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Images in Nephrology
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A rare cause of secondary hypertension

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A 20-year-old obese man was referred to our hospital with 1-year hypertension and mild hypokalaemia (potassium, 3.3 mmol/l). The ratio of postcaptopril plasma aldosterone concentration (PAC) to plasma renin activity (PRA) was high [25.8 (ng/dl)/0.33 (ng/ml/h) = 77.4]. The PAC post-saline loading test remained high (28.1 ng/dl). The 24-h urinary catecholamines and VMA (vanillyl mandelic acid) were within normal limits. Primary aldosteronism was diagnosed, and a computed tomography disclosed an isodense mass with a maximal diameter of 4 cm over the right adrenal gland (Figure 1). The patient then underwent right laparoscopic adrenalectomy. Grossly, a well-encapsulated 4.5 × 4.0 × 3.5 cm yellowish tumour with central necrosis was noted. Histologically, the tumour was composed of pleomorphic cells with high-grade nuclei, prominent nucleoli, and >1/3 of the tumour presenting patternless sheets of cells. Furthermore, the mitotic count was >5 in 50 high power fields with atypical mitotic figures (Figure 2a and b). Adrenocortical carcinoma (ACC) was diagnosed according to the modified Weiss classification system [1]. Subsequent immunohistochemical studies confirmed that the tumour was aldosterone producing (Figure 2c and d). Two months after the operation, PAC and PRA were 32.7 ng/dl and 25.45 ng/ml/h, respectively, and the patient became normotensive.

ACCs are rare and account for an estimated 0.05–0.2% of all malignancies [2]. Hormonally functioning tumours occur in ∼50% of ACC patients. Nevertheless, the aldosterone-producing ACC are even rarer. There is a bimodal occurrence by age, with a peak incidence at <5 years, and a second peak between 40 and 50 years [3]. The differentiation between benign and malignant neoplasms is often difficult by preoperative image. However, a tumour size of >4 cm should raise clinical suspicion of adrenocortical malignancy, even at a young age.

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Conflict of interest statement. None declared.

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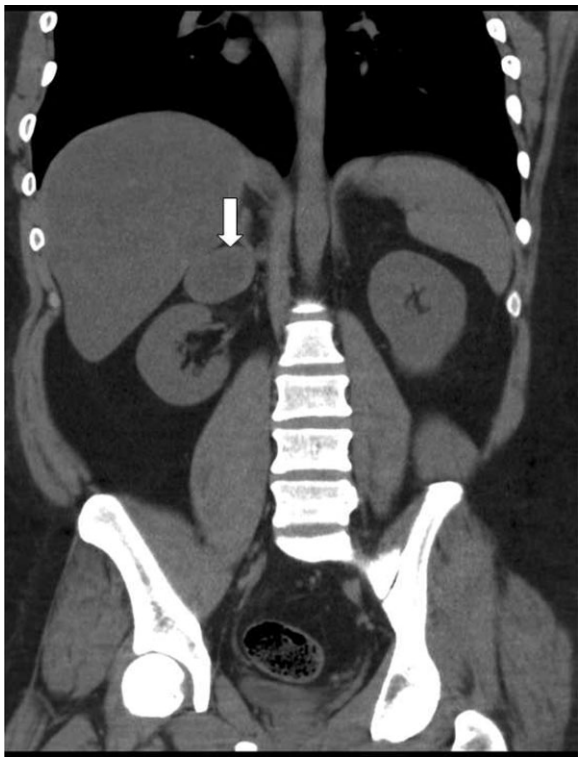

Fig. 1. Adrenal tumour. Non-contrast CT scan shows an oval tumour, 4 cm in diameter, in the right adrenal region.

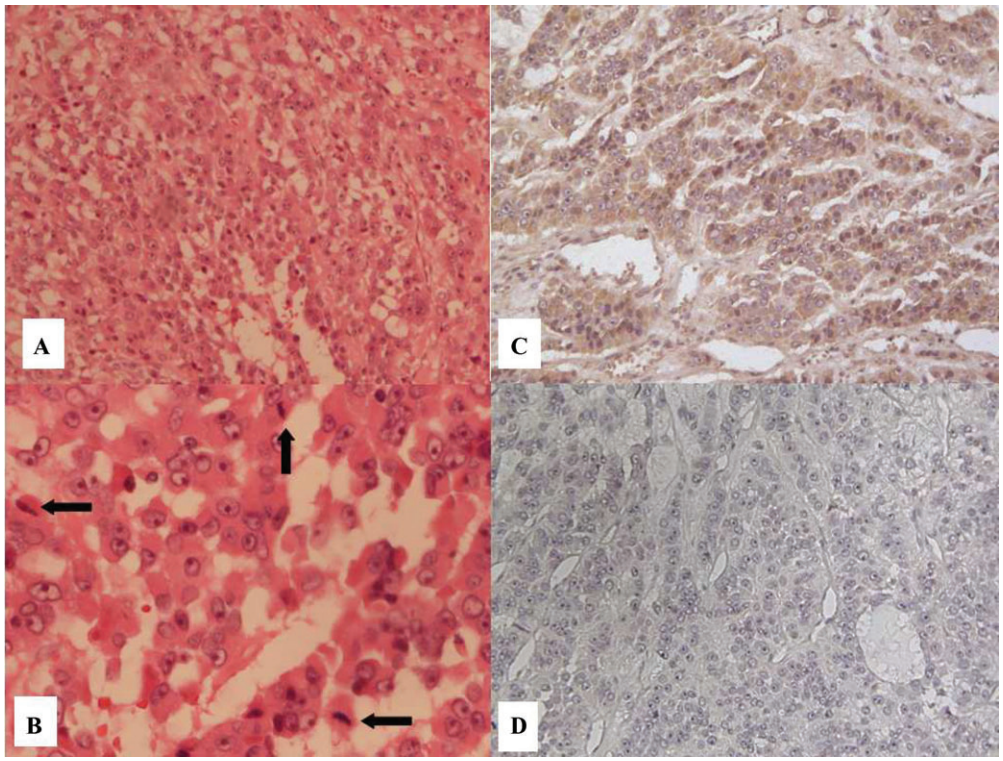

Fig. 2. Histopathology of adrenocortical carcinoma. (**a**) Pleomorphic tumour cells form patternless sheets of cells. (**b**) Tumour cells with eosinophilic cytoplasm, high nuclear grade and atypical mitotic figures (arrows) (haematoxylin and eosin stain, 100×; 400×). (**c**) Positive immunohistochemical staining for aldosterone (100×). (**d**) Substitution of non-immune serum for the primary antibody eliminated the signal as negative control (100×).