



## **ENDOVASCULAR THERAPY IN ACUTE MESENTERIC ISCHEMIA: A CASE REPORT**

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### **ABSTRACT**

Acute mesenteric ischemia (AMI) is a rare, sudden vascular event that unless diagnosed and treated very early, has a very high morbidity and mortality. Early diagnosis of AMI needs a high degree of clinical suspicion, especially if the patient is older than 50 years of age with cardiac disease. AMI can be due to superior mesenteric artery (SMA) emboli, non-occlusive mesenteric ischemia, SMA thrombosis, superior mesenteric venous thrombosis and focal segmental ischemia of colon. SMA occlusion by embolus or thrombus can be managed angiographically with aspiration of embolus, thrombolytics and stenting, non-occlusive mesenteric ischemia can be managed by vasodilator therapy with papaverine, nitroglycerine or prostaglandin E1, mesenteric venous thrombosis can be managed with anticoagulants while surgical methods like embolectomy, thrombectomy, arterial bypass and resection of infarcted bowel will be required in most cases, especially when signs of peritonitis develop. We report a case of proximal level superior mesenteric artery embolic obstruction that was diagnosed very early and managed by endovascular therapy with good success.

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### **INTRODUCTION**

The bowel can be viable with a 75% reduction of mesenteric blood flow for 12 hours without any histopathological changes (1). The severity of AMI depends on the complete or partial occlusion of SMA, number of arteries involved, duration of ischemia and availability of collateral arterial circulation. Inadequate blood flow to part or whole of the small intestine and the right half of the large intestine that happens suddenly can be due to superior mesenteric artery emboli of cardiac origin (incidence 50%), non-occlusive mesenteric ischemia due to vasospasm or hypotension due to myocardial infarction, congestive heart failure, aortic insufficiency, renal or hepatic disease, sepsis, and patients following cardiac surgery (incidence 25%), SMA thrombosis due to atherosclerosis, cardiac diseases, malignancies and Inflammatory bowel diseases (IBD) (incidence 10%), superior mesenteric venous thrombosis due to hypercoagulable state, liver cirrhosis or pancreatic diseases, abdominal malignancies, abdominal surgery and IBD (incidence 10%) and focal segmental ischemia due to strangulation of bowel or atherosclerosis with incidence of 5%.

Clinically, patient presents with severe abdominal pain which is out of proportion to abdominal signs, though in later stages, signs of peritonitis may become more dominant. While Doppler Ultrasonogram can be helpful to diagnose proximal level SMA embolic or thrombotic obstruction, the abdominal multidetector CT (non-contrast, arterial phase and venous phase contrast), not only gives a clue to diagnosis, gives information about the current level of bowel ischemic injury and its complications, but also helps to exclude other causes of acute abdominal pain and it is currently the first investigation of choice. CT findings in AMI include thickening of bowel wall, hyper attenuating bowel wall, filling defects in mesenteric arteries or veins, absent wall enhancement, paper thin bowel wall, mesenteric stranding, pneumatosis and portal venous gas, free peritoneal gas (2).

**Case Report:** A 52-year old man presented in emergency department with intolerable continuous severe abdominal pain, predominantly around the umbilicus and on the right lumbar and right iliac fossa region, of sudden onset, lasting for 2 hours. He was afebrile, had stable vitals, his abdomen was flat, soft, no tenderness and the bowel sounds were heard. His ECG showed atrial fibrillation and his Ultrasonogram abdomen was normal except for mildly dilated IVC. Doppler USG suggested proximal superior mesenteric artery (SMA) complete

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occlusion. Since the diagnosis was made very early, he was taken up for angiographic confirmation and management. SMA angiogram showed large rounded filling defect at proximal level with complete obstruction to flow (Figure A), suggesting embolic occlusion at proximal level. SMA was cannulated with 6F-JR4, aspiration of emboli and intra-arterial injection of Urokinase 2.5 Lakh units were done. Endovascular management was completed within 4 hours from the onset of his pain abdomen. Angiogram at the end of procedure (Figure B) was normal.

He was closely monitored for his vital signs and abdominal signs in the cardiac intensive care unit. Surgical team was kept ready in case of any worsening. His pain abdomen subsided completely in 4 hours after angiography. CECT abdomen done on the next day was completely normal. Over the next three days, he improved rapidly and got discharged on the fourth day with antiarrhythmics and anticoagulants. He was doing very well in the follow up for more than a year.



Figure A SMA angiogram



Figure B SMA angiogram after endovascular therapy

## DISCUSSION

Emboli from cardiac source usually gets lodged in superior mesenteric artery because of its acute angulation from the aorta and because of its larger size. Large embolus usually gets lodged in the first 8 cm of SMA and it will result in severe continuous pain abdomen, as there is less collateral arterial circulation. Large embolus with complete occlusion at proximal level of SMA can cause bowel necrosis as early as 6

hours and hence a quick intervention is required. Treatment options for SMA embolic occlusion include endovascular therapy and surgical methods. Successful usage of intraarterial Urokinase for acute mesenteric ischemia due to SMA embolism has been documented as early as 1986 (3). Selection of right candidates for using thrombolytic agents in SMA embolism was by choosing patients in whom the diagnosis was made very early before the development of peritoneal signs clinically and absence of bowel infarction in CT abdomen (4). Main drawback of endovascular therapy is that it is not possible to assess the bowel viability and hence, close monitoring of patient after the procedure for any signs of peritonitis and a surgical backup are required. In a 9 years long study comparing the success of endovascular therapy with traditional surgical methods, the endovascular therapy was found to have lesser overall mortality 39% against 50% mortality among those who underwent traditional surgical procedures (5). Resection of lengthier necrotic bowel and complications like acute renal failure, acute myocardial infarction and pulmonary failure that can occur following endovascular therapy or surgical mesenteric bypass were more common with surgical methods than with endovascular therapy as per large retrospective studies (6,7). In our reported case, we were able to diagnose and treat acute SMA embolism with endovascular therapy within 4 hours and hence the patient neither developed any complications nor required surgery.

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