A mycotic aneurysm of the aortic arch

Clinical History:
A 60-year-old diabetic male patient with chronic kidney disease on haemodialysis was hospitalised for sepsis due to methicillin-susceptible Staphylococcus aureus bacteraemia. He presented back pain and fever. Piperacillin/tazobactam and vancomycin were initiated and a chest-abdomen-pelvis computed tomography (CT) was requested to detect infectious foci.

Imaging Findings:
Contrast-enhanced chest-abdomen-pelvis CT scan revealed a focal, saccular dilatation in the aortic arch, with perianeurysmal fluid-density collection and fat stranding (Fig. 1). Vertebral spondylodiscitis in D10 and D11 vertebral bodies was also present.

Blood tests revealed mild anaemia (haemoglobin levels: 12 g/dL; reference value 13-17.5 g/dL), leukocytosis (leukocyte levels: 13.96 x 10^9/L; reference value 4-11 x 10^9/L), and elevated C-reactive protein (33 mg/dL; reference value <0.5 mg/dL).

The patient was maintained on antibiotics and the CT scan was repeated two weeks later. The scan revealed an increase in pseudoaneurysm size, with a multilobulated appearance (Fig. 2). Perianeurysmal fluid-density collection and fat stranding were also present. Septic arthritis of the left coxofemoral joint was also diagnosed on magnetic resonance.

One week later, he repeated the CT scan and the pseudoaneurysm was stable. Some hours later, the patient had a sudden cardiac arrest and did not respond to advanced life support resuscitation manoeuvres.

Discussion:
An infected or mycotic aneurysm results from an infectious process involving the arterial wall. The aorta is the most commonly affected artery [1-3]. Mycotic aortic aneurysm (MAA) is an uncommon condition, associated with significant morbidity and mortality [2,4,5].
Infected aneurysms can result from: infection of a pre-existing intimal defect by circulating infectious agent; haematogenous spread of infectious microemboli into vasa vasorum of a normally-sized artery or a pre-existing aneurysm; contiguous involvement of a vessel from an adjacent source of sepsis; or direct infectious inoculation of a vessel wall during vascular trauma [1,6]. The infectious arteritis causes arterial wall destruction with contained rupture and formation of a pseudoaneurysm. Staphylococcus, Streptococcus and Salmonella species are amongst the most common pathogens of MAA [1,4,7,8]. Predisposing factors include intravenous drug abuse, depressed immunity, diabetes mellitus, endocarditis, and septicaemia [2,4,7,9].

MAA diagnosis is often delayed, owing to the protean manifestations. Patients can present with fever and abdominal, back, or thoracic pain, depending on the location of the aneurysm [4,10], although some may be asymptomatic. Blood tests can show leukocytosis, elevated C-reactive protein, and positive blood cultures [4,10,11]. In addition to the clinical evidence of infection, the presence of suspicious imaging findings on CT or magnetic resonance angiography [12] may lead to MAA diagnosis.

Imaging is necessary to diagnose and characterise the infected aneurysms, to identify complications, to map the relevant vascular anatomy for treatment planning, and to assess treatment efficacy. CT angiography is the imaging method of choice.

Early changes of aortitis preceding MAA formation at CT include irregular arterial wall, periaortic fat stranding or hypoattenuating concentric rim, periaortic soft-tissue mass and periaortic gas [1].

On CT, MAA appears as a focal, contrast-enhancing aortic dilatation that is usually saccular, which can be multilobulated and may present rapid expansion [1,12-14], as was the case in our patient. Disrupted intimal calcifications may also be seen [14]. Furthermore, perianeurysmal mass, stranding, fluid, gas and/or haematoma, and osteomyelitis in adjacent vertebral bodies may occur [12-15]. The vertebral spondylodiscitis and the septic arthritis of the left hip joint that our patient presented were probably other infectious foci.

MAA is associated with a poor prognosis because it tends to grow rapidly and rupture; besides, patients with MAA often have severe comorbidities, are immunosuppressed, and have co-existing sepsis [16].

Treatment options for MAA include antibiotic therapy alone or in combination with surgical and/or endovascular therapy [16,17].

Written patient consent for this case was waived by the Editorial Board. Patient data may have been modified to ensure patient anonymity.

Differential Diagnosis List: Mycotic aortic aneurysm, Inflammatory aneurysm, Tuberculous aortic aneurysm

Final Diagnosis: Mycotic aortic aneurysm

References:


Description: Axial (1a) and sagittal (1b) contrast-enhanced CT scan images show a saccular pseudoaneurysm in the aortic arch (measuring 4 x 4 cm – transverse x longitudinal axis), with perianeurysmal fluid-density collection and fat stranding (arrows). The pseudoaneurysm is also clearly depicted on volume-rendered images, indicated by arrows (1c and 1d). Origin: © Department of Radiology, Hospital de Santa Maria, Centro Hospitalar Universitário Lisboa Norte/ Portugal 2017.
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