CASE REPORT

An uncommon presentation of acute mesenteric ischemia following isolated spontaneous superior mesenteric artery (SMA) dissection

J. Arudchelvam[1,2], S Gobinath [1], H. F. D. G. D. Fonseka [1], R.P.S. Prasanga [1], R. Cassim[2], M. Wijeyaratne[2]
[1]National Hospital of Sri Lanka, Colombo, Sri Lanka
[2]Department of Surgery, Faculty of Medicine, University of Colombo, Sri Lanka

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Introduction

Acute mesenteric ischemia (AMI) results from sudden reduction in aterial blood flow threatening its' viability. It can be due to four different pathologic processes;arterial thrombosis, arterial embolism, non-occlusive mesenteric ischaemia and mesenteric venous thrombosis [1,2]. Thromboembolic occlusion of the superior mesenteric artery (SMA) is the most common cause of acute mesenteric ischemia accounting for 67 to 95 percent of cases [3]. AMI presents with sudden onset abdominal pain with minimal signs on abdominal examination. Therefore the diagnosis is often missed or delayed resulting in poor outcome. Isolated superior mesenteric artery (SMA) dissection causing AMI is a rare presentation with an incidence of 0.06%, and can be easily missed [4,5]. Among the visceral arteries, SMA dissection is the [6]. In arterial dissection, there is an intimal tear resulting in the blood entering the sub intimal or intimo-medial plane. This results in separation of the arterial wall layers. As a consequence, dissection causes obstruction to blood flow by means of a dynamic or a static intimal flap [7]. Potential etiologies include atherosclerosis, medial degeneration of the arterial wall, infection, hypertension, and arteriopathies. Arteriopathies associated with SMA dissection include Ehlers-Danlos syndrome type IV and other connective tissue disorders [4]. Here we present a surgically managed case of an isolated SMA dissection and its outcome.

Case presentation

A 63-year-old male with a history of diabetes mellitus and hypertension for 3 years duration presented to the emergency department with a sudden onset epigastric pain for 6 hours. The pain worsened with meals. He did not have a fever. The patient was not a smoker and he did not have hypertension.

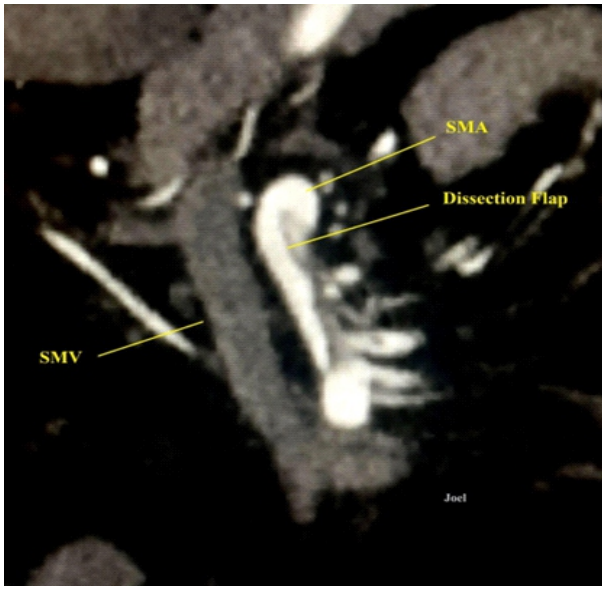

Figure 1: Angiogram showing the SMA dissection with thrombosed false lumen.

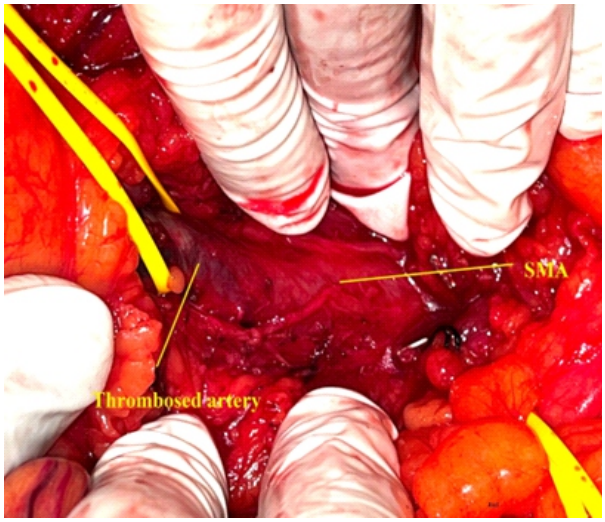

Figure 2: Intraoperative image demonstrating thrombosed SMA.

His abdomen was non tender on examination and he was haemodynamically stable. The bowel sounds were sluggish on auscultation. Distal pulses were equal and symmetric in all four extremities.

An abdominal x-ray did not reveal any abnormalities. The

Correspondence: J. Arudchelvam
E-mail: joelaru@yahoo.com
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serum lactate level was elevated (2.6 mmol/L, normal - 0.5-1). An ultrasound scan of the abdomen revealed no flow in the distal SMA and a possible thromboembolic occlusion of the SMA was suspected. A Contrast enhanced computed tomography scan (CT) of the abdomen and pelvis with a computed tomography angiogram (CTA) was done. This showed an isolated flow limiting SMA dissection. The dissection flap started about 3 cm distal to the origin of the SMA. The dissection flap extended for about 5 cm. The major branches of the SMA were perfused from the true lumen while the false lumen was false lumen was thrombosed (Figure 1). The distal SMA was also thrombosed and bowel wall was edematous.

An emergency laparotomy was done. On laparotomy, the small and the large intestines were viable. SMA was mobilized; a thrombosed segment extending from 3 cm to 8 cm along the SMA was noted (Figure 2).

A longitudinal arteriotomy was done on the SMA at the distal healthy segment. Intimal flap was noticed proximally. A thrombectomy was done to the distal segment using a Fogarty catheter. Following which a good backflow was noted. The dissection flap was tagged with 7/0 Polypropylene sutures. The infrarenal aorta was exposed and an aorta to SMA saphenous venous graft bypass was performed (Figure 3). A good graft and distal pulses were noted intraoperatively. Following reperfusion, there was a transient reduction in blood pressure that recovered with fluid boluses. The serum lactate level was elevated to 3.6 mmol/L in the immediate postoperative period, and returned to the normal level in 6 hours.

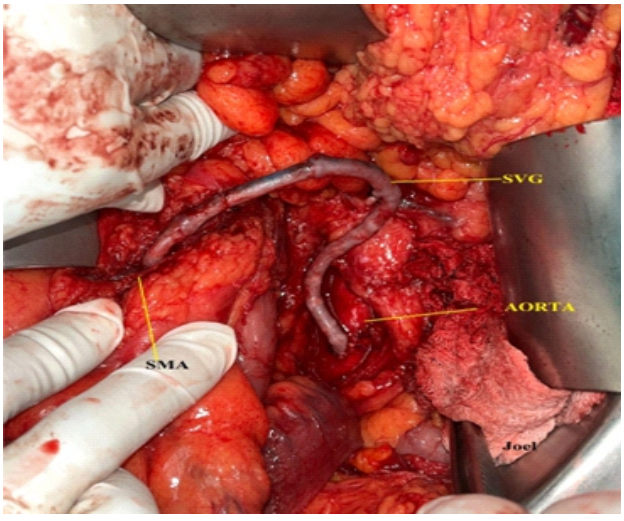

Figure 3: intra operative image showing aorta to SMA saphenous vein graft bypass

Patient had an uneventful recovery following an Intensive Care Unit (ICU) stay of two days and was discharged home on day six.

Discussion

Isolated superior mesenteric artery (SMA) dissection causing AMI is a rare presentation with an incidence of 0.06% [4,5].The usual described mean distance from the SMA ostium to the beginning of the dissection is from 1.5 cm to 3 cm. At this site, there is a transition zone between the fixed retro pancreatic proximal part of the artery and the relatively mobile distal part. The mobile part of the artery moves on the fixed part with the movements of the bowel [5,9]. This is thought to be the cause for the 1.5 cm to 3 cm segment being commonly affected by the dissection. In this patient the dissection began at 3cm from the SMA origin.

There is a male predominance in isolated SMA dissection among the published literature is difficult to be delineated [9]. The etiology for the dissection amidst the presence of normal inflammatory and autoimmune markers, the patient being a non-smoker with well controlled blood pressure.

The management of SMA dissection depends on the timing (delay) of the diagnosis, the degree of bowel ischemia on presentation and the hemodynamic stability of the patient [8]. Management modalities include conservative, endovascular, and surgical. However the best treatment strategy for isolated SMA dissection has not been defined due its rarity [8].

Conservative management includes bowel rest, blood pressure control, anticoagulation with heparin and antiplatelet administration. This is possible only if the patient is haemodynamically stable and with no clinical or radiological evidence of bowel ischemia or rupture of SMA branches [9].

Revascularization should be considered in the presence of bowel ischemia, progression of dissection and progression of thrombus in the SMA [10].

Endovascular treatment includes intralesional thrombolytic therapy, angioplasty combined with placement of stents [9, 13]. It was not opted in this case as the emergency endovascular facilities were not available and the bowel wall was showing evidence of ischemia i.e. oedema of the bowel wall.

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The first reported saphenous vein graft bypass for SMA dissection was a performed by Sisteron and Vieville in 1975 [12]. Other described surgical procedures include resection and anastomosis with an interposition graft, SMA transposition, thrombectomy, intimectomy and venous patch repair and bypass with synthetic grafts [9].

In this case a surgical treatment was opted as there was worsening symptoms and radiological evidence of bowel oedema. Therefore an aorta to SMA saphenous vein graft bypass was done and a successful outcome was obtained.

Conclusion

Spontaneous isolated SMA dissection causing acute mesenteric ischemia is a rare presentation and can be easily missed. Being aware of such cause for a sudden onset abdominal pain is essential to prevent delays in diagnosis. Management depends on the early diagnosis, degree of bowel ischemia and hemodynamic stability of the patient. It can be managed conservatively or by endovascular and surgical revascularization. The best management modality is not established but it has to be tailored to the individual patient.

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Learning Points:

- Acute mesenteric ischemia can present with nonspecific symptoms
- High degree of clinical suspicion is needed to make the diagnosis
- Revascularisation should be considered in patients with no imaging and surgical evidence of bowel gangrene.