

Acute Mesenteric Ischaemia: Case report, technical considerations and innovative approaches

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Abstract

Acute mesenteric ischaemia is a worrisome clinical condition with high mortality. We present a 90 years old male patient, known case of atrial flutter who developed acute mesenteric ischaemia. This was due to superior mesenteric artery embolus. He underwent successful superior mesenteric embolectomy and made a smooth recovery. He was symptom free and was discharged from hospital on 5th post-operative day on life long anticoagulants. Early diagnosis, adequate resuscitation and attention to finer technical details of superior mesenteric embolectomy can save a life in selected patients.

Keywords: Acute mesenteric ischemia, Surgery of mesenteric arteries, Ischemic bowel disease.

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Introduction

Acute mesenteric ischaemia (AMI) is a difficult condition to treat. It is a fairly common cause of 'acute abdomen' in the elderly. About 10% of patients presenting with acute abdomen over the age of 70 years had AMI.¹ Patients with occlusion of Proximal superior mesenteric artery (SMA) have severe intestinal ischaemia and may end up in extensive necrosis.³ There are a few patients who make smooth recovery. We report a case of an elderly gentleman, who presented with acute mesenteric occlusive ischaemia and underwent SMA embolectomy.

Case Summary

A 90 years male with acute abdominal pain for the last 3 hours presented in September 2018 in the emergency department of Aga Khan University Hospital, Karachi. He was a known case of atrial flutter but was not on any anticoagulation. His pain was severe, continuous and diffuse and associated with nausea. On abdominal examination there was mild tenderness and bowel sounds were not audible. CT abdomen showed thrombus in mid portion of SMA. Origin of both the coeliac and SMA were patent. As he was active and independent and was enjoying a good quality of life, decision to perform SMA embolectomy

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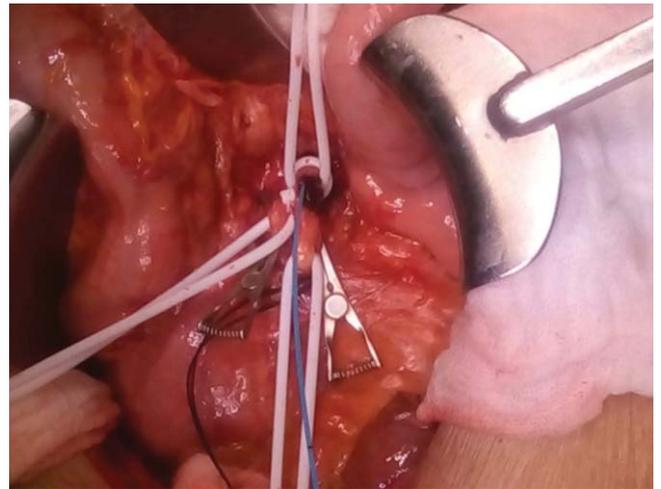


Figure: Fogarty catheter extracting clot from the superior mesenteric artery.

was made. Patient gave the informed consent. He was started on therapeutic dose of heparin.

Under general anaesthesia, diagnostic laparoscopy was performed. Dusky bowel was seen indicating severe ischaemia. Midline laparotomy was therefore performed. Through the base of the transverse colon and root of mesentery, SMA was exposed. It was not palpable and dissection was performed by anatomical landmarks. After dissecting all its branches, systemic heparin 3000IU was administered intravenously. Clamps were applied and transverse arteriotomy was performed. Size 3 Fogarty catheter was passed proximally (Figure). Clot was retrieved and a good flow was established. Embolectomy catheter was also run distally, but no clot was retrieved. Arteriotomy was closed with prolene 6/0 continuous sutures. Good flow was established which lead to a change in the colour of the bowel. Abdominal cavity was closed. Patient was extubated and shifted to ICU for monitoring. He was kept on therapeutic heparin in the postoperative period. He made a satisfactory recovery and started tolerating diet on 4th post-operative day. He was discharged on 5th post-operative day on subcutaneous enoxaparin. Tab rivaroxaban 20 mg daily was prescribed, later. On the follow up at six weeks, he was symptom free. Therapeutic anticoagulation was advised lifelong.

Discussion

Acute mesenteric ischaemia is a life-threatening emergency. If diagnosed early, it is treatable. Only high index of suspicion is not enough for treating acute mesenteric ischaemia. It needs multidisciplinary care. An early CTA can help in differentiating occlusive versus non-occlusive acute mesenteric ischaemia.⁴ It can show non-enhancement of the arterial vasculature with timed intravenous contrast injections.

As a general principle, exploration should be as early as possible. It is fair to start with diagnostic laparoscopy to see the condition of the bowel. If there is extensive necrosis, it is human to leave the patient for best comfort care. If there is any chance of revascularization, patient is explored via midline laparotomy. The extent of necrotic bowel is assessed. Before resecting any segment of the dead bowel, options of revascularization are considered. For acute mesenteric ischaemia due to an embolus, embolectomy is recommended.⁵ SMA is usually exposed at the base of the mesentery. Transverse colon is lifted cephalad and small bowel retracted downwards, overlying mesentery is dissected in transverse fashion. By both blunt and sharp dissection, SMA is controlled. It has a number of branches at this point and each branch is individually managed. One needs at least 4 to 5 cm length of artery for performing embolectomy. SMA is surrounded by a lot of lymphatic and adipose tissue. Before making arteriotomy, artery is palpated for disease status. Transverse arteriotomy can be closed primarily without any significant narrowing and is preferred in healthy arteries. In atherosclerotic arteries with possibility of doing a bypass, longitudinal arteriotomy is performed. It does require patch closure to minimize any chance of narrowing. Arteriotomy is performed when patient is fully anticoagulated. Stay stitches can be placed at both corners of arteriotomy to prevent further extension. First proximal embolectomy is performed during which clamp is placed at distal end. This is to prevent accidental migration of the clot. To start with, a smaller size catheter is used to cause minimal arterial wall injury. The size can be increased, if needed. Arteriotomy is closed with 6/0 or 7/0 prolene primarily or with a patch. Care is taken to pass the needle through all the layers of arterial wall. This is to tag intimal plaque securely and to prevent any dissection. Before the last knot, the vessel is irrigated to remove any residual thrombus or loose plaque. Some time is given to assess the change in the status of the vascularity of the bowel. The return of a palpable pulse, colour of bowel returning to pink and with some contractile activity indicates successful embolectomy.

The other approaches to explore superior mesenteric artery are via lesser sac and by mobilizing 4th part of duodenum

after dividing the ligament of Trietz. They do require little more dissection.

For acute on chronic ischaemia, the primary lesion is either bypassed or dealt with retrograde cannulation of the SMA. Bypass of SMA is either antegrade or retrograde. In the antegrade bypass, inflow is taken from supraceliac aorta, which needs suprarenal aortic clamping. This is associated with major haemodynamic changes. In retrograde bypass, inflow is taken from one of disease free iliac artery. This avoids aortic cross clamping.

Retrograde cannulation of SMA is performed in Hybrid OR with good imaging.⁶ In this, SMA is dissected and standard arteriotomy and embolectomy is performed. After this SMA is cannulated in a retrograde manner and appropriate sheath placed over the guidewire. The culprit lesion is crossed in retrograde with a hydrophilic guidewire. This guidewire is grasped by a snare passed through one of the femoral artery accesses. When end of the guide wire comes through the femoral sheath, it is exchanged with a stiffer wire. Appropriate ballooning and stenting across the lesion is performed. This approach avoids aortic clamping and is done in a shorter time duration than a standard bypass.

Following relief of ischaemia, dealing with the consequences of re-perfusion is a challenge. It does need intensive care monitoring. This case shows that by early recognition, appropriate planning and meticulous surgical technique, successful SMA embolectomy can be performed.

Conclusion

Early recognition, good resuscitation and timely SMA embolectomy can save the life of a well-selected patient of AMI.

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