hanson^{1,2} & Christopher Harold²
¹Warwick University, Coventry, United Kingdom; ²University Hospital Coventry, Coventry, United Kingdom

54 year south Asian woman was found to have mild hypercalcaemia of 2.64 mmol/l, vitamin D of 21 nmol/l and PTH of 4.9 pmol/l in 2013. She had a DEXA scan showing osteopenia of the fourth lumbar vertebrae. She did not have any symptoms suggestive of hypercalcaemia but reported generalised aches and pains. She had a past medical history of hysterectomy, right oophorectomy, dyspepsia and asthma. She was initially treated with vitamin D. Repeat calcium, vitamin D and PTH normalised and she was diagnosed with secondary hyperparathyroidism due to vitamin D deficiency and discharged. In 2017 she was referred back due to raised PTH and calcium, with normal vitamin D. She was diagnosed with primary hyperparathyroidism and had a neck ultrasound scan. As this did not find any adenoma, she underwent nuclear medicine scan, which also failed to localise adenoma. She had a 24-hour urinary calcium excretion which came back normal at 5.4 mmol. MRI neck indicated possible presence of parathyroid adenoma at the upper pole of the right thyroid gland. She continued to have non-specific aches and pains and was referred for right parathyroidectomy in 2017. In 2019 she underwent resection of right superior parathyroid adenoma. Unfortunately, she continued to have mildly elevated calcium post-operatively. Histology showed normal gland and she was referred for another surgical opinion. In March 2020 she had 4D CT which failed to locate any residual parathyroid adenoma. She underwent inferior thyroid vein exploration. This suggested a raise in PTH level towards the right lower part of the neck, however, repeat ultrasound

| Year | Adjusted calcium (mmol/l) | vitamin D (nmol/l) | PTH (pmol/l) |
|----------------|---------------------------|--------------------|--------------|
| 2013 | 2.64 | 21 | 4.9 |
| 2013 | 2.56 | 104 | 2.5 |
| 2016 | 2.7 | 38 | 4.6 |
| 2017 | 2.74 | 80 | 4.1 |
| 2018 | 2.65 | 59 | |
| 2019 (post-op) | 2.86 | | |
| 2019 | 2.68 | 41 | 4.5 |
| 2020 | 2.84 | 51 | 3.1 |
| 2021 | 2.68 | 77 | 2.4 |
| 2022 | 2.55 | 78 | |

scan failed to show adenoma. In 2020 it became apparent that she had a strong family history of hypercalcaemia and failed parathyroidectomies in her mother and brother, and unexplained hypercalcaemia in her son. She has a repeat 24-h urinary calcium excretion which came back normal at 2.6mmol/l. She also had a repeat bone density scan which showed worsening of osteopenia in lumbar spine. Eventually, she underwent calcium creatinine excretion ratio which was 0.0073, suggesting familial hypercalcaemic hypercalcaemia. She was referred for genetic testing and asked to undergo testing for MEN syndrome.

DOI: 10.1530/endoabs.91.CB60

CB61

Asymptomatic hypercalcaemia with Hip fracture- Primary Hyperparathyroidism

Aisha Irfan

East and North Hertfordshire NHS trust, Lister Hospital, Stevenage, United Kingdom

78 years old lady admitted with fall and right hip fracture under the orthopaedic team was referred to endocrinology with high calcium levels (2.84 mmol/l). Patient was mobile and independent, had a mechanical fall, no preceding symptoms. She had no symptoms of hypercalcaemia. She had background history of osteoarthritis and previous history of removal of skin cancer. She was taking calcium supplements, but they were stopped at the time of admission. She was an ex-smoker. Her mother had a hip fracture but there was no family history of hypercalcaemia. Her clinical examination didn't reveal any neck swelling, no breast lump, or any lymphadenopathy or organomegaly. Her hypercalcaemia work up showed PTH of 22.37 pmol/l, normal renal function, myeloma screen was normal, full blood count was normal, and CRP was raised post operatively. Initially she was treated with intravenous fluids, and she received bisphosphonates. Further work up showed normal chest X-ray and no evidence of malignancy on chest, abdomen, and pelvis CT scan. She was discharged from the hospital after her blood calcium levels were below 2.80 mmol/l (2.2-2.6mmol/l) and she started to mobilize. Further tests were done as an outpatient. DEXA scan showed BMD Lumbar spine, T Score: -3.6 BMD Total Hip, T Score: -3.5 BMD Femoral Neck, T Score: -3.7 Her calcium levels started to creep up, so she was started on cinacalcet in Outpatient clinic. Her Urine calcium creatinine clearance ratio was 0.0175, Vitamin D levels were 49.2 nmol/l. Urinary 24 calcium was 10.14 mmol/24h (2.5-7.5), TFES, ACE levels and anti-TTG were within normal range. Ultrasound neck showed a 11 x 6 x 15 mm isoechoic nodule with polar vascularity in right thyroid lobe inferiorly, likely a parathyroid lesion. SPECT CT scan of parathyroid showed 8x13x15 mm SPECT avid right nodule. She was discussed in parathyroid MDT and the outcome was to offer urgently right inferior targeted parathyroidectomy.

DOI: 10.1530/endoabs.91.CB61

CB62

Diagnosis and Management of Primary Hyperparathyroidism

Arlène Gatt & Sandro Vella

Mater Dei Hospital, Msida, Malta

A 57-year-old gentleman presented with severe hypercalcaemia (Corrected Calcium 3.48 mmol/l) associated with polyuria and polydipsia. He denied pruritus, nausea, vomiting, abdominal pain, constipation or other aches and pains. He denied syncope, seizures, haematuria or recent urinary tract infections. He had a past history of bilateral urolithiasis as well as right pyelonephritis and hydronephrosis requiring nephrostomy, Crohn's Disease and Diverticular Disease. Drug History included Mesalazine 1g 8-hourly, Azathioprine 150 mg daily, Omeprazole 20 mg daily, Vitamin B12 and Folic Acid. The above results are in-keeping with severe hypercalcaemia secondary to primary hyperparathyroidism (PHPT). A parathyroid adenoma could not be identified on ultrasound or 99mTc-sestamibi scan, however a possible right parathyroid adenoma was found on CT. Bone Density and Ultrasound Kidneys were normal. The patient was initially managed as an in-patient, in view of the severity of the hypercalcaemia. This included intravenous fluids and 4 mg Zoledronic acid IV, following dental review, as well as cardiac monitoring. However, the hypercalcaemia was refractory to the latter, and the patient was therefore started on Cinacalcet 30 mg 12-hourly and up-titrated to reduce the risk associated with severe hypercalcaemia pending parathyroidectomy. Two months after the acute presentation, the patient underwent an explorative parathyroidectomy with the right superior and inferior parathyroid glands excised. The former contained a parathyroid adenoma as identified on histology. PTH pre-incision was 92.5 pg/ml and 20 minutes post-

Examination was unremarkable with a normal neck exam.

| Test | Result | Reference Range |
|------------------------------------|---|----------------------|
| Corrected Calcium | 3.48 | 2.15-2.55 mmol/l |
| Phosphate | 0.86 | 0.87-1.45 mmol/l |
| Albumin | 37 | 32-52 g/l |
| Magnesium | 0.95 | 0.65-1.05 mmol/l |
| Alkaline Phosphatase | 82 | 40-129 U/l |
| Parathyroid Hormone (PTH) | 83 | 15-65 pg/ml |
| PTHrP | No pathologic concentration of PTHrP detectable | <1.5 pmol/l |
| Total 25(OH) Vitamin D | 38 | 30-100 ng/ml |
| 24Hr Urinary Calcium | 8.73 | 2.5-8 mmol/24hr |
| Calcium/Creatinine excretion ratio | 0.03 | In-keeping with PHPT |
| Thyroid Stimulating Hormone | 0.776 | 0.3-3 mIU/ml |
| Free Thyroxine | 15.85 | 11.9-20.3 pmol/l |
| Serum Protein Electrophoresis | No monoclonal band detected | |
| Coeliac screen (anti-Tissue TG Ab) | 1.8 | 0.9-9.0 IU/ml |
| Cortisol | 339 | 145.4-619.4 nmol/l |
| Angiotensin Converting Enzyme | 46 | 20-70 U/l |
| Sodium | 143 | 136-145 mmol/l |
| Potassium | 4.38 | 3.5-5.1 mmol/l |
| Urea | 7.3 | 1.7-8.3 mmol/l |
| Creatinine | 128 | 59-104 micromol/l |
| eGFR | 57 | mls/min/1.73m2 |

excision 19.7pg/ml with an 80% delta change. Following parathyroidectomy, both parathyroid hormone and serum corrected calcium normalised, and the patient remained asymptomatic. Cinacalcet had been stopped one week prior to the parathyroidectomy.

DOI: 10.1530/endoabs.91.CB62

CB63

A Young Woman with Symptomatic Primary Hyperparathyroidism and a Renal Stone

Shaile Khan, Fausto Palazzo, Sara Haboosh, Presheela Behary, Florian Wernig, Jeremy Cox & Alexander Comminos

Imperial College Healthcare NHS Trust, London, United Kingdom

A 27-year-old Caucasian woman was referred to the Endocrine Bone Clinic after investigations for general malaise revealed hypercalcaemia and elevated parathyroid hormone levels. She had no history of constipation, abdominal pain, bone pain, or other related symptoms. She had no history of renal stones or fractures and no change in weight. Her past medical history included asthma and she took a salbutamol inhaler as required. She had no family history of endocrine pathology. General examination was unremarkable. Her adjusted calcium level was 3.01mmol/l (RR2.2-2.6), phosphate level was 0.61mmol/l (RR0.8-1.5), parathyroid hormone level was elevated at 14 pmol/l (RR1.6-7.2) with low vitamin D levels 18.9nmol/l (RR70-150). She had normal renal function and normal thyroid function. 24 hour urinary collection was taken which excluded familial hypocalcaemic hypercalcaemia (24h urine calcium 8.49mmol/24h (RR2.5-7.5), urine calcium:creatinine ratio 0.03). She had a normal pituitary profile, normal gut hormone profile and genetics did not identify any familial cause (genes tested: CASR, CDC73, CDKN1A/1B/2B/2C, MEN1, RET). An initial Sestamibi scan did not localise any clear adenoma. A neck ultrasound revealed a 14mm lesion bulging out of the posterior aspect of the right thyroid lobe. Given the uncertainty as to the origin, an FNA was performed with non-diagnostic histology but a PTH level of 861 pmol/l. A renal ultrasound revealed bilateral unobstructing renal calculi, with the largest stone measuring 6.2mm. A bone densitometry scan showed normal bone density including at the distal radius. She was referred for parathyroid surgery and was advised to increase her fluid intake. Due to her work as a delivery driver, she found it difficult to adhere to this due to lack of toilet facilities. Her malaise continued with development of nausea and constipation. Therefore, cinacalcet was introduced while awaiting surgery, with symptomatic relief. At parathyroidectomy, an abnormal right superior parathyroid was excised with subsequent normalisation of calcium and parathyroid hormone levels and symptomatic resolution. The histology revealed hypercellular parathyroid tissue and so she continues under follow-up. She remains normocalcaemic and her previous renal stones are no longer present on imaging.

DOI: 10.1530/endoabs.91.CB63

CB64

An atypical case of hyperparathyroidism

Ahmad Eyadeh^{1,2} & Khyatisha Seejore¹

¹Department of Endocrinology, Leeds Centre for Diabetes and Endocrinology, St James's University Hospital, Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom; ²Endocrinology Division, Internal Medicine Department, Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan

A 70-year-old female patient was referred to the Endocrine clinic after incidental finding of significant hypercalcaemia (3.19 mmol/l, NR: 2.20-2.60 mmol/l) during work-up for cognitive decline. She had a known background of T2DM, hyperlipidaemia, osteoarthritis with a previous right total hip replacement and a laparoscopic cholecystectomy. She was first reviewed in clinic in June 2022 and was almost asymptomatic, except for memory issues. She denied previous history of renal calculi and had no fragility fractures in the past. There was no family history of hypercalcaemia or endocrinopathy. On clinical examination, she had a normal blood pressure. There were no palpable neck masses. Screening into end organ complications of hypercalcaemia revealed no nephrolithiasis and the bone density scan (DEXA) showed normal bone density. Calcium-creatinine clearance ratio was 0.02, thereby excluding familial hypocalcaemic hypercalcaemia and confirming primary hyperparathyroidism. Parathyroid localisation studies demonstrated a solitary 2.3 cm right superior parathyroid lesion on SPECT-CT. She suffered a rapid decline in cognitive function and was urgently referred for surgical management in view of rising hypercalcaemia. There was an increased risk of hungry bone syndrome in view of significant hypercalcaemia and PTH levels. She was started on vitamin D replacement and cinacalcet titrated to 90 mg twice daily with no significant improvement in her calcium levels which remained persistently above 3.0 mmol/l. She underwent parathyroidectomy in December 2022 with no immediate complications. The histology showed atypical features, including a prominent trabecular growth pattern and fibrous band formation, suggestive of an atypical parathyroid adenoma (APA). She is currently stable with normal calcium levels and will be closely monitored biochemically and radiologically in view of the uncertain malignant potential of APA. Of note, no specific guidelines for the surveillance of patients with APA after parathyroid surgery exist so far.

Baseline investigations:

| | | Reference Range |
|----------------------------|------------------------------|-----------------|
| Adjusted calcium | 3.31 mmol/l | 2.20 - 2.60 |
| Phosphate | 0.72 mmol/l | 0.80 - 1.50 |
| Parathyroid hormone (PTH) | 43.1 pmol/l | 1.5 - 7.6 |
| Alkaline phosphatase (ALP) | 114 iu/l | 30 - 130 |
| Vitamin D | 32 nmol/l | 50 - 100 |
| eGFR | 58 ml/min/1.73m ² | |
| 24-hour urine calcium | 5.94 mmol/24h | 2.50 - 7.50 |
| | Volume = 1.09L | |

DOI: 10.1530/endoabs.91.CB64

CB65

The familial hypocalcaemic hypercalcaemic mask

Stefano Busti

Royal Lancaster Infirmary, Lancaster, United Kingdom

Background

Primary hyperparathyroidism is a relatively common endocrine disorder. Familial hypocalcaemic hypercalcaemia is an important differential diagnosis but is much less prevalent. We examine a case of hypercalcaemia where there was some initial diagnostic uncertainty.

Case report

A 55-year-old lady was referred from primary care with mild hypercalcaemia, low mood, constipation and urinary frequency. She had a previous history of renal stones at the age of 38, a previous clavicular fracture and no history of renal disease. Her mother has a history of osteoporosis but there is no other family history of calcium-related disorders. She was not on any diuretics or any calcium supplements. Initial blood tests from primary care showed an adjusted calcium of 2.64 with a PTH of 14 and a Vitamin D level of 60.5. An initial calcium creatinine clearance ratio in secondary care came back at 0.0049, a result more consistent with familial hypocalcaemic hypercalcaemia than primary hyperparathyroidism. A renal tract ultrasound as well as a DEXA scan showed no abnormalities. A repeat calcium creatinine clearance ratio came back as inconclusive (< 0.014), with a repeat adjusted calcium of 2.69, a PTH of 11.9 and a Vitamin D level of 51. The clinical suspicion of primary hyperparathyroidism remained, so an ultrasound of the parathyroid gland and a SestaMIBI SPECT scan were requested. These both showed evidence of a left-sided inferior parathyroid adenoma. A third calcium creatinine clearance ratio was positive at 0.021 and primary hyperparathyroidism was finally diagnosed.

DOI: 10.1530/endoabs.91.CB65

CB66

Primary hyperparathyroidism vs Familial hypocalcaemic hypercalcaemia

Lisa Chin-Harty

Hereford County Hospital, Hereford, United Kingdom

A 61-year-old male was referred for hypercalcaemia. He was experiencing generalized fatigue and underwent several investigations which included serum calcium. He had recently been treated for two episodes of chest infections. At that time, he was also experiencing weight loss and night sweats. His symptoms have since resolved. He had no symptoms of hypercalcaemia- polyuria, polydipsia, abdominal pain, constipation, bone pain, or headaches. He was not taking calcium supplements. He had no chronic illnesses. There was no family history of hypercalcaemia or hyperparathyroidism. Physical examination was normal except for an elevated BMI of 33.6. His initial investigations showed mild hypercalcaemia, hypophosphatemia, and elevated PTH (see table). Urine BJP and serum ACE levels were normal. There were no previous calcium levels prior to his initial presentation to suggest longstanding hypercalcaemia. His bone density scan was normal. Imaging did not show any renal calculi. His calcium: creatinine clearance ratio (CCCR) was 0.0083 which suggested familial hypocalcaemic hypercalcaemia. Genetic testing for FHH was negative. At subsequent review, repeat studies show a CCCR of 0.0129 with corresponding serum calcium of 2.83 mmol/l, phosphate 0.68 mmol/l(0.8-1.43), and PTH of 96.3 ng/l. While familial hypocalcaemic hypercalcaemia is a rare entity, it is important to differentiate it from primary hyperparathyroidism to prevent unnecessary surgery. There are several clinical features that can be used to discern between the two pathologies, but urinary calcium excretion is primarily used to determine the likely diagnosis and further investigation. However, what are the sensitivity and specificity of this test? Additionally, is there a parathyroid hormone level that makes primary hyperparathyroidism more likely in spite of the calcium creatinine clearance ratio?

| | 15/03/2022 | 22/08/2022 | 27/02/2023 |
|------------------------------------|------------|------------|------------|
| Calcium (2.15-2.55 mmol/l) | 2.83 | 2.72 | 2.75 |
| Phosphate (0.8-1.43 mmol/l) | 0.68 | 0.74 | 0.77 |
| Albumin (g/l) | 43 | 45 | 44 |
| Parathyroid hormone (15-65 ng/l) | 96.3 | 114.9 | 107.4 |
| 25-OH Vitamin D (nmol/l) | 74 | 101 | 70 |
| eGFR (ml/min/1.73m ²) | 80 | 82 | 86 |
| Serum Creatinine (67-115 umol/l) | 84 | 83 | 79 |
| 24-hour urine: | | | |
| Volume (ml) | 2008 | 2440 | |
| Calcium concentration (mmol/l) | 3.4 | 1.7 | |
| Calcium excretion (9-17 mmol/24hr) | 6.8 | 4.1 | |
| Creatinine concentration (mmol/l) | 7.8 | 6.2 | |
| Creatinine excretion (mmol/24h) | 15.7 | 15.1 | |
| CCCR | 0.0129 | 0.0083 | |

DOI: 10.1530/endoabs.91.CB66

CB67

Recurrent primary hyperparathyroidism

Farouq Ahmed

Mid Yorkshire Hospital Trust, Wakefield, United Kingdom

Introduction

- Primary hyperparathyroidism is a relatively common disorder affecting 1 in 500 women and 1 in 2000 men aged over 40 years.

- Diagnosis of primary hyperparathyroidism is confirmed biochemically with synchronous elevation of serum calcium and inappropriate elevation of parathyroid hormone.

- Parathyroid adenomas are the most common aetiology. Around 80% are a single, benign adenoma, which in most cases is sporadic. Multiple adenomas and hypertrophy of all 4 glands are less common.

Case presentation

A 78-year-old male with previous history of Primary hyperparathyroidism in 2018, Basal cell carcinoma, CKD 3 and IHD. He was diagnosed with primary hyperparathyroidism in 2018 after he had had high calcium during routine blood. Renal USS did not show no renal stones. Bone Mineral density revealed osteopenia. Parathyroid US, difficult to identify any parathyroid adenoma. Sestamibi scan: demonstrates intensely sestamibi avid prolapsed right superior parathyroid

In 2018

| | Level | Reference |
|------------------|-------------|------------------|
| Adjusted calcium | 2.94 mmol/l | 2.2-2.6 mmol/l |
| Phosphate | 0.43 mmol/l | 0.80-1.50 mmol/l |
| PTH | 16.3 pmol/l | 1.6-6.9 mmol/l |
| eGFR | 45 ml/min | |

During admission:

| | Level | Reference |
|------------------|-------------|------------------|
| Adjusted calcium | 3.02 mmol/l | 2.2-2.6 mmol/l |
| Phosphate | 0.74 mmol/l | 0.80-1.50 mmol/l |
| PTH | 17.3 pmol/l | 1.6-6.9 mmol/l |
| eGFR | 42 ml/min | |

adenoma 2.3 cm inferior to the lower border of the cricoid cartilage. There is a further low grade sestamibi avid 2.9 cm prolapsed left superior adenoma 2.1 cm inferior to the lower border of the cricoid cartilage. For that he underwent parathyroidectomy and the two adenomas had been removed and confirmed to be parathyroid adenomas. After the surgery he had normal calcium Level till Jul 2022 when he was admitted to the hospital.

He was not on any medications that can cause hypercalcaemia. MM screening was negative. Vitamin D Level was normal. During the hospital admission he was managed with hydration, bisphosphonate and Cinacalcet. Given that he has hypercalcaemia after normal level calcium more than 6 months after the surgery, the impression was recurrent primary hyperthyroidism. Further plan included parathyroid Ultrasound, Sestamibi scan, 24 hours urinary calcium excretion and discussion regarding possible parathyroidectomy. Unfortunately, the patient died before completion of the investigation with un-related issue.

Discussion and Learning point

Recurrent primary hyperparathyroidism is defined as a recurrence of hypercalcaemia after a normocalcaemic interval of greater than 6 months post-parathyroidectomy. It is more common in patients with double parathyroid adenomas compared with those with a single adenoma or hyperplasia.

DOI: 10.1530/endoabs.91.CB67

CB68

A pt bed bound diabetic patient presents with unexplained drowsiness

Moe Kyaw & Amit Banerjee

St Helens and Knowsley NHS Trust, Prescott, United Kingdom

A 71 year lady, who has past history of acute ischaemic stroke (now bed bound and can only get out of bed with the help of a hoist), Type 2 diabetes melitus, HTN, CKD and high lipid. She is on Metformin 1 gm twice daily, Ramipril 5 mg at night, Clopidogrel 75 mg od, Atorvastatin 80 mg od. She was brought to hospital by unexplained drowsiness and poor oral intake. Her blood sugar was 72, ketone 5.2, Ph: 7.21, Na: 165, Urea 14 and calculated osmolality of 412. Her chest xray and ct head were unremarkable. Mildly high inflammatory markers. She was showing features of both Diabetic ketoacidosis (DKA) and Hyperglycaemic Hyperosmolar state (HHS). She was initially managed with DKA protocol (fixed rate insulin) with 10 units of Tresiba (basal insulin) cover. Her DKA resolved in 4 hours into the treatment but her Blood sugar remained 37 with an osmolality of 360. Then DKA protocol stopped and she was started on HHS pathway (insulin infusion rate halved) and fluid replacement. Her HHS resolved in 24 hrs time. Her fixed rate of insulin infusion was switched to variable rate and observed for 24 hrs more (she remained on Tresiba 10 units). When her oral intake got better, Her Tresiba and Variable rate stopped and she was started on Novomix-30 bd. She

was observed in hospital for 24 hr more and then got discharged back to home. Community nurse referral sent for administration of insulin. It is important to remember that when feature of of DKA and HHS presents together, then to treat DKA first.

DOI: 10.1530/endoabs.91.CB68

CB69

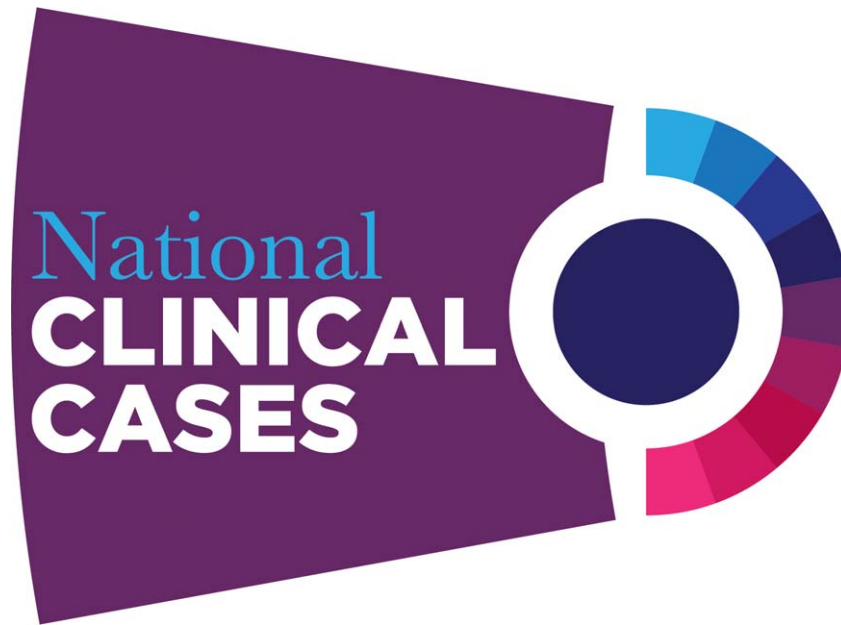
'Changing faces'- A new diagnosis of acromegaly presenting with euglycaemic DKA

Nadia Osman, Henna Patel & Kirun Gunganah

Barts Health NHS Trust, London, United Kingdom

A 43-year-old Bangladeshi lady was seen in the endocrinology clinic after recent admission to hospital with vomiting and headaches. Her past medical history included Type 2 diabetes, hypertension, ischaemic heart disease and goitre. During admission, a diagnosis of euglycaemic diabetic ketoacidosis (DKA) was made (pH 7.31, bicarbonate 18.3, glucose 7.8 and ketones 6.1) secondary to SGLT-2 inhibitor. This was managed with a fixed rate insulin infusion, intravenous fluid hydration and cessation of SGLT-2 inhibitor. Brain imaging was arranged for further assessment of her persistent headaches and vomiting. An incidental left sided pituitary macroadenoma, measuring 17 x 11 x 8 mm, with grade II cavernous involvement, was confirmed on MRI imaging. On resolution of DKA, the patient was discharged home on a basal bolus insulin regime. In clinic, review of the history revealed a 5-year history of worsening intermittent headaches associated with visual blurring, increasing nose, jaw and hand size, splayed teeth and two-year history neck swelling with hoarse voice. On systems enquiry, there was a one-year history of oligomenorrhoea, significant hair loss and polyarthralgia with no change in bowel habit. On examination, features of acromegaly were noted including coarse features, spade-like hands, splayed teeth and macroglossia. She was hypertensive with a BP of 150/98 mmHg. Cardiovascular, respiratory, and abdominal examinations were unremarkable. Visual fields were intact to red pin with no focal neurology. Further investigations showed: HbA1c 70mmol/mol, C-peptide 574, Triple Ab negative, elevated IGF-1 411 mg/l(65.6 -249.2), Free T4 13.8 pmol/l, TSH 1.05mU/l, ACTH 4ng/l, Cortisol 348nmol/l, prolactin 125mU/l, oestradiol < 19 pmol/l, LH 42unit/l, FSH 68unit/land Testosterone <0.5nmol/l. A new diagnosis of acromegaly was made after she failed to suppress her GH levels on an oral glucose tolerance test and she has been referred to tertiary endocrinology services. DKA as the presenting feature of acromegaly is a rare occurrence but nonetheless an important diagnosis to not overlook as can be life-threatening if left untreated. Proposed mechanisms for the development of DKA in patients with acromegaly include increased insulin resistance, inhibition of fatty acid metabolism and increasing lipolysis leading to ketosis, due to GH and IGF-1 excess. Glucagon has also been considered as a possible contributing factor to DKA development and may be increased in acromegaly. Excessive glucagon reduces hepatic fructose 2,6 biphosphate, a metabolite that inhibits gluconeogenesis in the liver and induces hepatic ketogenesis.

DOI: 10.1530/endoabs.91.CB69



Society for Endocrinology National Clinical Cases 2023



Endocrine Abstracts

Volume 91
April 2023

Society for Endocrinology National Clinical Update 2023

Friday 24 March 2023, Royal Society of Medicine
London, United Kingdom

Programme Chair:

Dr Miles Levy (*Leicester*)
Dr Helen Turner (*Oxford*)

Abstract Markers:

Dr Karin Bradley (*Bristol*)
Dr Antonia Brooke (*Exeter*)
Professor William Drake (*London*)
Dr Simon Howell (*Preston*)
Dr Abdulfattah Lakhdar (*London*)
Professor Karim Meeran (*London*)
Dr Daniel Morganstein (*London*)
Professor Michael O'Reilly (*Dublin*)
Dr Julia Ostberg (*Watford*)
Professor Aled Rees (*Cardiff*)
Professor Peter Taylor (*Cardiff*)
Dr Nicola Zammit (*Edinburgh*)

CONTENTS

| | |
|--------------------------------|----------|
| Oral Communications | OC1–OC10 |
| Poster Presentations | P1–P48 |

Oral Communications

OC1**'Pseudo-failure' of adrenal vein sampling due to cortisol co-secretion by KCNJ5-mutant adenoma, and prediction of complete clinical success by urine hybrid steroid assay**

Kate Laycock^{1,2}, Xilin Wu^{1,2}, Emily Goodchild^{1,2}, Matthew Matson¹, Alessandro Prete², Angela Taylor³, Wiebke Arlt³, Alasdair McIntosh⁴, Alexander McConnachie⁴, Heek Cheow⁵, William Drake^{1,2} & Morris Brown²

¹Barts Health, London, United Kingdom. ²Queen Mary University of London, London, United Kingdom. ³University of Birmingham, Birmingham, United Kingdom. ⁴University of Glasgow, Glasgow, United Kingdom. ⁵Cambridge University Hospitals, Cambridge, United Kingdom

Case history

A previously well 45-year-old lady presented with a 3-year history of hypertension initially diagnosed at a routine health check. Her blood pressure (BP) was 170-180/90-100 mmHg.

Investigations

Showed hypokalaemia (K⁺ = 3 mmol/l; NR 3.5-5.3 mmol/l), raised aldosterone (976pmol/l; NR 100-500pmol/l) and suppressed renin activity (<0.2nmol/l/h), meeting criteria for diagnosing primary aldosteronism (PA). CT adrenals showed a 2.5 cm left adrenal nodule. Her cortisol was unsuppressed (171nmol/l) following dexamethasone 1 mg overnight. ACTH was 8ng/l (NR 0-46ng/l). She was referred to our centre following unsuccessful cannulation of her right adrenal vein on adrenal vein sampling (AVS) locally. She was enrolled into the MATCH trial, designed to compare the accuracy of [11C]metomidate positron emission tomography computed tomography (MTO) scanning, with AVS in predicting outcomes of PA after surgery(1). MTO demonstrated a left SUVmax ratio of 1.52 indicating a high probability of unilateral left-sided disease. The ACTH-stimulated AVS found the left adrenal vein was cannulated but the selectivity index on the right was 2.6 (threshold >3). Retrospective inspection of the venogram found likely cannulation of both adrenal veins. Her urinary hybrid steroid 18-hydroxycortisol to cortisol ratio was 6.5.

Results and treatment

A left laparoscopic adrenalectomy was performed. Post-operatively she was prescribed hydrocortisone and persistent biochemical abnormality led to a year's treatment with hydrocortisone. Her BP fell to 110/72 mmHg on no treatment and there was correction of electrolytes, aldosterone (226pmol/l) and renin (3.3nmol/l/h). Histology confirmed an aldosterone producing adenoma (APA) and Sanger sequencing of cDNA from tumour and adjacent adrenal found a somatic KCNJ5 mutation, p.Gly151Arg.

Conclusions

Both AVS studies concluded that the right adrenal vein was not cannulated. Her KCNJ5-mutant APA was co-secreting cortisol, as is often the case. It is likely that there was suppression of cortisol secretion from the right gland which led to a reduced cortisol ratio between the right adrenal vein and inferior vena cava. MTO scanning permitted the diagnosis of unilateral PA in this patient. MATCH considered predictors of complete vs partial or absent clinical success following adrenalectomy. In multivariate analysis on genotype, age, sex and ancestry, KCNJ5-genotype was the major independent variable. Furthermore, urine multi-steroid profiling identified higher 18-hydroxycortisol levels in patients with KCNJ5-mutant adenomas, with almost no overlap between them and other patients. Our patient illustrates how adoption of urinary steroid profiles into preoperative workup can select the minority of PA patients most likely to enjoy complete clinical success.

1. Wu X.2023. DOI:10.1038/s41591-022-02114-5

DOI: 10.1530/endoabs.91.OC1

OC2**Granulomatous hypophysitis associated with Inflammatory Bowel Disease**

Muna Guma, Yaasir Mamoojee, Suann Tee, Andy James, Clare Nicholson & Chris Lamb

Royal Victoria Infirmary, Newcastle upon Tyne, United Kingdom

Background

Pituitary abscesses are rare and carry a high mortality risk. Recurrence of such abscesses is even rarer, with only 9 cases previously reported in the literature to our knowledge. We describe a case of a recurrent pituitary abscess, felt to be associated with inflammatory bowel disease. Case history, investigations, results and treatment A 27-year-old female presented with a right 6th nerve palsy

associated with a 3-month history of headache post-partum. Further investigations revealed panhypopituitarism and a peripherally-enhancing cystic sellar mass, impinging on the optic chiasm. Initiation of steroid therapy unmasked diabetes insipidus, but her headache improved. Her WCC was expected, but her CRP elevated at 114 mg/L. She underwent an endoscopic pituitary biopsy, and frank pus was drained from the fossa. Gram staining was negative, but cultures later grew *Streptococcus pneumoniae* and *Staphylococcus epidermidis*. She received empirical antimicrobial therapy. She recovered her pituitary hormones post-operatively, apart from her gonadal axis. A granulomatous inflammatory response and chronic lymphatic infiltrate were noted in Rathke's cleft cyst on histology. Three years later, she developed a recurrence of her pituitary abscess associated with panhypopituitarism and diabetes insipidus. Pus was again drained, but microbiology cultures were negative. Soon after, she was diagnosed with Inflammatory Bowel Disease (IBD) when investigated for diarrhoea and mouth ulcers. She was treated with budesonide but suffered a flare-up of her IBD. She was then initiated on adalimumab, a monoclonal antibody used as a disease-modifying antirheumatic drug. Close biochemical and radiological surveillance of her pituitary remained satisfactory. 20 months later, she reported a minor headache. MRI of the pituitary fossa revealed a recurrence of her pituitary abscess but smaller than her previous episodes. Her pituitary functions were normal except for her known central hypogonadism. Her serum adalimumab level was undetectable and her anti-adalimumab antibody level elevated at >160 ng/mL (reference range <10). Given that her vision was not compromised by her recurrent pituitary abscess, she was started on high dose steroid therapy. Repeat imaging 3 weeks later demonstrated a significant reduction in the size of the pituitary mass. She is now established on azathioprine and infliximab as second-line immunosuppressive therapy and has stopped steroid therapy. Her surveillance imaging remains stable.

Discussion

Granulomatous hypophysitis associated with IBD is exceedingly rare. We demonstrate the role of immunomodulation in the acute management of recurrent pituitary abscess, felt to be associated with IBD with a high degree of certainty. DOI: 10.1530/endoabs.91.OC2

OC3**"It runs in the family" – A kindred of exercise induced hypoglycaemia**

David Tansey & Donal O'Shea

St. Vincent's University Hospital, Dublin, Ireland

Section 1: Case history

Persistent hyperinsulinemic hypoglycaemia may be caused by either a solitary tumour of the pancreas secreting excessive insulin, i.e. an insulinoma or, rarely by nesidioblastosis. A 70-year-old man was referred with symptoms of hypoglycaemia. He had a positive 72-hour-fast with episodes of hypoglycaemia and high insulin levels.

Section 2: Investigations

EUS showed a small 3 x 4mm hyperechoic lesion in the body of the pancreas. His Octreotide scan and calcium stimulation test failed to locate any other discreet lesions. He was started on trial of Diazoxide and somatostatin analogue but didn't tolerate them due to GI side effects. Routine genetic screening for causes of congenital hyperinsulinism did not identify a pathogenic variant.

Section 3: Results and treatment

Following NET MDT, he had a laparotomy and underwent a distal pancreatectomy for the treatment of suspected insulinoma. The histopathology showed a 3mm well differentiated NET grade 1, consistent with an Insulinoma. Mitotic activity was 1 per 20 HPF and the Ki67 was <2%. The remaining pancreas showed focal prominent islets and ductuloinsular complexes. On screening, 3 other family members had positive 72-hour-fasts. They all had octreotide scans, MRI Pancreas and 68Ga-DOTA-exendin-4 PET/CT localisation scans, that reported no insulinoma. Following NET MDT, they all had either distal or subtotal pancreatectomies. Their symptoms have now improved but not fully resolved. The histopathology on these patients revealed 3 of 4 major criteria and 1 of 4 minor criteria for a histopathological diagnosis of diffuse adult nesidioblastosis.

Section 4: Conclusions and points for discussion

We describe a unique case series of a family who presented with symptoms of hyperinsulinemic hypoglycemia. Insulin mediated hypoglycemia can be difficult to characterise and the source difficult to localise. However, when no discrete abnormality is found, other diagnoses should be considered. In our family, an insulinoma was found in only one of the patients while findings consistent with nesidioblastosis, were found in the others. Whole genome sequencing is ongoing on affected family members.

DOI: 10.1530/endoabs.91.OC3

OC4**A rare case of hypergonadotrophic hypergonadism due to mild androgen insensitivity syndrome (MAIS)**

Adhithya Sankar & Mohit Kumar

Royal Albert Edward Infirmary, Manchester, United Kingdom

A 29-year-old man presented with an 18-month history of reduced libido and lethargy. His symptoms started after cessation of anabolic steroids for three years. His childhood and development history were unremarkable with normal onset of puberty and development of secondary sexual characteristics. He had no past medical or family history of note. Clinical examination demonstrated normal BMI, musculature, distribution of body hair, testicular volume, and genital size. Biochemical investigations revealed elevated fasted early morning testosterone 42.9 nmol/l (8.4-28.7), elevated LH 11.7 U/L (2.0-9.0), FSH 2.7 U/L (1.0-18.0), DHT 4.20 nmol/l, DHEA 6.7 µmol/L, SHBG 53 nmol/l, androstenedione 4.3 nmol/l, albumin 47 g/L, IGF-1/TFTs/prolactin all normal. Elevated testosterone was re-tested at a different centre to rule out assay interference and measured separately with mass spectrometry (36.4 nmol/l and 35.4 nmol/l, respectively). Similarly, LH remained elevated on re-testing, confirming hypergonadotrophic hypergonadism. An MRI pituitary and CT thorax, abdomen and pelvis were both normal, excluding pituitary and neuroendocrine tumours. Subsequently, he was referred to genetic services for investigation. Genetic sequencing identified a hemizygous pathogenic missense variant c.2270A>G p.(Asn757Ser) in the androgen receptor (AR) gene. Combining the genetics with the clinical phenotype, a diagnosis of mild androgen insensitivity syndrome (MAIS) was reached. The patient was educated on the potential impact of MAIS on fertility and referred to the fertility services. Genetic counselling and testing were offered to his female relations and the patient was subsequently commenced on a trial of testosterone therapy for symptom relief. Androgen insensitivity syndrome (AIS) is a rare x-linked recessive condition, resulting from AR gene mutations, with a prevalence of 2-5 cases per 100,000. Over 1000 unique AR gene mutations have been identified, which result in a spectrum of phenotypes, including complete, partial, or mild androgen insensitivity syndrome. In this case, symptoms initially suspicious for hypogonadism were unmasked following cessation of hormone self-medication. The normal male clinical phenotype, with elevated gonadotrophins and testosterone, prompted initial investigation for a neuroendocrine tumour. Subsequently, genetic testing identified an AR gene mutation, clinching the diagnosis of MAIS. The prevalence of MAIS remains unclear; however, its subtle clinical and biochemical features may cause under-reporting. MAIS should be considered in patients presenting with a normal male phenotype, elevated gonadotrophins and normal/high testosterone and may present with infertility as the sole symptom. The role of testosterone replacement in MAIS remains a subject of debate.

DOI: 10.1530/endoabs.91.OC4

OC5**The success story of Osilodrostat for optimisation of severe Cushing's Disease**Yuvanaa Subramaniam¹, Neil Dorward², William M Drake¹ & Antonia M Brooke³

¹Department of Endocrinology, St Bartholomew's Hospital, London, United Kingdom. ²Department of Neurosurgery, National Hospital for Neurology and Neurosurgery, Queen Square, London, United Kingdom. ³Department of Endocrinology, Royal Devon University Healthcare Foundation Trust, Exeter, United Kingdom

A 51-year-old gentleman presented in June 2022 with pneumobilia, staph liver abscesses and rapidly conducted atrial fibrillation requiring ITU admission. He had a 2-year history of typical Cushingoid features and hypogonadism, 4 agent hypertension since 2012, fragility fractures, previous renal calculi, pulmonary emboli and diabetes. He had not been able to walk unaided for a year (was mobilising with crutches on admission). In retrospect, he had previously had a cortisol of 726nmol/l at 1pm in 2017. His past medical history included type A thoracic aortic aneurysm dissection, open repair (and cardiac arrest) in 2016. His admission was complicated by pneumonia, Covid and Influenza and he became bed-bound. He was noted to be hypokalaemic with a cortisol >1750nmol/l, ACTH of 78ng/L. His cortisol levels post-8mg dexamethasone suppression test was 1590nmol/l. MR pituitary showed a 9mm hyper-enhancing lesion in the anterior pituitary which on retrospect had been visible on previous CT imaging in 2011. CT adrenals showed diffusely enlarged adrenal glands. He was unable to tolerate sufficient metyrapone and ketoconazole to achieve biochemical control of his Cushing's syndrome and so he was commenced on intravenous etomidate and

transferred to St Bartholomew's Hospital (Nov 22). In order to facilitate outpatient medical preparation for pituitary surgery, compassionate use of Osilodrostat was obtained, titrating from a starting dose of 2mg bd to 30mg twice a day over several weeks whilst continuing with maximally tolerated ketoconazole. Osilodrostat was well tolerated. He walked out of hospital for respite over Christmas, with good control of his cortisol, returning in January 23 for pre-transphenoidal surgery. His post-operative Day 1 cortisol was 12nmol/l. Osilodrostat, a novel steroidogenic inhibitor targeting the 11β-hydroxylase, is now approved for the treatment of Cushing's disease (CD) in the United States and Cushing syndrome in Europe. Although the mainstay of treatment for CD is surgery, medical therapy is often required, to control hypercortisolism to minimise pre, peri and post-operative complications. Osilodrostat works similarly to metyrapone and a study comparing metyrapone and Osilodrostat showed that Osilodrostat works faster in achieving target cortisol levels and controlling blood pressure. The long-term outcomes of Osilodrostat in CD showed good tolerability with a small proportion of adverse effects. Hence, Osilodrostat proves to be a good alternative to metyrapone in optimising Cushing's when cortisol levels need to be reduced rapidly and for patients intolerant to metyrapone although more head-to-head clinical trials are needed to analyse this in a larger cohort.

DOI: 10.1530/endoabs.91.OC5

OC6**A miraculous case of muscle weakness and bone pain: the jaw-dropping factor.**Mariana Abdel-Malek, Majid Alameri, Kunwar Bhatia, Sairah Khan, Suchana Mukhopadhyay, Josiah Eyeson, Fiona McDonnell, Preeshilla Behary, Jeremy Cox & Alexander Connors
Imperial College Healthcare NHS Trust, London, United Kingdom**Case History**

A 47 year-old female was referred to the Endocrine Bone Unit with worsening back, rib and leg pain associated with significantly reduced mobility. In the preceding year, she had repeatedly presented to healthcare providers with no clear neurological deficit, no fractures identified on X-Ray and normal MRI appearances of the whole spine. Aside from well-controlled asthma and gestational diabetes, she had no significant past medical, medication, social or family history of note.

Investigations

Her bloods revealed hypophosphataemia for over three years, reaching a nadir of 0.32mmol/l (0.80-1.50), and which persisted despite oral phosphate replacement alongside Vitamin D repletion. The remainder of her routine biochemistry was unremarkable. A DEXA scan demonstrated low bone density of L2-L4 (Z score -4.1) and hips (Z score -3.5). On assessment of urinary phosphate excretion, she had significantly reduced tubular reabsorption (TRP) 38.7% (>85%) and tubular maximum reabsorption of phosphate to GFR ratio (TmP/GFR) 0.14mmol/l (0.84-1.23). Further testing detected no abnormality in retinol binding protein or urinary amino acids, and thus excluded renal tubular injury or Fanconi syndrome. A 1,25 Vitamin D level was 66pmol/l (RR 55-139), and she notably had an inappropriately raised Fibroblast Growth Factor 23 (FGF23) level of 105 RU/mL (<100).

Results and Treatment

A Ga68 DOTATATE PET CT demonstrated focal intense uptake within the right lower mandible. An MRI mandible characterised a smooth well-circumscribed nodule 11x7mm in the right buccogingival sulcus, correlating to the focus of intense DOTATATE uptake. An ultrasound delineated a submucosal nodule over the right mandibular body, also identified on oral examination. Collectively, the biochemical, radiological and clinical findings suggested an FGF23-secreting tumour and the patient proceeded to local excision of the lesion with wide margins. The histopathology was consistent with a phosphaturic mesenchymal tumour. Her bloods subsequently demonstrated biochemical cure with a normal phosphate and FGF23 level, without supplements. Her bone density improved by 89.9% in the lumbar spine (Z score +1.7) and 60.2% in the hips (Z score +0.3). She has remained normophosphatemic since with remarkable recovery in weakness, pain and mobility observed.

Conclusion

Tumour induced osteomalacia (TIO) is a rare paraneoplastic syndrome caused by an FGF23-secreting lesion in the bone or soft tissue. It is characterised by FGF23-dependent phosphate wasting and associated osteomalacia. It is vital to suspect in cases of chronic hypophosphataemia associated with bone pain, fragility fractures or muscle weakness given that tumour excision can be biochemically and clinically curative.

DOI: 10.1530/endoabs.91.OC6

OC7**Hypokalaemia: An unusual feature of pseudohypoparathyroidism****Type 1b**

Ananthi Anandhakrishnan^{*1}, Rachel Flynn^{*1}, Jansher Khan¹, Kumbirai Dodzo¹, Gadintshware Gaoatswe[†], John P Monson^{1,2} & Kirun Gunganah¹

¹Department of Endocrinology, Newham University Hospital, Barts Health NHS Trust, London, United Kingdom. ²Professor Emeritus Barts and the London NHS Trust, London, United Kingdom

Section 1: Case history

A 23-year-old female presented to the Emergency Department with a 3-month history of intermittent chest pain and palpitations. She was found to be hypokalaemic and hypocalcaemic. On direct-questioning she reported 3 weeks of perioral paraesthesia and muscle spasms. She had an unrestricted diet and no other personal or family history of note. She was normotensive with a sinus tachycardia and normal QT-interval. Chvostek's negative, with no features to suggest growth retardation. She was admitted for intravenous electrolyte replacement.

Section 2: Investigations

Hypocalcaemia 1.58mmol/l, normal serum phosphate 1.29mmol/l and elevated parathyroid hormone (PTH) levels 127pmol/l were detected on admission. 25-OH Vitamin-D3 was deficient (22mmol/l) with a normal serum magnesium 0.8mmol and elevated ALP 944U/L. A spot urine calcium:creatinine ratio was low (0.0028). She was osteoporotic at the lumbar spine (T-score -2.8) and osteopaenic at the femoral neck (T-score -1.4). With a hypokalaemia (2.9-3.3mmol/l), there was kaliuria (urine potassium 68mmol), a detectable aldosterone (226pmol/l) and elevated renin (7nmol/l). Renal function was preserved with normal serum bicarbonate 24.9mmol/l. An ultrasound renal tract was normal.

Section 3: Results and treatment

Despite vitamin-D loading, an ongoing requirement for electrolyte replacement with highly elevated PTH levels prompted genetic and epigenetic testing for syndromes associated with PTH-resistance and renal tubulopathies. A loss of maternal methylation pattern in GNAS was detected. This, alongside a negative family history was consistent with the diagnosis of sporadic pseudohypoparathyroidism type-1b. A renal tubulopathy screen was negative. The patient was commenced on alfacalcidol, Vitamin-D3 and oral potassium. A sustained resolution of her symptoms and improvement in her biochemistry was seen at 4-months; PTH 54.1pmol/l, Ca 2.32mmol/l, Phosphate 0.9mmol/l, ALP 377U/L, K 4.3mmol/l.

Section 4: Conclusions and points for discussion

Pseudohypoparathyroidism type-1b is characterised by PTH-resistance in proximal renal tubules due to epigenetic changes in the differential methylated regions in the GNAS gene (chromosome 20q13.2). The loss of maternal-specific methylation of GNAS has been associated with downregulation of Gsz expression and cAMP dependent signalling pathways necessary for PTH action. Interestingly, our patient was normophosphataemic and hypokalaemic on presentation which is very unusual with only 2 other reported cases. It is possible that renal peritubular potassium channels are also governed by Gsz/cAMP pathways, and downregulation may promote renal potassium loss. More research into epigenetic regulation of GNAS/Gsz/cAMP related pathways is required to elucidate the intricate relationship between PTH-dependent calcium, phosphate and potassium handling in the kidneys.

DOI: 10.1530/endoabs.91.OC7

OC8**Bruns-Garland syndrome (diabetic amyotrophy) associated with SGLT2 inhibitor and its rapid HbA1c improvement: a case-report**

Kalyani Nagarajah, Grigorios Panagiotou & Julia Platts
University Hospital Llandough, Penarth, United Kingdom

Background

Bruns Garlands syndrome is a rare disorder in people living with diabetes, manifesting as unilateral or bilateral muscle pain, weakness and atrophy in the proximal region of the lower limbs. Herein, we present the case of a patient with Bruns-Garland syndrome caused by sodium/glucose co-transporter 2 inhibitors (SGLT2i).

Case description

A 55-year-old male with background of type 2 diabetes for 5 years, and currently on oral therapy, presented to the emergency admissions unit with ketosis, acidosis and borderline hyperglycaemia (ketones 6 mmol/l, pH 7.21 and blood glucose of 11 mmol/l, respectively). On further questioning, his diabetes control was suboptimal with some mild tingling sensation in his lower limbs first noticed a year ago; Empagliflozin was added to his therapy at that time, resulting in significant weight loss of about 8 kgs over 6 weeks and a substantial reduction in

HbA1c from 103 to 48 mmol/mol in less than 6 months. On examination, he had widespread vitiligo, and proximal muscle wasting with bilateral lower limb weakness, reduced reflexes and paraesthesia, suggestive of peripheral neuropathy. Baseline myopathy screening was negative. Imaging studies were negative for sinister causes of weight loss. MRI spine was inconclusive, suggesting mild degenerative changes with multifocal disc prolapses and nerve root impingements, but no spinal canal stenosis. Nerve conduction studies of upper and lower limbs revealed a moderately severe, length dependent sensorimotor axonal neuropathy. This was confirmed with electromyography indicating an axonal peripheral neuropathy, with superimposed bilateral lumbar plexopathy/femoral neuropathy, suggestive of acute on ongoing neurogenic changes in bilateral lower limbs distally and proximally. Despite HbA1c improvement, his symptoms further progressed to debilitating proximal myopathy, with severe paraesthesia and burning sensation over his thighs in the next few months, despite Vitamin B12 levels replacement therapy.

Conclusion

Rapid improvement of HbA1c with SGLT2i or a direct effect of SGLT2i can significantly worsen background neuropathic changes leading to Bruns-Garland type diabetic amyotrophy. With the widespread use of SGLT2i, it is important that physicians treating patients with diabetes recognise these symptoms and consider this association in patients developing fatigue and weakness.

DOI: 10.1530/endoabs.91.OC8

OC9**ACTH- producing pheochromocytoma**

Sahar Iftikhar¹, Simon Aylwin¹, Benjamin Whitelaw², Dylan Lewis² & Klaus-Martin Schulte²

¹Royal Surrey County Hospital, Guildford, United Kingdom. ²Kings College London, London, United Kingdom

Case history

We present a case of 36Y old male who presented with worsening leg edema, leg ulceration and poor mobility leading to admission in intensive care due to sepsis and hemodynamic instability. Found to have metabolic alkalosis with hypokalaemia. Clinically, moon-like facies, low proximal muscle mass, skin hypopigmentation (mainly hands), broken skin fingers and legs, abdominal fat distribution. Investigations: Random cortisol 2348nmol/l, post 1mg dexamethasone cortisol 2886nmol/l, ACTH 443 ng/L, testosterone 4.0nmol/l. Plasma metadrenalines and normetadrenalines were >25000 pmol/l. CT CAP/Adrenals - Left 7.3 cm adrenal mass consistent with ACC with multiple lung metastases lung lesions were investigated and found to be inflammatory. MRI Pituitary normal. FDG PET showed metabolically active left adrenal malignancy. The new bilateral pulmonary changes are likely inflammatory/infective. The pulmonary nodules which were seen on CT CAP were thought to be likely metastasis. MIBG was consistent with a diagnosis of Pheochromocytoma. Treatment: Was initiated on metyrapone and alpha blockade. He improved markedly after starting metyrapone. Underwent left open adrenalectomy. Histology was in keeping with Pheochromocytoma with capsular irregularities. Ki67=7.4%. Capsular and lymphovascular invasion. PASS score was 10. Immunohistochemistry SDHB preserved. Post-operatively results showed normal ONDST and plasma metanephrines. SST demonstrated adrenal insufficiency and remains on hydrocortisone. Genetic testing did not reveal a genetic cause of phaeochromocytoma.

Conclusion and points of discussions

ACTH secreting phaeochromocytoma is extremely rare but should be considered in the differential diagnosis.

References

1. Clinical, biochemical, and tumour characteristics in patients with ectopic ACTH.
2. The utilisation of different imaging modalities.
3. Role of drugs such as Metyrapone, alpha blockade pre-operatively.
4. Review of literature

DOI: 10.1530/endoabs.91.OC9

OC10**Recurrent painful ovarian cysts: what should an endocrinologist be aware of?**

Mayuri Agarwal¹, Cornelius Fernandez² & Dilip Eapen²

¹Nottingham University Hospital NHS Trust, Nottingham, United Kingdom. ²United Lincolnshire Hospital NHS Trust, Boston, United Kingdom

Case history

A 33 year old lady with irregular menstrual cycles and infertility presented to gynaecologist with recurrent abdominal pain and bloating. Her pain was found

secondary to bilateral ovarian cysts. She had repeated laparoscopic ovarian cystectomies since 2018. In December 2021, modest hyperprolactinemia (1065MIU/L, RR 102-496) with negative macroprolactin test was noted, and MRI pituitary revealed 18x17x13mm pituitary macroadenoma. Cabergoline was started and she was referred to endocrine team. A diagnosis of non-functioning pituitary macroadenoma unrelated to ovarian cysts was initially considered. However, on further review of pituitary profile, inappropriately normal FSH levels (even with raised 17-β oestradiol) and suppressed LH levels were noted. Therefore, FSH secreting pituitary tumor (FSHoma) was considered, and it was concluded that recurrent ovarian cysts were attributed to spontaneous ovarian hyperstimulation syndrome in absence of using ovulation inducing agent.

Investigations

MRI pituitary (December 2021) - 18x17x13mm pituitary macroadenoma with mild suprasellar extension indenting the optic chiasm along with deviation of the pituitary stalk towards left. Visual fields- normal.

Results and treatment

With cabergoline, her abdominal symptoms along with estrogen and prolactin levels settled. However, interval MRI pituitary 6 months later revealed no change in size of pituitary macroadenoma. After discussion in pituitary MDT, transsphenoidal surgery with hope of preventing ovarian cyst recurrence was recommended.

Conclusion and point of discussion

FSHomas are usually non-functioning rare pituitary tumors, with no clinical evidence of hormonal hypersecretion. When functioning, the continuous FSH exposure from FSHoma can cause ovarian hyperstimulation syndrome due to associated raised estrogen levels. The characteristics of FSHoma in reproductive-

aged women are enlarged multicystic ovaries, elevated serum 17-β oestradiol, normal to mildly raised FSH, suppressed LH, menstrual disorder, infertility, and ovarian hyperstimulation. In this case normal FSH level in setting of raised estrogen and suppressed LH was overlooked at first instance. Diagnosis of FSHoma is further supported by elevated serum alpha subunit levels. In many patients with FSHoma, accurate diagnosis is often delayed by several years and many women might have undergone repeated ovarian procedures that are detrimental to the ovarian function of infertile patients.

Results of pituitary profile blood test:

| | Prolactin (MIU/l) | 17-β oestradiol (pmol/l) | FSH (IU/l) | LH (IU/l) |
|-----------------------------|--|--------------------------|------------|-----------|
| August 2020 | 633 | 1993 | 12.7 | 0.8 |
| September 2021 | 1065 | 2723 | 12.4 | 0.5 |
| December 2021 | 1237 | 4365 | 9.1 | 0.4 |
| January2022 (on cabergolin) | 39 | 316 | 7 | 3 |
| Other tests | 9 am cortisol 452, IGF-1 10, TSH 3, free T4 13.6 Alpha subunit of FSH - elevated 2.12 IU/L (normal range <1) | | | |

DOI: 10.1530/endoabs.91.OC10

Poster Presentations

P1**Hereditary Paranglioma-Phaeochromocytoma Syndrome: A case of malignant paraganglioma discovered following surgery for breast carcinoma**Shaila Khan, Fatima Bahowairath, Fausto Palazzo & Jeannie Todd
Imperial College Healthcare NHS Trust, London, United Kingdom**Section 1: Case**

A 42-year-old woman developed central chest pain four hours after undergoing right mastectomy for intraductal breast carcinoma. Serial blood pressures were recorded as significantly elevated, up to 240/130mmHg. There was no history of new-onset headaches, palpitations, anxiety, hirsutism, change in weight or easy bruising. She had no other significant past medical history or family history.

Section 2: Investigations

An electrocardiogram was normal and troponin levels were not elevated. A computer tomography pulmonary angiogram was performed which excluded pulmonary embolism (PE), but also revealed a large (12 cm x 6.6 cm) left-sided retroperitoneal mass. Plasma normetanephrine and metanephrine levels were not elevated. Renin and aldosterone levels were raised at 243ng/l and 1490pmol/l respectively, ratio 2pmol/mg (RRs: 0.5-3ng/l and 90-700pmol/l). FDG-PET scan showed an intensely avid area within the lesion, with no other sites of FDG uptake. Repeat measurement of plasma metanephrines included 3-methoxytyramine levels which were significantly raised at 21 906pmol/l (RR < 180pmol/l).

Section 3: Results and treatment

The results primarily raised concern for adrenocortical carcinoma. Initial imaging showed central necrosis within the suspected tumour with marked peripheral vascularity, with the mass encasing the renal artery. The renin:aldosterone ratio did not indicate primary aldosteronism. However, 3-methoxytyramine levels were strongly indicative of phaeochromocytoma or paraganglioma. The patient underwent left adrenalectomy and nephrectomy. Histology confirmed a moderately differentiated paraganglioma with evidence of capsular and vascular invasion with a Ki-67 index of between 18-20%, which was excised completely. The patient's hypertension was treated successfully with alpha blockade using doxazosin. A Gallium Dototate PET-CT scan was carried out four weeks after surgery. This showed no tracer avid disease. Genetic testing confirmed succinate dehydrogenase gene subunit A (SDHA) related Hereditary Paranglioma-Phaeochromocytoma Syndrome (HPPS). Future imaging surveillance will consist of annual whole body and neck MRI. The patient underwent genetic counselling to discuss screening and surveillance for her brother and two primary school-aged children.

Section 4: Conclusions and points for discussion We describe a case of HPPS and malignant paraganglioma, diagnosed during active treatment of a separate primary malignancy. The case illustrates the challenges in diagnosis at varying stages of investigation. Here, a hypertensive crisis, which is well-known to occur with paraganglioma and phaeochromocytoma, occurred as an index event, but the incidental finding on imaging for PE was key to elucidating the diagnosis. This case also highlights the diagnostic value of 3-methoxytyramine and issues that may arise around genetic counselling.

DOI: 10.1530/endoabs.91.P1

P2**Is it MEN2B or not? That is The Question**Yuvanaa Subramaniam¹, Jessica Lee¹, Laura de Benito-Llopis² & Aditi Sharma¹¹Department of Endocrinology, St Bartholomew's Hospital, London, United Kingdom. ²Department of Ophthalmology, Moorfields Eye Hospital, London, United Kingdom

A 35-year-old gentleman was referred to our Endocrinology department by Moorfields Eye hospital. He reported a one-year history of visual decline in his right eye, which led to prescription glasses, and incidental finding of bilateral conjunctival nodules. He had reduced visual acuity (pinhole right eye: 6/24 and left eye 6/6) and prominent corneal nerves on slit-lamp examination. He underwent an excisional biopsy of the conjunctival nodules confirming bilateral conjunctival neuromas; prompting an urgent Endocrinology referral due to the known association with MEN2B syndrome. He denied any symptoms related to phaeochromocytoma or medullary thyroid cancer. His past medical history included complex Crohn's disease resistant to biological treatment and infective endocarditis of the pulmonary valve related to his Hickmann line which was inserted for nutritional optimisation. His other medical history included renal stones and recent cholecystectomy for a perforated gallbladder. There was no personal or family history of endocrinopathies. He recently had a 7-month-old son, conceived by IVF, due to oligozoospermia. On examination he was tall

(height of 183.1 cm), with a marfanoid habitus. His BMI was 16 kg/m². His BP was 114/70mmHg. He had a high arched palate, tongue, and conjunctival neuromas. He had evidence of previous abdominal surgeries. The rest of his systems examination was unremarkable including neck and visual fields. His serum adjusted calcium, phosphate, parathyroid hormone, thyroid function, calcitonin, carcino-embryonic antigen, and plasma and urinary metanephrines were unremarkable. Genetic testing did not reveal a pathogenicity in the RET proto-oncogene associated with MEN2B. Exome sequencing revealed a heterozygous pathogenic SOS1 (son of sevenless-1) frameshift mutation, suggestive of pure mucosal neuroma syndrome (MNS). This is the second ever reported case in literature of a patient with pure MNS associated with ocular manifestations. Pure MNS is a recently described clinical entity distinct from MEN2B with typical physical features of MEN2B including marfanoid habitus and mucosal neuromas, but without the associated endocrinopathies (medullary thyroid carcinoma or pheochromocytoma) and RET mutation. Due to the rarity of MNS, the implications on long term screening, management and genetic counselling remain uncertain. As endocrinologists, it is important to be aware and distinguish between pure MNS from MEN2B to avoid unnecessary prophylactic treatments such as thyroidectomy, as the offspring is at 50% risk of inheriting this variant.

DOI: 10.1530/endoabs.91.P2

P3**A rare case of hypergonadotropic hypogonadism: A combination of two rare entities**Emmanuel Ssemmondo¹, Thozhukat Sathyapalan^{1,2}, Mo Aye², Shiva Mongolu² & Harshal Deshmukh^{1,2}¹University of Hull, Hull, United Kingdom. ²Hull University Teaching Hospitals NHS Trust, Hull, United Kingdom**Case History**

This 19-year-old Caucasian female was seen in the Endocrine clinic with history of primary amenorrhea. She had a low sexual drive, no breast development but reported presence of axillary and pubic hair growth. Her main concern was whether she would be able to conceive. She had no comorbidities and took no regular medications. She never smoked and consumed no alcohol. On examination, she was 171 cm tall with a weight of 65.5 kg. She had normal external female genitalia. The cardiovascular, respiratory and abdominal examination was normal. The breasts were undeveloped (Tanner stage I), with sparse long pubic hair (Tanner stage II).

Investigations

Anterior pituitary profile, anti-Müllerian hormone (AMH), oestradiol, thyroid function, pelvic ultrasound scan, MRI scan of the abdomen and pelvis as well as karyotyping.

Results and treatment

Oestradiol (< 55pmol/l (normal= 82-903)) and AMH (<0.2pmol/l) were undetectable. Gonadotropins were significantly raised with a FSH-100 IU/L (normal=3.0-9.0) and LH-30IU/L (normal 2.0-11.0). Other hormones measured were normal; TSH-1.4mU/L (normal 0.35-4.7), Testosterone-0.9nmol/l (normal=0-1.9), SHBG-37nmol/l (normal=35-100), IGF-1-29.2nmol/l (normal=14.0-54.0) Trans-vaginal ultrasound scan showed no ovaries, a very small uterus with a very thin endometrium of 0.7mm. MRI pelvis showed a small uterus, with a thin streak of tissue where the uterus fundus should be but no discernible zonal anatomy. There was no endometrial stripe and no ovaries. The cervix was small but normal cervical anatomy. The vagina was normal. Other abdominal organs were normal. Karyotyping results are pending. The patient was to be started on combined hormonal replacement therapy (HRT).

Conclusions and points for discussion

This patient has a combination of ovarian agenesis and Müllerian duct hypoplasia. Primary amenorrhea with hypergonadotropic hypogonadism and absent ovaries on imaging supports a diagnosis of ovarian agenesis. Karyotyping results are pending. Differential causes of ovarian agenesis may include pure gonadal dysgenesis 46XX, Turner syndrome with mosaicism or the rare forms of non-mosaic Turner syndrome where individuals could be of tall stature similar to this case. Other causes like 46XY Swyer syndrome are possible but unlikely in our patient. She has presented late, which is unusual, when puberty can't be induced. Using the ESHRE/ESGE classification of congenital female genital tract anomalies, this patient is U5b (aplastic uterus with rudimentary cavity), C0 (normal cervix), V0 (normal vagina). This makes Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome less likely. Treatment is with HRT. She will also need a baseline DXA scan and psychological counselling to come to terms with the diagnosis.

DOI: 10.1530/endoabs.91.P3

P4**A case of acute intermittent porphyria in a pregnant lady with hyponatraemia**Rizwan Haq¹, Emma Murray², Paul Hamilton², Helen Wallace¹ & Karen Mullan¹¹Regional Centre for Endocrinology & Diabetes, Royal Victoria Hospital, Belfast, United Kingdom. ²Clinical Biochemistry, Royal Victoria Hospital, Belfast, United Kingdom

Case History

A 27-year-old lady, seven weeks gestation presented to ED during her second pregnancy with abdominal pain, vomiting, constipation and hyponatraemia (Na = 114mmol/l). She had attended twice earlier during her pregnancy with presumed hyperemesis gravidarum. Because urinary sodium was elevated at 181mmol/l, dehydration was deemed unlikely and she was initially treated as SIADH with 1.2L fluid restriction and 2.7% 200mls of hypertonic saline. Sertraline was held. Repeat sodium next day had dropped further to 112mmol/l, following which a further 2.7% NS bolus was given. Sodium remained refractory to this, despite being followed up by a 500ml 1.8% saline infusion at 50mls/hr. An abdominal ultrasound was obtained for persistent generalised abdominal pain which was unremarkable. Laxatives were given as bowels hadn't opened in more than one week. Starvation ketosis without acidosis was noted and dietetic input was requested. Intravenous Pabrinex was given. A porphyria screen was requested at this stage, which was suggestive of acute intermittent porphyria. Biochemistry was consulted and the patient was sent to HDU for haem arginate infusion 3 mg/kg daily for 4 days. Fluid restriction was lifted and the patient was given 0.9% NS for the remainder of her admission and sodium normalised. No neurological or respiratory deficit was noted during her admission.

Investigations

Abdominal Ultrasound: Biliary sludge Chest X-ray: Normal

Results and Treatment

Osmolality(serum)= 237 mOsm/kg [Ref.275-295 (mOsm/kg)] Osmolality(urine)= 587 mOsm/kg Urea = 1.4mmol/l (2.5-7.8mmol/l) Urine(Na)= 181mmol/l Ketones= 3.6mmol/l Urine porphobilinogen= 559.8 (0-10.7 umol/l) PBG/Creatinine= 64 (<1.5umol/mmol) Porphyrin/Creatinine= 796 (0-40nmol/mmol)

Conclusion and Points for Discussion

Acute intermittent porphyria is rare autosomal dominant condition characterised by partial deficiency of the enzyme hydroxymethylbilan synthase, which results in the accumulation of porphyrin precursors in the body. It can be triggered by various factors such as pregnancy and other hormonal changes, fasting, infections, medications and alcohol consumption. It can present with abdominal pain, constipation, tachycardia, hypertension, behavioural changes, seizures and peripheral neuropathy or paralysis. Drugs that may precipitate acute intermittent porphyria include: anabolic steroids, antidepressants (MAOI, TCA), hormonal contraceptives, antifungals, sulphonylureas and taxanes. A safe drug list can be found on the UKPMIS website. Although acute intermittent porphyria is a very rare disorder, this case highlights the need to consider porphyria as a differential diagnosis in a patient with abdominal pain and refractory or unexplained hyponatraemia.

DOI: 10.1530/endoabs.91.P4

P5**An unusual case of adrenal mass**Lauran Noel, Dominic Cavlan & David Randall
Barts Health NHS Trust, London, United Kingdom

Case history

A 59 year old woman presented to hospital with severe abdominal pain, diarrhoea and vomiting. Her past medical history included end stage renal failure of unknown cause, renal transplant with antithymocyte globulin (ATG) induction ten years prior, treated pulmonary tuberculosis, hypertension and new onset diabetes after transplant (NODAT).

Investigations

A CT scan of the abdomen demonstrated an 85 x 74 x 96mm heterogenous mass arising from the right adrenal gland and infiltrating the liver. This was suspicious for adrenocortical carcinoma or pheochromocytoma and she was referred to the endocrinology team. The patient had hypertension which was well controlled on a single oral agent, but she described paroxysmal episodes of anxiety associated with flushing and headache. There were no clinical features of cortisol or androgen excess. 24hour urine cortisol levels were normal (21nmol/day), and plasma and urine metanephrine levels were all within normal limits. The potential for an additional differential for her adrenal mass was considered on the basis of her history of immunosuppression and a very high serum level of Epstein Barr Virus (>200,000 copies): post-transplant lymphoproliferative disorder. An US-guided biopsy was undertaken to establish a histological diagnosis. She received alpha-blockade with doxazosin in preparation for this.

Results and treatment

Histology from the adrenal biopsy demonstrated an EBV positive high grade lymphoma, consistent with post transplant lymphoproliferative disease. No adrenal tissue was identified in the mass. Immunohistochemistry was positive for CD20 and CD79a. There was no evidence of metabolically active nodal disease or metastases above or below the diaphragm on FDG-PET CT. She was initiated on R-CHOP chemotherapy following oncology review.

Conclusions and points for discussion

This case demonstrates a rare cause of adrenal mass. Post transplant lymphoproliferative disorder is a common cause of malignancy in solid organ transplant patients, although a rare cause of isolated adrenal mass. Biopsy of adrenal masses is rarely undertaken due to the risk of seeding or causing hypertensive crises. However, this patient had a history of renal transplant, high cumulative immunosuppressive dosing and a high EBV titre. This in conjunction with normal metanephrines justified the biopsy in this case, and was imperative for confirming the diagnosis.

DOI: 10.1530/endoabs.91.P5

P6**Hypercalcaemia in a patient with sarcoidosis and a positive functional parathyroid scan**

Muna Guma, Yaasir Mamoojee, Richard Quinton, Catherine Napier & Ian Forrest

Royal Victoria Infirmary, Newcastle Upon Tyne, United Kingdom

Introduction

Hypercalcaemia diagnosed in hospital setting is most commonly PTH-independent and malignancy related, whilst hypercalcaemia discovered in community setting is commonly secondary to Primary Hyperparathyroidism (PHPT). Other rare causes include granulomatous diseases such as sarcoidosis and familial hypocalcaemic hypercalcaemia (FHH).

Case Summary

A 73-year-old male with a background of hypertension and chronic kidney disease stage 3 was found to be hypercalcaemic on routine blood tests by his GP. He had no symptom of hypercalcaemia and his CXR demonstrated bilateral lower zone opacifications. He was admitted to hospital with an adjusted serum calcium of 3.03 mmol/l (NR 2.2 – 2.6) and an eGFR of 53 mL/min/1.73m². He received intravenous Zoledronic acid and was referred to the Endocrine team for follow-up. His serum vitamin D level was low at 35 nmol/l and his PTH was 5.6 pmol/l (NR 1.1 – 6.4). He received a loading dose of oral vitamin D (100,000 units) followed by daily replacement dosing. His adjusted serum calcium level remained elevated, varying between 2.87 and 3.13 mmol/l, with a suppressed serum phosphate level at 0.51 mmol/l (NR 0.8 – 1.5). His fractional urine calcium excretion, based on a 24 hour urine collection, remained low at 1%, despite vitamin D supplementation. By that time CT imaging of his chest demonstrated features suggestive of pulmonary sarcoidosis. His serum angiotensin converting enzyme level was normal. Given the level of persistent hypercalcaemia, functional imaging of the parathyroid was undertaken which demonstrated a 1.1 cm enhancing nodule posterior to the lower pole of the right lobe of the thyroid suggestive of a parathyroid adenoma. His persistently low urine calcium excretion prompted genetic testing for FHH which revealed a monoallelic pathogenic calcium-sensing receptor (CASR) variant on chromosome 3.

Discussion

Our case highlights the importance of investigating for FHH in patients with PTH-dependent hypercalcaemia and persistently low urine calcium excretion despite replete vitamin D levels. What is unique in our patient is the coexisting diagnosis of sarcoidosis and probable PHPT. To what extent these two diagnoses are influencing his serum calcium level remain unclear. Nevertheless our patient remains asymptomatic from his hypercalcaemia with no evidence of end-organ damage on bone density scan and renal imaging.

DOI: 10.1530/endoabs.91.P6

P7**Calciophylaxis in a patient with hypoparathyroidism complicated by hypercalcaemia secondary to immobility**

Isabelle van Heeswijk, Lynsey Havill, Rebecca Kinton, Antonia Ugur & David Hughes

Royal Derby Hospital, Derby, United Kingdom

Section 1: Case history

The case concerns a 53-year-old gentleman who developed calciophylaxis following a bioprosthetic aortic valve replacement. His past medical history

included Multiple Endocrine Neoplasia Type 1 (MEN-1) for which he had previously undergone total parathyroidectomy with failed graft auto-transplantation. The resulting hypoparathyroidism was managed with alfacalcidol and calcium supplements. Post cardiac valve replacement he developed acute renal injury and necrotic lesions started to appear on the skin of his buttocks, abdomen and limbs.

Section 2: Investigations

An incisional skin biopsy confirmed the histological diagnosis of calciphylaxis with Von Kossa staining demonstrating widespread calcium deposition in vessel walls and within the subcutis. At time of diagnosis, adjusted calcium was 3.03mmol/l and phosphate level 1.88mmol/l, in-keeping with overtreatment of hypoparathyroidism.

Section 3: Results and treatment

The calciphylaxis was managed conservatively with regular wound care and aggressive antibiotic treatment for infections in order to prevent death from sepsis. To reduce further ex-ossesous soft tissue calcification his calcium and phosphate levels were carefully managed with titration of alfacalcidol and calcium supplements, including the phosphate binder calcium acetate. During his 10 month inpatient stay he developed other complications including chest infection, acute kidney injury and wound haemorrhage. He was bed bound for the majority of his time in hospital which triggered immobility hypercalcaemia. This was treated with infusions of pamidronate and total cessation of alfacalcidol and calcium supplements. He required extensive therapy input and was even supported in achieving a personal goal of attending an international football match with his teenage daughter. Despite many setbacks, the patient survived and was discharged home where he has now regained his mobility and remains under close monitoring.

Section 4: Conclusions and points for discussion

Calciphylaxis is a rare life threatening disorder characterised by painful necrotic lesions of the skin. Ex-ossesous soft tissue calcification leading to occlusion of cutaneous arterioles resulting in tissue necrosis. It has an exceptionally high mortality – up to 80% - with most deaths occurring due to sepsis. The vast majority of cases occur in patients with chronic renal disease with only a handful ever reported in the context of hypoparathyroidism. Management of calciphylaxis centres on controlling calcium and phosphate levels, wound care, pain management and prevention of sepsis. In conclusion, this case describes an often-fatal condition occurring in unusual circumstances and the management that led to the patient's survival against the odds!

DOI: 10.1530/endoabs.91.P7

P8

A rare case of FGF23 producing tumour

Narmadha Munisamy, Nur Azman & Kimberley Lambert
Royal Hampshire County Hospital, Winchester, United Kingdom

Case history

A 67-year-old lady was referred to endocrinology with an 8-year history of mild hyperparathyroidism with Parathyroid hormone of 7.4 -15.3 pmol/l (Normal - 1.95-8.49). Her corrected calcium ranged from 2.46-2.66 mmol/l (Normal 2.2 - 2.62), phosphate 0.63 -1.0 mmol/l (normal 0.8-1.5), normal renal function and normal vitamin D. Her urine calcium to creatinine ratio was 0.7 mmol/mmol (Normal 0-0.4).

Investigations and treatment

She had myalgia due to severe osteoporosis and her DEXA scan showed T score of -2.8(hip), -4.5(spine). She had lost about 1.5 cm from maximal adult height, despite Alendronic acid treatment. She had a negative sestimibi scan and was referred to the tertiary metabolic bone centre to identify the cause for her severe osteoporosis. She was ex-smoker, quit smoking at 34 years of age, attained menarche at 11 years and menopause at the age of 48 by hysterectomy. Tertiary team recommended genetic testing to look for familial hypercalcaemia and hypocalciuria which came back as negative. On review back in endocrinology clinic it was noted she had an intermittent mild hypophosphatemia and on further testing a reduced renal tubular reabsorption of phosphate Tmp/gr- 40% (0.624 mmol/l/GFR (0.8-1.35). Her Fibroblast growth factor 23 (FGF23) was elevated at 473iu/ml (0-100). She was referred to the tertiary centre for investigation into tumour induced osteomalacia, she is currently awaiting for a 68- Gallium DOTATE PET scan in February 2023.

Conclusion

The elevated FGF23 and low phosphate levels suggest the possibility of oncogenic osteomalacia. FGF23 is a hormone which regulates serum phosphate levels and excess production of it causes several hypophosphatemic disease. It is also responsible for autosomal dominant hypophosphatemic rickets/osteomalacia. FGF23 was identified as causative humoral factor for tumour induced osteomalacia. It is characterised by low renal tubular reabsorption of phosphate and low serum Dihydroxyvitamin D levels for hypophosphatemia. FGF23 causes

low serum phosphate by suppressing the phosphate reabsorption in the renal tubule and in the intestine.

DOI: 10.1530/endoabs.91.P8

P9

Spontaneous haemorrhage into parathyroid adenoma masquerading as parathyroid carcinoma

Matthew North, Yogesh Bhatt & Mark Cohen
Barnet Hospital, Royal Free London NHS Foundation Trust, London, United Kingdom

Case history

A 63-year-old female was admitted to our hospital in January 2022 with neck swelling that had developed over five days with associated dysphagia to fluids. Biochemistry revealed severe hypercalcaemia with a corrected calcium of 3.82 mmol/l (2.20 - 2.60 mmol/l) and PTH of 78.7 pmol/l (1.6 - 6.9 pmol/l), and an associated AKI (creatinine of 174 umol/L from a baseline of 80). Ultrasound initially showed a left-sided 3 x 2 cm nodule suggestive of a large parathyroid adenoma / carcinoma. The patient subsequently developed a significant amount of bruising over the chest wall, originating from the anterior neck, consistent with haemorrhage.

Investigations

CT imaging of the neck and chest showed a 4.7 x 3.8 cm soft tissue mass posterior to the left lobe of the thyroid associated with subcutaneous inflammatory change, and an associated 7.2 x 4 cm contiguous soft tissue mass encasing the oropharynx and upper oesophagus with an appearance highly suspicious of malignancy. Due to the significantly elevated PTH level there was a high index of suspicion for parathyroid carcinoma therefore MRI imaging was performed, which showed a mass of indeterminate appearance likely to represent a parathyroid lesion (adenoma / carcinoma) with surrounding soft tissues suggestive of haemorrhage from the lesion or severe inflammatory changes. A MIBI scan identified two mildly tracer avid soft tissue nodules posterior to the upper and lower poles of the left hemithyroid, and the left soft tissue density lesion posterior to left lobe was not tracer avid, compatible with haemorrhage.

Results and treatment

Hypercalcaemia was treated with continuous IV fluids, zoledronate and cinacalcet. Neck swelling was initially managed with IV steroids. There were no airway concerns, but an NG tube was inserted to allow for feeding. Serum calcium and PTH levels fell, and she was discharged after twelve days with serum calcium in the normal range. She proceeded to have a parathyroidectomy and left hemi-thyroidectomy in August 2022 once swelling had settled and bruising resolved. Histology confirmed a benign parathyroid adenoma (left superior). At her most recent clinic follow-up in October 2022 serum calcium was normal at 2.52 mmol/l.

Conclusions and points for discussion

Haemorrhage into a large parathyroid adenoma can mimic parathyroid carcinoma with severe symptomatic hypercalcaemia, very high PTH levels and dysphagia.

DOI: 10.1530/endoabs.91.P9

P10

A case of hypothalamic lipoma causing Hyperprolactinemia in a patient with a family history of Birt-Hogg-Dubé syndrome

Geethika Thota & Natalia Brans
Saint Peter's University Hospital, New Brunswick, USA

Case Presentation

A 41 year old female with a medical history significant for depression presented to the clinic for evaluation of bilateral nipple discharge for 5 months. The patient reported that for the last 5 months she started noticing expressible nipple discharge. She reported no associated headaches, vision changes. She denies the use of vitamins, supplements, herbal remedies. No associated fatigue, changes in the shoe/ring size, heat/cold intolerance, tremors, recent weight changes. She denies neck enlargement, neck pain, dysphagia. The patient reported her menstrual cycles are always been heavy, irregular (every 33-50 days). She was never pregnant and not on any contraceptives. She has been on Sertraline for the last 4 years with no recent dose changes. Family history was significant for Birt-Hogg-Dubé Syndrome (BHD) in Father, brother, and sister.

Investigations

Initial labs showed Hb 13.3g/dl(11.1-15.9g/dl), WBC 6.8x10³/UL (4-11 x 10³/UL), Platelet 218x 10³/UL (150-450 103/UL). Comprehensive Metabolic Panel is within limits. Hormonal analysis revealed TSH 1.180uiu/ml (0.45-

4.5uiu/ml), Free T4 1.15ng/dl(0.82- 1.77ng/dl), T3 91(71-180ng/dl), FSH 3.8mIU/ml, LH 3.7 mIU/ml, IGF-1 83ng/mL(74-239ng/mL) Prolactin 107ng/ml (4.79-23.3ng/dl), Monomeric prolactin 75.7ng/ml, macroprolactin percent 23%, Serum Estradiol 16pg/ml. HbA1C 5.6%94.8-5.6%), Serum AM Cortisol 6.5 mg/dl (6.2-19.4 mg/dl). The urine Pregnancy test was negative. Given low normal AM cortisol, a Cosyntropin stimulation test was done, which was normal. MRI Pituitary with contrast showed flattening of pituitary contour compatible with a partially empty Sella turcica and an 8mm fat intensity in hypothalamic region compatible with a lipoma, stable since last 4years. The patient was referred to neurosurgery for further evaluation. The patient currently remained asymptomatic and medical therapy is not indicated as she doesn't have plans of pregnancy. Genetic testing for BHD was discussed. The patient will be followed in the clinic with a follow-up of prolactin levels.

Conclusion

Intracranial lipomas are rare and mostly asymptomatic. Our case demonstrates a rare presentation of hypothalamic lipoma in a patient with family history of BHD causing hyperprolactinemia probably resulting from compression of dopaminergic neurons of the hypothalamus. BHD is an autosomal dominant condition presenting with multiple benign skin tumors like lipoma, fibrofolliculomas, lung cysts, kidney lesions, etc. To our knowledge, intracranial lipomas have not been reported in patients with this syndrome. Further genetic analysis in our case may link the possible presentation of intracranial lipomas in BHD syndrome.

DOI: 10.1530/endoabs.91.P10

P11

Abstract Withdrawn

DOI: 10.1530/endoabs.91.P11

P12

A rare case of Hyperparathyroidism Jaw Tumour Syndrome without jaw tumours

Sarah Mulholland¹ & Alex Lewis²

¹University Hospitals North Midlands, Stoke, United Kingdom. ²Manchester University NHS Foundation Trust, Manchester, United Kingdom

Case History

A 19-year-old female presented with painful left shoulder after slipping whilst doing press-ups. Plain x-ray showed a proximal humeral fracture, as well as a large bone cyst raising concerns of a pathological fracture. She had no past medical history and was not taking any regular medications. On further questioning she did complain of a 2 year history of bilateral painful shoulders and left knee pain. Family history was significant for her father suffering primary hyperparathyroidism aged 27 which resolved spontaneously. Paternal grandmother had recently been diagnosed with primary hyperparathyroidism (aged > 50). She was referred to the local fracture clinic, and due to the x-ray appearances she was also referred to the sarcoma service.

Investigations

MRI of both shoulders suggested bilateral proximal humeral metaphyseal aneurysmal bone cysts (ABC). Subsequent whole body MRI showed cystic lesions in both proximal humeri, as well as within the left ilium, right fibula and left distal femur. Fluoroscopic guided biopsy of the left distal femur lesion showed giant cell-rich tumour of bone, with no evidence of malignancy.

Results and treatment

Biochemistry showed parathyroid hormone 82.8 pmol/l (1.6-6.9), corrected calcium 3.33 mmol/l (2.2-2.6), phosphate 0.61 mmol/l (0.8-1.5), Vitamin D 41.7 nmol/l (> 50). On review there was a previously unreported lesion in her right lower parathyroid gland on the whole body MRI, and MIBI SPECT scan confirmed increased tracer uptake in this area, in keeping with a right inferior parathyroid adenoma. A diagnosis of pHPT was made and cinacalcet was commenced. The patient underwent an urgent right lower parathyroidectomy and histopathology confirmed parathyroid adenoma. Calcium normalised without complication. Genetic testing revealed heterozygous deletion of exons 4-7 in CDC 73 gene, confirming the diagnosis of HPT-JT.

Conclusion and points for discussion

Hyperparathyroidism jaw tumour syndrome (HPT-JT) is a rare autosomal dominant inherited endocrine neoplasia syndrome that predisposes to parathyroid adenomas and carcinomas, ossifying fibromas of the jaw, and renal and uterine tumours.¹ HPT-JT is associated with deletions in the CDC73 tumour suppressor

gene.² Despite its appearance in the name, ossifying jaw tumours are only present in 50% of cases of HPT-JT.² Patients require lifelong surveillance due to risk of parathyroid carcinoma and extra-parathyroid tumours. This case highlights the importance of considering family history and wider genetic testing in young patients with primary hyperparathyroidism. Cascade testing allows for early detection and treatment to reduce risk of complications.

DOI: 10.1530/endoabs.91.P12

P13

Phaeochromocytoma in pregnancy: not all hypertension is essential

Mohitraje Mankumare, Helmine Kejem, Jenny Myers & Clare Mumby
Manchester Royal Infirmary, Manchester, United Kingdom

Case history

We report a case of a 36-year-old female. She was Para 1 and 10 years prior had a vaginal delivery of a normal sized infant after an uncomplicated pregnancy. She was subsequently diagnosed with hypertension managed with Ramipril-10mg. She booked in her second pregnancy at 12 weeks/gestation. Ramipril had been stopped at positive pregnancy test and booking blood pressure was 139/85. Labetalol was commenced and she was seen in the pregnancy hypertension clinic.

Investigations

Renal USS with anomaly scan Renal MRI scan Adrenal hormone panel Routine biochemistry

Results and treatment

The renal USS at 20 weeks showed a 6.5 cm echogenic area in the upper pole of left kidney and the MRI confirmed a 7.8 cm adrenal mass radiologically suspicious of a phaeochromocytoma. A phaeochromocytoma was diagnosed at 22 weeks gestation. She was seen jointly by Obstetrics/Endocrinology and given her advancing gestation and the need to adequately alpha-block prior to any surgery a decision was made to manage her medically with tumour resection post-delivery. She started on doxazosin and titrated to maintain a balance between control of maternal blood pressure and utero-placental flow. Mode of delivery was discussed in detail and a decision for an elective C-section was made. Scans showed normal fetal growth until 33+6 when placental growth hormone testing indicated an increased risk of placental disease. Worsening hypertension led to admission and elective C-section at 35+6. Delivery was complicated by a 2L post-partum haemorrhage and acute kidney injury secondary to period of relative hypotension, which required dialysis. PET and MRI imaging confirmed isolated adrenal phaeochromocytoma and adrenalectomy was performed. She is currently off dialysis with an eGFR 43. Genetic screen- normal.

Conclusion and discussion

Phaeochromocytoma is very rare in pregnancy and carries significant risk of morbidity and mortality to mother and foetus. The optimum management strategies and mode of delivery have limited evidence. This case highlights the haemodynamic instability that can occur particularly around childbirth with the risk of haemorrhage. Investigation for secondary hypertension should be considered in all young hypertensives including in the pregnant population with diagnoses of chronic hypertension.

| | |
|-------------------------|--|
| Renin 3.1 nmol/l/hr | 3.1 nmol/l/hr (normal range for pregnancy) |
| Aldosterone | 1477 pmol/l (normal range for pregnancy) |
| ARR | 476 primary aldosteronism unlikely |
| Cortisol | 716 nmol/l |
| UFC | 126 nmol/24hrs (<165) |
| Plasma metadrenaline | 170 pmol/l (<510) |
| Plasma normetadrenaline | 17476 pmol/l (<1180) |
| 3-methoxytyramine | 209 pmol/l (<180) |
| Creatinine | 48 mmol/l |

DOI: 10.1530/endoabs.91.P13

P14

Hypercalcaemia and delusions of blood poisoning: a parathyroid adenoma refractory to ultrasound-guided ethanol ablation

Alessandro Conti, John Anderson & Emily Goodchild
Homerton University Hospital, London, United Kingdom

Case history

An 85-year-old man with primary hyperparathyroidism, resistant to cinacalcet, presented to hospital with paranoid delusions, weakness, constipation and thirst.

His past medical history was of vitamin D deficiency and arthritis of the spine. Regular medications were lansoprazole, senna, and fluticasone nasal spray. He was a never-smoker and had no relevant family history. Neck examination was unremarkable.

Investigations

Corrected serum calcium (cCa) was initially 4.54 mmol/l, parathyroid hormone (PTH) 104.5 pmol/l, phosphate 0.52 mmol/l, potassium 2.9 mmol/l. 24-hour urinary calcium was 10.1 mmol/dL and calcium:creatinine clearance ratio 2.24. Early morning cortisol was 957 nmol/l, thyroid and liver function were within reference ranges. Initial intravenous fluid therapy lowered cCa to 4.12 mmol/l. A Tc-99m Sestamibi scan identified an oxyphil-rich parathyroid adenoma related to the left upper lobe of the thyroid, later confirmed on ultrasound as a well-defined 17x8x14 mm oval parathyroid lesion with peripheral cystic change.

Results and treatment:

His frailty precluded parathyroidectomy. Management with intravenous fluids, pamidronate, cinacalcet, and denosumab failed to normalise cCa or PTH. Ultrasound-guided ethanol ablation of his parathyroid adenoma was performed. Under local anaesthetic and ultrasound-guidance, a 23-gauge needle was inserted into the parathyroid adenoma and 0.2mls 100% ethanol was injected into the lesion. The procedure was well tolerated with no immediate complications. PTH decreased from 104.5 pmol/l to 24.0 pmol/l and cCa decreased from 3.33 mmol/l to 2.94 mmol/l. The procedure was repeated twice, at 19 and 28 days. Although cCa briefly normalised to 2.49 mmol/l after the third ablation, it returned to a peak of 4.94 mmol/l, and the nadir of PTH was 24.0 pmol/l. The patient died as a result of poor oral intake and hypotension, two months after the first ablation.

Conclusions and points for discussion

Ultrasound-guided ethanol ablation of a parathyroid adenoma is an alternative to surgery in resistant hyperparathyroidism. Results elsewhere showed significant reduction in adenoma size, PTH, and cCa in a comparable patient population (Yazdani, Khalili, Siavash, et al., 2020). This technique carries a relatively small side effect profile and the resources required to perform it are available in district general hospitals. In this case, the procedure was technically successful and showed measurable biochemical improvement. It offered some hope to the patient and his carers, despite events revealing that the improvement was not sustained. The process may help others in this difficult position.

DOI: 10.1530/endoabs.91.P14

P15

What is the role of 11C Methionine PET-CT in the clinical evaluation of ACTH-dependent Cushing's disease?

Adetokunbo Idowu, Mon Hla & Sheharyar Qureshi
West Middlesex University Hospital, London, United Kingdom

Case History

26 year old man with uncontrolled hypertension and weight gain over the last 10–15 years associated with abdominal stretch marks. His past medical history includes hypertension managed with four oral anti-hypertensive agents and a BMI of 36.74 kgm² (with centripetal obesity). There is no family history of hypertension.

Investigations

However, there was historical biochemical evidence of hypokalaemia (between 2.6–3.2mmol/l) in the past year but his serum aldosterone levels was not elevated (renin 1.2 nmol/l/h, serum aldosterone <60 pmol/l). Further investigations include 24 hour urinary free cortisol (774 nmol/day), post ONDST serum cortisol (807 nmol/l) with serum ACTH 56.7 ng/dl. These were suggestive of possible Cushing's disease. His enhanced MRI of the pituitary gland did not identify a discrete lesion and there was no enlargement of the pituitary gland noted. His CT scan of the abdomen revealed bilateral adrenal enlargements.

Results and Treatment

Given the high suspicion of ACTH-dependent Cushing's syndrome, his case was discussed at our regional pituitary multi-disciplinary team meeting and further tests performed. These are: i) cortisol day curve that identified persistently elevated serum cortisol levels with non-suppressed ACTH; ii) elevated salivary cortisol levels taken on three occasions; iii) an elevated 9am serum cortisol level following repeat ONDST (380nmol/l); as well as iv) IPSS that revealed a central to peripheral ACTH gradient that excluded ectopic ACTH. He was then commenced on metyrapone 500mg BD and further cortisol day curves were performed to guide the up-titration of his metyrapone dose. His whole body DEXA scan revealed a BMD that is below the expected range for age at the lumbar spine and hips. NM Methionine PET/CT demonstrated heterogeneous tracer activity in pituitary gland with slightly higher activity towards the right and minor left lateral extension.

Conclusions and Points for discussion

Different imaging modalities having been utilised to evaluate ACTH dependent Cushing syndrome. We advocate the use of 11C Methionine PET CT in the evaluation of pituitary adenomas due to its high sensitivity and ability to detect lesions that may be difficult to identify on cross-sectional MRI sequences. Our case also highlights the importance of multidisciplinary approach in the timely diagnosis and management of patients with high suspicion of Cushing's disease.

References

A role for 11C-methionine PET imaging in ACTH-dependent Cushing's syndrome. Koulouri et al. Eur J Endocrinol 2015 Oct;173(4):M107-20. doi: 10.1530/EJE-15-0616. Epub 2015 Aug 5.

DOI: 10.1530/endoabs.91.P15

P16

Oncocytic parathyroid adenoma presenting with refractory hypercalcaemia and multiple incidental Brown tumours

Nur Azman, Narmadha Munisamy, Dana Le Carpentier, Maria Syed, Paul Spraggs, Jimmy Li Voon Chong, Kimberley Lambert & Meenakshi Parsad

Royal Hampshire County Hospital, Winchester, United Kingdom

Case History

A 61-year-old Caucasian female from Ukraine presented with severe hypercalcaemia following routine blood tests performed by the GP. She reported symptoms of back pain and joint pains. She had renal stones 10 years prior. No history of thiazide or lithium use. No red flags; no change in appetite or weight loss. There was no familial history of Multiple Endocrine Neoplasia (MEN). Examination of her neck, cardiorespiratory, abdomen and breasts were normal.

Investigations

Initial corrected calcium in hospital was 3.81mmol/l (2.2-2.62 mmol/l), with low phosphate 0.63mmol/l (0.8-1.5mmol/l), elevated PTH 173.9pmol/l (1.95-8.49pmol/l), 25-OH vitamin-D 40nmol/l (50-374nmol/l), eGFR 66mls/min, ALP 235U/L (30-130U/l). 24-hour urine calcium was raised 11.3mmol/day (2.5-7.5mmol/day). QT interval was normal on ECG. Urinary tract ultrasound did not demonstrate any calculi. Chest X-ray revealed three opacities projected over right lower lung, arising from the anterior ends of the ribs. Subsequent Chest CT showed multiple expansile lytic rib lesions accounting for the x-ray appearance, with metastasis or myeloma as differential diagnosis. Her myeloma screen was negative. The CT scan also detected a soft tissue lesion 17x24x22mm inferior to the right thyroid lobe, which may represent a parathyroid adenoma in the context of Primary Hyperparathyroidism. This nodule was also identified on neck ultrasound. Whole-body FDG PET-CT confirmed the presence of an enlarged right lower parathyroid gland with multiple brown tumours of the skull, appendicular and axial skeletons. Her DEXA scan demonstrated osteoporosis of the radius, T-score -4.9.

Results and treatment

She was initially treated with aggressive fluid resuscitation and intravenous Pamidronate 90mg, following which calcium level decreased to 3.23mmol/l. She was also started on cinacalcet 30mg daily, in response to this calcium began to fall. Subsequent outpatient reviews had led to multiple admissions for intravenous fluids and Pamidronate over a period of three months, proving that she had refractory hypercalcaemia. She underwent right inferior parathyroidectomy whereby the nodule was fully resected. Histological examination was in keeping with an oncocytic parathyroid adenoma, weighing 7 grams. Calcium was normalised at 2.42mmol/l post-operatively and she is recovering well.

Conclusions and discussion

Primary Hyperparathyroidism with end-organ damage is an indication for surgical intervention. In this case, the timing for parathyroidectomy was relatively urgent due to refractory hypercalcaemia and intolerance to cinacalcet. Osteitis Fibrosa cystica (Brown tumour) is rare occurring in about 2% of patients with Primary Hyperparathyroidism. We expect that the skeletal lesions will regress with normalisation of PTH and calcium levels.

DOI: 10.1530/endoabs.91.P16

P17

47 XYY Syndrome; compared to XXY; do both 'Y' and Thyroxine differ?

Andrew Solomon, Aiman Haddad & Tabish Saifce
London North West University Healthcare NHS Trust, London, United Kingdom

Case history

We present a 61-year-old male with a background history of 47 XYY syndrome who was referred to the endocrine outpatient service with abnormal thyroid function tests. He has mild learning disabilities, asthma, action tremor, erectile dysfunction, and type 2 diabetes. He was tall in stature with obvious clinodactyly. He had been evaluated for his tremor by our Neurology colleagues.

Investigations

His blood tests results were as follow- TSH 5.38 mIU/L (0.27-4.20), FT4 11.6 pmol/l (12.0-22.0), FT3 4.5 pmol/l (3.1-6.8), Testosterone 16.9nmol/l (6.3-26.5), LH 15.6 IU/L (1.7-8.6), FSH 7.7IU/L (1.5-12.4), Prolactin 200 mIU/L (86-324), Cortisol 309 nmol/l, IGF-1 16.3 nmol/l (3.5-32.0). His Anti TPO were negative.

Discussion of results

His testosterone levels were normal with mildly elevated LH and normal FSH. The Thyroid function tests were in keeping with primary hypothyroidism with negative antibodies.

Conclusions and points for discussion

47 XYY Syndrome, also known as Jacobs syndrome (JS), is a rare genetic condition. Hallmark clinical features includes tall stature, clinodactyly, macrocephaly & hypertelorism. Recognized associated complications includes asthma, action tremor, seizure disorders, infertility, and psychological problems (1). An action tremor can be seen in JS and should be a clue to consideration of karyotyping. Also patients should be offered genetic testing to rule out Klinefelter's syndrome (KS) 47 XXY where some patients sometimes share JS features including tall stature & infertility. In KS, the testes are likely to be small in volume with presence of gynecomastia. There are no previous studies to suggest any correlation between Hypothyroidism and JS, but one multicentre study showed that the prevalence of hypothyroidism in KS was similar to normal male population, showing absence of increased risk of hypothyroidism associated with the XXY karyotype (2).

References

1. Sood B, Clemente Fuentes RW. Jacobs Syndrome. 2022 Sep 26. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. PMID: 32491631.
2. Balercia, G., Bonomi, M., Giagulli, V.A. et al. Thyroid function in Klinefelter syndrome: a multicentre study from KING group. *J Endocrinol Invest* 42, 1199–1204 (2019). <https://doi.org/10.1007/s40618-019-01037-2>

DOI: 10.1530/endoabs.91.P17

P18

Recurrent symptomatic pituitary hyperplasia mimicking macroprolactinoma in pregnancy

Michael Onyema¹, Quratulain Tanveer², Samira Khalilova¹, Fannie Lajeunesse-Trempe¹, Simon Aylwin¹ & Georgios K. Dimitriadis¹
¹King's College Hospital, London, United Kingdom. ²Croydon University Hospital, London, United Kingdom

(1) 30-year-old woman presenting at 34 weeks of pregnancy with symptoms of persisting headaches, diplopia and nausea. She presented again 4 years later with similar symptoms in a subsequent pregnancy at 35 weeks with additional complaints of blurred peripheral vision. (2) During her first pregnancy biochemistry revealed marked prolactin elevation (14,000 mIU/l). A non-contrast MRI scan of the pituitary revealed significant enlargement of the gland (22 x 14.4 x 12.5mm) beyond expected physiological limits in pregnancy and in close relation to the optic chiasm. Ophthalmology assessment showed normal visual fields, visual acuity and colour vision. She was managed conservatively with spontaneous resolution of symptoms after delivery. A 3 month post-partum contrast MRI showed her pituitary gland had returned to normal. Prolactin levels normalised (156 mIU/l) at 17 months post-partum, after breast feeding had ceased. During her second pregnancy prolactin levels were once again markedly elevated (34,692 mIU/L and 24,855 mIU/L on repeat). A non-contrast MRI scan revealed a 22 x 14.5 x 12mm well defined isointense pituitary lesion reported as a macroadenoma, with mild mass effect on the optic chiasm. Ophthalmology assessment showed an unremarkable OCT with a slightly constricted right-sided Goldmann visual field. (3) Per MDT discussion she commenced Cabergoline therapy (only taken for 1 week). Symptoms once again resolved soon after delivery. A contrast MRI scan at 4 months post-partum showed her pituitary gland had returned to normal again without an identifiable focal lesion. 6 months post-partum her visual field assessment was unremarkable; additionally further prolactin levels were normal (breast feeding ceased at 3 months post-partum). On endocrine clinic review at this time she remained stable and asymptomatic. On further questioning she had regular menstrual periods between pregnancies (both

of which were spontaneous) and there was no history of galactorrhoea when not breast feeding. No further children were desired, but a recommendation was made for visual field monitoring during any potential future pregnancy. (4) Pituitary hyperplasia is a common entity in pregnancy. Exaggerated symptomatic hyperplasia in pregnancy is a rare occurrence and recurrent episodes in the same individual even more so. Assessment requires review of clinical, hormonal and radiological findings. Surgical intervention is unlikely to be indicated in such cohorts due to its transient nature across the peripartum period. Medical therapy with dopamine agonists should be considered especially when associated with accelerated biochemical hyperprolactinaemia, and visual field monitoring is advisable in future pregnancies.

DOI: 10.1530/endoabs.91.P18

P19

Heart failure as the index presentation of Addison's disease: Case Report

Siphya Joseph
 Dorset County Hospital, Dorchester, United Kingdom

Background

Cardiac failure is an infrequently reported complication of Addison's disease which is unique in its reversibility. We report a rare case of heart failure as the initial presentation of Addison's disease.

Case Summary

A 39-year-old gentleman presented with classical features of heart failure and hypotension. His Echocardiogram showed moderately impaired left ventricular function. Addison's disease was suspected due to hyponatremia, hyperkalaemia and low cortisol levels; A short synacten test confirmed this and he was started on dual therapy — hydrocortisone and fludrocortisone. His left ventricular function returned to normal in 5 days. He was followed up with hydrocortisone day curve.

Discussion

Heart failure is a rare but acknowledged complication of Addison's disease. In majority of the cases, the cardiac dysfunction secondary to Addison's disease is reversible with dual therapy of glucocorticoids and mineralocorticoids. Expeditious recognition and initiation of pharmacotherapy is crucial for the reversibility and resolution of symptoms.

DOI: 10.1530/endoabs.91.P19

P20

A Preventable Gonadectomy!

Keerthi Madhurya Kethireddi, Parez Namiq & Anna Crown
 Royal Sussex County Hospital, Brighton, United Kingdom

A 36-year-old man from Romania was referred to the urology clinic with a two-year history of a painful left testicular swelling. On examination, both testes had multiple solid non-tender masses. An ultrasound scan of the testes showed bilateral, symmetrical infiltration of both testes, with scattered calcifications and enhanced blood flow. The differential diagnosis included testicular cancer, granulomatous diseases, leukaemia and adrenal rests. A CT scan showed no metastatic/nodal disease. Blood tests showed normal urea and electrolytes, full blood count, hCG, LDH and alpha-fetoprotein. He was referred to the Royal Marsden Hospital urologists, who reviewed in Testicular Supranetwork MDT meeting, and recommended a bilateral orchidectomy. He had no children but was keen to start a family. Analysis of two semen samples showed azoospermia. He was offered referral to a local fertility centre for micro-surgical testicular sperm extraction or referral to a specialist centre for extraction of sperm at the time of orchidectomy, but was concerned about having cancer and delaying treatment, so he decided to proceed to bilateral orchidectomy. Post-operatively, he was discharged on Testosterone gel 40mg daily. The endocrine team subsequently received a referral as he was fatigued and dizzy post-operatively, with nausea and vomiting and also his histopathology report suggesting the possibility of the adrenogenital syndrome with a differential diagnosis of Leydig cell tumours. In endocrine clinic, he reported taking prednisolone throughout his life, but he didn't know the indication of it, therefore GP was not able to prescribe steroid, so he continued to source it from Romania. He reported was extremely poorly as a neonate and was transferred from the rural hospital to the main hospital in

Bucharest. He was of short stature (154 cm), and short compared to his family. His sister was fit and well. Post-operative blood tests showed a low sodium 125 mmol/L, high potassium 5.9 mmol/L, midday cortisol 74 nmol/L. Subsequent biochemical and genetic tests confirmed the diagnosis of congenital adrenal hyperplasia due to 21-hydroxylase deficiency (17-OH-P 739 nmol/L). The plasma aldosterone was 170 pmol/L by mass spectrometry, with a renin of 12080 mU/L. Re-review of 'staging' CT scan confirmed bilateral diffuse nodular adrenal enlargement. Discussion points include whether the diagnosis of testicular adrenal rest tumors should have been made pre-operatively, and if subsequent treatment could have restored fertility. It highlights the importance of discussing testicular swellings prospectively with male patients with CAH to ensure appropriate management.

DOI: 10.1530/endoabs.91.P20

P21

Crystal Healing in endocrine disease

Hester Lacey, Ali Chakera & Anna Crown
Royal Sussex County Hospital, Brighton, United Kingdom

We present two cases of alternative approaches to treating endocrine disease.

Case 1

A 55-year-old man became steroid dependent in 2017, following a skiing accident and C3/4 fracture, for which he received 13-months of high-dose hydrocortisone. Upon cessation, he developed adrenal crisis, confirmed on short synacthen test. Hydrocortisone replacement therapy was begun. His dose was doubled, then tripled to control his symptoms, in addition to frequent rescue injections for crises. His high steroid requirement was felt due to significant neuropathic pain and dose reduction attempts failed. In 2021, he decided to attempt to 'stimulate' his adrenals to recover functioning, using crystal meth and ice baths, methodology he researched online. By December 2021, he had discontinued hydrocortisone, serum cortisol increased to within normal range and symptoms resolved. He remains off hydrocortisone, and now plans to wean off crystal meth.

Case 2

Case 2 is a 47-year-old woman who presented in 2011 with secondary amenorrhoea and hyperprolactinaemia. Her pituitary profile was otherwise normal. MRI pituitary demonstrated adenoma with suprasellar extension, diagnosed as a likely non-functioning adenoma. Surgery was discussed, but surveillance agreed. Prolactin gradually rose in 2014, associated with slight adenoma enlargement. A diagnosis of macroprolactinoma was considered, and cabergoline recommended, however the patient was a practitioner of crystal healing and preferred to attempt healing techniques to target her symptoms. Surveillance imaging showed progressive reduction in size with no residual adenoma by 2019, confirmed in 2021, with abrupt normalisation of prolactin, despite no medical or surgical intervention, improvement she attributed to her healing practices.

Investigations:

| Case 1 | | | Case 2 | |
|------------|-----------------|--------|--------|-------------------|
| Date | Cortisol nmol/L | | Date | Prolactin (miu/L) |
| 14/8/2018 | 48 | 30mins | 2011 | 970 |
| 19/3/2019 | 10 | 53 | 2014 | 3945 |
| 27/9/2019 | 312 | | 2015 | 351 |
| 06/12/2021 | 431 | | | |
| 29/11/2022 | 456 | | | |

Conclusions

We describe two cases of complementary therapies associated with remarkable improvements in endocrine disease. In case 1, clinical and biochemical resolution of adrenal insufficiency was surprising, given high steroid requirements. However, there is plausibility in his methodology. Methamphetamines are a known HPA-axis stimulant, with marked ACTH-mediated adrenal glucocorticoid secretion following ingestion. Case 2 details a rare but recognised clinical course of non-functioning pituitary adenomas. Resolution also coincided with menopause, which can occur with prolactinomas. Crystal healing could have been causative or coincidental in this notable improvement. The patient keeps copies of her sequential imaging to support crystal healing practices. These cases highlight the power of self-belief as an influential healer in medicine.

DOI: 10.1530/endoabs.91.P21

P22

Cystic Prolactinoma unmasking Meningoencephalocele: When medical treatment leads to surgery

Sophie Greenhalgh & Alexander Lewis

Manchester University NHS Foundation Trust, Manchester, United Kingdom

Case history

21-year-old male presented in November 2006 with visual loss, headaches and fatigue. No previous past medical history. Visual field testing confirmed a left temporal hemianopia with right temporal upper quadrantanopia.

Investigations

Brain imaging revealed a large macroadenoma with suprasellar and lateral extension. Hormone testing demonstrated abnormalities in TSH 5.13 mU/L, Free T4 7.1 pmol/L, random Cortisol 64nmol/L and Testosterone 2.3nmol/L, with an elevated Prolactin 4661 mU/L (lower than expected for the size of lesion). Cabergoline was initiated from January 2007 in attempt to shrink the tumour prior to surgery, in addition to Hydrocortisone and Levothyroxine replacement.

Results and treatment

By May 2007 there was significant reduction in tumour size following up-titration of Cabergoline. This translated to both subjective and objective improvement in vision, with only a small residual left temporal upper quadrantanopia. Prolactin reduced to 494mU/L. Following MDT discussion, surgery was indefinitely postponed and patient continued on medical therapy. MRI imaging in July 2007 confirmed the lesion was no longer compressing the optic chiasm. Ongoing monitoring demonstrated further radiological shrinkage of the macroadenoma and complete normalisation of visual fields and acuity. In November 2009, the left posterior aspect appeared predominantly cystic and extended into the medial temporal lobe. Cystic degeneration of the lesion continued to increase over the next 7 years, but the patient remained asymptomatic on Cabergoline. In early 2018, he developed increasingly frequent episodes of speech disturbance and lip smacking. Following neurological and neurosurgical assessment, the patient was diagnosed with Temporal lobe epilepsy and initiated on anti-epileptic drugs (AEDs). Further imaging illustrated this was due to formation of a medial temporal meningoencephalocele colliding with the expanding cystic prolactinoma, as a result of dopamine agonist therapy. In November 2018, the patient underwent transsphenoidal repair of the meningoencephalocele and resection of the residual treatment-resistant prolactinoma. Histology confirmed anterior pituitary tissue with a lactotroph predominance. Post-surgery, Prolactin suppressed and seizures were eventually controlled on a reduced combination of AEDs. His Cabergoline has been reduced gradually since late 2021 and as of February 2023, Prolactin remains suppressed.

Discussion

Cabergoline remains first line treatment for macroprolactinomas. Its efficacy in reducing tumour size and normalising Prolactin levels, means only a minority of patients go on to require surgical resection. Cystic degeneration can reflect the impact of dopamine agonist therapy on macroprolactinomas, or may represent tumour infarction. Medical treatment can also unmask skull-base defects.

DOI: 10.1530/endoabs.91.P22

P23

A case of persistent hypercalcaemia in the treatment of granulomatous disease

Nadia Osman, Henna Patel & Kirun Gunganah
Barts Health NHS Trust, London, United Kingdom

Section 1: Case history

A 49 year old South Asian gentleman was admitted to the emergency department after monitoring blood tests showed hypercalcaemia (corrected calcium of 3.67mmol/L) and acute kidney injury. He had a recent admission with a new diagnosis of miliary tuberculosis and superadded bacterial infection, complicated by a long and complex ITU admission after initiation of treatment. He was discharged home on colecalciferol 4000 units daily in addition to his anti-tuberculosis agents. On admission, he reported some osmotic symptoms but was otherwise well. He appeared clinically dehydrated but haemodynamically stable. Colecalciferol was stopped and he was managed with IV fluid rehydration whilst further investigations were carried out.

Section 2: Investigations

Blood tests showed a corrected calcium of 3.64mmol/L, PTH 1.0pmol/L, 25 OH vitamin D 95nmol/L, ALP 77units/L, phosphate 1.28mmol/L and serum ACE 73. Myeloma screen was negative. CT imaging showed some improvement of the original pulmonary changes and no evidence of malignancy. A serum 1,25 dihydroxyvitamin D3 was requested in the context of slow to recover hypercalcaemia and was found to be raised at 149pmol/L.

Section 3: Results and treatment

The patient was managed with a combination of IV fluid rehydration, bisphosphonate infusion, a course of steroids to cover for concomitant

granulomatous disease with eventual normalisation of corrected calcium (2.41mmol/l) and PTH (2.2pmol/l).

Section 4: Conclusions and points for discussion

Hypercalcaemia has been described in granulomatous diseases¹ and occurs via endogenous Vitamin D activation through extra-renal production of 1-alpha-hydroxylase. This is mediated through activated macrophages producing 1-alpha-hydroxylase, independently of negative feedback loops⁵; often with a normal 25OH Vitamin D. Vitamin D may have a role in the treatment of tuberculosis. In vitro studies have shown that the up-regulation of 1,25OH₂ Vitamin D can induce an anti-mycobacterial response alongside modifying immune response⁶. Several randomised controlled trials show varying evidence with Vitamin D supplementation and the rates of sputum smear conversion. However given the potential anti-inflammatory benefits and low cost this remains a part of the treatment regime in many centres.⁹ When considering the treatment of hypercalcaemia secondary to granulomatous disease, steroid supplementation will down regulate the immune related activation of 25OH vitamin D.⁸ Although to avoid the need for these management plans the decision to use Vitamin D in the treatment of TB should be carefully considered given the potential systemic complication of hypercalcaemia in a high risk patient.

DOI: 10.1530/endoabs.91.P23

P24

A case report: Cholestatic hepatitis secondary to carbimazole therapy in the management of Graves' thyrotoxicosis

Shar Lei Yee & Kamal Abougilila

University Hospital of North Durham, Durham, United Kingdom

Section 1: Case history

A 51-year-old lady was referred to our endocrinology clinic with a 6-month history of palpitations, generalized muscle aches, heat intolerance, increased sweating and significant unintentional weight loss. She is normally fit and well without any significant past medical problem. Her thyroid function tests showed thyrotoxicosis picture with TSH < 0.05 mIU/L, Free T4 76pmol/l, Free T3 > 30.8 pmol/l with positive TSH receptor antibodies (34.9U/L). Her initial liver function tests were normal. The diagnosis of thyrotoxicosis secondary to Graves' disease was made and she was started on carbimazole 40 mg once a day with propranolol 80 mg SR twice a day. 4weeks later, she developed jaundice, itchy skin, diarrhoea and dark urine.

Section 2: Investigations

Her blood results showed cholestatic picture with Bilirubin 83 umol/L, ALT102 U/L, ALP 447 U/L. Carbimazole was then stopped. She had an ultrasound abdomen which showed normal liver and biliary duct. Liver autoantibody screen and hepatitis serology for hepatitis A, B, and C were all negative. While her ALT and ALP came down within a couple of days of stopping carbimazole therapy, her bilirubin level continued to rise up to 160 umol/L on day 11 until it started to come down gradually following that.

Section 3: Results and treatment

She had a total thyroidectomy done for the definitive management of thyrotoxicosis. She developed symptomatic hypocalcemia following total thyroidectomy which was treated with one Alpha and calcium replacement therapy. Apart from that, she had a very good recovery from surgery and she was put on levothyroxine therapy for life long. On reviewing her bloods one year after thyroidectomy, she was biochemically euthyroid on levothyroxine therapy and liver function tests remained normal.

Section 4: Conclusions and Points for discussion

Cholestatic hepatitis is a rare but serious side effect of carbimazole therapy which can lead to life-threatening liver failure if left untreated. Our patient developed significant hyperbilirubinemia within 4 weeks of starting carbimazole and bilirubin continued to rise for up to 11 days after stopping the offending drug. Currently, routine monitoring of LFTs is not recommended, as cholestatic hepatitis associated with carbimazole therapy remains rare. This case highlights the importance of educating all the potential side effects to patients before starting the treatment and doing urgent investigations if patients develop adverse symptoms.

DOI: 10.1530/endoabs.91.P24

P25

Treat the patient not the disease - A case of a Neuroendocrine Tumor presenting as Cushing's

Bhavna Sharma, Asjid Qureshi, Aimee Di Marco, Sarah Partridge & Florian Wernig

Hammersmith Hospital, London, United Kingdom

68 years old male was admitted with cough and fever during the second UK covid surge. Recent new diagnosis of hypertension and diabetes with worsening psychotic symptoms on background of schizophrenia. Noted previous hypernatremia, hypocalcemia, hypomagnesaemia along with marked refractory hypokalemia and metabolic alkalosis. Cushing's syndrome phenotype was not noted. Failed to suppress cortisol during an overnight dexamethasone suppression test with plasma cortisol remaining 1045 nmol/l. 24-hour urinary free cortisol was 3536 nmol/l and midnight plasma cortisol was 856 nmol/l. Plasma ACTH 275 ng/l with low dose dexamethasone suppression test not revealing fall in cortisol (remaining at 900 nmol/l) Pituitary MRI was normal. CT chest, abdomen and pelvis showed bulky adrenal glands, multiple bronchovascular lung nodules and right lower lobe consolidation and a left supraclavicular soft tissue density of 2 cm which did not show significant DOTATATE uptake. Patient was commenced on metyrapone which was gradually up titrated to 1.5 mg TDS to achieve a mean plasma cortisol of around 300 nmol/l for presumed Cushing's. Eplerenone was added for hypokalemia. He was gradually switched to high-dose metyrapone and 4mg prednisolone as block and replace regime. He was started on rivaroxaban 10 mg for DVT prophylaxis as well as prophylactic co-trimoxazole. Histology of left supraclavicular lymph node was suggestive of a well differentiated neuroendocrine tumor with Ki-67 proliferation index of 2%. It stained negative for ACTH and positive for TTF-1, chromogranin and synaptophysin. Plasma calcitonin was raised at 28,000 pg/ml thus confirming a diagnosis of medullary thyroid cancer with probable ectopic ACTH secretion. Planned total thyroidectomy had to be abandoned due to very advanced disease and medical treatment with Cabozantinib was commenced. Despite a good clinical response to cabozantinib due to low tolerance mainly related to abdominal pains patient was switched to a selective RET inhibitor selpercatinib. This patient is a case where patient preferences and choices alongside a provisional diagnosis treatment has been successful in convoluted patient journey to achieve positive outcomes.

DOI: 10.1530/endoabs.91.P25

P26

Non-islet cell tumour hypoglycaemia (NICTH)

Yin Yin, Ianitha Srikugan, Cynthia Mohandas, Arthur Ogunko & Itopa Abedo

Dartford and Gravesham NHS Trust, Dartford, United Kingdom

An 87-year-old lady was admitted to hospital with severe unexplained hypoglycaemia with capillary glucose of 1.8 mmol/l and went on develop recurrent episodes of symptomatic hypoglycaemia during this admission. She had a background history of diabetes mellitus, well under controlled with diet and a previous diagnosis of solitary fibrous pleural tumour of left lung, which was resected completely in 2013 but reoccurred in 2022 with left sided pleural effusion. Her liver and renal function tests were within normal reference range. She has a normal cortisol response to synacthen test as follows: 335nmol/l at zero minutes, 955 nmol/l at 30 minutes and 1066nmol/l at 60 minutes. CT chest showed a 22 cm solid lesion in the left hemithorax, which had enlarged, considerably in comparison with previous scans and represented a recurrence. Laboratory assessment during one of the hypoglycaemic episodes (venous glucose 1.3 mmol/l (3.6-5.4)) revealed a C-peptide of 25 pmol/l(normal range 370- 1470) and insulin level of < 12 pmol/l (normal level 18-173). Paraneoplastic hypoglycaemia likely due to NICTH was suspected, however IGF-2 level could not be processed due to unavailability of radiolabelled assay. She was deemed an unsuitable candidate for further operation and chemotherapy by the lung multi-disciplinary team. An initial attempt to treat hypoglycaemia with a tapered dose of prednisolone failed, so she was continued on oral prednisolone 15 mg once a day. Unfortunately, hypoglycaemia (capillary blood glucose 1.7mmol/l) re-occurred and she was re-admitted to hospital and Prednisolone dose was increased to 30 mg once day. If this fails Growth hormone injection will be next available treatment option for her although her prognosis is poor in view of the advanced neoplastic disease.

Discussion

- NICTH is a rare cause of paraneoplastic hypoglycaemia and is mostly seen in mesenchymal and epithelial tumours
- It is due to an underlying tumour producing excessive insulin like growth factor (IGF-2) or pro IGF-2.
- It can cause profound and persistent hypoglycaemia and may not respond to medical treatment and the main stay of treatment is surgical excision of underlying tumour

DOI: 10.1530/endoabs.91.P26

P27**How we treated a challenging case of Radioiodine (RAI)-refractory Papillary Thyroid Carcinoma in a young woman!**

Geethika Thota & Roopa Roy

Saint Peter's University Hospital, New Brunswick, USA

Case Information

A 39-year-old woman from Guatemala with no significant past medical history initially presented with swelling in neck & obstructive symptoms. She was diagnosed with papillary thyroid carcinoma in March 2017 & underwent a total thyroidectomy & LN Dissection. Pathology showed multifocal, largest tumor size 3.2 cm, with one involved lymph node, significant angiolymphatic invasion, and was staged as initially received 121 mCi of radioactive iodine ablation in April 2017. However, she developed recurrence and disease progression over a five-year course are summarized below.

Investigations

- Dec 2017 - US Neck mapping - 2 abnormal nodules in lower left thyroid fossa, persistently abnormal speculated lymph node cluster in left mid-neck. FNAB of the Thyroid nodule, LN - Negative for malignancy, TSH <0.1
- Nov 2018 US Neck mapping showed cystic degeneration of lymph nodes 35 mm, and stable thyroid nodules in left fossa, TSH <0.1
- Feb 2019 US Neck showed stable/smaller left lymph node with progressive cystic change.
- Dec 2019 Abnormal left internal jugular chain node. Biopsy positive for MALIGNANCY. Plan was to proceed with LN Dissection, WBS. Surgery was delayed due to COVID Pandemic and family issues.
- June 2020 shows the stability of left internal jugular LN
- Oct 2020 LN Dissection, total of 6 lymph nodes 1 in Level 4, 3 in Level 2, and 2 in Level 3 positive for PTC with extracapsular extension.
- Feb 2021 stimulated TG 21.6, 125 mCi of RAI; pretreatment scan with 0.4% uptake, WBS scan with no abnormal uptake.
- Nov 2021 The previously visualized left thyroid fossa nodule is stable. There is a larger bilobed nodule; suspicious nodules are present.
- Dec 2021 PET /CT - Focal FDG avidity within left paratracheal region associated with a small amount of soft tissue thickening is suspicious for recurrent malignancy. FDG Activity in left external iliac & inguinal Lymph node, CT neck with enlarged left level 1B LN and 7mm left thyroid fossa
- Feb 2022 FNAB of left thyroid fossa lesion 2/22 positive for malignancy. CT Thorax/ Abdomen/ Pelvis- Negative, She was started on Lenvatinib 24mg daily, had S/E hand-foot syndrome, and Lenvatinib was reduced to 14mg daily.

Radioiodine (RAI)-refractory thyroid cancer is extremely rare, with an incidence of 4-5 cases per million a year. This case illustrates the challenging management of radioiodine-refractory DTC in a 39-year-old woman with recurrence. Further clinical trials investigating alternative therapies in the treatment of RAI-R thyroid cancer would be of great benefit to patients seeking treatment.

DOI: 10.1530/endoabs.91.P27

P28**Mitochondrial DNA Depletion syndrome 1 (MNGIE type) – a rare cause of premature ovarian failure?**Michael Matheou¹, Garry D Tan¹, Fredrik Karpe¹, Stefen Brady², Louisa Kent², Kassim Javaid³, Jonathan Marshall⁴, Deborah Shears⁵ & Helen E Turner¹

¹Oxford Centre for Diabetes, Endocrinology and Metabolism, Oxford University Hospitals Foundation Trust, Oxford, United Kingdom. ²NHS England Highly Specialised Service for Rare Mitochondrial Disorders, Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom. ³Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal sciences, University of Oxford, Windmill Road, Oxford, United Kingdom. ⁴Gastroenterology, Horton General Hospital, Oxford University Hospitals NHS Trust, Banbury, United Kingdom. ⁵Oxford Centre for Genomic Medicine, Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom

Case history

A 39 year old lady was being investigated and managed for premature ovarian insufficiency (onset aged 29y) associated with an unusual constellation of symptoms. Following normal childhood and pubertal development, she subsequently developed fatigue, multiple gastrointestinal symptoms and was underweight with evidence of weight loss, and a most recent BMI of 17 kg/m². She had previously been reviewed due to marked absence of subcutaneous fat in the lower extremities with acanthosis nigricans. A possible diagnosis of acquired

partial lipodystrophy was made, although the cause was unclear (genetic analysis was negative for commoner causes (*LMNA*, *PPARG* and *PLIN1*)). HbA1c was normal but pioglitazone was commenced in view of the marked insulin resistance. She had no other medical problems. She was the oldest child of consanguineous first-cousin parents of Pakistani origin. She had 5 younger siblings. They were all reported to be well apart from one brother who died age 21y, with a history of generalised weakness and failure to thrive throughout childhood.

Investigations

Hormone profile at diagnosis confirmed POI (FSH 81.5 IU/ low oestradiol 40 pmol/l). Autoantibody screen was negative and karyotype was normal (46,XX), with a normal repeat size for *FMRI*. Ultrasound pelvis demonstrated a thin endometrium and small ovaries. Latest DEXA scan from 2022 showed osteoporosis; T score of -3.4 total hip. Concurrent gastroenterology investigations showed oesophageal dysmotility and severe gastroparesis. Cross-sectional imaging highlighted a 9.9mm angiomyolipoma of the right kidney, prompting MRI head to exclude tuberous sclerosis which incidentally demonstrated symmetrical abnormal diffuse T2/FLAIR hyperintensities in the white matter suggestive of a leukodystrophy.

Management

In light of the diagnostic uncertainty, history of consanguinity and features of leukodystrophy on MRI, she underwent whole genome sequencing which identified homozygosity for the c.559C>T; P.(Gln187*) variant in the thymidine phosphorylase gene (*TYMP*). This was a novel variant not previously reported in the literature which was considered to be pathogenic and associated with Mitochondrial DNA depletion syndrome 1 (MNGIE type).

Conclusion and points for discussion

Mitochondrial DNA depletion syndrome 1 (MNGIE type) is a rare autosomal recessive progressive degenerative disease. Cardinal features are gastrointestinal dysmotility, cachexia, peripheral neuropathy, ocular signs, hearing loss and leukoencephalopathy. Although there are no reports of POF associated with this disorder in the literature, ovarian function is known to be affected in other mitochondrial conditions, and we postulate that this is the cause of her amenorrhoea.

DOI: 10.1530/endoabs.91.P28

P29**Pathological fracture in Osteitis Fibrosa Cystica: a late skeletal complication of uncontrolled primary hyperparathyroidism**

Georgia Vellacott, Zaw Htet, Andrew McLaren & Chitrabhanu Ballav Buckinghamshire Healthcare NHS Trust, Aylesbury, United Kingdom

Case history

An 80-year-old woman, with a background of primary hyperparathyroidism (PHPT), presented to the emergency department with a spontaneous pathological fracture of her left femoral shaft. Blood tests revealed severe hypercalcaemia (corrected calcium 3.26 mmol/L, 2.1 – 2.55) after being lost to follow up for twenty years. She was vitamin D replete after supplementation, had normal renal functions (creatinine 76 umol/L, 50-98), and high parathyroid hormone (PTH 199 pmol/L, 3-12), confirming PHPT. A technetium 99m-sestamibi scan of her parathyroid gland found intense isotope uptake on right and left sides of her neck. Ultrasound correlation was unclear because of the presence of thyroid nodules. She was medically optimised with Cinacalcet, having initially declined parathyroid surgery.

Investigations

Plain radiography demonstrated a displaced fracture of the proximal left femur through a lucent area. Magnetic resonance imaging revealed abnormal tissue within the bone marrow at the point of fracture and two additional abnormal lesions in the right proximal femur. Computed tomography (CT) of the chest, abdomen and pelvis showed no evidence of underlying malignancy. Whole-body low-dose CT demonstrated multiple, lytic lesions throughout the non-vertebral skeleton; tibiae and femurs, right patella, left radius, right index metacarpals, 2nd and 4th left metacarpals and right 4th middle phalanx. Serum electrophoresis and immunoglobulins were within normal ranges, ruling out myeloma as a diagnosis.

Results and treatment

The patient underwent long gamma nail fixation of the left femur and prophylactic intramedullary nail fixation of both the right femur and left tibia, given the pending fracture risk. She was started on Denosumab (60mg subcutaneously every six months) to reduce osteoclastic activity, and Cinacalcet (60mg orally daily) to reduce serum calcium level while undergoing orthopaedic surgery. Five months following presentation, the patient underwent a right superior and left parathyroidectomy. Histological analysis confirmed parathyroid adenoma of the left inferior parathyroid.

Conclusion and points for discussion

The patient described here had been lost to follow up for almost twenty years and unfortunately presented with uncontrolled PHPT resulting in pathological

fracture, and multiple lytic lesions at risk of further fractures requiring significant surgical management. Although extensive bone disease such as this is a rare manifestation of uncontrolled PHPT; it highlights the importance of early parathyroidectomy as the treatment of choice in preventing loss of bone mineral density. Additionally, this case demonstrates that uncontrolled PHPT should be considered in the differential diagnoses of multiple, osteolytic lesions in patients presenting with pathological fractures.

DOI: 10.1530/endoabs.91.P29

P30

Sleep - associated seizures in a thyrotoxic patient

Ngozi Vivienne Obi & Budd Mendis

Nottingham University Hospitals, Nottingham, United Kingdom

History

A 33-year-old man presented to emergency with weight loss of 3 months duration, intermittent sweating and heat intolerance. He had a brother with thyroid disease treated with levothyroxine and did not smoke. He was tremulous and short of breath, with a regular heart rate of 115b/min and blood pressure of 143/71mmHg. Initial assessment showed mildly diffuse non-tender goitre with a bruit, no cervical lymphadenopathy, mild proptosis with mild scleral congestion. TSH 0.01; FT4 88 pmol/l and FT3 30 pmol/l, normal blood glucose and PH, renal function, electrolytes and complete blood count. Inflammatory screen was normal. He was commenced on carbimazole 40mg daily, propranolol 20mg twice daily, and discharged home. Two days later, he re-presented with generalised tonic-clonic seizures during an afternoon nap. His girlfriend described the event during which he was unresponsive. This lasted for few minutes. There was no tongue biting or incontinence. He denied headaches, nor visual phenomena and had no aura, and had been taking his new medications. Post event, he was drowsy, disoriented and had no recollection of events. During his admission, he had two further seizures as described above, witnessed by staff, with full recovery over some hours. Each time, there was no demonstrable neurological deficits.

Results

Further investigations as below: CT brain normal. Echo: Non-dilated chambers, LV ejection fraction is > 55% with no diastolic dysfunction. Immunoglobulins: within normal, no serum paraprotein detected. TPO abs >1300.0 iu/ml (0.0 - 60.0) TSH receptor antibodies and TG antibodies present. MRI head: normal EEG: Occasional faster activity over the frontal region. No epileptiform activity and no focal change.

Diagnosis

A diagnosis of autoimmune thyrotoxicosis was made and patient continued carbimazole 40 mg daily, titrated according to biochemical response. He completed twelve-month anti-thyroid therapy, and was successfully weaned off medications, maintaining euthyroidism off carbimazole. He has remained seizure free and did not require treatment with anti-epileptic medications.

Points for Discussion:

- 1) It is well known that hyperthyroidism is associated with central nervous system dysfunction like hyperexcitability, irritability and disturbance in consciousness but clear-cut seizure disorder is rare prompting us to do a literature search which returned under 15 case reports.
- 2) Moreso, our patient was started on propranolol to control his symptoms. Although it was only a small dose, it is unclear what role this played in precipitating the seizures as propranolol has been named as a drug that could lower seizure threshold in overdose.

DOI: 10.1530/endoabs.91.P30

P31

A Case of Ipilimumab induced New-Onset Type1 Diabetes Mellitus in a Patient with Renal Cell Carcinoma

Geethika Thota & Hongxiu Luo

Saint Peter's University Hospital, New Brunswick, USA

Case Presentation

A 50-year-old female with a recent diagnosis of Renal cell cancer (RCC) with hepatic metastasis and hypothyroidism was referred to the clinic for the management of Diabetes Mellitus (DM). The patient was diagnosed with RCC in 2017 and was treated with immunotherapy Ipilimumab for two years. No family history of Diabetes Mellitus and denies history of corticosteroid usage. No previous episodes of Diabetic Ketoacidosis. She was diagnosed with Diabetes Mellitus one year after starting Ipilimumab and was managed on a basal-bolus insulin regimen. She was also on levothyroxine for the last two years for

hypothyroidism and remained clinically and biochemically euthyroid. She attained menopause 10years ago. Physical examination is unremarkable with normal monofilament tests.

Investigations

Initial labs showed a Complete blood count within normal. The comprehensive metabolic panel showed Glucose 104mg/dl (74-106 mg/dl), Potassium 4.2 mmol/l (3.5 -5.0 mmol/l), Bicarb 25mmol/l (21-33 mmol/l). Hb A1C 6.5%. C-peptide 0.3ng/ml(0.8-3.85ng/ml), GAD 65, ia2 and insulin antibodies negative, TSH 3.420uIU/L (0.5-4.5 uIU/l), Free T4 1.16ng/dl (0.79-2.35 ng/dL), Total T3 78 (71-180ng/dl), Thyroid Peroxidase antibodies(TPO) negative. Pituitary hormone analysis ruled out possible central, which showed FSH >200 IU/L, LH 78.6 IU/L, ACTH 31pg/mL(10-60pg/mL), Serum AM cortisol within normal. The patient was diagnosed with New-onset Type 1 Diabetes Mellitus (Ty1DM) and was started on an insulin pump with DEXCOM for continuous glucose monitoring, requiring a total daily dose of around 15-20 units/day. The patient currently remains asymptomatic and will be followed in the clinic with labs.

Conclusions

Immunotherapy with Anti-CTLA 4 antibody Ipilimumab is the latest advancement in the management of several types of cancer. Various endocrine-related toxicities on the adrenal, thyroid, pituitary are the most commonly reported adverse effects of checkpoint inhibitors. However, our case demonstrates a potential side effect of Ipilimumab-induced New onset Ty1DM. Regular monitoring of blood glucose levels during and after treatment with Ipilimumab is recommended to prevent the fatal side effect of Diabetic Ketoacidosis. Although Immune-related side effects like autoimmune thyroiditis, autoimmune hypophysitis are permanent, given the rarity of the occurrence of Ty1DM after Ipilimumab, it is still unclear if there is a chance of beta-cell recovery or progresses to permanent beta-cell dysfunction.

DOI: 10.1530/endoabs.91.P31

P32

Non-islet cell tumour hypoglycaemia (NICTH) caused by an intrathoracic tumour and responding well to glucocorticoid therapy

Shafana Ahamed Sadiq, Neha Jeyakar, Giuseppe Maltese, Nikhil Johri, Mamta Joshi & Steve Hyer

Epsom and St Helier University Hospitals NHS FT, Carshalton, United Kingdom

Case History

An 81-year-old gentleman was brought to A&E by ambulance after being found to be hypoglycaemic at home by paramedics. His wife reported that he experienced unsteadiness and slurred speech after waking up in the morning and she called the emergency number. On arrival of paramedics, his capillary blood glucose was found to be 1.2 mmol/l and he was administered intravenous dextrose. He also had a couple of similar episodes which were resolved with food. He is not known to have diabetes or alcohol abuse. He had a past medical history of right lung fibrous mesothelioma for which he underwent radiotherapy in 2016 and had been under surveillance. He had several comorbidities including atrial fibrillation, heart failure and hypertension. His medications included Amiodarone, Bisoprolol, furosemide, Spironolactone, Ramipril and Edoxaban.

Investigations

As part of an initial work-up, a CT scan of the chest revealed a right hemi-thoracic neoplasm which had marginally increased in size, when compared to imaging organised 6 months earlier. Further laboratory investigations revealed a normal response to short SynActhen test and normal thyroid function. His prolonged supervised fasting test, confirmed spontaneous hypoglycaemia with concomitant undetectable insulin, C-peptide and pro- insulin. Having excluded islet cell tumour as a cause of hypoglycaemia, we requested IGF-2/IGF-1 ratio, which was elevated at 12.7, consistent with the diagnosis of non-islet cell tumour.

Treatment

He was prescribed Prednisolone 10 mg OD at bedtime, and he was asked to carry out pre-meal and mid night capillary glucose testing to establish the dose of steroids. He responded well and his hypoglycaemic episodes were abolished with steroid treatment.

Discussion

Non-islet cell tumour hypoglycaemia (NICTH) is a rare cause of hypoglycaemia which is due to excessive secretion of insulin-like growth factor (IGF)-2 or pro IGF-2. These molecules can activate the insulin receptor and can cause hypoglycaemia. NICTH is mostly seen in epithelial and mesenchymal tumours. Complete tumour resection is curative but is often delayed or unfeasible. For patients with advanced disease, radiation, and/or chemotherapy have been shown to reduce hypoglycaemia, although to a lesser degree. If patients are not suitable for surgery or when hypoglycaemia persists after surgery, radiation, chemotherapy, medical therapy with glucocorticoids or recombinant GH have been utilized. Glucocorticoids act by promoting hepatic gluconeogenesis, lipolysis, and

reducing peripheral glucose uptake. Glucocorticoids also help to decrease the levels of pro-IGF-2 either by decreased tumour production or by clearance.

DOI: 10.1530/endoabs.91.P32

P33

Aarskog Syndrome - A rare cause of primary hypogonadism

Aparna Chaudhary & Ram Prakash Narayanan

Diabetes Centre, St Helens Hospital, St Helens, WA93DA, Liverpool, United Kingdom

Case history

We present a case of a 34-year-old male diagnosed with bilateral gynecomastia referred to the endocrine clinic. Notable background of left cryptorchidism with orchidopexy at the age of 15, delayed puberty, chronic testicular pain and atopic dermatitis. On examination he had short stature, hypertelorism, low set ears, broad short hands, brachydactyly and clinodactyly of 5th fingers. There was no evidence of cleft lip/palate, teeth abnormalities or inguinal/abdominal hernias. Family history of Aarskog syndrome in multiple male family members including nephews who needed orchidopexy in childhood.

Investigations

Biochemistry was suggestive of a primary hypogonadism picture with low-normal testosterone levels 8.7 nmol/l (6.9 – 23.2) high FSH 25.2 iu/L (1.4–18.1) and borderline-high LH 8.3 iu/L (1.5 – 9.3). Normal oestradiol and prolactin levels. US testes confirmed bilateral small testicles. US breast was normal.

Results and treatment

The patient did not himself recollect being formally diagnosed with Aarskog Syndrome, but his childhood records confirmed that this diagnosis had been made. We have referred him to clinical genetics to explain the condition to him in more detail and its associations. A DEXA scan revealed a low Z score for his age, and we commenced him on vitamin D and calcium supplementation. His echocardiogram was unremarkable. Patient was advised for regular dental checks. He has also been referred to the andrology department for sperm assessment and banking in advance of testosterone supplementation.

Conclusions and points for discussion

Aarskog syndrome also known as facioidigitogenital syndrome is a rare and underdiagnosed X linked recessive genetic disorder only discovered in 1970. The prevalence estimates are thought to be 0.4 per million. 20% of cases implicate FDG1 gene variants and runs in families with male predominance though there are reports of females with milder phenotypes. Diagnosis is by the characteristic combination of short stature, facial, skeletal and genital anomalies and can be supported genetically. Clinical features can also involve dental and cardiac abnormalities and mild learning/behavioural impairment often confined to childhood. This abstract aims to prompt clinicians to consider Aarskog syndrome in patients who present with the triad of facio-digito-genital symptoms. Timely diagnosis can trigger screening for associated abnormalities, genetic counselling and treatment.

DOI: 10.1530/endoabs.91.P33

P34

Fertility options for a rare cause of primary amenorrhea

Veronica Chirila-Berbentea & Beas Bhattacharya

Royal United Hospital of Bath, Bath, United Kingdom

Section 1: Case history

A 17 year old lady who was referred to our endocrinology clinic due to primary amenorrhoea in 2019. She had well-established secondary sexual characteristics and hyperprolactinaemia. Patient mentioned one episode of PV bleed when she was about 10 years old.

Section 2: Investigations

Bloods (Feb2020) showed: FSH: 6.2 IU/l; LH: 5.1IU/l; prolactin 1.048 mIU/l; testosterone 1.3 nmol/l. MRI pituitary: lipoma of corpus calosum and pituitary gland asymmetry likely microprolactinoma; MRI pelvis: agenesis of the uterus and upper two thirds of her vagina; minimal lower vaginal vault; bilateral intra-pelvic ovaries Genetic testing: 46 XX with no mosaicism; Bone densitometry DXA: normal.

Section 3: Results and treatment

Diagnosis made as MRKH (Mayer-Rokitansky-Küster-Hauser) syndrome type 2. As we know MRKH is a congenital abnormality (1:4,500 live births) affecting the uterus and upper vagina and can be of two sub-types. In type 1 there is isolated congenital

aplasia of uterus and two thirds of vagina, while in type 2, there is at least one other organ involvement such as vertebral defect, renal abnormality, hearing defect and cardiac involvement. She was referred for further management to the MRKH national centre in London. Echocardiogram was normal, renogram was normal. MRI spine showed normal spinal cord but a right carotid body tissue lesion suggestive of carotid body paraganglioma. MRI neck pointed towards schwannoma with normal metanephrines and she is under follow up. She was started on Microginon 30 for 6 months which increased her uterine size significantly from 29 to 49 mm.

Section 4: Conclusions and points for discussion

Endocrinology clinic follow up: brought up a relevant and important question regarding fertility option. She has intact and functioning ovaries but agenetic uterus and vaginal structure. Therefore options and expectation management are vital in such a presentation. Referring to fertility clinic for possibility of donor egg and IVF surrogacy or even egg freezing for future. This is line with the possibility of ovarian failure. Fertility might be achieved via egg collection and IVF surrogacy or even uterus transplantation. We face a few challenges in this situation regarding her oestrogen replacement for bone protection as her ovaries are still producing oestrogens.

References

1. Diminished ovarian reserve and ectopic ovaries in patients with MRKH syndrome candidates for Uterus Transplantation: our experience; Author: Basilio Pecorino; Clinical and Experimental Obstetrics & Gynecology.(2021)

2. Uterine transplantation in women with MRKH; Author: Weyers, S; EJOG 273; Netherlands, Amsterdam; 2022

DOI: 10.1530/endoabs.91.P34

P35

Severe hyperprolactinaemia associated with domperidone with normal MRI pituitary

Kerrie Thackray & Felicity Kaplan

East and North Hertfordshire NHS Trust, Stevenage, United Kingdom

Section 1: Case History

A 28 year old female initially presented to Endocrinology in 2020 with hirsutism and irregular menstruation but reassuring biochemistry. In 2022, she was referred to Gastroenterology with weight loss, vomiting and dyspepsia and found to have severe hyperprolactinaemia. Past medical history included anxiety/depression. Current medication was esomeprazole 40mg OD and mebeverine 135mg TDS. Cyclizine 50mg TDS had previously been prescribed, followed by domperidone 10mg TDS started three weeks prior to gastroenterology review. The patient was not using hormonal contraception and was not pregnant or lactating. She smoked marijuana four times weekly. She had no new signs or symptoms of hyperprolactinaemia or hormone excess.

Section 2: Investigations

Initial biochemistry in 2020 was reassuring with normal thyroid function and gonadotrophins, although prolactin was not checked at this time. Blood tests in November 2022 demonstrated normal thyroid function and gonadotrophins, but prolactin was significantly elevated at 3833 mU/L. Macroprolactin was excluded. Blood tests in December 2022, 20 days after discontinuing domperidone, demonstrated normal pituitary function and normalised prolactin of 211 mU/L. MRI pituitary in December 2022 demonstrated a normal gland with no apparent differential enhancing lesion.

Section 3: Results and treatment

Given the normalised prolactin and no clinical evidence of hyperprolactinaemia, the patient was reassured and discharged from the Endocrinology Clinic.

Section 4: Conclusions and points for discussion

Prolactin levels in females are generally <500 mU/L, with drug induced hyperprolactinaemia usually associated with only modest hyperprolactinaemia, although severe hyperprolactinaemia is well-recognised as a side effect of metoclopramide, risperidone and phenothiazines. Prolactin >2000 mU/L may indicate a pituitary adenoma. Domperidone is a peripherally selective D2-receptor antagonist acting at the lactotrophs of the anterior pituitary to reduce intracellular cyclic AMP thereby increasing prolactin production. It is thought to cause only mild hyperprolactinaemia. Previous work by Bouwers et al demonstrated that a single dose of domperidone might increase prolactin to 157-2638 mU/L with sustained but lower levels of hyperprolactinaemia following two weeks of treatment. Esomeprazole has been suggested as a cause of hyperprolactinaemia in several case reports, potentially by inhibition of CYP3A4 elevating oestrogen levels. Marijuana has been similarly implicated although literature is mixed with reports of decreased, increased and unchanged prolactin associated with cannabinoids. The significant degree of transient hyperprolactinaemia in this patient may have been exacerbated by co-administration of domperidone with long-term esomeprazole and/or by cannabinoid use and resolved with discontinuation of domperidone.

DOI: 10.1530/endoabs.91.P35

P36**An unusual presentation of Grave's disease**

Younes R Younes¹, Kerushan Thomas¹, Kavitha Lakshmi¹, Vidhu Nayyar¹, Sunil Zachariah¹, James Clark¹, Benjamin C T Field^{1,2} & Julian Emmanuel¹

¹East Surrey Hospital, Surrey & Sussex Healthcare NHS Trust, Redhill, Surrey, United Kingdom. ²Section of Clinical Medicine, Faculty of Health & Medical Sciences, University of Surrey, Guildford, Surrey, United Kingdom

We present a case of a 44-year-old female with fluctuating thyroid function over 12-14 years. The patient originally presented with a high TSH, normal free T3/T4 and a negative anti-TPO antibody. She was initially monitored, then went onto Levothyroxine replacement in an antenatal setting. Subsequently, 12-18 months later, she presented with hyperthyroid symptoms and vastly elevated TSH-receptor-antibody (TSHR-ab) titre of > 10 IU/L, the upper limit of normal being 2.9 IU/L. She was commenced on Carbimazole, with this continuing for 4-years. We have observed a fluctuating thyroid profile and antibody profile, over a 12-14 year period and treatment with Levothyroxine followed by Carbimazole in the same patient. We note that prior to 2018, TSHR-ab assessment was not widely available. This case highlights the fluctuating nature of TSHR-ab titre related symptoms, as interestingly, the same patient displayed both underactive and overactive thyroid physiology over a 12-year period. Her TSH fluctuated between 13.6 to 0.01 mU/L 10-12 years prior to the initiation of Levothyroxine. Symptoms also fluctuated and so the patient was monitored and not treated, this decision being supported by a negative TPO-antibody titre. There was thought that this could have been sub-acute thyroiditis or sub-clinical presentation. The patient was monitored and as TFT did return to normal range, the patient was discharged. After a period of observation, she presented in florid hyper-thyroid phase finally with very high TSHR-ab titre. According to the American Thyroid Association statement (1), the severity of symptoms are proportional to the amount of antibody titre, as noted in this case. There was no overlap with TPO-antibody titre, as this patient's TPO-antibody titre was normal. This prompted another endocrinologist to monitor and not treat the fluctuating TFT's, and this remained the case for some time till final presentation with florid symptoms, high Free T4/ T3 and suppressed TSH.

References

1. Ross DS, Burch HB, Cooper DS, Greenlee MC, Laurberg P, Maia AL, et al. 2016. American Thyroid Association guidelines for diagnosis and management of hyperthyroidism and other causes of thyrotoxicosis. *Thyroid* (2016) 26(10):1343–421. 10.1089/thy.2016.0229

DOI: 10.1530/endoabs.91.P36

P37**Craniopharyngioma: A Comprehensive Overview of a Challenging Pituitary Mass**

Patrick MCGown¹, Kavita Narula², Ramesh Nair², Anastasia Gontsarova², Zane Jaunmuktane¹, Mark Ferguson², Nigel Mendoza², Niamh Martin², Karim Meeran² & Sanjeev Mehta¹

¹London North West University Healthcare NHS Trust, London, United Kingdom. ²Imperial College Healthcare NHS Trust, London, United Kingdom

Case history

A 44-year-old female presented with 6-week history of gradual deterioration in her left vision associated with eye pain. She saw an ophthalmologist who noted that she had reduced visual acuity (6/24) and colour vision (Ishihara colour vision score 3/15) in her left eye with left relative afferent pupillary defect (RAPD). It was thought that she may have a left retrobulbar neuritis so she was advised to attend A&E for an urgent neurology assessment. On examination, she was noted to have diplopia on left lateral gaze, with left sided RAPD and a left nasal hemianopia.

Investigations

MRI of her orbits and brain demonstrated a 15 x 18 x 20 mm lobulated suprasellar mass compressing the optic chiasm (OC) and left optic radiation. Blood tests on admission showed a normal anterior pituitary profile other than a very mildly elevated prolactin of 581 mIU/L (102-496).

Results & treatment

Her case was discussed in the regional pituitary multidisciplinary team (MDT) meeting. Her imaging findings were in keeping with cystic craniopharyngioma. As she had visual impairment with OC and left optic radiation compression, she underwent urgent Extended Endoscopic Transsphenoidal removal of suprasellar

Craniopharyngioma (EETS). Histopathology showed adamantinomatous craniopharyngioma (ACP) with no unusual features. She initially suffered from post operative complication with CSF leak that was promptly repaired. After a short period of polyuria which was either due to vasopressin deficiency or over-hydration, she developed SIADH. This was managed with strict fluid restriction and resolved promptly. Post-operative imaging demonstrated an excellent resection. As there was a good surgical resection, the plan was to undertake surveillance imaging in the first instance before proceeding to radiotherapy.

Conclusions & points for discussion

Craniopharyngiomas are tumours of low histological malignancy which originate from remnants of the craniopharyngeal duct epithelium. The commonest histological subtype is ACP, which is diagnosed with a bimodal peak of incidence (5-15 years & 45-60 years). Clinical presentation is usually with symptoms of increased intracranial pressure, visual impairment and endocrine abnormalities. Treatment comprises of neurosurgery and radiotherapy. Although long-term survival is high, quality of life is frequently impaired due to their close proximity to the optic chiasm, hypothalamus and pituitary gland. Hypothalamic involvement and treatment-related hypothalamic damage frequently result in hypothalamic obesity, fatigue and psychosocial problems. Pituitary surgery may be associated with vasopressin deficiency in the first few days, followed by SIADH. Electrolytes should be monitored closely to direct active fluid restriction.

DOI: 10.1530/endoabs.91.P37

P38**Beneficial side effects: A case of difficult hyperthyroidism treated with Lithium**

Allan Acosta & Ali Hameed

Causeway Hospital - Northern Health and Social Care Trust, Coleraine, United Kingdom

A case of a 48-year-old lady who is under follow-up in the clinic at Causeway Hospital, Northern Ireland for hyperthyroidism. She has a medical history of SLE under follow-up Rheumatologists and bronchial asthma. She presented with palpitations, tremors, sweating, and heat intolerance. On examination, the patient appears anxious. Blood pressure was 130/80, PR 140, RR 20, T 37, SPO2 98% A. Her eye examination revealed no lid lag, exophthalmos, and no redness. Examination of the neck revealed diffuse goiter, firm, non-tender, and no retrosternal extension. There are fine tremors on the hands and moist when touched. Laboratory examinations showed FT4 31.5 pmol/l, TSH < 0.02, and FT3 8.3 pmol/l. TSH receptor antibody was positive. ECG showed sinus tachycardia, and normal chest xray. She was initially started with Carbimazole 20 mg once daily, however, she cannot tolerate it and developed a sore throat and skin rash. A full blood count did not reveal any agranulocytosis. Diltiazem was initially started for symptom relief and tachycardia. Patient symptoms worsened prompting admission to the hospital. We have coordinated with her Rheumatologist about whether propylthiouracil can be tried in view of not affecting her current SLE medications. PTU 100 mg BD was started. Cardiology was also consulted to optimize the management of her tachycardia. A cardioselective, Nebivolol 2.5 mg once daily was suggested to replace Diltiazem. Unfortunately, the patient again developed rashes after PTU was started. A decision to try non-conventional medication, Lithium carbonate modified release, to treat thyrotoxicosis was made. She was started with the dose of 200 mg twice daily. Lithium concentration was checked accordingly for titration of doses (0.4-1.0 mmol/l). The patient's condition improved and managed to tolerate lithium well. She was discharged from the hospital with a close follow-up in our Endocrine clinic. She is maintained on Lithium carbonate modified release 400 mg in AM and 200 mg in PM and Nebivolol 5 mg once daily. She was scheduled for a definitive treatment of radioactive iodine with a plan to stop the Lithium 1 week prior to the RAI treatment. Lithium can be considered as a treatment for hyperthyroidism in case the patient cannot tolerate conventional anti-thyroid drugs like carbimazole and propylthiouracil. Lithium can affect the production in many ways: (1) it inhibits iodine uptake, (2) it inhibits iodine tyrosine coupling, alters thyroglobulin structure, and inhibits thyroid hormone secretion, (3) it also decreases peripheral conversion of T4 to T3.

DOI: 10.1530/endoabs.91.P38

P39**An unusual case of neuropathy**

Veronica Chirila-Berbentea & Beas Bhattacharya
Royal United Hospital of Bath, Bath, United Kingdom

Case history

This 28 year old lady with a new diagnosis of T1DM (April 22) and uveitis complained of severe pain over the trunk described as a burning sensation but not associated with any neurological deficit. There is no history of head trauma, neck trauma or radiation to head and neck area and no skin changes or spinal deformity. She has developed this pain after starting insulin in April 22.

Investigations

May 22: Hb 119, MCV: 85.0; U&Es:normal; LFTs:normal; HbA1c:107; TSH 1.9, freeT4 15.4, B12:520, folate 6.7, ferritin 17, Vitamin D 37, TTG 1.1; September 22: HbA1c: 41 Borrelia Burgdoferi antibodies: negative; syphilis serology: negative MRI brain and spinal cord: no areas concerning of demyelination.

Results and treatment

Diagnosis was made as insulin neuritis or Treatment-induced neuropathy in diabetes (TIND). TIND is a condition characterized by severe distal limb pain, damage in the peripheral nerve fibre and autonomic dysfunction, preceded by a period of rapid glycaemic control. It has been reported in both type 1 and type 2 diabetics treated with insulin or oral hypoglycaemic agents who typically have a history of poor glycaemic control. Pathogenesis of TIND is unknown, with proposed mechanisms including endoneurial ischaemia, hypoglycaemic microvascular neuronal damage and regenerating nerve firing. Pain can affect other areas including the trunk and abdomen, or be more generalised (1). Initially, she was started on Gabapentin, but no improvement. Therefore, amitriptyline and pregabalin were started and her symptoms have improved.

Conclusions and points for discussion

Patients with TIND are at a high risk of associated microvascular disease. Most patients had rapid progression of retinopathy that developed in conjunction with the onset of neuropathic pain (2). In our case, her HbA1c dropped from 107 to 41 in less than 6 months. There is a significant increase in incidence of TIND when the decrease in HbA1c is > 2% over 3 months. Patients with a higher baseline HbA1c, a history of diabetic anorexia or weight loss may be at high risk for TIND and particular care is warranted with intensive glycaemic management of these patients. (3)

References

1. Insulin neuritis and diabetic cachectic neuropathy: a review; Michael Knopp, Maithili Srikantha, Yusuf A Rajabally; Curr Diabetes Rev. May 2013.
2. Gibbons CH, Freeman R. Treatment-induced diabetic neuropathy: a reversible painful autonomic neuropathy. Ann Neurol 2010;.
3. Treatment-induced neuropathy of diabetes: an acute, iatrogenic complication of diabetes; Christopher H. Gibbons and Roy Freeman; BRAIN 2015

DOI: 10.1530/endoabs.91.P39

P40**Rare Case of Metastatic Glucagonoma, A Diagnostic Twist**

Wajihah Amjad & Joanne Randall

James Paget University Hospital, Gorleston, United Kingdom

73 year old lady with metastatic pancreatic cancer referred to diabetes clinic with worsening of her diabetes control. She was primarily under care of Gastroenterology department, for her symptoms of weight loss, abdominal pain, diarrhoea, sweating and anaemia. Her scan showed metastatic pancreatic cancer arising from tail of pancreas with metastasis to liver. The liver biopsy of secondary liver deposit was not conclusive. She had borderline diabetes at her presentation worsened over 3 months from 51mmol/mol to 89 mmol/mol. She was started on oral hypoglycemia agents for few weeks with no improvement, she was then started on insulin therapy. Her case was again discussed in HBMDT for further investigation where it was agreed she should undergo Endoscopic ultrasound biopsy and a neuroendocrine tumour work up was requested. Her Urinary Hydroxyindole Acetic Acid was raised on 2 consecutive occasions. Fasting gut hormone profile revealed chromogranin A and b raised to 306 pmol/l and 242pmol/l respectively. Serum glucagon raised to 243pmol/l. Endoscopic ultrasound for tissue confirmation showed Metastatic Well Differentiated neuro endocrine tumour tail of pancreas grade 2, Ki 67 of 7%. Hence diagnosis of metastatic Glucagonoma. Patient was advised to start on Lanreotide plus chemotherapy after discussion in neuroendocrine and oncology MDT. Patient refused treatment. Patient still follow up in diabetes clinic. She is unable to gain weight because of catabolic effect of glucagon despite discussions with dietetics. Glucagonomas are very rare tumours arising from alpha cells of pancreas 1,2. Most are solitary, but can be associated with Multiple endocrine neoplasia syndrome rarely. This case has unique presentation from very start, interesting twists to final diagnosis. She has few symptoms of Glucagonoma syndrome diabetes, diarrhoea, sweating, Anaemia and weight loss, but no skin rash. 1-Glucagonoma syndrome: A case report JISHU WEI,1,* SHIBO LIN,1,* CONG WANG,2 JUNLI WU,1 ZHUYIN QIAN,1 CUNCAI DAI,1 KUIRONG JIANG,1 and YI MIAO1 Author information Article notes Copyright and License information Disclaimer 2-Glucagonoma and Glucagonoma Syndrome: A Case

Report with Review of Recent Advances in Management Ashraf Al-Faouri, 1, * Khaled Ajarma, 1 Samer Alghazawi, 1 Sura Al-Rawabdeh, 2 and Adnan Zayadeen 3

DOI: 10.1530/endoabs.91.P40

P41**Cushing's Disease in the time of COVID**

Victoria Tyndall & Stuart Ritchie

NHS Lothian, Edinburgh, United Kingdom

Case history

A 37 year old mother of two was referred to DGH by the GP for possible PCOS in 2019. She had an 18 months of weight gain, hirsutism, oligomenorrhoea, abdominal distension, back pain and fatigue. Medical history included asthma and she worked as a teacher. On Endocrine clinic review, she was noted to be floridly Cushingoid. Urgent referral to tertiary Endocrinology in Edinburgh was auctioned and a diagnosis of Cushing's Disease was made alongside multiple resulting sequelae. Trans-sphenoidal surgery (TSS) undertaken, with further surgery a probability.

Investigations

Investigations showed a raised urinary cortisol of 1768nmol/24hr and plasma ACTH 122ng/L. A 10mm "asymmetry" of the pituitary with no obvious adenoma was reported on MRI. CT chest/abdo/pelvis revealed no extra-pituitary source of ACTH, plus new T7/8 fragility fractures. CRH stimulation test gave a flat response of 132ng/l to 148ng/L. Inferior petrosal sinus sampling (IPSS) was undertaken under GA as the patient could not lie flat due to pain. IPSS showed peripheral ACTH levels between 46 -109 rising to 1265-1560 in the petrosal sinus, consistent with a pituitary source. Again, a relatively flat ACTH and cortisol response during IPSS was noted, while prolactin levels indicated good cannulation of petrosal sinuses.

Results/treatment

A "Block and replace" regimen of Metyrapone / Hydrocortisone was initiated. Treatment of multiple sequelae of Cushing's was undertaken, including anti-hypertensives, glucose monitoring, thromboprophylaxis, bisphosphonates, analgesics and diuretics was commenced while awaiting IPSS. The left side of the gland was debulked and post-operatively a transient AVP deficiency spontaneously resolved. Day 3 morning cortisol level was 139nmol/l indicating cure was unlikely. She was discharged on hydrocortisone. Since surgery, abdominal girth, weight and peripheral oedema have reduced but central obesity remains challenging. Blood pressure is controlled. The patient is undergoing serial dexamethasone suppression testing and MRI, with further TSS likely in future.

Conclusions/points for discussion

Cushing's Disease is diagnostically challenging for non-specialty doctors and Endocrinologists alike, and there is often a significant delay in diagnosis. Medical management with Metyrapone was challenging due to a paradoxical worsening of hypokalaemia and hypertension, necessitating additional therapies and monitoring. Regular long term follow up of patients with treated Cushing's is paramount in ensuring any recurrence of disease is identified promptly and early second surgery considered. This case highlights significant long term impact on patient morbidity and cardiovascular risk which can be worsened by clinical and pandemic-related delays.

DOI: 10.1530/endoabs.91.P41

P42**A treasure hunt! An unusual presentation of benign thyroid tissue as neck masses**

Geethika Thota

Saint Peter's University Hospital, New Brunswick, USA

Case Description

A 66-year-old lady with a past surgical history of partial left lobectomy for unclear reasons 30 years ago was referred by the surgeon for evaluation of thyroid nodules. She reported noticing palpable neck masses but didn't report associated heat/cold intolerance, palpitations, diarrhea, tremor, fatigue, skin/hair /sleep /weight/appetite changes. No associated neck pain, dysphagia, fever, upper respiratory tract infection symptoms, or vaccination. No obstructive symptoms reported. No recent Biotin, herbal or over-the-counter remedies. No similar

complaints in the past and no family history of thyroid disorders. There was no radiation exposure in the past. Medications include Aspirin 81 mg, and Olmesartan-amlopidine-HCTZ. She is postmenopausal. No smoking/alcohol/recreational drugs. Vitals normal and BMI 22.7 Physical examination is significant for two right-sided rubbery, non-tender, mobile masses in the right upper neck and palpable right thyroid nodules.

Investigations

The biochemical evaluation revealed normal CBC, CMP.

-TSH 1.33IU/mL, FT4 1.06ng/dl

-Thyroid US: two thyroid nodules 20x19x13mm, 9x8x7mm and several small nodules in right lobe and one Right mid jugular chain lymph node

-US Neck mapping: R level III mid jugular: three lymph nodes measuring 4-5 mm, no fatty hila, other levels and left side are normal

-Lymph node Excisions of two right cervical lymph nodes showed fragments of benign thyroid tissue; no lymphoma, however flow cytometry couldn't be performed due to lack of significant lymphoid population.

-Thyroseq molecular test from the lymph nodes samples obtained was negative for genetic mutation

-Repeat Thyroid US- Stable thyroid nodules

-Repeat TFT after 2 months, TSH 2.180IU/mL, FT4 1.00ng/dl remained clinically and biochemically euthyroid.

Discussion

Ectopic thyroid tissue (ETT) is a rare phenomenon and usually occurs along the normal path of thyroid descent. There have been reports of thyroid tissue found in places such as the abdominal organs, pelvis, axilla, and thoracic cavity. It is, however, rare to find thyroid tissue within lateral neck masses. When thyroid tissue is found in a cervical lymph node, the suspicion of nodal metastasis of differentiated carcinoma of the thyroid should be high. In our case, FNAB of thyroid nodules, excision biopsy of lymph nodes, and a Thyrosequence molecular test were negative for malignancy. Our hypothesis is that in our patient with a previous history of thyroid surgery, the seeding of cells from thyroid tissue may be the possible mechanism.

DOI: 10.1530/endoabs.91.P42

P43

Corticosteroids can prolong the duration of COVID-19 shedding, in the absence of symptoms

Kerushan Thomas¹, Younes R Younes¹, Kavitha Lakshmi¹, Vidhu Nayyar¹, Sunil Zachariah¹, James Clark¹, Benjamin C T Field^{1,2} & Julian Emmanuel¹

¹East Surrey Hospital, Surrey & Sussex Healthcare NHS Trust, Redhill, Surrey, United Kingdom. ²Section of Clinical Medicine, Faculty of Health & Medical Sciences, University of Surrey, Guildford, Surrey, United Kingdom

A recent case series commented on adverse COVID-19 outcomes among patients with Cushing's syndrome, despite minimal symptoms and low inflammatory markers. Excessive glucocorticoids can impede adaptive immune response to viruses, leading to increased infection risks (1). Sarker et al discussed glucocorticoids binding to viral spike-proteins, inhibiting receptor interactions and contributing to prolonged positive swabs, in the absence of symptoms (2). We report the case of a 66-year-old Caucasian male who presented with pyrexia (39.2°C), whilst undergoing inpatient rehabilitation. He was recently diagnosed with transverse myelitis and commenced on high dose glucocorticoids (70mg Prednisolone). The patient denied respiratory symptoms, oxygen saturation was stable on air, and chest XR unremarkable. Bloods results showed; lymphocyte 0.9 x 10⁹ L, CRP 51 mg/L. Combined nose and throat swab on March 14th 2020, was SARS-CoV-2 RNA positive via RT-PCR. Repeat testing 24-hours later remained positive (cycle threshold value 21). With no further pyrexia, he was discharged after an observation period. He remained well, until re-presenting two months later with urinary symptoms; suprapubic pain, polyuria and dysuria. He was hypotensive (90/56), pyrexical (40.2°C), urine dipstick positive for leucocytes and nitrites. Blood results showed: lymphocyte 0.3 x 10⁹/L, CRP 293mg/L. CT and chest XR showed no infective changes. Nevertheless, he tested positive for COVID-19 RNA on May 12th 2020 (cycle threshold value 19.14). The microbiological findings, antibiotic response and urinary symptoms in the absence of respiratory signs, suggested sepsis secondary to E.coli, rather than SAR-CoV-2 re-infection. With chest XR showing no evidence of COVID-19 pneumonia, this supports prolonged asymptomatic SARS-CoV-2 shedding as opposed to chronic infection. This case highlights the role of immunosuppression in viral persistence, focally in patients using high dose exogenous steroids. Importantly, the patient discussed, had persistent RNA detection for 59-days despite no CT changes or respiratory symptoms. Interestingly, his family tested SARS-CoV-2 negative. Although this could suggest that persistently RNA positive individuals may not remain infectious; further peer-reviewed data is required.

References

1. Belaya, Z., Golounina, O., Melnichenko, G et al. (2021). Clinical course and outcome of patients with ACTH-dependent Cushing's syndrome infected with novel coronavirus disease-19 (COVID-19): case presentations. *Endocrine*, 72, 12–19.
2. Sarker, H., Panigrahi, R., Hardy, E., Glover, et al (2022). Glucocorticoids Bind to SARS-CoV-2 S1 at Multiple Sites Causing Cooperative Inhibition of SARS-CoV-2 S1 Interaction With ACE2. *Frontiers in Immunology*, 13.

DOI: 10.1530/endoabs.91.P43

P44

Challenges in the management of chronic hypoparathyroidism and severe hypocalcaemia in post thyroidectomy- is there a rationale in using recombinant human parathyroid hormone?

Lakshmi Nijith, Sigmund Chan, Lisa Ward, Nicole Bottoms & Ritwik Banerjee

Luton and Dunstable University Hospital, Luton, United Kingdom

39-year-old female, with a past medical history of Graves Hyperthyroidism, underwent total thyroidectomy 18 years ago, with resultant hypoparathyroidism, hypocalcaemia and hypothyroidism. Her calcium levels are usually in the range of 1.6-1.8 mmol/l, but there are times when it can go to dangerously low levels (range of 1.4-1.15 mmol/l) causing symptoms, sometimes with ECG changes, requiring hospital admissions and IV calcium replacements. There is no parathyroid activity detected when she is hypo calcaemic. Her TSH levels are always high, even on adequate dose of levothyroxine. After careful questioning and assessment, we got to know that the medication compliance seems to be a major concern, but we have never been able to get her to accept that fact. She was very clear that she has been taking all her medications as prescribed, but also mentioned about some episodes of abdominal discomfort, sometimes frequent diarrhoea after taking those, which can sometimes making her to omit doses. Currently she is on AccreteD3(1500/400) 5 tablets three times a day, alfalcidol 4.5 mg twice daily and levothyroxine 225 mg daily. Her most recent hospital admission was two months ago, when the calcium levels went down to 1.18 mmol/l with symptoms, QT prolongation in ECG, requiring hospital stay, and the calcium levels were 1.82 mmol/l following intravenous calcium infusion. Her levothyroxine absorption test has shown that she was able to absorb levothyroxine when it was given, strongly suggesting that she should be able to absorb her calcium and alfalcidol. Her recent blood tests showed Serum Calcium (adjusted) of 1.82 mmol/l (post calcium infusion), TSH-12.1 mIU/L, Free T4-13.3 pmol/l, PTH 0.2 pmol/l We are planning for a clinical psychologist review to see if we can benefit from an assessment and to identify extraneous factors contributing to non-compliance. The clinical question is whether there is a role of recombinant parathyroid hormone therapy in this clinical context. There are case reports and studies suggesting the rationale of using these agents to treat post-thyroidectomy hypoparathyroidism, but there are no clear guidelines favouring their use in non-compliance induced severe hypocalcaemia.

DOI: 10.1530/endoabs.91.P44

P45

A case of hypogonadotropic hypogonadism (HH) due to CHARGE syndrome

Mariyam Shazra¹, Nour Elkhateeb², Soo-Mi Park² & Craig Parkinson¹
¹Ipswich Hospital, Ipswich, United Kingdom. ²Cambridge University Hospital, Cambridge, United Kingdom

Case history

A 26-year-old man was referred to the Endocrine Clinic due to lack of erections and infrequent shaving for 12 months. An extensive past medical history was noted, the majority of which was attributed to a diagnosis of cerebral palsy. Problems included feeding difficulties from birth with NG, followed by PEG feeding from age 3 to 20, gross motor, speech and language developmental delay, bilateral severe hearing impairment necessitating hearing aids, long sightedness, scoliosis, hypermobility, ataxia and eosinophilic colitis. He denied use of exogenous testosterone and was not seeking fertility. He reported normal smell sensation. Examination revealed a pre-pubertal male with small testes (left = 4 mL, right = 6mL, Tanner stage 3).

Investigations

Blood tests confirmed HH. Testosterone = 1.01 nmol/l (8.64-29.0), SHBG 137.2nmol/l (18.3-54.1), FSH 3.2 IU/L (1.5-12.4), LH 1.5 u/L (1.7-8.6). Prolactin 373mIU/L. Short Synacthen test - normal, TSH 2.10 mIU/L, FT4 16.3 pmol/l, IGF1 17.2nmol/l (11-33) MRI pituitary was normal and he declined a DXA scan. Genetic testing for Kallmann's syndrome was negative and a normal karyotype was returned. Given the associated phenotypic findings testing of the gene panel (R148.1) for HH was requested. This revealed a pathogenic heterozygous CHD7 mutation known to cause autosomal dominant HH type 5 with or without anosmia. Following review by the Cambridge Clinical Genetics Service a diagnosis of CHARGE syndrome was made.

Treatment

The patient has commenced testosterone treatment and will be assessed for Growth Hormone Deficiency (GHD). Screening for other manifestations of CHARGE syndrome is now underway.

Conclusions and points for discussion

CHARGE syndrome is a rare (approximately 1 in 15000 live births) genetic condition and consists of a cluster of abnormalities - Coloboma, Heart defects, choanal Atresia, Retarded growth and development, Genital abnormalities and Ear anomalies - but a wide range of other manifestations have also been described including cleft lip, oesophageal atresia, GHD (15% of cases), typical facial appearance and HH (present in 60% of cases). Deafness occurs in 90-95% of patients with CHARGE syndrome - thus, the presence of deafness in someone with HH should prompt genetic assessment for this condition allowing the provision of holistic care. This presentation will describe CHARGE syndrome in more detail.

DOI: 10.1530/endoabs.91.P45

P46**An unusual presentation of Pituitary macroadenoma in an acute medical take**

Yin Yin, Jessica Tan, lanitha Srikugan, Itopa Abedo, Arthur Ogunko & Cynthia Mohandas

Dartford and Gravesham NHS Trust, Dartford, United Kingdom

Case History

A 64-year-old gentleman presented to the emergency department with acute onset dizziness, nausea, vomiting and difficulty in standing. Although his symptoms lasted only for a few hours, his neurological examination was unremarkable. His past medical history included atrial fibrillation, factor V Leiden deficiency and previous left lower limb DVT. He was not on any medications that can cause hyperprolactinaemia. The stroke team who reviewed him initially diagnosed it as an acute episode of vertigo of a non-vascular aetiology and requested initial CT head that did not show any acute intracranial pathology but it showed a bulky pituitary gland. He was reviewed by the endocrine consultant in the medical take and on further questioning, he denied any history of galactorrhoea, headaches, visual disturbances or symptoms of hypogonadism.

Investigations

Formal Goldmann visual field testing showed no significant abnormality; Pituitary profile showed a raised Prolactin 24886 mIU/L (56-278), random cortisol 284 nmol/l, FSH 4.4 IU/L (1.5-18), LH 2.5IU/L (1.5-9.3), testosterone 3.4 nmol/l (8.4-27.4), TSH 2.82mIU/L (0.3-4.8), IGF1 17.5nmol/l. MRI Pituitary confirmed a pituitary macroadenoma measuring 12mm x 12mm x 21mm partially obscuring suprasellar cistern and showing a protrusion into the left carotid siphon with no optic chiasm compression or no cavernous sinus invasion.

Results and treatment

He was commenced on cabergoline 500 mg once weekly and then discharged. Interestingly his prolactin levels dropped to 273 mIU/L within 8 weeks of treatment with cabergoline. Pituitary Multidisciplinary team meeting advised continuation of dopamine agonist therapy and repeating MRI Pituitary in 6 months.

Conclusions and points for discussion

The novelty in this case is the unusual presentation of an incidental finding of a pituitary macroadenoma in an acute medical take with significant hyperprolactinaemia in a patient who did not display any symptomatology associated with this degree of disease reported in the literature. It was just by chance that his CT scan was reviewed by an endocrinologist earlier on during the admission process and baseline pituitary function was requested. Hence the diagnosis was picked up which could have been easily missed in a busy medical take. The rate of resolution of hyperprolactinaemia on Cabergoline within the first few weeks of treatment is interesting in our case, although there have been similar case reports but with CSF rhinorrhoea following treatment of giant invasive macroprolactinomas, unlike our case who remained well and carefully monitored.

DOI: 10.1530/endoabs.91.P46

P47**Pre-clinical Autoimmune Adrenalitis, biochemically diagnosed; Treat or Not?**

Ahmed M Gharib Ahmed & Elizabeth Cheyne
North Bristol Trust, Bristol, United Kingdom

The Case

We are presenting a 51-year-old Caucasian lady with known type 1 diabetes who was diagnosed with Autoimmune Addison's Disease (AAD) during investigation of persistent hyponatremia. She was admitted with DKA back in November 2022 that was believed to be due to gastroenteritis. Usually, her diabetes control has been reasonable over the years with no severe chronic complications or diabetes-related hospital admissions. In the hospital, she suffered from ongoing hyponatremia that was thought to be due to hypovolemia and excessive Dextrose 5% used with IV insulin. On discharge, Sodium and potassium were 126 and 4.9 mmol/l respectively. GP got back to us two weeks after discharge since sodium failed to improve and hence hyponatremia work up was initiated. This revealed low morning cortisol that remained stationary after Synacthen stimulation. The ACTH came back strikingly high and adrenal antibodies came back positive. Clinically, the patient was completely asymptomatic with no manifestations of hypoadrenalism. BP was 120/70 with no orthostasis. She neither had GI symptoms or hyperpigmentation.

Investigations

| | | |
|-----------------------------|---------------------------|------------------|
| Sodium: 121-132 pmol/l | Potassium: 4.5-5.9 pmol/l | ACTH: 571.9 ng/l |
| Basal cortisol: 273 nmol/l* | 30 and 60-min | Adrenal |
| | post-Synacthen: | Antibodies: |
| | 277 and 263 nmol/l* | positive |

The rest of routine biochemistry was normal

*Cut off level to diagnose adrenal insufficiency is 450 nmol/l

Treatment

Despite being asymptomatic, we decided to treat with hydrocortisone and fludrocortisone and monitor clinical and biochemical follow up

Conclusion and points for discussion

- AAD has a long latency before presentation in most patients.
- Adrenal steroidogenic function is on a steep downward trajectory at the time of diagnosis and that declines irrespective of the steroid replacement treatment and changes to ACTH levels.
- This looks like the opposite of honeymoon period in T1DM where there's slight improvement of B-cell function following insulin therapy.
- A minor subset of patients with AAD like this lady, have residual low-level adrenal steroidogenesis. Whether these patients represent a distinct cohort either in terms of their etiopathogenesis, requirement for steroid replacement or resilience to adrenal crisis and other complications remains unknown.
- This somehow resembles mild C-peptide positivity in some patients with milder forms of T1DM.
- This observation is important, because it likely indicates preservation of adrenal capsular stem cells despite the autoimmune attack. This may open new therapeutic window in the future to ameliorate this chronic condition.

DOI: 10.1530/endoabs.91.P47

P48**Poly Cystic Ovarian Syndrome: Common condition, with unusual presentation**

Wajiha Amjad

James Paget University Hospital, Gorleston, United Kingdom

18 year old female was referred to endocrinology from Paediatric and adolescent gynaecology with secondary amenorrhoea. She had her menarche at age of 15 years with profuse bleeding for three days only, no spontaneous periods afterwards. She had no symptoms of weight gain, increased hair growth, galactorrhoea, headache or any skin changes. She had significant history of hair loss. She had normal milestones. She achieved her adrenarche and thelarche at age of 12-13 years. Family history unremarkable. She has normal weight BMI = 23, no signs of hirsutism except her Scalp hair line is thin. No Skin changes pertinent to Cushing's syndrome, insulin resistance. Her hormonal profile revealed normal FSH, LH estradiol and progesterone. Although she has raised Testosterone 4-4.2ng/l on consecutive occasions. DHEAS, Androstenedione, 17 OH progesterone normal. Her further workup showed normal ovarian morphology. MRI adrenal unremarkable. She is labelled as case of polycystic syndrome on basis of her oligomenorrhoea and increase testosterone level. She received metformin along with mini pill and then medroxyprogesterone without any effect on her cycle. She later received combined oral contraceptive pill

resulting in withdrawal bleeding. This case is unusual presentation in the context of Secondary amenorrhea just after onset of menarche 1.2. No clinical features. No response to metformin and progesterone. 1-Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group 2004 Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. *Fertil Steril* 81:19–25 [PubMed] [Google Sr]. 2-Characterization of

Functionally Typical and Atypical Types of Polycystic Ovary Syndrome *JJ Clin Endocrinol Metab.* 2009 May; 94(5): 1587–1594. Published online 2009 Feb 24. doi: 10.1210/jc.2008-2248 Jennifer Hirshfeld-Cytron, Randall B. Barnes, David A. Ehrmann, Anthony Caruso, Monica M. Mortensen, and Robert L. Rosenfield DOI: 10.1530/endoabs.91.P48

Author Index for Clinical Update

- Abbbara, Ali WF3
 Abbas, Afroze CB41
 Abouglila, Kamal CB36
 Abraham, Prakash CB52, WC15, WD11
 Abumuaileq, Miral **WA12**
 Agha-Jaffar, Rochan WD4
 Ahamed Sadiq, Shafana **WG2**
 Ahmed, Faroug **CB67**
 AhmedMohamed, Isra CB22
 Akbar, Shahzad **CB29**, WA8
 Al Radhi, Balqees **CB53**
 Al-Ansari, Mustafa WG4
 Al-Riyahi, Mohammad **WG1**
 Al-Sahaf, May WD4
 Al-Sharefi, Ahmed CB53
 Albor, Christo **WE7**
 Aldafter, Assaad **WB2**
 Ali, Mudassir **CB36, CB57**
 Almond, Max WD6
 Alyamani, Arwa **WA11**
 Anandhakrishnan, Ananthi **CB24, WF4**
 Anizor, Chinedu **CB4**
 Anthony, Alan CB41
 Antonypillai, Charles WA16, WC4
 Armeni, Eleni WD15
 Arunagirinathan, Ganesh WF10
 Asam, Muhammad CB34
 Asia, Miriam WD6
 Aslam, Aisha **CB23**
 Aung, Pyei **WA10**
 Awadelkareem, Abuzar **CB34**, WD8
 Awala, Orighomisan **WH6**
 Aziz, Umaira CB50, WC2

 Baig, Irfanulla WF6
 Bakhit, Mohamed WD5
 Banerjee, Amit CB68, WH4
 Bano, Gul CB46, CB59, WB3
 Bashir, Kefah **WG4**
 Basu, Ansu CB25
 Behary, Preeshila CB58, WF3
 Behary, Presheela CB63
 Bell, Richard CB35, WA6
 Berry, Simon **WB1**

 Bhagi, Ridhi CB56
 Bhayat, Hasina WF6
 Biddanda, Aiyappa **WC12**
 Boelaert, Kristien WC11
 Bonanos, Stathis **CB28**
 Bramble, Delanos **CB11**, CB31
 Brooke, Antonia WG6
 Buch, Harit WH6
 Burri, Sushma **WC7**
 Busti, Stefano **CB65**
 Busu, Zvidzayi **WF8**

 Carroll, Paul CB32, WF2, WG5
 Carty, David WA3
 Casey, Caoimhe **WC8**
 Chagger, Herpreet **CB15**
 Chin-Harty, Lisa **CB66**
 Chopra, Tanya **WF5**
 Cilia, Kyle **CB6, WC1**
 Comninos, Alexander N CB58, WF3, CB63
 Coppini, David WA7, WC10, WD3
 Cox, Jeremy CB58, CB63, WD4, WF3
 Craus, Sarah WA7, WC10, WD3
 Cussen, Leanne **WG3**

 Dawood, Huzaifa **WA5**
 de Silva, Nipun Lakshitha **WE4**
 De Sliva, Purnami WH2
 Debono, Miguel CB55, WB1
 Deshmukh, Harshal WA9
 Dewdney, Charlotte **WF7**
 Dhar, Mili **CB40**
 Dhatariya, Ketan WG6
 Di Marco, Aimee WD9
 Dimitriadis, Georgios CB13
 Dimitropoulos, Ioannis CB31, WF9
 Dover, Anna WF7
 Down, Andrew **WC16**
 Drake, William WB5, WD7
 Dugal, Neal WD2
 Dugal, Neil WD14
 D Costa, Ryan Vernon WH1

 Elsayed Mohamed Ali, Nihad **CB42**
 Eyadeh, Ahmad **CB64**

 Faheem, Muhammad **CB50, WC2**
 Farooqui, Azhar WF8
 Flynn, Rachel **WC13**
 Foteinopoulou, Evgenia **WA15**
 Fraser, Sheila CB41

 Gajaweera, Gayan WC4
 Galloway, Natasha **WA1**
 Gamage, Kavinga **CB5**
 Gatt, ArlÒne **CB10, CB62**
 Georgios, Giovos CB54
 Ghieth, Sherif CB11
 Gilbert, Jacqueline CB12
 Gill, Gurmit WE5
 Gilroy, Michael **CB49**
 Gopalakrishnan, Prethivan Pillai **CB38**
 Graf, Anneke WH2
 Grixti, Lydia **WE1**
 Grossman, Ashley WD15
 Gunathilake, Sonali WA16
 Gunganah, Kirun CB24, CB69, WF4
 Gupta, Piya Sen WG5

 Haboosh, Sara CB63, WG5
 Hadjiminias, Dimitri J WF3
 Hamdan, Sawsan CB11, CB31
 Hanson, Petra **CB60**
 Harrold, Christopher CB60
 Hegde, Pallavi WD10
 Hill, Arnold WD2
 Hirwa, Kagabo **WF9**, WH7
 Hnin, Thanda CB34
 Hope, David **CB2**
 Htet, Soe Nyi Nyi **WH7**
 Htun, Kyaw Zin **WE6**
 Htwe, Nang Poe Poe Han **CB41**
 Hughes, David WD5
 Hunter, Steven J CB28
 Hyer, Steve WG2

 Irfan, Aisha **CB61, CB8**
 Islam, Quazi **WD15**
 Issuree, Kiran **WC11**

 Jayasena, Channa WE4
 Jegavanthan, Dhulashiha WA16, WC4
 Jeyaka, Neha WG2
 Johri, Nikhil WG2
 Jones, Ben WD4
 Joseph, Angel Mary **WH1**

 Joshi, Mamta WG2
 Julia, Calvo Latorre WC5
 Juszcak, Agata WD6

 Kabir, Afrin WA9
 Kaplan, Felicity WC9
 Kapoor, Ashutosh **WD4**
 Karra, Eftimia WD15
 Karunasena, Nayananjani WC4
 Khalilova, Samira CB13
 Khan, Asra CB9
 Khan, Hamza **CB18**
 Khan, Huma Humayun **CB19**
 Khan, Irfan CB34
 Khan, Irfan Iqbal **WD8**
 Khan, Shaila **CB63**
 Khine, May Thin **CB20, WB6**
 Khoo, Bernard WD15
 Khoo, Serena Sert Khim CB38
 Khor, Xiao Ying **CB21**
 Khor, Xiao ying **WD16**
 Kilcoyne, Ciara **WC6**
 Kong, Ngai WA6
 Koutroukas, Vaios **WG6**
 Krishnan, Amutha WH5
 Krishnasamy Ganapathy, Kavitha Dhevi **CB25**
 Kumar, Jesse CB4
 Kumarathunga, Dineesha CB54, **WA16, WC4**
 Kumarathunga, P A D M **WE8**
 Kurera, Isuri WD13
 Kyaw, Moe **CB68, WH4**

 Leanne, Cussen WD14
 Lewis, Alexander CB23, WA10, WF11
 Lin, Nyan **WH2**
 Ling, Yong WG4

 Macinerney, Ruth CB44
 Madden Doyle, Lauren WG3
 Majeed, Waseem WD16
 Malhotra, Gaurav CB50, WC2
 Malik, Amna **WE5**
 Maltese, Giuseppe WG2
 Mamoojee, Yaasir CB47, CB53, CB57, WD8
 Masinghe, Sanjana CB34

- McDonnell, Tara **WD14**,
WG3
McEvoy, Robert **WA14**
McGowan, Anne WC8
Meeran, Karim WE4
Melina, Kostoula WC5
Melvin, Audrey WC6
Miller, Ben WD6
Miller, Clare WD14, WG3
Mills, Edouard G **WF3**
Ming, Yong CB38
Minhas, Raisa WG4
Mitchell, Catherine WG4
Mladenova, Irinia WD15
Mongolu, Shiva CB29,
WA8
Moran, Carla WD14
Morrin, Martina WD2
Morrison, Amy **WD1**
Mula, Abigail **WA7**,
WC10, **WD3**
Mullan, Karen CB28
Musselwhite, Janine **WH3**
- Naeem, Ammara WD15
Naidoo, Jarushka WD2
Napier, Catherine CB47,
WD8
Narayanaswamy,
Shakunthala WC9
Nizami, Atif **CB9**
Nizamuddin, Khwaja CB9
North, Matthew CB58
Nwachukwu, Chinaza
WH5
- O'Reilly, Michael W WG3,
WD14, WD2
Olaogun, Idowu **CB1**,
CB3, **WB4**, **WE2**
Olaremi, Japhet **CB27**
Omer, Maria **WA2**, **WD10**,
WF1
Osman, Nadia **CB69**,
WB5, WD7
Osman, Shaima **CB51**
O'Brien, Odharnaith WD2
Pacitti, Siobhan **WC14**
- Palazzo, Fausto CB63
Pallai, Shillo CB44
Panicker, Janki CB14,
WA2, WD12
Panteliou, Ellie WH2
Papanikolaou, Nikoleta
WE4
Patel, Dipesh WD15
Patel, Henna CB69, WB5,
WD7
Patel, Nishchil CB31, WF9
Pathmanathan,
Sivatharshya CB5
Patil, Aashutosh **CB7**
Pearce, Simon CB47
Perumal, Samundeeshwari
CB12
Phang, Soo Yee **CB17**
Pierides, Michael WF8
Pillai, Anita CB44
Purewal, Tejpal WF1
- Quinton, Richard WE1
- Ramlochansingh, Osada
WA4
Ramsingh, Jason CB57
Randeve, Harpal WE8
Ranganatha, Rao CB54
Rashid, Razan Ali **CB47**
Reid, Laura **WF10**
Rich, Laura WC16
Robinson, Robert CB44
Robinson, Stephen WD4
Ronchi, Cristina WD6
Roy Chowdhury,
Sharmistha CB56
Roy, Sabyasachi **WD13**
Rubab, Gul **WH5**
Ryan, Cliona WD2
- Sadaf, Shaikh **CB45**
Sahoo, Saroj WD15
Salari, Syeda **CB26**
Saqib, Aaisha WF2, WG5
Sarwani, Aysha **WD2**
Sarwar, Amna Kiran **WC3**
Sathyanarayan, Sheela
CB13, **WF2**
- Sattar, Nosheen **CB55**
Sawhney, Natasha **CB52**
Seckl, Michael WD9
Seechurn, Shivshankar
WF5
Seejore, Khyatisha CB64
Sennik, Devesh WH2
Shah, Shivangi WH6
Shahbuddin, Ibrahim
CB44
Shamsaldeen, Mohammed
CB14, **WD12**
Sharma, Bhavna **WA13**
Sharma, Sangita **CB39**
Sheikh, Abdur-Raof
CB30
Sheikh, Anum **WC5**
Shekar, Nitin CB34
Shekhda, Kalyan WD15
Sherlock, Mark WD14,
WD2
Shonibare, Tolulope WH1
Siddiqi, Ayesha WC13
Silveira, Maria WC7
Simpson, Helen WC12
Singh, Ainesh WD4
Skordilis, Kassi WD2
Skordis, Kassiani WD6
Sloan, Gordon **CB44**
Smith, Jamie WH7
Smout, Vera **WF12**
Srinivasan, Shari WD2
Stanworth, Roger WD5
Su Khin, Kyaw Linn **WD6**
Subbiah, Kasi **CB12**,
CB13
Subramanian, Venkatram
CB35, **WF6**
Sumanatilleke, Manilka
CB5
Syed, Akheel CB21, WD16
- Taqi, Muhammad CB29,
WA8
Tarigopula, Giridhar WG4
Tebbs, Daniel CB58
Thackray, Kerrie **WC9**
Thadani, Puja CB54, WE8
- Thant, Aye Aye **WF11**
Tharakan, Goerge CB58
Tharma, Jasmine WG5
Thaw, Myat Myat WD6
Thirupathirajan, Vikram
Ajit Rajan **CB31**
Thurston, Layla **WD9**
Triantafyllou, Christina
CB46, **CB59**
Tsoutsouki, Jovanna **CB58**
Tulsi, Dooshyant **CB46**,
CB59, **WB3**
Tuthill, Antoinette WA14
- Uddin, Mohammad Salah
WA9
- Vaineri, Erika WD4
van Heeswijk, Isabelle
WD5
Vella, Sandro CB10, CB62
Velusamy, Anand CB33,
WF2
Verma, Amit **WA3**
- Wallace, Helen CB28
Wellala, Vindya **CB54**,
WE8
Wernig, Florian CB48,
CB63, WD4, WD9
White, Margaret **CB37**
Whitelaw, Ben WA4
Win, Wutyee **CB43**
Wood, Kirsty **WD11**
Wright, Rohana WA15
- Yang, Lisa **CB48**
Young, Ekenechukwu
WA6
Yousseif, Ahmed WD15
Yovos, George WE8
- Zac-Varghese, Sagen **WE3**
Zafar, Sadia **CB56**
Zaki, Beenish **CB32**, **CB33**
Zeeshan, Amna **CB22**
Zia Rao, Komal **WG5**
Zubair Ullah, Hafiz
Muhammad **WC15**

Author Index for National Clinical Cases

- Abdel-Malek, Mariana **OC6**
 Abedo, Itopa P26, P46
 Abouglila, Kamal P24
 Acosta, Allan **P38**
 Agarwal, Mayuri **OC10**
 Ahamed Sadiq, Shafana **P32**
 Ahmed, Ahmed M Gharib **P47**
 Alameri, Majid OC6
 Amjad, Wajiha **P40, P48**
 Anandhakrishnan, Ananthi **OC7**
 Anderson, John P14
 Arlt, Wiebke OC1
 Aye, Mo P3
 Aylwin, Simon OC9, P18
 Azman, Nur **P16, P8**
- Bahowairath, Fatima P1
 Ballav, Chitrabhanu P29
 Banerjee, Ritwik P44
 Behary, Preeshilla OC6
 Bhatia, Kunwar OC6
 Bhatt, Yogesh P9
 Bhattacharya, Beas P34, P39
 Bottoms, Nicole P44
 Brady, Stefen P28
 Branis, Natalia P10
 Brooke, Antonia M OC5
 Brown, Morris OC1
- Cavlan, Dominic P5
 Chakera, Ali P21
 Chan, Sigmond P44
 Chaudhary, Aparna **P33**
 Cheow, Heok OC1
 Cheyne, Elizabeth P47
 Chirila-Berbentea, Veronica **P34, P39**
 Chong, Jimmy Li Voon P16
 Clark, James P36, P43
 Cohen, Mark P9
 Comninos, Alexander OC6
 Conti, Alessandro **P14**
 Cox, Jeremy OC6
 Crown, Anna P20, P21
- de Benito-Llopis, Laura P2
 Deshmukh, Harshal P3
 Di Marco, Aimee P25
 Dimitriadis, Georgios K. P18
 Dodzo, Kumbirai OC7
- Dorward, Neil OC5
 Drake, William M OC1, OC5
- Eapen, Dilip OC10
 Elkhateeb, Nour P45
 Emmanuel, Julian P36, P43
 Eyeson, Josiah OC6
- Ferguson, Mark P37
 Fernandez, Cornelius OC10
 Field, Benjamin C T P36, P43
 Flynn, Rachel OC7
 Forrest, Ian P6
- Gaoatswe, Gadintshware OC7
 Gontsarova, Anastasia P37
 Goodchild, Emily OC1, P14
 Greenhalgh, Sophie **P22**
 Guma, Muna **OC2, P6**
 Gunganah, Kirun OC7, P23
- Haddad, Aiman **P17**
 Hameed, Ali P38
 Hamilton, Paul P4
 Haq, Rizwan **P4**
 Havill, Lynsey P7
 Hla, Mon P15
 Htet, Zaw **P29**
 Hughes, David P7
 Hyer, Steve P32
- Idowu, Adetokunbo **P15**
 Iftikhar, Sahar **OC9**
- James, Andy OC2
 Jaunmuktane, Zane P37
 Javaid, Kassim P28
 Jeyakar, Neha P32
 Johri, Nikhil P32
 Joseph, Siphy **P19**
 Joshi, Mamta P32
- Kaplan, Felicity P35
 Karpe, Fredrik P28
 Kejem, Helmine **P13**
 Kent, Louisa P28
 Kethireddi, Keerthi Madhurya **P20**
 Khalilova, Samira **P18**
 Khan, Jansher OC7
- Khan, Sairah OC6
 Khan, Shaila **P1**
 Kinton, Rebecca P7
 Kumar, Mohit OC4
- Lacey, Hester **P21**
 Lajeunesse-Trempe, Fannie P18
 Lakshminpathy, Kavitha P36, P43
 Lamb, Chris OC2
 Lambert, Kimberley P16, P8
 Laycock, Kate **OC1**
 Le Carpentier, Dana P16
 Lee, Jessica P2
 Lewis, Alex P12
 Lewis, Alexander P22
 Lewis, Dylan OC9
 Luo, Hongxiu P31
- Maltese, Giuseppe P32
 Mamoojee, Yaasir OC2, P6
 Mankumare, Mohitraje **P13**
 Marshall, Jonathan P28
 Martin, Niamh P37
 Matheou, Michael **P28**
 Matson, Matthew OC1
 McConnachie, Alexander OC1
 McDonnell, Fiona OC6
 McGown, Patrick **P37**
 McIntosh, Alasdair OC1
 McLaren, Andrew P29
 Meeran, Karim P37
 Mehta, Sanjeev P37
 Mendis, Budd P30
 Mendoza, Nigel P37
 Mohandas, Cynthia P26, P46
 Mongolu, Shiva P3
 Monson, John P OC7
 Mukhopadhyay, Suchana OC6
 Mulholland, Sarah **P12**
 Mullan, Karen P4
 Mumby, Clare P13
 Munisamy, Narmadha P16, **P8**
 Murray, Emma P4
 Myers, Jenny P13
- Nagarajah, Kalyani **OC8**
 Nair, Ramesh P37
 Namiq, Parez **P20**
- Napier, Catherine P6
 Narayanan, Ram Prakash P33
 Narula, Kavita **P37**
 Nayyar, Vidhu P36, P43
 Nicholson, Clare OC2
 Nijith, Lakshmi **P44**
 Noel, Lauran **P5**
 North, Matthew **P9**
- O'Shea, Donal OC3
 Obi, Ngozi Vivienne **P30**
 Ogunko, Arthur P26, P46
 Onyema, Michael **P18**
 Osman, Nadia **P23**
- Palazzo, Fausto P1
 Panagiotou, Grigorios OC8
 Park, Soo-Mi P45
 Parkinson, Craig P45
 Parsad, Meenakshi P16
 Partridge, Sarah P25
 Patel, Henna **P23**
 Platts, Julia OC8
 Prete, Alessandro OC1
- Quinton, Richard P6
 Qureshi, Asjid P25
 Qureshi, Sheharyar P15
- Randall, David P5
 Randall, Joanne P40
 Ritchie, Stuart P41
 Roy, Roopa P27
- Saifee, Tabish P17
 Sankar, Adhithya **OC4**
 Sathyapalan, Thozhukat P3
 Schulte, Klaus-Martin OC9
 Sharma, Aditi P2
 Sharma, Bhavna **P25**
 Shazra, Mariyam **P45**
 Shears, Deborah P28
 Solomon, Andrew **P17**
 Spraggs, Paul P16
 Srikugan, Ianitha P26, P46
 Ssemmondo, Emmanuel **P3**
 Subramaniam, Yuvanaa **OC5, P2**
 Syed, Maria P16
- Tan, Garry D P28
 Tan, Jessica P46
 Tansey, David **OC3**

Tanveer, Quratulain **P18**

Taylor, Angela OC1

Tee, Suann OC2

Thackray, Kerrie **P35**

Thomas, Kerushan P36,

P43

Thota, Geethika **P10, P27,**

P31, P42

Todd, Jeannie P1

Turner, Helen E P28

Tyndall, Victoria **P41**

Ugur, Antonia P7

van Heeswijk, Isabelle **P7**

Vellacott, Georgia P29

Wallace, Helen P4

Ward, Lisa P44

Wernig, Florian P25

Whitelaw, Benjamin OC9

Wu, Xilin OC1

Yee, Shar Lei **P24**

Yin, Yin **P26, P46**

Younes, Younes R **P36,**

P43

Zachariah, Sunil P36, P43