CASE REPORT

Embolic superior mesenteric artery (SMA) occlusion secondary to a cardiac sarcoma

Alexander Robinson,¹ Thomas Woodman,² Baris Ozdemir,¹ Ary Phaily¹

¹Department of General Surgery, Ashford and Saint Peter's Hospitals NHS Trust, Surrey, UK

²Department of Accident and Emergency, Ashford and Saint Peter's Hospitals NHS Trust, Surrey, UK

Correspondence to

Dr Alexander Robinson, robinson.a@gmail.com

Accepted 1 March 2016

SUMMARY

We present a case of embolic acute mesenteric ischaemia (AMI) secondary to an underlying cardiac sarcoma, an exceedingly rare presentation only reported twice before. A 46-year-old man presented to accident and emergency department during the night with severe abdominal pain and vomiting. An urgent CT angiograph demonstrated superior mesenteric artery (SMA) occlusion with ischaemic small bowel. Joint surgical effort from vascular and general surgeons successfully recanalised the SMA and a 20 cm segment of small bowel was resected. Postoperatively, an echocardiogram demonstrated a mass within the left atrium. After cardiothoracic resection, the mass was found to be a rare undifferentiated cardiac sarcoma. Further staining on the embolus retrieved from the SMA revealed scattered spindle cells with a similar immunohistochemistry profile to that of the resected cardiac sarcoma. The patient was subsequently discharged well on lifelong warfarin.

BACKGROUND

Acute mesenteric ischaemia (AMI) is a surgical emergency with a high mortality rate; it can be difficult to diagnose as it is described as classically presenting with 'pain that is out of proportion to the clinical examination'. AMI can be caused by both arterial and venous occlusion, and a further type is described as non-occlusive mesenteric ischaemia (NOMI). Regardless of the aetiology, the management is similar, with delayed intervention of >6 h from presentation being associated with significantly worse outcomes.¹⁻³ Open surgery is classically the treatment of choice although endovascular intervention has become a treatment of interest in recent years.⁴ The presented case is a rare cause of mesenteric ischaemia secondary to an embolus from a cardiac sarcoma, only reported twice before in the literature. The diagnosis was made within 2 h of presentation and the patient taken to theatre within 6 h. Subsequently, the patient was discharged well following both, abdominal and cardiothoracic surgery. The case demonstrates how early diagnosis and urgent vascular/general surgery can result in excellent outcomes. The report also includes extraordinary CT images, which may provide a valuable learning opportunity.

CASE PRESENTATION

A 46-year-old man with no previously known or surgical history presented in the early hours of the morning to a district general hospital, with severe abdominal pain and vomiting. Triage observations were normal aside from a respiratory rate of 23.

The pain began 5 days prior, after the patient had eaten a Chinese meal, and the patient had self-medicated for a 'stomach bug'. The pain became significantly worse in the 6 h preceding his accident and emergency (A&E) attendance. The pain was described as 9/10 in severity in the epigastrium and was associated with mild vomiting. His bowels, unusually for the patient, opened 4 days earlier and no flatus was passed for the preceding 12 h. He was not obese, had minimal alcohol intake and a 10-year pack smoking history.

In light of the severity of abdominal pain, an urgent surgical review was sought and on further questioning the patient admitted to experiencing palpitations over the past few weeks.

INVESTIGATIONS

Blood test revealed normal amylase, white cell count $9.8 \times 10^9/L$ and C reactive protein 231 mg/L. Venous lactate was 1.7 mmol. Chest X-ray was normal and plain abdominal X-ray revealed some distended but not dilated small bowel loops in the left upper quadrant (figure 1). Two ECGs in the A&E department were sinus although in a short segment an irregular rhythm was suggested.

CT angiography (CTA) revealed a segmental thrombosis in the superior mesenteric artery (SMA) with an abnormal segment of small bowel in the left upper quadrant (figures 2 and 3).

An echocardiogram was performed postabdominal surgery, which revealed a large mass in the left atrium.

DIFFERENTIAL DIAGNOSIS

The initial diagnosis from the A&E physician was pancreatitis, but this was felt unlikely, as the amylase was normal.

Figure 1 Distended small bowel loops in the left upper quadrant on a plain abdominal X-ray.

To cite: Robinson A, Woodman T, Ozdemir B, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2016-214575

Figure 2 Corresponding coronal image displaying segmental filling defect in the superior mesenteric artery, with abnormal oedematous bowel loops.

The surgical registrar felt that a diagnosis of AMI was the most important diagnosis to investigate for. Owing to the patient's history of some palpitations an embolic occlusion of the SMA was felt to be most likely, although venous thrombosis was a possible diagnosis in light of the history of vomiting over the past 5 days.

TREATMENT

The diagnosis of AMI was performed and the patient transferred to emergency theatre. Intravenous fluids and abdominal sepsis antibiotics were administered. A midline laparotomy was performed, which revealed an ischaemic segment of jejunum with questionable viability. The vascular surgeons performed an SMA embolectomy and the vessel was closed with a saphenous

Figure 3 Sagittal image of superior mesenteric artery embolus.

vein patch. After allowing time for reperfusion to occur, a small segment, approximately 20 cm, of small bowel was resected with a primary anastomosis. Postoperatively, the patient was transferred to the intensive treatment unit for recovery.

During this time, an echocardiogram was performed to look for a source of the embolus, which revealed a large mass in the left atrium, thought at that stage to represent an atrial myxoma. Postrecovery from the abdominal surgery the patient was transferred to a tertiary cardiothoracic centre, where he underwent a complex procedure to remove the cardiac lesion. Subsequent histology revealed a cardiac sarcoma as the underlying cause for his embolic event. Further staining on the embolus retrieved from the SMA revealed scattered spindle cells with a similar immunohistochemistry profile to that of the resected cardiac sarcoma.

OUTCOME AND FOLLOW-UP

The patient was discharged home following successful cardiothoracic surgery, on lifelong warfarin.

DISCUSSION

AMI can be split into three categories, acute arterial occlusion (SMA), mesenteric venous thrombosis (MVT) and NOMI. SMA occlusion causes ischaemia by reducing splanchnic flow directly whereas MVT causes ischaemia secondary to increased venous pressure causing oedema and, eventually, progressing to transmural infarction.^{5 6} NOMI is reduced splanchnic flow secondary to a number of different causes,⁷ which are outside the scope of this case report.

AMI is a surgical emergency with an incidence of 12.9/100 000 in a Swedish study; of these cases, 68% were secondary to arterial occlusion, 16% secondary to venous occlusion and 16% secondary to NOMI;³ arterial occlusion was secondary to an embolus 58% of the time whereas thrombosis of pre-existing atherosclerosis was the cause in 42% of cases. However, there is some degree of discrepancy between published data, and an American study reported that arterial thrombosis comprised 50% of cases compared with 33% for embolic occlusion.¹

Unfortunately, the non-specific symptoms and signs can lead to a delay in diagnosis. The use of CTA has increased significantly from 31% in the 1990s to 83% in the 2000s,¹ and is often available within the emergency department. This, in theory, may lead to a reduction in the published time dependent mortality rates of <10% with treatment within 6 h to 50% within 24 h to 70% with treatment occurring >24 h after presentation.^{2 8}

Cardiac malignancies are rare, comprising 25% of total cardiac tumours, the prevalence of which was found to be 0.02% during postmortem studies.⁹ Mesenteric ischaemia secondary to a cardiac sarcoma is, therefore, extremely rare. Only two similar cases have been published,^{10 11} however, in neither of these cases did the patient survive longer than 1 month following presentation.

The management of small bowel ischaemia is a time dependent emergency and, without intervention, it is invariably a fatal event. Perioperative mortality is high and in some cases it may be appropriate for a palliative approach in those who have a P-Poosum score, which is suggestive of poorer outcomes. Endovascular recanalisation has been reported in a number of cases, however, it relies on the early presentation and diagnosis, and often requires a laparotomy to confirm the viability of the re-vascularised bowel,⁴ this negates some of the benefit of a minimally invasive approach. Open surgery has the advantage of allowing visual assessment of the viability of the bowel and

determining the patency of the mesenteric vessels through either, palpation or using a hand-held Doppler. It also allows surgical resection of ischaemic bowel, thereby removing the septic source and permitting vascular intervention as required.

This case highlights that early recognition and treatment of bowel ischaemia can lead to excellent outcomes. Careful history taking can elicit features that increase the suspicion of ischaemic bowel, such as palpitations, as in this case. The images presented here are an excellent demonstration of SMA ischaemia, and early recognition of this feature by the surgical team following the CT scan allowed rapid surgical management with minimal delay.

Learning points

- ▶ Early recognition of small bowel ischaemia correlates with better outcomes.¹²
- ▶ Pain out of proportion to the clinical examination should raise suspicion of mesenteric ischaemia.
- ▶ Following the diagnosis and management of superior mesenteric artery occlusion, it is necessary to determine the underlying pathology with ECG/echocardiograms, as required.

Acknowledgements The authors would like to thank the surgical, radiological and pathology teams involved in the care of the patient. The authors would also like to thank Mr S Thillainayagam for his guidance and support.

Contributors AR was involved in the drafting of the case report assisted by AP. TW and BO admitted the patient and were involved in editing of the manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Ryer EJ, Kalra M, Oderich GS, *et al.* Revascularization for acute mesenteric ischemia. *J Vasc Surg* 2012;55:1682–9.
- 2 Oldenburg WA, Lau LL, Rodenberg TJ, *et al.* Acute mesenteric ischemia: a clinical review. *Arch Intern Med* 2004;164:1054–62.
- 3 Acosta S. Epidemiology of mesenteric vascular disease: Clinical implications. *Semin Vasc Surg* 2010;23:4–8.
- 4 McGarry JG, McEvoy SH, Brophy DP. Endovascular recanalisation of an acute superior mesenteric artery occlusion. A case report and review of the literature. *Ann Med Surg* 2015;4:76–9.
- 5 Harnik IG, Brandt LJ. Mesenteric venous thrombosis. *Vasc Med* 2010;15:407–18.
- 6 Singal AK, Kamath PS, Tefferi A. Mesenteric Venous Thrombosis. *Mayo Clin Proc* 2013;88:285–94.
- 7 Stamatakis M, Stefanaki C, Mastrokalos D, *et al.* Mesenteric ischemia: still a deadly puzzle for the medical community. *Tohoku J Exp Med* 2008;216:197–204.
- 8 Klar E, Rahmanian PB, Bücken A, *et al.* Acute mesenteric ischemia: a vascular emergency. *Dtsch Arztebl Int* 2012;109:249–56.
- 9 Hoffmeier A, Sindermann JR, Scheld HH, *et al.* Cardiac tumors—diagnosis and surgical treatment. *Dtsch Arztebl Int* 2014;111:205–11.
- 10 Clores MJ, Monzur F, Rajapakse R. Acute mesenteric ischemia caused by rare cardiac tumor embolus. *ACG Case Rep J* 2014;2:27–9.
- 11 Lim L, Collier K, Harland R, *et al.* A rare cause of a small bowel infarction. *J Surg Case Reports* 2011;11.
- 12 Duran M, Pohl E, Grabitz K, *et al.* The importance of open emergency surgery in the treatment of acute mesenteric ischemia. *World J Emerg Surg* 2015;10:45.

Copyright 2016 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