



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**SUPERIOR MESENTERIC ARTERY THROMBOSIS - A RARE ABDOMINAL EMERGENCY**

**KEY WORDS:** Superior mesenteric artery thrombosis, CT angiogram, CECT abdomen.

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**ABSTRACT**

Mesenteric artery thrombosis is occlusion of arterial supply of intestine. It is potentially a fatal illness typically of the superior mesenteric artery, which supplies small intestine and right colon. The overall prevalence of this condition is estimated to be 0.1% of all hospital admissions. Therefore, although the entity is an uncommon cause of abdominal pain, diligence is always required because if untreated, mortality has consistently been reported in the range of 50%. Early diagnosis and timely surgical intervention are cornerstones of modern treatment and are essential to reduce the high mortality associated with this entity. The advent of endovascular approaches in parallel with modern imaging techniques may provide new options. Herein, we present a case of superior mesenteric artery thrombosis in a 48-year-old female who presented with diffuse pain in abdomen and bilious vomiting's, managed initially with thrombolysis and due to incomplete recanalization in CT angiogram resulting in gangrene of bowel loops in CECT abdomen, managed eventually with surgery. Although rare, early diagnosis and management hold the strongest potential for improving outcomes in this disease process.

**INTRODUCTION**

Acute mesenteric ischemia is defined as sudden interruption of the blood supply to a segment of the small intestine, leading to ischemia, cellular damage, intestinal necrosis and eventually death if left untreated. It may be non-occlusive or occlusive, with primary etiology further defined as mesenteric arterial embolism (50%), mesenteric arterial thrombosis (15-25%), or mesenteric venous thrombosis (5-15%) [1]. It is an uncommon but life-threatening emergency. Despite, all advancements in its diagnosis and treatment, it still carries an indoor mortality rate of 59-93%. Almost all presentations involve abdominal pain. Unfortunately given the large differential diagnosis of abdominal pain, mesenteric ischemia is often misdiagnosed or even missed. It characteristically presents with abdominal pain out of proportion with physical examination i.e., lack of guarding, rebound tenderness, other peritoneal signs. [2]. The mid-abdominal or epigastric pain is often followed by diarrhea, bleeding per rectum, vomiting. It is important to have high index of suspicion for patients with multiple cardiovascular risk factors like history of stroke, myocardial infarction or peripheral vascular disease. CT angiography is the first step for evaluating intestinal vasculature in the acute setting with a sensitivity of 96% and specificity of 94% [3]. It also evaluates nonvascular findings such as bowel wall thickening, mesenteric fat stranding, pneumatosis and portal venous gas. MR angiography can be used in conditions where CT is contraindicated. Endovascular thrombolysis, angioplasty and stenting of mesenteric vasculature are management strategies only when patient presents in an early stage. Late cases are usually treated with more invasive option of surgical resection of gangrenous bowel, which itself carries high morbidity and mortality rates. [4].

**Case Report**

A 48year old female, presented to the emergency department with complaints of diffuse, spasmodic pain abdomen and bilious vomiting's for 3 days. Pain aggravated after half an hour of intake of food and relieved on vomiting. History of obstipation present.No comorbidities.

On examination: She is moderately built. Vitals: Pulse rate 120/min, blood pressure 150/90mmhg, respiratory rate 20/min, saturations 100% on room air. Per abdomen examination is soft, diffuse tenderness present, guarding present, no rigidity, bowel sounds present. Continuous ryles tube aspiration is bilious. Digital rectal examination is normal.

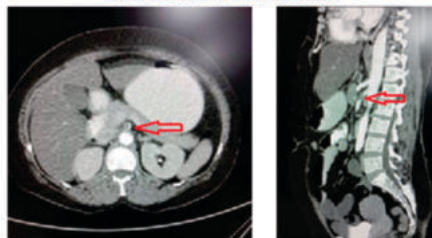
Urine output adequate.

**Investigations and Management**

Complete blood picture: Elevated total leukocyte count (15,000)  
 Renal function tests: Within normal limits  
 Coagulation profile: Within normal limits  
 Arterial blood gas analysis: Metabolic acidosis

Triple phase CT (oral + iv contrast) showed near thrombotic occlusion of SMA at its origin and complete branches in right iliac fossa with ischemia of mid and distal ileal loops.

TRIPLE PHASE CT ABDOMEN



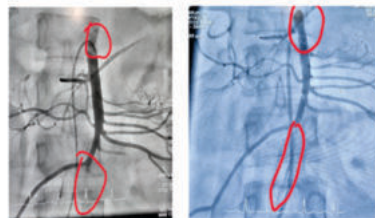
Coronal View

Sagittal View

**Medical Management**

- Thrombolysis of superior mesenteric artery was done with alteplase and heparin infusion for 24 hours.
- Follow up CT angiogram after 24 hrs. which showed recanalization at the origin of SMA and no significant recanalization in the distal ileal branches.

CT ANGIOGRAPHY



Before Thrombolysis

After Thrombolysis (SMA origin recanalised)

CECT abdomen (iv contrast) was done which showed gangrenous jejunal and ileal loops.

Surgical Management: In view of the above findings, patient is taken up for Exploratory laparotomy and proceed.

Surgery executed: Exploratory laparotomy with resection of small bowel with end-to-end jejunioileal anastomosis.

Operative findings: Gangrenous distal jejunum 60cm from Duodenojejunal flexure, entire ileum up to 10cm from ileocecal valve, blackish fluid in peritoneum with oedematous mesentery with completely thrombosed vessels. Rest of the bowel was normal.



Postoperative period is uneventful. Patient is gradually started on oral diet, passed stools and is discharged in stable condition.

### DISCUSSION

Acute mesenteric ischaemia is defined as a group of disease characterized by an interruption of the blood supply to varying portions of small intestine leading to ischaemia and secondary inflammatory changes. Acute thrombosis of splanchnic veins is a rare and often misdiagnosed condition. The incidence is low, estimated at 0.09-0.2% of all acute surgical emergencies. Arterial ischemia is approximately 15 times more common than venous ischemia [5]. The extent of thrombosis correlates with outcome. Complete thrombosis mortality remains high despite therapy due to life threatening intestinal necrosis. Partial or chronic thrombosis are associated with higher survival rates. Thrombosis in superior mesenteric artery most commonly occurs at the level of ostia and results in ischemia of entire mid gut, which leads to infarction if left untreated. Patients with SMA thrombosis shares common features associated with atherosclerotic disease such as hypertension, hyperlipidemia, diabetes, smoking. These patients often have a history of other vascular event such as myocardial infarction, stroke, peripheral vascular disease. SMA thrombosis commonly occurs in patients with chronic mesenteric ischemia and frequently precipitated by intravascular volume depletion like dehydration. Poor signs and symptoms of this disease leads to delay in the diagnosis. Patients often present with severe abdominal pain that is often out of proportion to clinical findings [6]. High index of suspicion is required to diagnose SMA thrombosis. Angiography is considered "gold standard" for diagnosing mesenteric vascular occlusion. However, nowadays, multidetector CT angiography has become investigation of choice. In a recent meta-analysis, it showed a sensitivity and specificity of 93.3% and 95.9% respectively [7]. An aggressive resuscitation and hemodynamic monitoring are required in these patients. Intra-arterial administration of thrombolytic agents has effectively restored mesenteric blood flow in selected patients when administered within hours of symptom onset. In case of failure of thrombolysis or delayed presentation, emergency laparotomy with resection of gangrenous bowel and endarterectomy must be performed. In the absence of enteric contamination, antegrade bypass with prosthetic conduit can be used as revascularization procedure of choice. Nevertheless, up to 70% of patients still require laparotomy after recanalization due to delay in diagnosis. Yet it remains vital to consider endovascular therapy prior to abdominal surgery to enhance intestine viability. A review of multiple meta-analysis found that endovascular therapy had reduced prevalence of bowel resection and morbidity [8]. A retrospective study conducted by Kia Lin, Jiaxiang Meng showed transcatheter thrombectomy or thrombolysis may be useful to restore blood flow, improve intestinal ischemia and avoid extensive bowel necrosis and resection [9], as observed

in this patient thereby preventing short bowel syndrome.

### CONCLUSION

Acute mesenteric ischemia is a life-threatening condition that requires a high index of suspicion and prompt diagnosis and treatment. The possibility of vascular problem should also be considered in a patient with abdominal pain. A highly coordinated multidisciplinary management enables establishing the diagnosis and tailoring the course of therapeutic action to specific case. Early recognition and early angiography with thrombolysis have a definitive role. Hence, this should be considered in differential diagnosis in patients presenting to emergency with acute abdomen.

**Conflicts of Interest:** None

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