EP-1221

Two treatment patterns of thyrotropinomas with over 3-year follow-up

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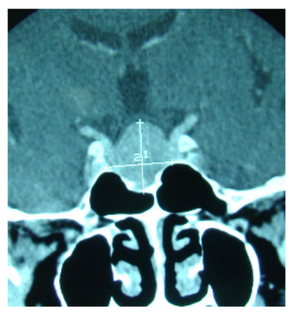
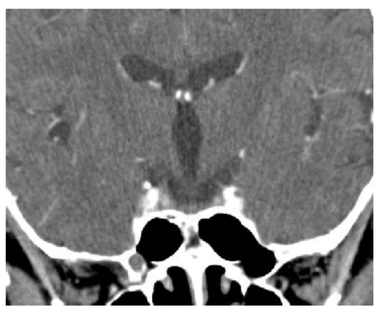
Thyrotropinomas are rare pituitary adenomas (~1% of pituitary tumors). Most of them are macroadenomas. Clinical features of hyperthyroidism are usually present. Neurosurgery is considered the first-line treatment, followed by medical therapy with somatostatin analogues or radiotherapy. We present 2 cases of TSH-secreting pituitary macroadenomas with different therapeutic approaches.

Case 1: ♂, 63-years old man presented with severe weight loss (25 kg in 6 months), atrial fibrillation and congestive heart failure.

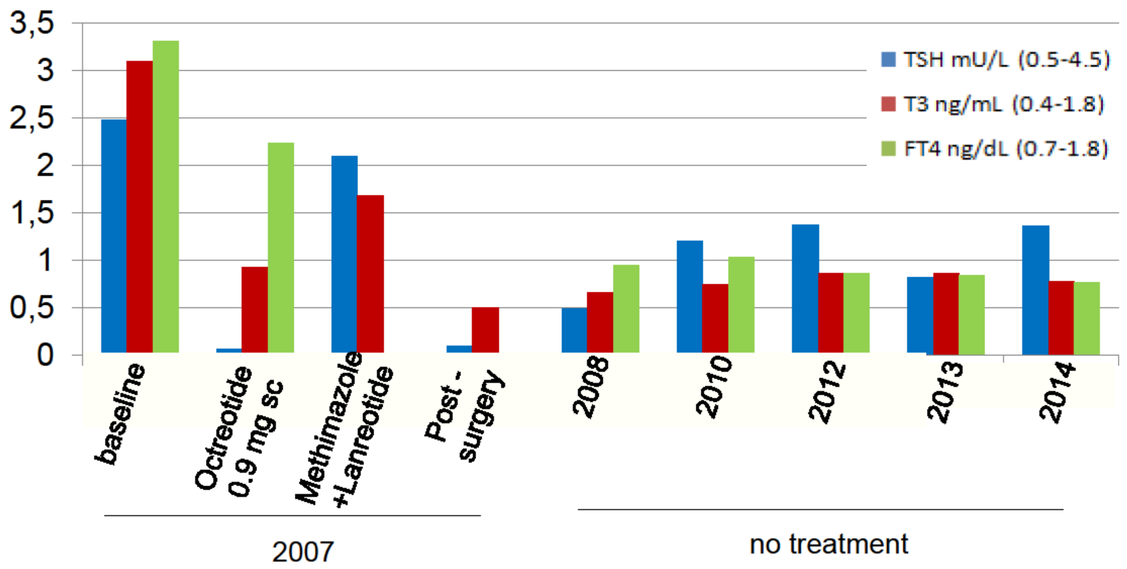
Diagnostic evaluation:
TSH: 7.5 mU/L, FT4: 45.5 pmol/L (9-19 pml/L) → **thyrotoxicosis with inappropriate TSH secretion**
Negative thyroid antibodiy screen (Anti-TPO: 5.6 U/L, TRAb: 0.1 U/L)
Pituitary function tests: gonadotropin insufficiency (LH: 0.86 U/L, FSH: 1.05 U/L, testosterone: 0.11 ng/mL)
Thyroid ultrasound showed no abnormalities
Normal visual field



Pituitary CT scan showed a macroadenoma (2.37/2.56 cm) with suprasellar extension



Post op CT scan showing no residual tumor



Thyroid function tests before and after transsphenoidal adenomectomy

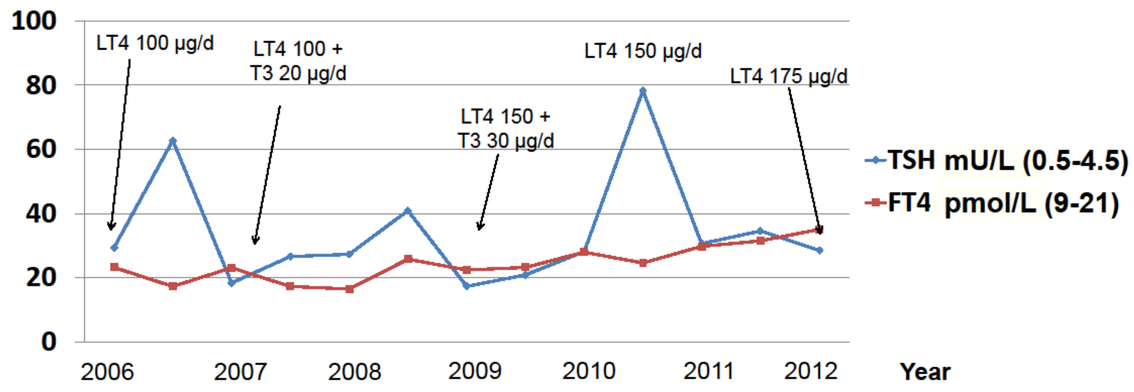
Treatment and follow-up

He received **somatostatin analogues** (Lanreotide 30 mg i.m. every 2 weeks after acute Octreotide test 0.1 mg sc every 8 hrs for 3 days, showing good response) and **antithyroid drugs** (methimazole 60→5 mg daily) for 3 months before **transsphenoidal tumor removal.**

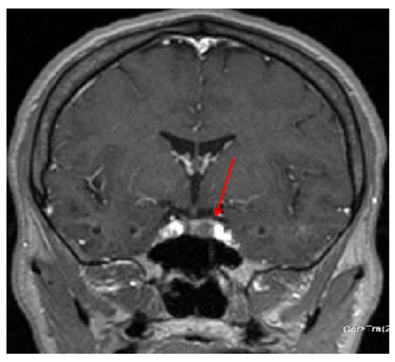
IHC: α and β TSH subunits – positive; negative for GH, PRL, FSH, LH → pure thyrotropinoma

After neurosurgery, he had **complete tumour removal and disease remission** without any antithyroid medication and no signs of recurrence after 7-year follow-up.

Case 2: ♂ 36-years, with a history of total thyroidectomy for thyroid follicular adenoma presented postoperative high TSH although he received daily substitution with 100 - 175 µg of levothyroxine and serum thyroid hormones were in high-normal concentrations. T3 (20-30 µg/day) was added to T4 treatment, but TSH remained high (between 41-18.4 mU/L for FT4 between 16.5-25.8 pmol/L), showing inadequate TSH secretion.



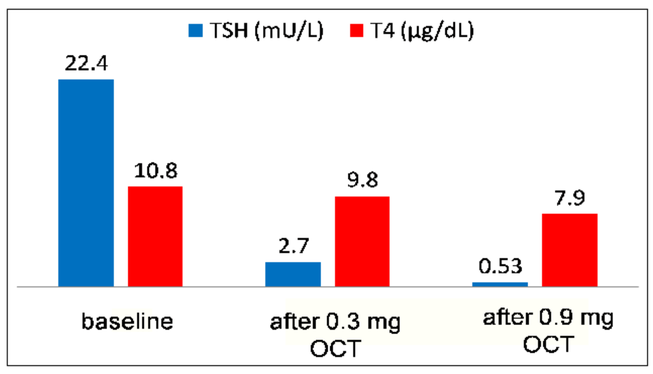
TSH and FT4 levels before diagnosis



Pituitary MRI revealed a 1.62/1.45/1.6 cm mass, without invasion of surrounding structures; no optic chiasm compression

Laboratory findings at diagnosis:

TSH = 22.4 mU/L, T4= 10.8 µg/dL (4.5-13) ⟶ **inappropriate TSH secretion**



Acute octreotide suppression test

showed decreasing of TSH after Octreotide s.c. (100 µg every 8 hrs) by 97.6 % with no significant change in serum T4 level (under LT4 substitution)

Other findings:

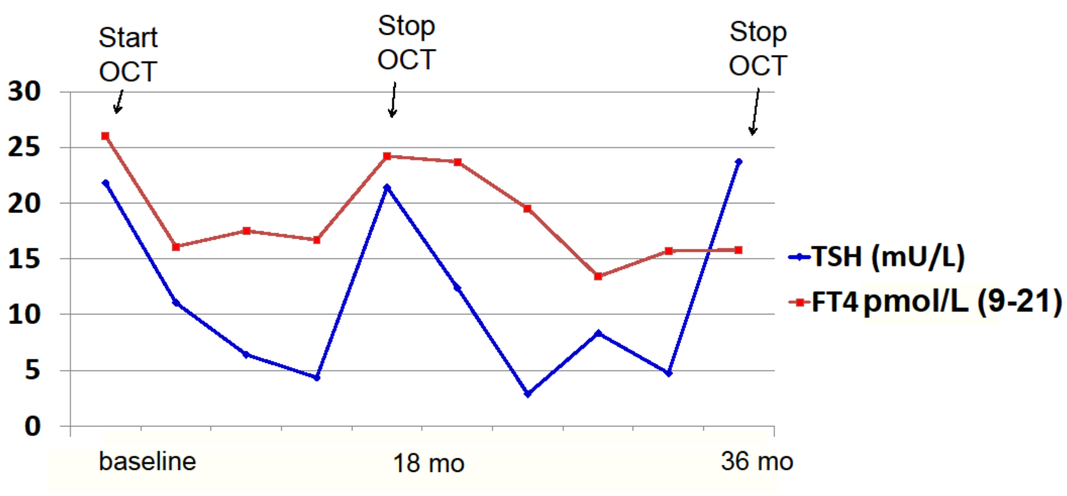
OGTT 75 g	0 min	30 min	60 min	120 min
GH (ng/ml)	0.09	0.05	0.05	0.05

normal GH suppression in OGTT

Prolactin: 3.42 ng/mL. No clinical signs or laboratory tests of pituitary insufficiency.
Thyroid ultrasound showed thyroid ablation.

Treatment and follow-up

The patient refused surgery and received chronic treatment with long-acting octreotide, 20 mg/month.
Along follow-up he had good biochemical response (lowest TSH under treatment between 4.35-2.87 mU/L while normal FT4 and T3 levels under substitution) and ~25% reduction of tumor dimensions (1.21/0.92/1.29 cm).
Whenever octreotide was stopped, inappropriate TSH secretion relapsed.



Evolution under treatment with somatostatin analogue

CONCLUSION

Neurosurgery is the treatment of choice in thyrotropinomas but when surgery is refused somatostatin analogues are an efficient alternative for long-time disease control.

Acknowledgements: This work received financial support through the project entitled "CERO – Career profile: Romanian Researcher", grant number POSDRU/159/1.5/S/135760, cofinanced by the European Social Fund for Sectoral Operational Programme Human Resources Development 2007-2013. Poster was presented at 17th European Congress of Endocrinology, Dublin (16 – 20 May 2015).