

Diagnosis of Bleeding Mycotic Iliac Aneurysm on Technetium-99m Renal Scan

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Since abdominal aneurysms are common in the elderly, it is not unusual to see incidental aneurysms on renal scintigraphy performed for other reasons. However, the initial discovery of a bleeding aneurysm on a renal scan in a patient with salmonella septicemia who has no other obvious focus of infection should be considered suspicious for mycotic aneurysm. A prompt diagnosis is crucial to avoid catastrophic outcome associated with delayed surgical intervention.

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We report a case of bleeding mycotic iliac aneurysm in a septicemic patient, which was initially diagnosed on ^{99m}Tc renal scintigraphy.

CASE REPORT

An 84-yr-old woman presented with a week long history of gradually increasing lethargy, decreased appetite and abrupt onset of fever without localizing signs. She was started on empiric broad spectrum antibiotics. Ultrasound of the abdomen demonstrated a right renal calculus without hydronephrosis. A blood culture revealed *Salmonella enteritidis*, the source of which could not be determined despite extensive laboratory investigations, including colonoscopy. She came back 2 wk later with left buttock pain and fever. An ultrasound revealed bilateral renal stones with mild left hydronephrosis. Blood cultures again grew salmonella. At this time, her medical course was complicated by acute myocardial infarction and an upper gastrointestinal bleed. After she had stabilized, a ^{99m}Tc-diethylenetriaminepentaacetic acid (DTPA) renal scan was performed (using 148 MBq of ^{99m}Tc) to assess hydronephrosis and left kidney function. On the flow phase of the renal scan, a round structure was outlined in the region of left common iliac artery just below the aortic bifurcation (Fig. 1A). It was visualized until 15 min into the blood-pool phase (Fig. 1B). The appearance of the structure suggested a leaking aneurysm of the left common iliac artery as opposed to a non-leaking aneurysm, since the activity persisted well into the blood-pool phase. It did not have the appearance of gastrointestinal hemorrhage because of its exact location in the left common iliac artery position and configuration. Both kidneys were functioning

normally and there was no hydronephrosis. There was no history of an invasive procedure, such as a needle biopsy, thereby ruling out the possibility of a pseudoaneurysm. Since she had documented recurrent salmonella septicemia without an obvious focus of infection with development of an aneurysm over a short period of time (previous imaging studies had revealed normal iliac arteries), a leaking mycotic aneurysm was diagnosed. A computed tomography (CT) scan was then performed, which confirmed the presence of a large, leaking left iliac aneurysm (Fig. 2). Operative intervention was not feasible due to the extensive nature of the lesion and her poor underlying medical condition. Two days later the patient suffered cardiopulmonary arrest and died. An autopsy was not performed.

DISCUSSION

Mycotic aneurysms, which result from inflammation and necrosis of the arterial wall caused by infection, account for 2.5% of all aortic aneurysms (1) and are commonly classified based on the pre-existing arterial status (normal, atherosclerotic, aneurysm, prosthesis) (2). The great majority of mycotic aneurysms occur in patients with predisposing risk factors, such as depressed immunocompetence (diabetes, malignancy, alcoholism, collagen vascular diseases, steroids, etc.) and congenital cardiovascular defects (patent ductus arteriosus, coarctation of aorta). Only 3% occur in truly healthy people (3). Salmonella is cited as being the most common pathogen, accounting for 18%–50% of all mycotic aneurysms (4,5). Since salmonellae are potent pathogens and can invade any organ (even the healthy arterial intima, which is highly resistant to infection), transient salmonella bacteremia, which is frequently associated with salmonella infection from any source, can lead to intravascular infection. Patients with salmonella cultured from blood, sputum and urine without adequate explanation must be suspected for intravascular infection (6). Infection by gram-negative organisms (such as salmonellae) has a high predisposition to early rupture and catastrophic hemorrhage (3).

The presence of an aneurysm can be documented on various imaging modalities, such as ultrasound, CT, MR (magnetic resonance) and nuclear scintigraphy. Gallium-67-citrate has been shown to accumulate in the mycotic aneurysm as well as in dissecting aneurysm because of resultant inflammation (7,8). Although aortic or iliac aneurysms have been demonstrated on various radionuclide imaging studies, such as during a gastrointestinal

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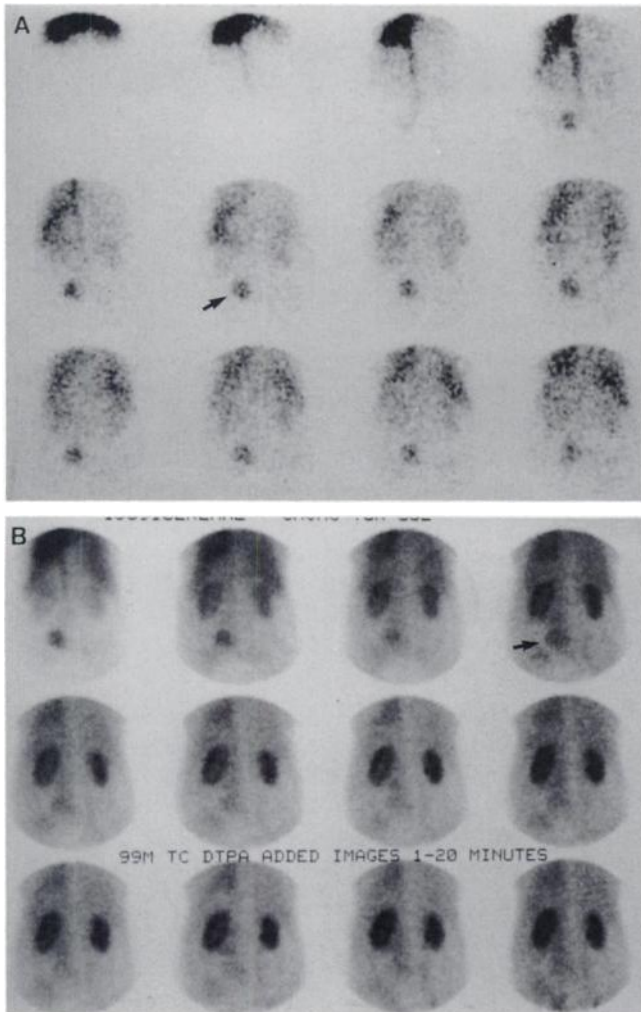


FIGURE 1. (A) Technetium-99m-DTPA renal scan demonstrates the presence of a left iliac artery aneurysm on the immediate flow phase (arrows). (B) Persistence of radionuclide in the same configuration (arrows) is much beyond the flow phase and is consistent with a leaking aneurysm.

bleeding study and renal scintigraphy (9,10), the presence of a leaking mycotic aneurysm was initially suspected on renal scintigraphy in our patient. Even though pathological confirmation of a leaking mycotic aneurysm could not be obtained in our patient, the development of an aneurysm over a short period of time with recurrent salmonella septicemia without a recognizable source of infection and a leaking aneurysm made the possibility of a mycotic aneurysm very strong. The possibility of a false aneurysm was unlikely as there were no prior interventional procedures performed. The renal scintigraphy played a major role in disclosing this unsuspected leaking aneurysm in our patient leading to appropriate further investigations.

CT is currently considered the modality of choice for establishing a diagnosis. In addition to demonstrating the size and extent of an aneurysm, CT also demonstrates leak and perianeurysmal hemorrhage in a noninvasive manner. If the infection is due to gas-forming organisms, one may see the presence of gas on CT. However, in the case of

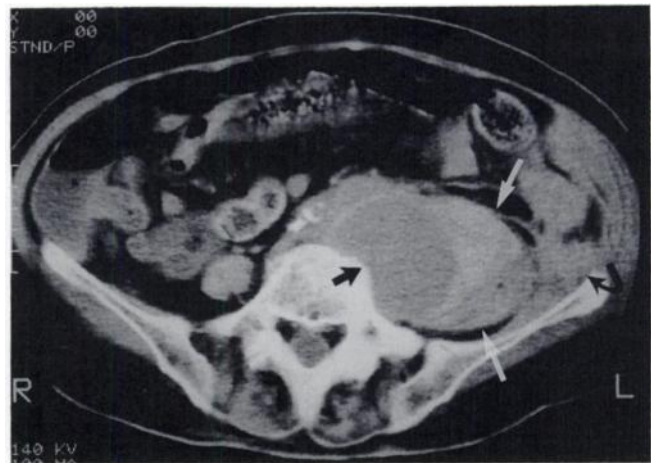


FIGURE 2. A CT scan at the level of iliac arteries confirms the presence of a large left iliac aneurysm (straight black arrow) with alternate high and low attenuating areas at the periphery representing thrombus formation (white arrows). Perianeurysmal hemorrhage and leak is seen lateral to the aneurysm and anterior to the lateral aspect of iliac bone (curved black arrow).

salmonella, there are no specific features which allow distinction of infected from noninfected aneurysm. Although angiography can depict the aneurysm and active leak, it has the disadvantages of being invasive, is unable to demonstrate extraluminal abnormalities and requires a minimum rate of bleeding for revealing a leak. Since the features of a mycotic aneurysm on imaging studies are nonspecific, a high index of suspicion is important. The prognosis is dismal, especially with medical therapy alone. Rapid surgical intervention with adjuvant antibiotics is the treatment of choice.

In summary, recognition of an unsuspected leaking aneurysm on scintigraphy (performed for other reasons) in a patient with unexplained septicemia (particularly salmonella septicemia) should arouse suspicion for a mycotic aneurysm, thus facilitating a timely diagnosis which is crucial to avoid the fatal outcome associated with delayed surgical intervention.

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