



Infective endocarditis with abdominal pain: just a coincidence?

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Mycotic aneurysm of the superior mesenteric artery is uncommon and can be associated with significant morbidity and mortality. We report a case of infective endocarditis with abdominal pain associated with enlarging mycotic superior mesenteric artery aneurysm. With the non-specific abdominal symptoms that are associated with superior mesenteric artery aneurysms, clinicians should have a low threshold for appropriate abdominal imaging in infective endocarditis.

Case report

A 23-year-old male was admitted with a 4-week history of intermittent fever and malaise following an episode of right foot cellulitis. At admission, his temperature was 38.5°C; pulse rate 100 and normotensive. Examination revealed grade 5 ejection systolic murmur and grade 4 end diastolic murmur at the left sternal border. Abdominal, pulmonary and neurological examinations were unremarkable.

The C-reactive protein was 143 mg/L, white cell count $10.1 \times 10^9/L$, haemoglobin concentration of 10.6 mmol/L, and erythrocyte sedimentation rate of 53 mm/h. Echocardiogram revealed thickened bicuspid aortic valves with vegetation associated with severe aortic regurgitation. Blood cultures grew alpha-haemolytic *Streptococcus*, and high dose penicillin G and gentamicin was commenced with fever settling after 5 days.

Aortic valve replacement surgery was planned—however, the evening prior to surgery, the patient developed several episodes of diarrhoea with mild colicky abdominal pain that was exacerbated by oral feeding. There was mild central abdominal tenderness, no mass was palpable, and no distension or signs of peritonitis. Active bowel sounds were heard. Per rectal examination and sigmoidoscopy were normal. The patient developed a low-grade fever with white cell count of $9.0 \times 10^9/L$ and haemoglobin concentration 10.2 mmol/L—but his renal function, liver function, amylase, and arterial blood gas were normal.

Stool microscopy and *Clostridium difficile* toxin were negative, and erect chest and abdominal radiographs were unremarkable. Computed tomography with double-contrast revealed a 1.7 x 1.5 cm aneurysm at the mid-to-distal part of the superior mesenteric artery (SMA). No extravasation, mural thrombus, or dissection was seen. Selective arteriogram confirmed a 2.5 cm fusiform SMA aneurysm arising proximal to origin of ileal branches, with good perfusion to the small bowel. (Figure 1)

Figure 1. Selective arteriogram showing superior mesenteric artery aneurysm



Combined procedure was performed including aortic valve replacement and mycotic SMA aneurysm resection and repair with saphenous vein graft. No small bowel infarction was identified during surgery.

The patient returned to full diet on postoperative day 3, and made an uneventful recovery. The aortic vegetation and SMA tissue showed no growth after prolonged incubation. He was discharged after completing 4 weeks' of postoperative intravenous penicillin G and gentamicin. The patient remains well at follow-up 9-months post-operatively with no abdominal complaints.

Discussion

Mycotic aneurysms of the visceral arteries are life-threatening diseases with potential to rupture and organ ischaemia. The incidence of mycotic aneurysms associated with endocarditis is between 2.5% and 10%.¹

Mycotic aneurysms may form from direct bacterial invasion, embolic occlusion, and immune complex deposition within the blood vessel.² The more common sites for mycotic aneurysms include aorta and cerebral arteries.² Intra-abdominal mycotic aneurysms such as SMA aneurysm can be relatively asymptomatic particularly at the early stages.

Our patient presented with mild colicky abdominal pain exacerbated by oral intake (claudication abdominis) and several episodes of diarrhoea, which initially was diagnosed to be gastroenteritis or *Clostridium difficile* colitis. Although no evidence of small bowel infarction was found intra-operatively, acute intestinal inflammation as well as mild ischaemia of the small bowel may both be involved in inducing such symptoms. Non-specific abdominal symptoms and signs may be confused with other

less life threatening abdominal conditions and clinicians should have a high index of suspicion.

Up to 38% of patients with superior mesenteric artery aneurysm would have ruptured at presentation.³ Excluding differential diagnoses with stool microscopy and culture, and *Clostridium difficile* toxin assay should not delay definitive imaging with computed tomography (CT) of the abdomen because aneurysm rupture or leakage is an emergency and carries significant increase in morbidity and mortality.^{3,4}

Selective visceral artery angiography following CT scan is advocated by many surgeons to help guide surgery— however, it is increasingly being replaced by contrast-enhanced magnetic resonance angiography (MRA).⁵ In this case, the time course suggested that the right foot cellulitis might have contributed to the development of infective endocarditis, particularly in the presence of a congenital bicuspid aortic valve. It is also interesting to note the speed at which mycotic SMA aneurysms can rapidly enlarge from the time of CT scanning to performing selective angiography. Classical management of mycotic superior mesenteric artery aneurysm include surgical resection of the aneurysm (aneurysmectomy) and arterial reconstruction with graft, or endoaneurysmorrhaphy with vein, followed by further 4 to 6 weeks of antibiotics guided by culture sensitivity.

In ruptured aneurysms, emergency surgical repair or embolisation of the ruptured aneurysm with metallic coils has been reported with success.^{4,6} However, the operative mortality associated with ruptured aneurysms can be 37% compared with minimal mortality rate in elective repair.³

More recently with advances in stent technology, endovascular stent-graft placement can be an attractive alternative to surgery, particularly in patients who are non-fit for surgery, or for dissecting and pseudoaneurysms of the SMA.^{7,8} Nevertheless, early elective surgery should be considered for patients at good operative risk with mycotic SMA aneurysm.

The case is a reminder that clinicians should have a high index of suspicion and have a low threshold for appropriate abdominal imaging in patients with infective endocarditis presenting with abdominal pain.

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