

Aldosterone-producing adrenocortical carcinoma, initially presented as a benign-looking lesion on CT

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Primary aldosteronism (PA) is characterized by inappropriate aldosterone production by the adrenal gland. PA is caused by unilateral aldosterone-producing adenomas (APAs), bilateral idiopathic hyperaldosteronism, and rarely adrenocortical carcinoma (ACC). ACCs are usually relatively large tumors accompanied by irregular margin, heterogeneous content, and delayed contrast washout on computed tomography (CT) scan. Herein, we report a case with PA caused by aldosterone-producing ACC, which initially presented as a benign-looking tumor on abdominal CT. A 56-year-old male was referred to our hospital for hypokalemia found in local clinic. He was diagnosed with hypertension 5 years ago and was taking two anti-hypertensive medications. His initial blood pressure was 141 over 94 mmHg, and serum potassium level was 2.7 mmol/L. Abdominal CT demonstrated a right adrenal mass at 2.9 cm with unenhanced Hounsfield unit (HU) of 27. Absolute washout and relative washout were 77% and 62%, respectively, which was consistent with adrenal adenoma. On the initial hormone work-up, increased aldosterone-renin ratio (199.4) was observed; serum aldosterone level was 63.8 ng/dL and plasma renin activity was 0.32 ng/mL/hr. The results of saline loading and captopril challenge tests also met the confirmation criteria for PA. Serum cortisol level after overnight dexamethasone suppression test was 3.72 µg/dL, indicating an aldosterone and cortisol-cosecreting adenoma. Although he refused adrenal venous sampling, laparoscopic right adrenalectomy was performed due to clinical features suggestive of APAs, including hypokalemia and marked aldosterone excess. After surgery, his blood pressure and aldosterone level were rapidly improved. However, histopathological examination confirmed ACC based on atypical mitotic figures, capsular invasion, and high nuclear grade; its Weiss score was 3 and Ki-67 labeling index was 2.2%. This case highlights the importance of a thorough investigation for adrenal tumors exhibiting HU of greater than 10 in patients with PA. Further research is required to clarify the influence of cortisol cosecretion on the characteristics of aldosterone-producing ACCs.

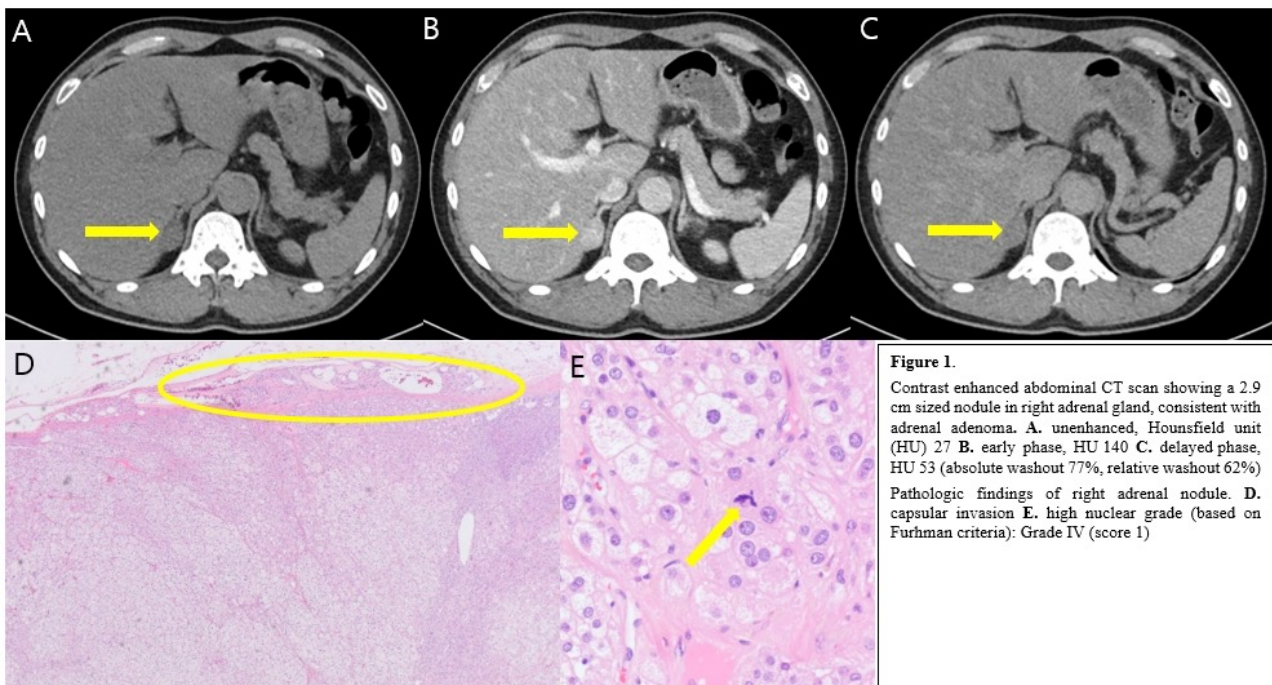


Figure 1. Contrast enhanced abdominal CT scan showing a 2.9 cm sized nodule in right adrenal gland, consistent with adrenal adenoma. A. unenhanced, Hounsfield unit (HU) 27 B. early phase, HU 140 C. delayed phase, HU 53 (absolute washout 77%, relative washout 62%) Pathologic findings of right adrenal nodule. D. capsular invasion E. high nuclear grade (based on Furhman criteria): Grade IV (score 1)