The Leeds Teaching Hospitals NHS
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Conn's Syndrome with Normal Plasma Renin Aldosterone Ratio

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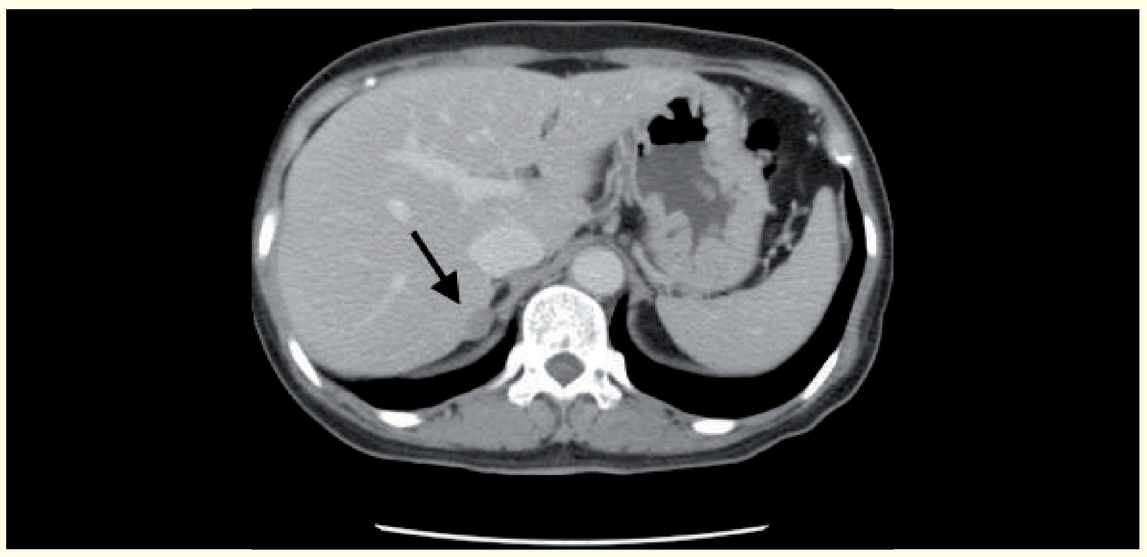
Background

- Conn's syndrome accounts for 35% of primary hyperaldosteronism.
- Elevated plasma aldosterone concentration to renin activity ratio is widely used as a screening diagnostic tool.
- However, we report an unusual presentation of Conn's syndrome with normal plasma renin aldosterone ratio.

Clinical presentation & Investigations

- A 48 year old man was seen in endocrine clinic with uncontrolled hypertension and severe hypokalemia. Primary hyperaldosteronism was suspected with blood pressure 170/110 mmHg, serum sodium 145 mmol/l, serum potassium 2.4 mmol/l and metabolic alkalosis with serum bicarbonate 29 mmol/l. Initial plasma renin aldosterone ratio was 290 with aldosterone 320pmol/l and renin 1.1nmol/L/h.
- Subsequently blood pressure was controlled and serum potassium was corrected. Repeated plasma renin aldosterone ratio while on doxazosin and normal potassium was again not consistent with Conn's, having aldosterone 365pmol/l, renin activity 0.8 nmol/L/h with ratio of 450.
- Abdominal MR scan showed a 1 cm nodule in the right adrenal (see Figure).
- Despite two normal plasma renin aldosterone ratios, clinical suspicion of Conn's disease led to further investigations. Saline infusion test revealed failure of aldosterone suppression at 225 pmol/l with relatively normal renin aldosterone ratio of 450 post saline infusion.

MRI Adrenals



- Subsequently, he underwent adrenal venous sampling which showed a significant gradient of aldosterone to the right adrenal gland.
- Right adrenal vein aldosterone 21940 pmol/l, cortisol 1630 nmol/l, ratio 13.5; left adrenal vein aldosterone 445 pmol/l, cortisol1491, ratio 0.3.
- A laparoscopic right adrenalectomy was done.
- Histology confirmed benign adenoma consistent with Conn's syndrome.
- Two months after surgery, blood pressure was 110/60 mmHg without antihypertensive, serum electrolytes remained normal, normal 24 hour urinary potassium at 85mmol/day, plasma aldosterone 230 pmol/l, renin activity 2.6 nmol/ l/h with aldosterone/renin ratio 88. He was discharged from endocrine clinic.

Conclusion

- Primary hyperaldosteronism can be a diagnostic dilemma for clinicians. Further investigations should be considered if there is strong clinical evidence despite normal plasma renin aldosterone ratio.

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