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Case report

An incidental detection of aortic aneurysm on Tc–99m MAG3 renal scintigraphy

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Abstract

A 71-year-old man with newly diagnosed hypertension was referred for Technetium-99m mercaptoacetyltriglycine (Tc-99m MAG3) renal scintigraphy to evaluate the recent onset of impairment in renal functions. Dynamic imaging revealed activity flow which was suspicious for aortic aneurysm (AA) with a concurrent decrease in left renal blood flow. CT angiography of the thoracoabdominal aorta confirmed that this area corresponded to AA. The purpose of this report was to present the first case of incidental detection of AA on Tc-99m MAG3 scintigraphy and highlight the importance of correlative imaging for the diagnosis of abnormal radioactivity accumulation in the region of vascular structures.

KEY words: aortic aneurysm, Tc-99m MAG3, renal scintigraphy, CT angiography

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Figure 1

Tc-99m MAG3 renal scintigraphic images. Camera parameters: posterior position, 15% window centered at 140 keV using 64 × 64 matrix. Acquisition was started with bolus injection of 185 MBq (5 mCi) Tc-99m MAG3 and dynamic imaging was performed at 2 seconds/frame for 16 frames and then 2 minutes/frame for 19 frames. Dynamic vascular phase imaging of renal flow scintigraphy with Tc-99m MAG3 demonstrated abnormal radiotracer accumulation that was suspicious for abdominal AA and decreased left renal blood flow (**A**, **B**, black arrows). The entire 40-minute dynamic posterior imaging demonstrated diminished extraction and excretion functions in the left kidney (**B**). According to these images, CT angiography was performed to confirm the suspected AA and to delineate the relationship of the aneurysm to the renal arteries.

Abdominal aortic aneurysm, defined as a permanent dilatation of the abdominal aorta to a size 50% greater than the normal segment, is thought to be a degenerative change of alteration in elastin and collagen and enzymatic degradation in the aortic wall [1, 2]. Increased age, smoking, male sex and family history are the major risk factors for developing AA [3, 4]. Duplex Ultrasonography is the most common modality to detect AA and CT angiography is the first choice of imaging studies to define the diameter of the aorta and suspected renal artery involvement in a patient with AA [4]. The scintigraphic first pass (blood flow) or blood pool studies may show unusual abdominal or thoracic features suggestive of aneurysm as an incidental finding [5–9].

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Figure 2

CT angiography examination of thoracoabdominal aorta. **A**. Three dimensional reconstruction image demonstrating fusiform aneurysmatic dilatation beginning from the ascending aorta extending to the iliac bifurcation, including the abdominal aorta; **B**. Sagittal view of AA; **C**. narrowed left renal artery (white arrow); **D**. Normal right renal artery (white arrow).

Figure 3

Corresponding contrast-enhanced computed tomography (CT) examination of the thoracoabdomen demonstrating a 69 × 64 mm measured aortic aneurysm (**A**, upper arrowheads) with kyphoscoliosis, normal pelvicalyceal system and asymmetry in renal size with a smaller left kidney (**A**, left arrow) and normal right kidney (**A**, right arrow). CT transaxial scans at the renal level showed a large abdominal AA with a lumen of 48 × 35 mm with a mural thrombus (**B**, **C**, arrowheads).

Detecting aortic aneurysm with Tc-99m MAG3 renal scintigraphy is not at all common and has been previously reported in literature in only one diagnosed case [5]. To the best of our knowledge, the case reported here is the first presentation of incidental aortic aneurysm detected with Tc-99m MAG3 which started from the ascending aorta and extended to the iliac bifurcation. The CT angiography findings (aortic aneurysm and mural thrombus) disclosed the renal scintigraphic features of suspected AA and decreased cortical

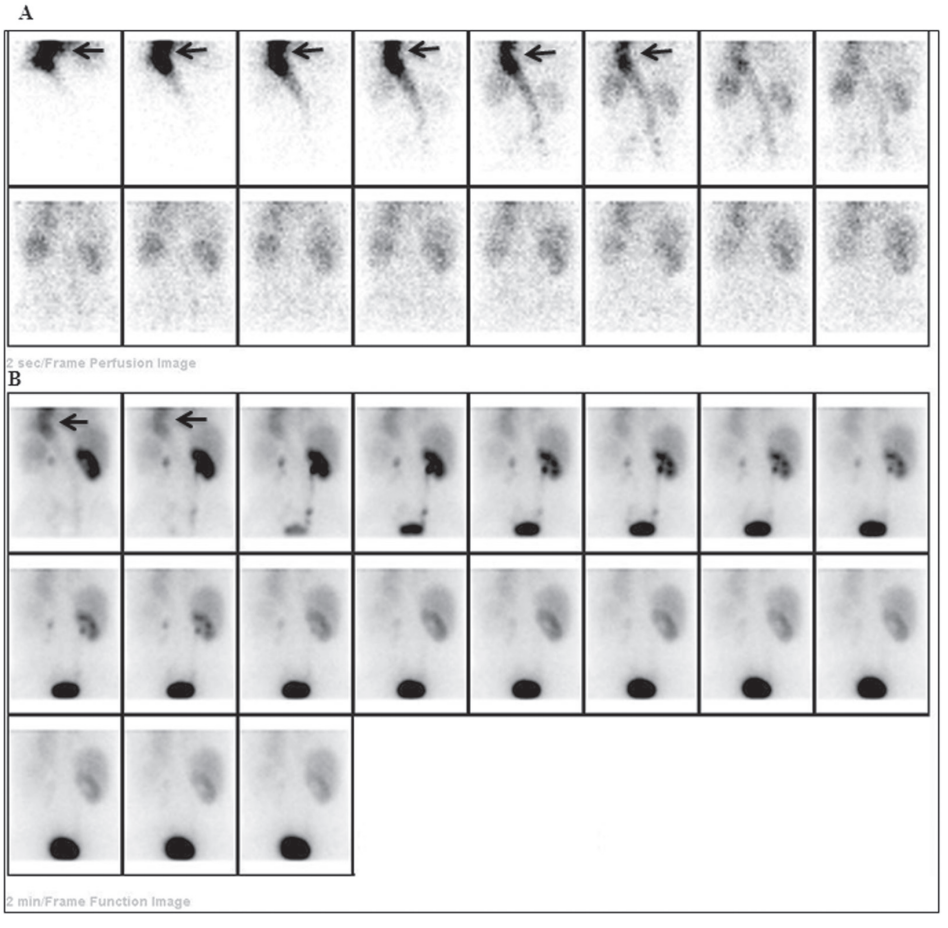

Figure 1.

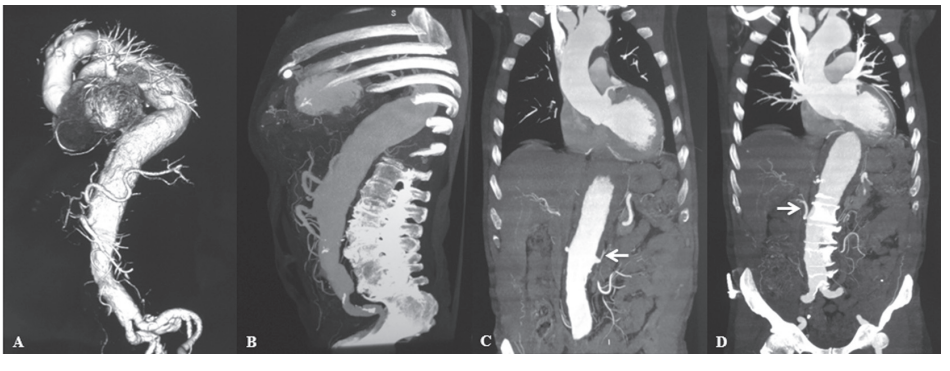

Figure 2.

radiotracer uptake, function and excretion of the left kidney. In the case presented here, the incidental detection of AA with Tc-99m MAG3 renal scintigraphy points at the importance of correlative imaging for the differential diagnosis of abnormal radioactivity accumulation in the region of vascular structures.

Figure 4

Chest X-Ray indicating aortic knob width and enlarged descending aorta (arrowheads).

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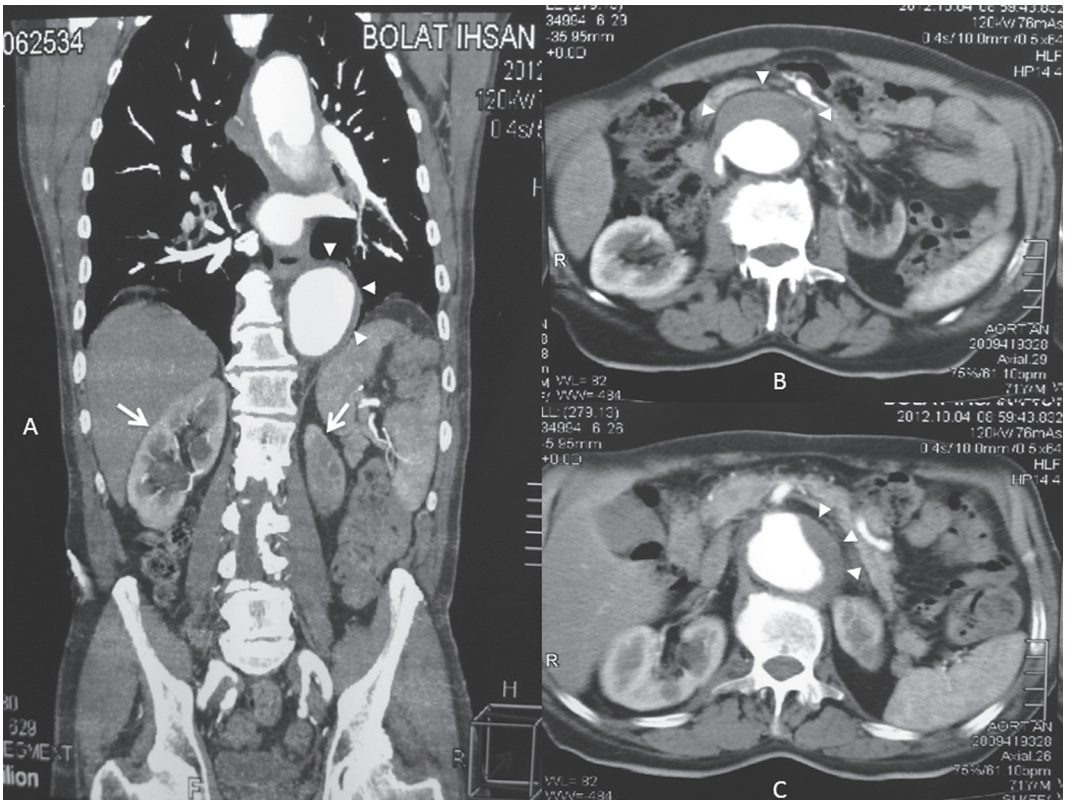

Figure 3.

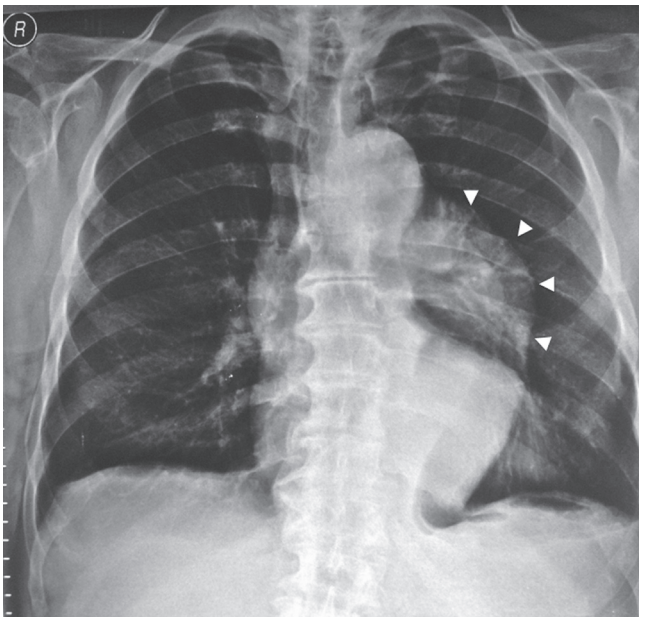

Figure 4.

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