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Seeking the invisible: I-131 NP-59 SPECT/CT for primary hyperaldosteronism

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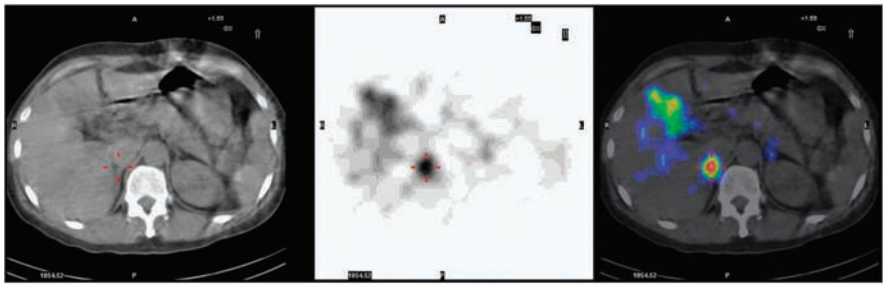

Figure 1 | I-131 NP-59 SPECT/CT. Transaxial images of CT (left) and corresponding SPECT (middle) fused to the SPECT/CT (right) demonstrated intense radiotracer uptake within right adrenal gland (red-cross sign).

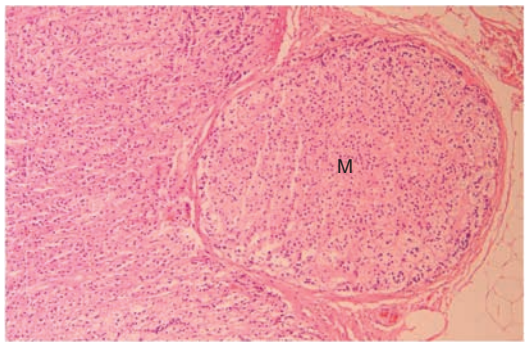

Figure 2 | Pathological findings. The resected right adrenal gland microscopically showed an encapsulated cortical micronodule (M), the largest diameter is 815 μm, demonstrating cordal bland cells within the fibrotic capsule of the adrenal gland. (Hematoxylin and eosin, original magnification × 100).

A 53-year-old female was newly diagnosed with hypertension with initial systolic blood pressure of 150 mm Hg in the previous year. Laboratory analysis was as follows: potassium 3.18 mmol/l, bicarbonate 33.8 mmol/l, aldosterone 25.9 ng per 100 ml (3.7–24.0 ng per 100 ml), plasma renin activity 1.45 ng per 100 ml per h (1.31–3.95 ng per 100 ml per h), aldosterone-to-renin ratio 17.86 (>30). Saline loading test was performed 3 months later and could suppress both aldosterone and plasma renin activity from the levels of 42.65 ng per 100 ml and 1.5 ng per 100 ml per h to 5.97 ng per 100 ml and 0.84 ng per 100 ml per h, respectively. CT (computed tomography) revealed no definite adrenal abnormality. Primary hyperaldosteronism was still clinically suspected despite the above negative tests. ^{131}I-NP-59 (6-beta-iodomethylnorcholesterol) SPECT (single-photon emission computed tomography)/CT disclosed intense uptake in the right adrenal gland (Figure 1). She underwent right adrenalectomy and the pathology revealed a cortical micronodule (Figure 2). Three months later, the serum potassium and blood pressure recovered completely. I-131 NP-59 scintigraphy has a high affinity for adrenocortical tissue. With the help of concurrently functional and anatomical studies, a hypersecretory adrenocortical micronodule was easily detected. This combined approach can sometimes reveal subtly functioning tumors causing primary hyperaldosteronism when there is high clinical suspicion but a negative saline-loading test and CT scan.