

Features of Acute Mineralocorticoid Excess from ACTH Secreting Bronchial Tumour

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ACTH secreting bronchial cancer can present with rapid fluid retention than typical Cushing's picture. High index of suspicion is needed for any such presentation.

Initial presentation and assessment:

- A 77 year old man with Type 2 Diabetes treated with oral hypoglycaemic agents only. (previously well control with HbA1c of 42mmol/mol) presented acutely unwell, with weakness, intermittent breathlessness, and worsening glycaemic control
- His body weight was 74.5kg, he had mild bilateral legs oedema, BP of 190/100mmHg, scattered expiratory wheeze, SaO₂ 91% and PO₂ 7.8mmHg on room air. Chest XR on admission reported; chronic right Lower lobe changes and a bulky Left hilum.
- Plasma Glucose was 22.4 mmol/l, potassium 2.4mmol/l, and sodium of 145mmol/l.
- He was treated for heart failure, started on Insulin therapy and triaged to endocrinology for Hyperglycaemia. Hypokalaemia was refractory to potassium infusion.

Further investigations and management:

- Echocardiogram was normal.
- CT Abdomen and chest confirmed 5cm left hilar mass with mediastinal lymphadenopathy, small bilateral pleural effusion, consistent with bronchial carcinoma and potential metastasis to both adrenals.
- Despite lack of Cushing's feature, Ectopic ACTH secretion was suspected.
- Urgent random serum Cortisol at 5pm was very high at 5294nmol/L with high plasma ACTH of 249ng/L (normal <50), 24hour Urinary Free Cortisol level was massive at 29211nmol/24hr (normal 50-300).
- He deteriorated within 48 hour with significant fluid retention, 5.5kg weight gain and pleural effusion requiring chest drain. Subsequent confirmatory test for Cushing's syndrome was deemed unnecessary.
- He was started on Metyrapone with dose actively up-titrated (1g tds in 12 days) against the mean serum cortisol day series, achieving mean cortisol of 980nmol/l.
- Spironolactone therapy initiated. The patient responded well, features of mineralocorticoid excess largely resolved (6 kg weight loss) and was able to undergo bronchoscopy, which confirmed small Cell Bronchial Carcinoma.

Cortisol Day Curve

Time	Cortisol (nmol/L) on Metyrapone 0.5 gr TDS	Cortisol (nmol/L) on Metyrapone 1gr TDS
09:00 hrs	2783	1531
11:00 hrs	2138	1012
13:00 hrs	2498	1048
15:00 hrs	1694	721
17:00 hr	1902	597

CT Images



Image1: CT chest with bulky Left hilar mass, most likely to be due to primary bronchogenic carcinoma



Image2: Image showing Bulky adrenals more evident on left side

Discussion:

- Rapidly progressing ACTH secreting bronchial tumour will not present with typical feature of Cushing's Syndrome.
- High index of suspicion of such a potential diagnosis is crucial.
- Bulky adrenals in this case were likely ACTH driven not metastasis (altering the staging).
- Metyrapone remained the first line of therapy improving metabolic changes¹.

References:

- 1-BMJ. 1977 July 23; 2(6081): 215–217.
- 2- European Journal of Endocrinology (2006) 155 725–733.