jnm/CASE REPORT

RADIONUCLIDE DETECTION OF A PHEOCHROMOCYTOMA

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An area of increased radioactivity was visualized superior to the right kidney during the flow phase of a routine radionuclide renal angiography using ^{99m}Tc-Sn-DTPA. This same area failed to concentrate the radiopharmaceutical during delayed static images. This sequence suggested a highly vascular mass above the right kidney. The mass proved to be an adrenal pheochromocytoma as was suggested by the radionuclide study.

The following report describes incidental visualization of an adrenal pheochromocytoma during the course of routine radionuclide renal angiography.

CASE REPORT

A 43-year-old white woman complained of bitemporal headaches, occasional sweating, dizziness, and vomiting as well as increasing constipation and a sensation of generalized warmth for 7–10 months. There had been a 20-lb weight loss without dietary restriction over the previous 10 months.

Previous hospitalization included delivery of a term gestation 18 years earlier. The pregnancy was complicated by moderate edema and albuminuria. A heart murmur was also found and thought to represent aortic stenosis. Two recent hospitalizations for evaluation of severe hypertension including cardiac catheterization revealed moderate mitral stenosis of probable rheumatic etiology although no definite history of acute rheumatic fever could be documented.

A review of systems was otherwise unrevealing.

Admission blood pressure was 160/100 mmHg supine; 135/100 mmHg standing. Systolic levels fluctuated from 110 to 190 mmHg and diastolic levels from 60 to 150 mmHg. The pulse was a sinus rhythm with rates from 60 to 130/min. Minimal arteriolar changes were noted on funduscopic examination.

Abnormal laboratory tests included a clearly diabetic glucose tolerance test; VMA of 12 mg/24 hr (normal: 1–7 mg/24 hr); 24-hr urinary catecholamines averaged 425 μg/24 hr (normal: 30–100 μg/24 hr); urinary metanephrines of 7 and 12 mg/24 hr (normal: 0.3–0.9 mg/24 hr); blood catecholamines were 1,296 ng/100 ml (normal: 2–32 ng/100 ml); routine urinalysis showed +1 albuminuria and a few (4–6) WBCs per high-power field. An electrocardiogram demonstrated sinus tachycardia and left atrial and ventricular hypertrophy.

Important normal studies included roentgenograms of the chest and gastrointestinal system as well as a hypertensive intravenous urogram.

The patient was referred for radionuclide renal angiography. This study was performed utilizing ^{99m}Tc-stannous-diethylenetriamine penta-acetic acid (^{99m}Tc-Sn-DTPA) in a dose of 10 mCi administered in a rapid bolus fashion. An Anger scintillation camera was utilized for a posterior angiographic study and sequential renal images recorded over the course of 20 min.

A striking finding on radionuclide angiography was increased radionuclide concentration above the right kidney (Fig. 1). Failure of this area to concentrate radioactivity during the next 20 min suggested either a vascular tumor of the upper pole of the right kidney or a highly vascular adrenal tumor.

A subselective arteriogram substantiated the findings of the radionuclide study.

At surgery, a pheochromocytoma, 5 cm in diameter, weighing 80 gm, was found adjacent to the upper pole of the right kidney.

DISCUSSION

Literature review failed to reveal a similar discussion of a pheochromocytoma detected during radionuclide angiography. Vascular tumors may be im-

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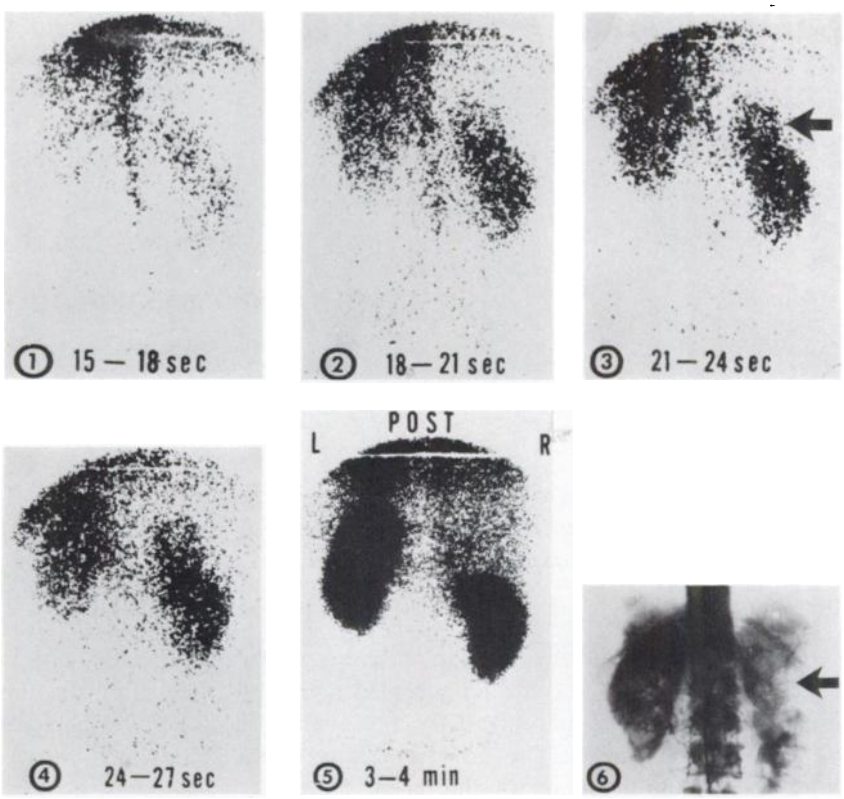

FIG. 1. Following intravenous administration of 10 mCi of ^{99m}Tc-Sn-DTPA, posterior images were recorded at 3-sec intervals. First four panels represent images from 15 sec to 27 sec after injection. Third panel shows area of increased radionuclide concentration above right kidney (arrow). Determination of kidney "size" for comparison can be ascertained from 3–4 min static image (fifth panel). Angiogram shown in sixth panel demonstrates a right suprarenal mass (arrow) that corresponds closely to area of increased radionuclide concentration in third panel.

aged during the course of radionuclide angiographic studies. Pheochromocytomas are commonly highly vascular and have a size range of several millimeters to 10 cm in diameter and a weight range of several grams to 3.6 kg.

The adrenal origin of the vascular lesion suggested by radionuclide angiography was supported by clinical findings, characteristic elevations of catecholamines and metanephrines, and a negative hypertensive intravenous urogram.

In summary, a radionuclide renal angiographic study revealed a vascular lesion above the upper pole of the right kidney correctly localizing a right adrenal pheochromocytoma. Despite the probable rarity of this circumstance, consideration should be given to the adrenal origin of highly vascular lesions seen above the kidneys especially when such a lesion fails to concentrate the renal localizing agent. This concept is further supported if the lesion fails to concentrate the renal agent over the expected time course but is well visualized during the angiographic portion of the study.