CASE REPORT

Acute mesenteric ischaemia with infective endocarditis: is there a role for anticoagulation?

Muhammad Waqas,¹ Shahan Waheed,¹ Zishan Haider,² Amir Hafeez Shariff¹

¹Department of Surgery,
The Aga Khan University,
Karachi, Pakistan
²Department of Radiology,
The Aga Khan University,
Karachi, Pakistan

Correspondence to
Dr Amir Hafeez Shariff,
amir.shariff@aku.edu

SUMMARY

A case of a 30-year-old woman with an end-stage renal disease and recently diagnosed with infective endocarditis, who presented with acute abdominal pain. An initial assessment of acute appendicitis was made. A CT scan of the abdomen showed a partially occluded superior mesenteric artery with radiographic evidence of ischaemia in an ileal loop. Intraoperatively, a 5–6 cm segment of the distal ileum was found to be non-viable. The segment was resected with the creation of a double-barrel ileostomy. This case report draws attention to the question of a need for anticoagulation for a septic embolus in the superior mesenteric artery. We could not find evidence on the use of postoperative anticoagulation in this scenario. In this case, the patient was started on oral anticoagulation.

BACKGROUND

Mesenteric ischaemia is an uncommon surgical emergency which poses a high morbidity and mortality if not diligently addressed.¹ Arterial emboli are the most frequent cause of acute mesenteric ischaemia and are responsible for approximately 40–50% of cases.² Most mesenteric emboli originate from a cardiac source. However, there is scarce literature on mesenteric ischaemia in the setting of infective endocarditis, with only a few published case reports. The role of anticoagulation for mesenteric ischaemia due to a septic embolus is not comprehensively discussed in the previously published literature. We are reporting an interesting case of acute mesenteric ischaemia associated with infective endocarditis in which we faced with a therapeutic dilemma regarding the use of anticoagulation.

CASE PRESENTATION

This 30-year-old woman with an end-stage renal disease on haemodialysis presented to the accident and emergency department with worsening abdominal pain over the past 2 days. A month prior to presentation, she had been diagnosed with infective endocarditis with a 4×7 mm highly mobile vegetation on the posterior leaflet of the mitral valve noted on echocardiography (figure 1). Blood cultures at that time revealed methicillin-sensitive *Staphylococcus aureus*, and she was prescribed intravenous vancomycin.

Physical examination revealed significant tenderness especially in the lower abdomen with localised guarding and rebound tenderness in the right lower quadrant. These findings raised the suspicion for acute appendicitis.

Figure 1 Transthoracic echocardiographic image at the time of diagnosis of infective endocarditis. A 4×7 mm vegetation is seen on the posterior leaflet of the mitral valve.

INVESTIGATIONS

Preliminary investigations showed a haemoglobin of 8.1 gm/dL, white blood cell count of $9.9 \times 10^9/L$ with 81% neutrophils, serum lactic acid of 3.6 mg/dL and a creatine of 11.3 mg/dL.

A CT scan of the abdomen and pelvis with intravenous contrast was obtained. Figures 2–4 demonstrate the radiological findings in the superior mesenteric artery and a loop of distal ileum.

TREATMENT

The patient was taken as an emergency case to the operating room where diagnostic laparoscopy showed a segment of the distal ileum to be partially ischaemic. The remainder of the small bowel and

Figure 2 Axial postcontrast CT showing a thick-walled ileal loop in the right iliac fossa with reduced enhancement (arrow) in the right half of this loop compared with the contralateral half of the circumference in the same loop suggestive of ischaemia.

To cite: Waqas M, Waheed S, Haider Z, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-009741

Figure 3 Coronal postcontrast CT scan showing a thickened ischaemic loop of small bowel with poor enhancement (arrow) in the right half of the loop compared with the contralateral wall.

colon appeared healthy. A mini laparotomy was then performed and the segment of ileum was resected with the creation of a double-barrel ileostomy. Palpations revealed pulsations in the superior mesenteric artery, indicating maintenance of blood flow and in keeping with the CT finding of partial, but not complete, occlusion.

She recovered uneventfully from surgery. Following much deliberation and differences of opinions among various

Figure 4 Axial postcontrast CT scan showing a subtle partial filling defect representing thrombus (arrow) in the distal superior mesenteric artery with slight fat stranding in the root of mesentery.

consulting physicians (general surgeon, cardiologist, infectious disease specialist, nephrologist and haematologist), the patient was started on systemic anticoagulation with intravenous heparin which was subsequently changed to oral warfarin. A transthoracic echocardiogram performed after surgery did not show any vegetation, suggesting that it had indeed embolised to the mesenteric vessels.

Histopathology showed extensive ulcerations of the segment of ileum without overt features of gangrene, indicating timely surgical intervention.

OUTCOME AND FOLLOW-UP

Three weeks following surgery, she was on warfarin with an international normalised ratio of between 2 and 3. Antibiotics for infective endocarditis are being continued.

DISCUSSION

Acute mesenteric ischaemia remains as one of the true surgical emergencies. Arterial embolism is the most common cause of acute mesenteric ischaemia. Although embolic events after infective endocarditis are common, mesenteric involvement is rare.

The first consideration in this case is whether early cardiac valve surgery would have prevented this complication. The most potent independent predictors of a new embolic event are the size and mobility of the vegetations.³ A recent review of the published literature concluded that a vegetation size of greater than 10 mm is a strong indication for surgery.⁴ The patient's vegetation measured 4×7 mm and thus did not meet size criteria for early cardiac surgery. Particular microorganisms, including *Staphylococci* (as in this case), *Streptococcus bovis* and *Candida* species do increase the risk of embolisation, but are of secondary importance.³

Following her emergency intestinal surgery, a therapeutic dilemma was encountered when considering the role of systemic anticoagulation in acute mesenteric ischaemia associated with infective endocarditis. A thorough literature search was performed with two aims: first to review the literature on acute mesenteric ischaemia in this setting, and second to assess studies describing the use of anticoagulation in this specific scenario. We could find only three case reports of mesenteric ischaemia secondary to infective endocarditis.

In the first case report, Misawa *et al*⁵ describe the case of a woman in her 70s with rheumatoid arthritis who presented with mesenteric ischaemia secondary to infective endocarditis. It was later learned that she had vegetations on the anterior leaflet of the mitral valve and underwent valve replacement following the diagnosis.

In a case series of 68 patients, Millaire *et al*⁶ found the rate of embolic events in the presence of infective endocarditis to be 51%, but there was only one case of mesenteric ischaemia. Details of that case were not described.

Another case was reported by Eickhoff *et al*.⁷ They described the case of a 26-year-old woman with ulcerative colitis. She developed infective endocarditis secondary to ulcerative colitis which then embolised and led to the occlusion of her superior mesenteric artery. That patient was also treated by the mitral valve replacement.

Should our patient have been anticoagulated after surgery? This question has not been addressed in the literature. The guidelines from the European Society of Cardiology on infective endocarditis also do not put forth a recommendation for this specific scenario.³

The role of anticoagulation in acute embolic mesenteric ischaemia is well established. Any patient in whom superior mesenteric artery embolisation is diagnosed requires preoperative systemic anticoagulation to prevent the propagation of clot around the embolus and to guard against further embolisation to the intestine or other organs.⁸ Extrapolating this reasoning to this case, where a septic embolus is present, provides the basis for the argument in favour of anticoagulation.

The European Society of Cardiology guidelines do state, however, that there is no indication for the initiation of antithrombotic drugs (thrombolytic drugs, anticoagulant or antiplatelet therapy) during the active phase of infective endocarditis.³ This is based on low levels of evidence where an increased risk of cerebral haemorrhage has been observed in patients with infective endocarditis who were taking oral anticoagulants. Those at the highest risk were patients with *S aureus* or who had suffered a previous neurologic event. This observation formed the crux of the argument against anticoagulation in the patient.

Following the extensive debate, the patient was started on anticoagulation without any adverse sequelae. In the absence of definitive guidelines, this case opens an important debate in this rare entity which will require further studies to fully elucidate.

Learning points

- ▶ Mesenteric ischaemia secondary to infective endocarditis is a very rare entity.
- ▶ The size of the vegetation in infective endocarditis is the most potent predictor of embolisation. In the patient with vegetations measuring more than 10 mm strongly consider early cardiac valve surgery.
- ▶ This case initiates an important debate on the role of anticoagulation in cases of septic embolism of the mesenteric vessels.

Contributors MW was involved in the conception, design, acquisition of data and drafting of the manuscript; SW was involved in the acquisition of data and drafting of the manuscript; ZH was involved in the acquisition of data; AHS was involved in the conception, design, drafting of the manuscript and critical revision of the manuscript; all the authors have given final approval.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Oldenburg WA, Lau LL, Rodenberg TJ, *et al.* Acute mesenteric ischemia: a clinical review. *Arch Intern Med* 2004;164:1054–62.
- 2 Lock G. Acute intestinal ischaemia. *Best Pract Res Clin Gastroenterol* 2001;15:83–98.
- 3 Habib G, Hoen B, Tornos P, *et al.* Guidelines on the prevention, diagnosis, and treatment of infective endocarditis (new version 2009): the Task Force on the Prevention, Diagnosis, and Treatment of Infective Endocarditis of the European Society of Cardiology (ESC). Endorsed by the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and the International Society of Chemotherapy (ISC) for Infection and Cancer. *Eur Heart J* 2009;30:2369–413.
- 4 Okonta KE, Adamu YB. What size of vegetation is an indication for surgery in endocarditis? *Interact Cardiovasc Thorac Surg* 2012;15:1052–6.
- 5 Misawa SI, Sakano Y, Muraoka A, *et al.* Septic embolic occlusion of the superior mesenteric artery induced by mitral valve endocarditis. *Ann Thorac Cardiovasc Surg* 2011;17:415–17.
- 6 Millaire A, Leroy O, Gaday V, *et al.* Incidence and prognosis of embolic events and metastatic infections in infective endocarditis. *Eur Heart J* 1997;18:677–84.
- 7 Eickhoff P, Fazekas T, Attarbaschi A, *et al.* Mitral valve endocarditis caused by ulcerative colitis followed by septic embolic occlusion of the superior mesenteric artery. *Eur J Echocardiogr* 2009;10:806–7.
- 8 Goldman L, Schafer AI, eds. *Goldman's cecil medicine*. 24th edn. Maryland Heights, MO: Elsevier, 2011:929.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow