



ENDOVASCULAR MANAGEMENT FOR LIFE THREATENING MESENTERIC ISCHEMIA IN TERTIARY CARE HOSPITAL

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Abstract:

Mesenteric ischemia is a rare life-threatening diagnostic and therapeutic emergency characterized by a sudden reduction in blood flow to the intestines, leading to ischemia and potential bowel necrosis. Therefore, accurate diagnosis along with prompt intervention is essential for improving patient outcomes. In this background, we present a case series of ten patients who underwent successful endovascular management for Mesenteric ischemia in a critically ill patients at a tertiary care hospital.

Keywords: Mesenteric ischemia; Blood flow; Intestines; Endovascular; Bowel infarction.

Introduction:

Mesenteric ischemia is a rare but life-threatening condition characterized by sudden interruption of blood flow to the intestines, leading to bowel infarction and potentially fatal outcomes if not promptly diagnosed and treated.[1] Recent epidemiological data by **Neshat H, et al., (2024)** [2] observed that, demographic patterns, demonstrating a mean age of presentation of 53.2 years and a marked male predominance (80%). These findings similar with previous studies by **Acosta and colleagues** [3] as well as **Bala et al.,** [1] which similarly reported a higher incidence of chronic mesenteric ischemia (CMI) in middle-aged to older males, further emphasizing the relevance of demographic risk identification in clinical practice.

The incidence of acute mesenteric ischemia (AMI) accounted for approximately 1–2% of all acute abdominal emergencies, with non-occlusive and thromboembolic causes being the most

common.[4,5,6] The overall mortality rate remains alarmingly high, ranging from 60% to 80%, primarily due to delayed diagnosis and the rapid progression to intestinal necrosis.[7,8]

In this era, advances in endovascular techniques have revolutionized the management of MI, offering a less invasive alternative to traditional surgical approaches and improving patient outcomes in select cases.[9,10] This case report will discuss the successful endovascular management of a patient presenting with life-threatening mesenteric ischemia in a tertiary care hospital.

Case series:

In this retrospective case series, clinical data were collected between February 2024 and February 2025. A total of 31 patients diagnosed with mesenteric ischemia secondary to occlusion of the SMA, IMA, or celiac artery were included. All patients were managed using endovascular interventions at a tertiary care centre.

All cases were confirmed through contrast-enhanced computed tomography angiography (CECTA), which defined the site and extent of mesenteric arterial thrombosis. Based on radiological and clinical assessment, patients underwent catheter-directed thrombectomy or intra-arterial thrombolysis. This was followed by percutaneous transluminal angioplasty (PTA) and stent deployment under fluoroscopic guidance. The choice between balloon-expandable and self-expanding stents was guided by vessel anatomy and lesion morphology.

Primary outcome measures included technical success rate, immediate restoration of mesenteric perfusion, bowel salvage, stent patency on follow-up imaging, and procedure-related complications. Technical success, defined as successful recanalization with adequate stent placement and immediate flow restoration, was achieved in 30 out of 31 patients (96.8%). Post-interventional angiography demonstrated prompt revascularization in all patients (100%).

Clinically, bowel viability was preserved in 30 patients (96.8%), with only one individual requiring segmental bowel resection due to irreversible transmural necrosis. Follow-up assessments at six months revealed a stent patency rate of 98% (30 of 31 patients). Restenosis occurred in 1 case and was effectively managed with repeat balloon angioplasty with stenting.

The procedure showed a favourable safety profile. No cases of distal thromboembolism, vessel perforation, or major haemorrhagic events were reported. Additionally, 30 out of 31 patients (96.8%) experienced significant symptomatic relief, including resolution of abdominal pain, improvement in gastrointestinal transit, and enhanced nutritional intake and status.

These findings support the efficacy and safety of endovascular therapy as a first-line approach in the management of mesenteric ischemia due to major mesenteric arterial occlusion.

❖ Case 1: Celiac artery stenting:

A 55-year-old male with a history of chronic smoking presented with postprandial abdominal pain. Imaging findings included tight stenosis of the celiac artery and complete occlusion of the SMA. In view of the preserved patency of the celiac axis, stenting of the celiac artery was undertaken to enhance mesenteric perfusion. The procedure was uneventful and led to clinical improvement.



Fig 1 (a): Pre-stenting DSA shows ostial high grade stenosis of celiac artery

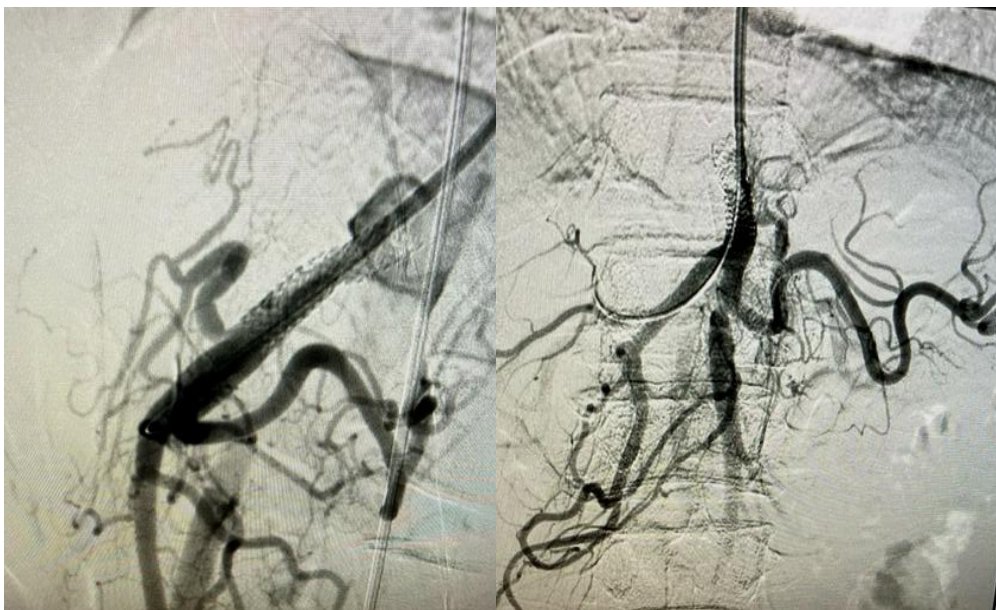
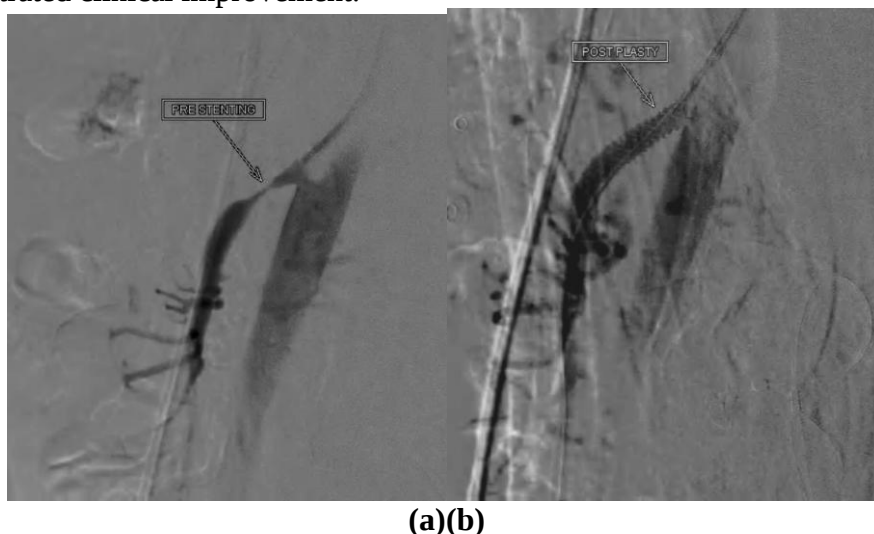


Fig.1 b-Post-stenting DSA shows good flow in celiac artery and branches.

❖ **Case 2: SMA stenting:**

A 57-year-old male presented with classical symptoms of chronic mesenteric ischemia, including severe abdominal pain. The patient had a history of chronic tobacco use. CT angiography and DSA showed significant proximal SMA stenosis with concurrent complete occlusion of the IMA. Given the dominant SMA disease and non-viable IMA, SMA stenting was performed. Post-intervention, the patient demonstrated clinical improvement.



(a)(b)
Fig.2 (a) Pre-stenting DSA showing high grade (more than 90%) SMA stenosis just after its origin;
(b): Post-stenting DSA showing good flow in SM and branches. No residual stenosis seen.

❖ **Case 3: SMA stenting:**

A 42-year-old chronic smoker presented with postprandial abdominal pain, poor appetite, weakness, and marked weight loss. Imaging revealed a short segment complete occlusion of the SMA just after its origin, along with celiac artery occlusion. As both major mesenteric vessels were involved, SMA stenting was undertaken to restore mesenteric perfusion. The intervention was technically successful, with early symptom relief.

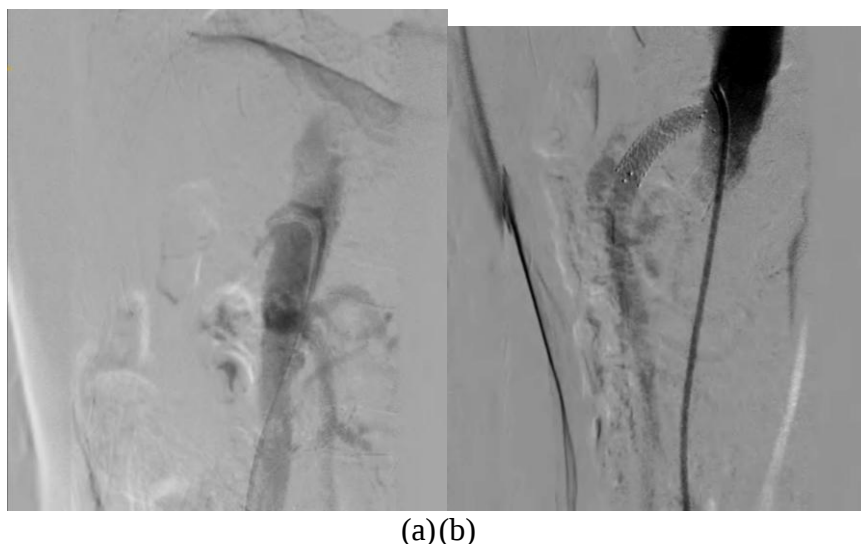


Fig 3 (a): Pre-stenting DSA shows complete occlusion of proximal SMA with no significant distal reformation seen.
(b): Post-stenting showing good flow in SMA with good flow into its branches across stent.

❖ **Case 4: SMA stenting:**

A 55-year-old male, with a history of chronic smoking, complained of abdominal pain and generalized weakness. DSA confirmed complete occlusion of the proximal SMA. Endovascular stenting of the SMA was performed, resulting in adequate revascularization and symptomatic improvement.

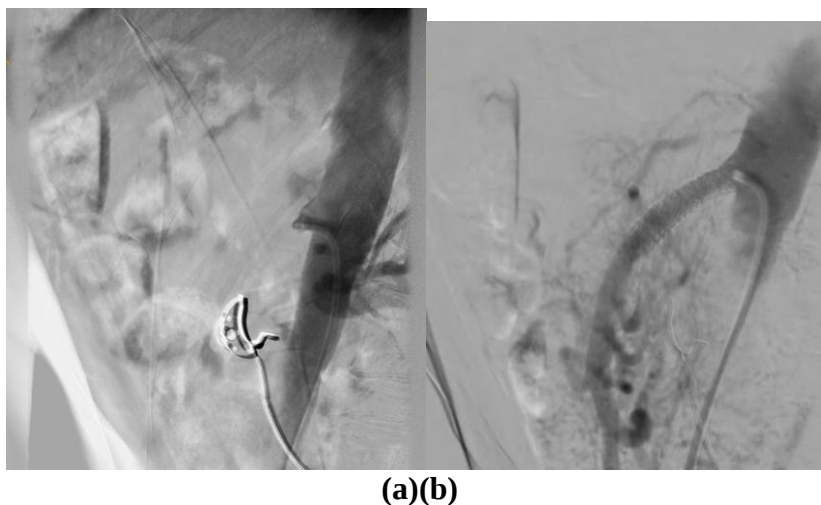


Fig 4 (a): Pre-stenting DSA shows complete occlusion of coeliac artery and SMA;
(b): Post-stenting DSA showing good flow in SMA and branches. No residual stenosis seen.

❖ **Case 5: SMA stenting with bowel complications:**

A 42-year-old male presented with abdominal pain and significant weight loss. He was found to have complete proximal SMA occlusion on imaging. Clinical evaluation indicated bowel ischemia with signs of gangrenous changes and intestinal perforation. Emergency SMA stenting was performed as part of a salvage procedure in conjunction with surgical management of the ischemic bowel. The case highlighted the critical importance of early diagnosis and intervention in AMI to prevent catastrophic intestinal outcomes.

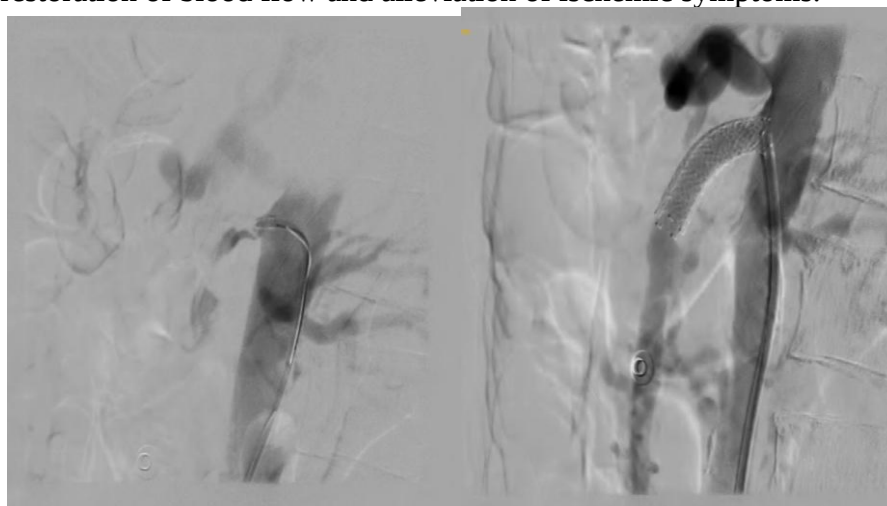


(a)(b)

Fig 5 (a) Pre-stenting DSA shows significant proximal SMA stenosis; (b): Post-stenting showing good flow in SMA. No residual stenosis seen.

Case 6: SMA stenting:

A 60-year-old chronic smoker presented with postprandial abdominal pain and features of mesenteric ischemia. CT angiography and DSA revealed a short segment occlusion of the SMA. Timely SMA stenting led to restoration of blood flow and alleviation of ischemic symptoms.

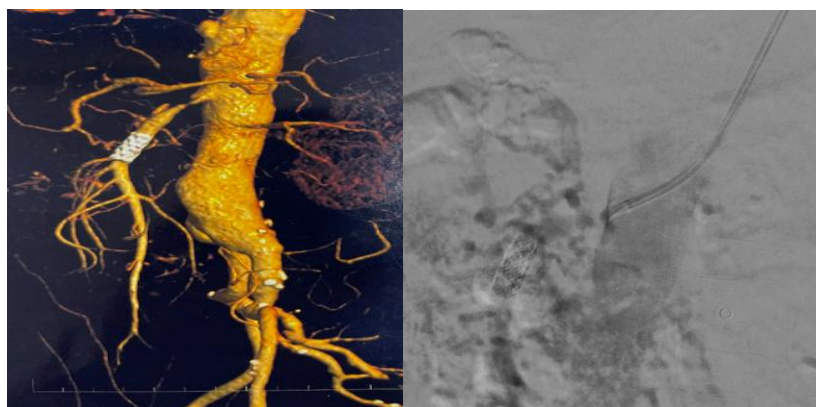


(a)(b)

Fig 6 (a): Pre-stenting DSA revealed a short segment occlusion of the SMA with no distal flow seen; (b): Post-stenting DSA resulted in restoration of blood flow into the SMA and alleviation of ischemic symptoms.

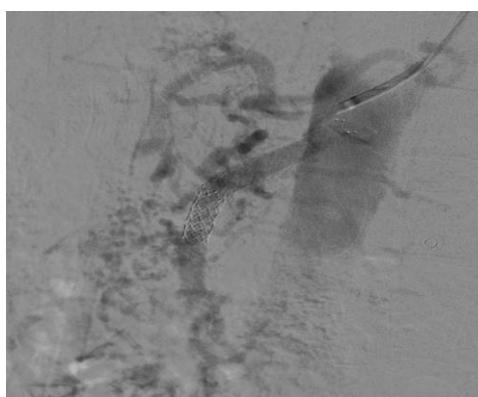
❖ Case 7: Recurrent SMA stenosis post-stenting:

A 59-year-old male with a past history of SMA stenting in 2017 presented with recurrent postprandial pain and significant weight loss. He was a chronic smoker. Imaging revealed short segment occlusion of the SMA at the origin, suggestive of in-stent restenosis or progression of disease. The case underscored the need for regular follow-up and surveillance imaging in patients undergoing endovascular interventions for CMI.



(a)(b)

Case 7 (a) CT abdominal angiography with 3D reconstruction and b) DSA shows high grade re-stenosis at SMA origin with Stent in situ seen distal to stenosis



(c)

Fig 7 c) post SMA re-stenting DSA shows good flow in SMA and its branches

❖ Case 8: IMA stenting:

A 48-year-old male presented with abdominal pain and significant unintentional weight loss. He had a long-standing history of heavy smoking and chronic alcohol consumption. CT angiography and DSA demonstrated complete occlusion of the celiac artery and SMA (without ositum), along with high-grade stenosis of the IMA. Thereby, the extensive mesenteric arterial involvement and the preserved patency of the IMA, the patient underwent successful IMA stenting, which resulted in symptomatic improvement.



(a)(b)

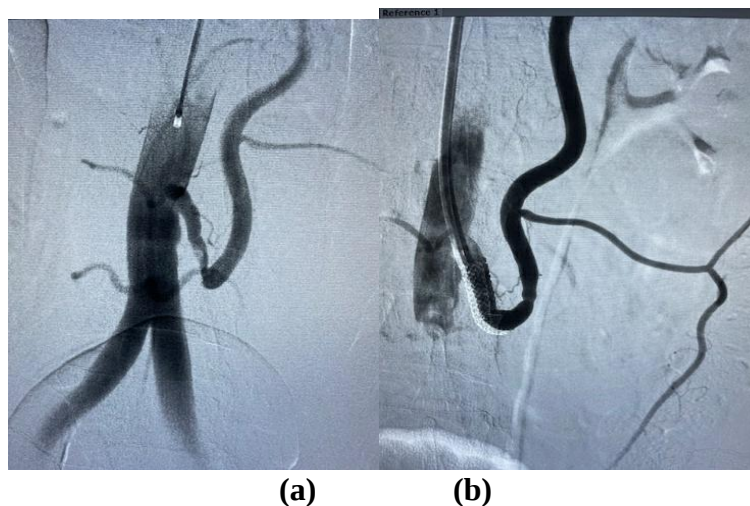
Fig 8. a) Presenting CT abdominal angiography and b) CT abdominal angiography with 3D reconstruction shows high grade stenosis at ostium of IMA



**Fig 8 (c): Pre-stenting DSA showing ostial high-grade stenosis of the IMA ;
(d): Post-stenting DSA showing good flow in IMA with no residual stenosis seen.**

❖ **Case 9: IMA stenting:**

A 55-year-old male, a chronic smoker, reported persistent postprandial abdominal pain and weight loss. The radiographic imaging revealed complete occlusion of the SMA and high-grade stenosis of the IMA. With the celiac axis not contributing to mesenteric perfusion, the decision was made to stent the IMA. Post-procedure, the patient experienced relief of symptoms, demonstrating successful revascularization.



**Fig 9(a): Pre-stenting-DSA showing high grade stenosis of IMA just after its origin
(b): Post-stenting DSA showing good flow in IMA. No residual stenosis seen.**

Discussion:

The present case series sheds light on the safety and effectiveness of endovascular intervention in the management of life-threatening Mesenteric Ischemia at our tertiary care center. All patients in this series presented with clinical features of Mesenteric Ischemia and prompt diagnosis followed by immediate endovascular revascularization including thrombolysis, angioplasty, or stenting, proved to be a safe and effective treatment modality for reducing morbidity and mortality.

In clinical settings, traditional open surgical approaches are often associated with higher morbidity and mortality due to their invasive nature and missed or delayed diagnoses. On the other hand, endovascular techniques offer a minimally invasive, targeted approach that, preserves bowel viability and improves clinical outcomes.[9]

According to a recent study by **Kendall N, et al., (2025)**, endovascular treatment is associated with lower in-hospital mortality and shorter ICU stays findings consistent with our observations.[11] Furthermore, advancements in imaging and catheter-based technologies have significantly improved early diagnosis and therapeutic precision. **Niang FG, et al., (2023)** emphasized in their case report the essential role of imaging, particularly CT scans, as a diagnostic tool for identifying the underlying cause of MI.[12] Similarly, **Ierardi AM, et al., (2017)**, in a case report and review article, demonstrated the feasibility of endovascular procedures with improved outcomes.[13] They also reported that, the majority of studies show lower bowel morbidity and mortality rates following endovascular therapy compared to open surgery, supporting the findings of our case series.

Based on our observations, early diagnosis remains the cornerstone of successful treatment, as delays can lead to irreversible bowel necrosis. Our findings support the growing consensus that, endovascular therapy should be considered a first-line treatment in selected cases of MI, especially in centres equipped with the necessary expertise and infrastructure.

Conclusion:

Endovascular stent placement represents a safe, effective, and minimally invasive therapeutic option for the management of mesenteric ischemia. Mesenteric ischemia is very challenging condition for diagnosis and treatment which needs expertise. SMA, celiac occlusions are difficult to cross sometimes we have to use multiple guide wires and different techniques to cross the occlusion. Now a days minimally invasive procedures like angioplasty with or without stenting play a vital role and is life saving if patient comes at early stages of disease. If patient comes in later stages with bowel gangrene open surgery is life saving and endovascular treatment can be planned later on. Endovascular technique facilitates prompt revascularization, demonstrates high technical success, and is associated with favourable bowel salvage rates and minimal procedural complications. As a cornerstone of interventional radiology, this approach is especially beneficial in hemodynamically unstable or surgically unfit patients, offering a life-saving intervention with durable long-term patency and clinical outcomes.

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