Superior Mesentric Artery Embolism
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Abstract
Mesenteric artery embolism is a rare and an acute abdominal emergency with a very high mortality rate which requires a high index of suspicion for its diagnosis. We hereby report a 55 years old male with rheumatic heart disease in atrial fibrillation with thromboembolic superior mesenteric artery occlusion with a fatal outcome.

INTRODUCTION
Mesenteric vascular occlusion is an uncommon condition which accounts for less than 1% of acute abdominal pain. The occlusion could be due to thrombotic process, vasculitis or embolic phenomenon. The diagnosis of intestinal ischemia begins with the ability of the clinician to suspect and recognize it. The difficulty of diagnosing the condition early and problem in distinguishing it from less lethal causes of abdominal pain leads to delay in treatment with resultant extensive intestinal infarction and gangrene. We hereby report a 55 years old male patient who had acute superior mesenteric artery embolism.

CASE REPORT
A 55 years old male patient presented to us with history of sudden onset of severe pain abdomen and vomiting of 4 days duration with history of having not passed stools during this period. Patient was a known case of rheumatic heart disease with mitral stenosis. He had undergone Percutaneous Transluminal Mitral Commissurotomy (PTMC) 4 years back and was on penicillin prophylaxis. He was a chronic smoker but not a known diabetic or hypertensive.

On clinical examination, patient was restless. There was no pallor, cyanosis, clubbing or lymphadenopathy. Pulse rate was 106/min which was irregularly irregular. BP was 80/50 mmHg. On examination of the cardiovascular system there was loud first heart sound, mid diastolic murmur with opening snap heard over apex. Respiratory system examination was within normal limits. On abdominal examination there was uniform distention with tenderness all over abdomen. There was no guarding or rigidity or rebound tenderness. Bowel sounds were absent.

Routine haematological investigations revealed leucocytosis (WBC-22,700/cumm) and elevated ESR (55 mm/hr). Biochemical investigations were within normal limits. ECG showed evidence of atrial fibrillation, and chest X-ray showed features of LA enlargement. ECHO revealed features of mitral stenosis with a clot in left atrial appendage. Erect abdominal X-ray (Fig. 1) showed multiple air fluid levels with dilated intestinal coils. Ultrasound scanning of abdomen showed dilated intestinal loops. Multislice CT Abdominal angiogram (Figs. 2, 3, 4) revealed occlusion of the mid and distal segments of superior mesenteric artery and its branches. There were dilated small bowel loops with wall enhancement of proximal colon and appendix. These features were suggestive of superior mesenteric artery embolism. The final diagnosis of rheumatic heart disease with post mitral valvuloplasty status in atrial fibrillation with intestinal ischemia was made. He was then referred to surgeon for further management. He was advised to be on medical management alone as he had worsening hypotension and his clinical condition had deteriorated. He was treated with low molecular weight heparin, antibiotics and inotropes. Patient died 4 days after admission to the hospital.

DISCUSSION
Mesenteric vascular occlusion was first described by Tiedemann in 1843. Intestinal ischemia can result from an acute reduction in the arterial supply either due to embolism, thrombosis or poor cardiac output or by blockage of the venous drainage or by a combination of both factors. Mesenteric embolism accounts for 25-30% of patients with intestinal ischemia. In all, 90-95% of emboli arise from the heart in patients with atrial fibrillation. The presence of a cardiac arrhythmia with or without associated rheumatic heart disease or a history of recent myocardial infarction in a patient with sudden onset of diffuse, severe, unremitting and generalized abdominal pain should raise the possibility of superior mesenteric artery occlusion. Our patient showed one of the cardinal features of mesenteric vascular occlusion namely a disproportionate lack of physical
signs in a patient with severe abdominal pain. To refute the diagnosis of acute mesenteric ischemia just because of the absence of rectal bleeding or blood on the examining finger or to wait for the signs of peritonitis is to await death of the bowel before attempting to revascularization. It is for this reason that the importance of the absence of abdominal signs cannot be overstressed. The bowel sounds in SMA occlusion may initially be active or normal. They tend to become decreased after three or four hours.

No laboratory tests are pathognomonic of acute mesenteric ischemia. Once SMA embolism is suspected, angiography and CT or MRI investigation should be taken as soon as possible in order to proceed to thrombolytic or surgical therapy while it is not too late. Angiography is necessary to distinguish between SMA thrombosis and embolism. In patients with thrombosis there may be a history of post prandial pain or mesenteric angina and the onset is rarely as sudden and dramatic as with embolism, so that delay in seeking treatment may occur. The embolism usually lodges just beyond the origin of the middle colic artery, where the caliber of SMA narrows rapidly and hence sparing of the upper jejunum and transverse colon. Thrombosis of the SMA due to atheromatous degeneration usually occurs in the proximal portion of the artery close to its origin from the aorta resulting in infarction of the bowel.

**Fig. 1:** Erect radiograph of Abdomen showing multiple air fluid levels, suggestive of intestinal obstruction.

**Fig. 2:** Three dimension Volume Rendering Technique - CT mesenteric angiogram showing abrupt cut off of the SMA after the origin of the left third jejunal artery.

**Fig. 3:** Sagital three dimension CT showing non enhancing hypodense filling defect in the distal SMA.

**Fig. 4:** Computed tomography axial section contrast study showing enhancement of bowel wall with dilated loop and air fluid level.
intestine from a point about 15 cms beyond the duodeno-
jejunal flexure, to the splenic flexure of the colon provided
the coeliac axis is functioning. Axial computed tomography
imaging has evolved over several years into a very useful
modality for diagnosis of mesenteric ischaemia and is
the test of choice in the diagnosis of acute mesenteric
ischaemia. Findings include focal or segmental bowel
wall thickening, submucosal oedema or haemorrhage,
pneumatosis and portal venous gas.\(^4\) Contrast enhanced
computed tomography detects acute mesenteric ischaemia
with sensitivity rates exceeding 90%. Although magnetic
resonance imaging with angiography is an excellent tool for
the evaluation of chronic mesenteric ischaemia, it should
not be the first technique used in the diagnosis of acute
mesenteric ischaemia, because of its potentially insufficient
resolution to adequately identify non-occlusive low flow
states or distal emboli.\(^5\)

In the case of a suspected diagnosis of SMA embolism,
the patient should be anticoagulated with heparin,
volume resuscitated and taken to the operating room for
an urgent embolectomy. Prophylactic antibiotics and full
hemodynamic monitoring are mandatory. Intestinal viability
is assessed after restoration of the blood flow. Intra-arterial
infusion of thrombolytic agents such as streptokinase,
urokinase, or recombinant tissue plasminogen activator
has been shown to be effective when used within 12 hours
of onset of symptoms. Forgoing surgical embolectomy in
favour of a less invasive approach may be appropriate in
a patient with appreciable operative risk.\(^6\) For acute SMA
thrombosis, contemporary opinion favors multiple vessel
revascularizations. Acute mesenteric arterial embolism or
thrombosis usually has more than 60% mortality rate.

To conclude mesenteric artery embolism is a rare and
urgent acute abdominal emergency with a very high
mortality rate, which requires a high index of suspicion in its
diagnosis. Delay in diagnosis results in extensive intestinal
infarction and gangrene which cannot be reversed even by
successful restoration of blood flow. This patient reached
the hospital 4 days after the onset of symptoms. This delay
perhaps contributed significantly to the fatal outcome.
Hence timely recognition is essential for a favorable
outcome.

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