CASE REPORT

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# A rare case of triple vessel disease of abdomen

**Raju Shinde**[1], **Sajika Dighe**[2]✉, **Sangeeta Shinde**[3]

[1]Professor, Department of Surgery, JNMC, Sawangi, Wardha, India
[2]Resident, Department of Surgery, JNMC, Sawangi, Wardha, India
[3]Professor and Head, Department of Pharmacology, JNMC, Sawangi, Wardha, India

✉**Corresponding author**
Resident, Department of Surgery, JNMC, Sawangi, Wardha,
India

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## ABSTRACT

*Introduction*: Mesentric ischemia is caused by decrease in intestinal blood-flow and classified as Acute or Chronic. Chronic mesenteric ischemia is an exigent trouble in surgical field with significant financial footprint and disastrous outcomes if left untreated. *Case Presentation*: 48 year male, non-alcoholic, non-smoker with no co-morbidities presented to emergency-room with complains of pain all-over the abdomen associated with loose stools without per-rectal bleeding. *Discussion*: Symptoms of CMI refers to episodic or constant hypo-perfusion of small intestine that typically occurs in patients with multi-vessel mesentric occlusion. It occurs commonly through atherosclerotic stenosis in 90% cases involving the celiac, superior mesenteric and inferior mesenteric. Less common factors include Vasculitis, Takayasu disease, Radiation therapy, fibromuscular dysplasia, thromboangitis obliterans, polyarteritisnodosum, median arcuate syndrome and cocaine abuse. *Conclusion*: Ischemic conditions of abdomen can have varied manifestations which can be easily mis-diagnosed.

**Keywords**: Mesentric ischemia, Atherosclerotic stenosis.

## 1. INTRODUCTION

Mesentric ischemia is caused by decrease in intestinal blood-flow and classified as Acute or Chronic. Chronic mesenteric ischemia is an exigent trouble in surgical field with significant financial footprint and disastrous outcomes if left untreated. It was 1st described in 1918 as "Abdominal Angina" by Goodman. 1st victorious open thromboendartectomy of SMA was executed by Shaw and Maynard in 1958. Since then surgical repair remained mainstay for CMI. However endovascular angioplasty and stenting has been newly admired for treatment of CMI due to its effective results and lesser morbidity and mortality as compared with open repair (Wohlauer et al., 2014; Hohenwalter, 2009).

## 2. CASE PRESENTATION

48 year male, non-alcoholic, non-smoker with no co-morbidities presented to emergency-room with complains of pain all-over the abdomen associated with loose stools without per-rectal bleeding. Prior CECT-Abdomen suggested acute thrombo-embolism of

superior mesenteric artery with opacification of SMA from its origin upto its terminal branches. Patient had no significant past history or history of any surgical or medical intervention. Patient had normal vitals, normal saturation and normal per abdomen findings with clear bowel sounds and normal per-rectal examination. Hence a decision of repeat CECT abdomen was taken in order to re-evaluate as patient's clinical condition was not matching the outside CECT report.

Repeat CECT was suggestive of chronic thrombosis of proximal part of SMA with reformation of distal SMA through collaterals between jejunal and middle colic artery through arc of riolanwith focal mild wall thickening of distal ileal loops with partial subacute intestinal obstruction with no e/o bowel gangrene or air in bowel wall. Hence on the basis of clinical condition and CECT, patient had underwent CT-Angiogram that showed critical ostial stenosis of celiac trunk- 100% and IMA-90% with chronically thrombosed proximal SMA with prominent arc of riolan. Hence a decision of stenting of IMA and balloon-plasty of celiac artery was taken and the patient underwent the same procedure through left brachial approach by 6f short sheath selective cannulation of IMA (figure 1-3).

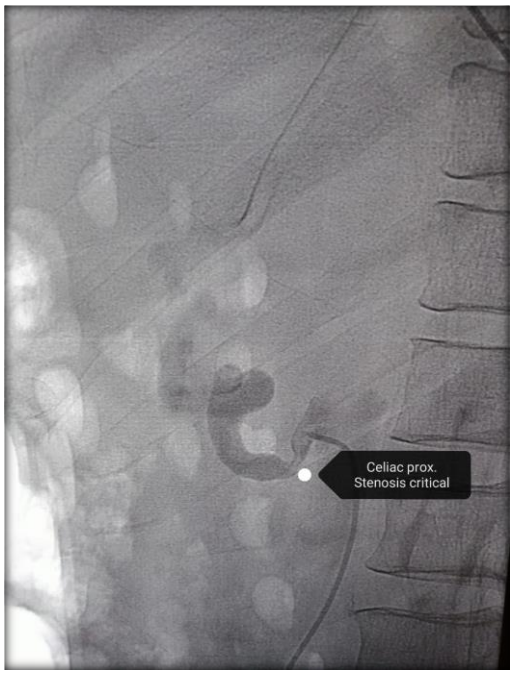


**Figure 1** showing critical stenosis of proximal celiac artery


**Figure 2** ostial stenosis of IMA

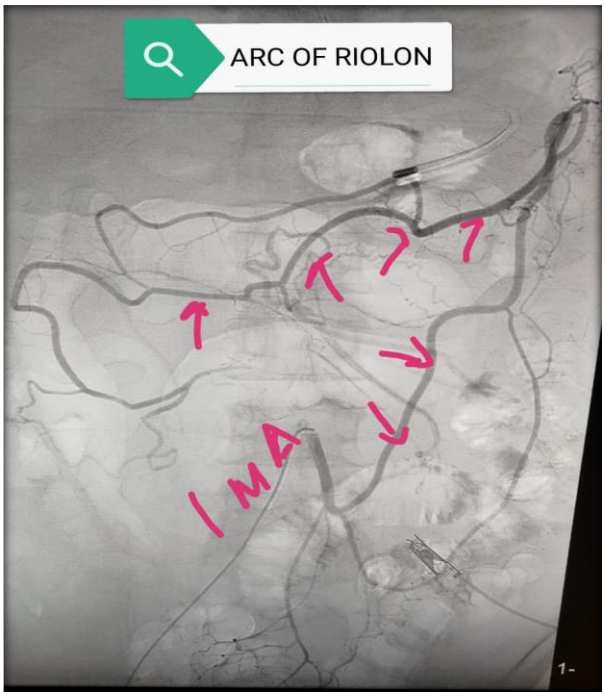


**Figure 3** Showing prominent arc of riolan

Torule out the cause of occlusion of the 3 major vessels of abdomen, various laboratory test were conducted which are as follows: Lipid profile with normal total cholesterol and normal HDL, LDL and VLDL, Anti-neutrophilic cytoplasmic antibodies (c-ANCA) and Anti ds-DNA antibody was normal, Homocysteine level in caution group, Anti thrombin III, Protein C and S within normal limits and Lupus Anticoagulant to be normal. Patient was then started on prophylactic anti-coagulation with aspirin 150 mg and clopidogrel 75 mg once a day and was advised small frequent meals. Patient was closely monitored in the ward and was asymptomatic hence was discharged with advice to follow up after 1 month for re-evaluation of endovascular revascularisation.

## 4. DISCUSSION

Symptoms of CMI refer to episodic or constant hypo-perfusion of small intestine that typically occurs in patients with multi-vessel mesentric occlusion. It occurs commonly through atherosclerotic stenosis in 90% cases involving the celiac, superior mesenteric and inferior mesenteric. Less common factors include Vasculitis, Takayasu disease, Radiation therapy, fibromuscular dysplasia, thromboangitis obliterans, polyarteritisnodosum, median arcuate syndrome and cocaine abuse. Predisposing factors to CMI includes female gender, smoking, hypertension, diabetes and hypercholesterolemia (Wohlauer et al., 2014; Hohenwalter, 2009; Shah et al., 2013; Barret et al., 2015; Alhomayani, 2020).

Clinical manifestations depend on vascular anatomy involved, existing collateral circulation and degree of atherosclerotic stenosis. A significant occlusion of atleast 2 out of 3 abdominal arteries is prerequisite and absolute occlusion of celiac axis must antecede the occlusion of rest of mesenteric arteries for symptoms of abdominal angina to occur. The celiac and SMA are linked via pancreatico duodenal artery running between gastro duodenal artery of celiac trunk and proximal SMA. The IMA and SMA are linked via paracolic arcade (Arc of Riolan or meandering mesentery artery) and marginal artery of left colon (Wandering Artery of Drummond). When IMA is blocked, the systemic vessels such as internal iliac artery supplies IMA via reverse flow and collaterals between SMA and IMA opens up via wandering artery Drummond and arc of Riolan. When all the three major visceral arteries are blocked, the intestines still receive blood supply via systemic collaterals such as the oesophageal and lumbar arteries and these accounts for lack of manifestations in some patients with triple-vessel disease (Shah et al., 2013).

Asymptomatic patients with multiple-vessel involvement generally are at greatest risk of becoming symptomatic, and approximately one-third may land into frank intestinal infarction. Abdominal angina expresses unrecognized postprandial pain in patients with occlusive mesenteric disease. The abdominal pain is an outcome of blood flow unable to fulfil visceral demand and is therefore believed to be similar to angina pectoris in patients with coronary artery disease or claudication in peripheral vascular disease. Postprandial symptom occurs typically within 15–30 min after the meal and last for 60–120 min. The classic presentation has gradual onset with clinical picture of significant abdominal angina, food phobia or anorexia, weight loss, diarrhoea, malnourishment

and abdominal bruit. Clinical scenario may suggest GIT, hepatic, gallbladder, or pancreatic pathology. Hence, a high level suspicion should be assigned for CMI patients with similar presentation. Development of symptoms from postprandial to constant abdominal pain with rising leukocyte count suggests impending intestinal infarction and urges emergency treatment by either angioplasty or surgery, although surgery has the advantage of allowing a thorough assessment of intestinal viability (Shah et al., 2013; Kitzing, 2009; Kolkman et al., 2004; Gibbons & Roberts, 2010).

Diagnosis is often missed due to deficiency of sensitive diagnostic tests. The diagnostic approach in patients with possible CMI emphasizes on identification of visceral arterial stenosis and illustration of mucosal ischemia. To alleviate clinical doubts, diagnosis to be confirmed by CT-Angiography of abdomen or Mesentric vessel duplex ultrasonography or magnetic resonance angiography and conventional DSA of mesenteric circulation. In our case we used CT-Angiography as it is commonly available, gold-standard for diagnosing and staging of arterial stenosis and useful to evaluate vessel origin, collateral circulation, degree of calcification in mesenteric vessels and to exclude pathologies like external compression by malignancy or median arcuate syndrome. Endovascular treatment should be preceded by mesenteric angiography to authenticate the origin of these 3 visceral arteries which can identify scenarios where origin of arteries from aorta are block and their origin cannot be spotted thus exhibiting direct percutaneous angiography exceptionally gruelling (Shah et al., 2013; Kitzing, 2009; Kolkman et al., 2004).

Symptomatic mesenteric ischemia authorizes the need for revascularization so as to decrease symptoms, upgrade quality of life and circumvent bowel ischemia and necrosis. To conclude between open revascularisation (OR) and endovascular revascularisation (ER) is very delicate and parameters like lesion anatomy, nutritional status and life expectancy must be considered. ER is preferred as 1st line treatment for CMI as it lesser rates of peri and post-procedural morbidity and mortality when compared to OR (Gibbons & Roberts, 2010).

Once two or more vessels are significantly stenosed (70%) or occluded, revascularisation of SMA 1st provides enduring advantage. However if SMA is not treated by ER due to calcification or ostial or long occlusion next aim is the celiac angioplasty or stenting since there is significant documentation in the literature about its therapeutic success. If these are not possible, attempt of IMA angioplasty is taken in account as would be expected in patients with occluded or stenosed origin of IMA that provides major supply to midgut via prominent marginal and paracolic arcades when both SMA and celiac are occluded (Gibbons & Roberts, 2010). In our case we have done stenting of IMA and balloon angioplasty of the celiac artery as there was complete occlusion of SMA as there was also rich collateralization between Celiac, SMA and IMA via the pancreatico duodenal artery and paracolic arcades.

## 5. CONCLUSION

Ischemic conditions of abdomen can have varied manifestations which can be easily mis-diagnosed in the emergency room as this in this case where the CECT did not match with patient's clinical condition.

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**Author Contribution**

Dr. Raju Shinde: - Diagnosis of the patient.
Dr. SajikaDighe: - corresponding author, compilation and publication.
Dr. Sangeeta Shinde: - Data collection.

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**Conflict of Interest**

No conflict of interest.

**Informed consent**

Written & oral informed consent was obtained from the participant included in the study.

**Data and materials availability**

All data associated with this study are present in the paper.

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