CASE REPORT

SPECT/CT for the accurate localization of $^{67}$Ga uptake in mycotic abdominal aortic aneurysm

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Abstract

We report a case of mycotic abdominal aortic aneurysm where the use of hybrid imaging with gallium scan demonstrated increased uptake in the infected aneurysm and aided in differentiating physiological uptake in the bowel from pathological uptake.

Key words: Gallium-67, SPECT, SPECT/CT, mycotic aortic aneurysm

Introduction

The term ‘mycotic aneurysm’ has been used since the 1800s for infected aneurysms resulting from bacterial endocarditis complicated by septic arterial emboli [1, 3]. Wilson et al. classified the infected aneurysms according to their clinical characteristics: mycotic (endocarditis-related), microbial arteritis, infection of existing aneurysm and post-traumatic infected false-aneurysm [4]. However, the majority of vascular surgeons nowadays keep to the commonly used definition of mycotic aneurysm to include all kind of infected aneurysms.

We report a case of mycotic abdominal aortic aneurysm where the use of hybrid imaging with gallium scan demonstrated increased uptake in the infected aneurysm and aided in differentiating physiological uptake in the bowel from pathological uptake.

Case report

A 61-year-old male with hypertension and a recent travel history to Cuba presented with a 3 week history of mild but unremitting pain in the lower abdomen and an episode of fever and chills 2 weeks prior to presentation. CT angiography of the abdomen was ordered for further evaluation of the pain, which revealed aortitis at the level of the infrarenal aorta with a pseudoaneurysm and small penetrating ulcer (Figure 1). A whole-body gallium-67 scan was ordered to assess for infection,
which showed focal accumulation in the aneurysmal sac (Figure 2). The patient was treated with broad-spectrum antibiotics for one week. A repeat CT of the abdomen was performed to assess the evolution of the infection, which showed expansion of the aneurysmal sac (Figure 3).
The patient underwent an operative procedure to repair the contained ruptured mycotic aneurysm with neo-aortic in-situ repair with right superficial femoral vein.

Microbiological examination and cultures of the resected aorta grew salmonella species, resistant to trimethoprim and ciprofloxacin, sensitive to ceftriaxone and ampicillin. He was started on Ceftriaxone intravenous antibiotic therapy, and continued for 6 weeks, then was switched to oral cefixime for a duration of 6 months.

Discussion

Organisms have been isolated from aneurysmal tissue in up to 76 percent of patients with mycotic aneurysms [5]. Staphylococcus spp. and Salmonella spp. remain the most common [6, 7]. The diseased aorta appears to be vulnerable to Salmonella, and this pathogen is frequently isolated in infected aneurysms due to bacteraemic seeding of atherosclerotic plaque [8].

The role of gallium-67 uptake in infected aortic aneurysms was previously described [9] on planar imaging with the aid of 3-phase $^{99m}$Tc-MDP bone scan. Aneurysms have been reported as incidental findings on the blood flow and blood pool images of $^{99m}$Tc-MDP or $^{99m}$Tc tagged erythrocytes [10, 11]. Infected aneurysms have been previously described in the literature with several radiotracers, such as gallium-67, In-111 tagged leukocytes, $^{99m}$Tc-hexamethylpropylene amine oxime (HMPAO) labelled leukocyte and $^{18}$F-FDG. [12-16]. Gallium-67 scan is considered not reliable in the abdomen because of physiological bowel activity. In this case, hybrid imaging with SPECT/CT was able to differentiate physiological gallium-67 uptake in the bowel and pathological uptake in the abdomen and also localized the uptake to the aortic pseudoaneurysm, which indicated the presence of an infected pseudoaneurysm, a potentially life-threatening condition [17].

References

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