

# Abdominal Angina Treated by Urgent Percutaneous Angioplasty: An Excellent Alternative to Surgical Revascularisation

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## ABSTRACT

Chronic Mesenteric Ischemia (CMI) presenting as acute abdomen can be treated percutaneously. An endovascular intervention has surpassed surgical revascularization over the past decade due to its lesser perioperative complication rate. Trans-femoral approach of revascularising is limited by its difficulty in coaxial alignment of the guiding catheter and hence, brachial artery and recently the radial approach have been utilized for mesenteric artery revascularisation for over a decade. Here by we report a case of chronic mesenteric ischemia having total occlusion of two and 70% occlusion of one of the three mesenteric vessels. The patient had presented with acute abdomen which in turn was percutaneously revascularised via the left brachial artery for the two major abdominal visceral vessels being superior mesenteric artery and inferior mesenteric artery.

**Keywords:** Brachial artery, Chronic mesenteric ischemia, Inferior mesenteric artery, Superior mesenteric artery

## CASE REPORT

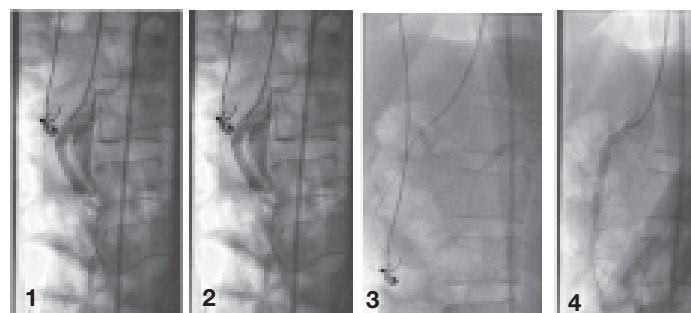
A 62-year-old male, ex-smoker with hypertension and diabetes was admitted for postprandial diffuse abdominal pain and anorexia over the past 45 days. There was history of 22 kilograms weight loss over one year. He has been visiting gastroenterologists for the past three months. His Upper Gastro-Intestinal (UGI) endoscopy and abdominal ultrasonography were unremarkable. The abdominal Computed Tomography (CT) angiography revealed a total occlusion with calcification at the Celiac Artery (CA) and Superior Mesenteric Artery (SMA) and also a significant stenosis greater than 70% at the ostium of the Inferior Mesenteric Artery (IMA). Surgical consultation was advised to the patient, which he refused. He was taken up for percutaneous revascularisation without delay. As the patient had many coronary risk factors we also chose to perform a coronary angiography which revealed mild Coronary Artery Disease (CAD).

### Treatment done in hospital: Interventional procedure

A femoral approach was chosen for the angiography of mesenteric vessels. Our primary objective was to first treat the narrowed IMA [Table/Fig-1]. An 8F renal sheath (Cordis®, USA) was used to hook the IMA and we tried to wire across the lesion. The work horse wire used here to cross the lesion was the floppy tip Sion blue j coronary wire (Asahi®, Japan). Next the Stent RACER® RX 7.0mm x 18mm (Medtronic®, USA) was used to pass across the bend. At this stage of procedure the stent could not be passed because of the acute downward angulations of IMA [Table/Fig-1]. Then immediately the left brachial artery was chosen for vascular access in view of achieving a proper alignment and strong back-up for the guiding catheter. The IMA was reached from above via left brachial artery, subclavian artery, descending aorta with a 7F JR guide and the lesion was successfully stented with RACER 7mm x 18mm stent [Table/Fig-2].

Next objective was to focus our efforts to treat the chronic total occlusion of the SMA keeping in mind that at least two of the main abdominal visceral vessels must be revascularised completely to make the patient symptom free. After repeated attempts with Gaia 1, Gaia 2 (ASAHI®), Chronic Total Occlusion (CTO) coronary wires, the lesion was crossed successfully [Table/Fig-3]. Firstly, a 1.25 mm x 8 mm Tazuna® rapid exchange Percutaneous Transluminal Coronary Angioplasty (PTCA) balloon catheter was used to cross the lesion and dilated. Then a 2.5mm x 15 mm NC coronary balloon (NC TREK RX & OTW balloon) (Abbott vascular®, USA) was used

for balloon dilatation followed by a 4 mm x 20 mm Pantera dilatation balloon. Finally a 7.0mm x 18 mm INVATEC HIPPOCAMPUS renal RX stent was chosen and placed across the ostial SMA [Table/Fig-4]. At the time of discharge his abdominal angina had improved and in the follow-up period of two months post procedure, the patient had regained almost 8 kg of weight along with a good quality of life.



**[Table/Fig-1]:** Image depicting the inferior mesenteric artery before stenting: note the stenotic area at the osteoproximal inferior mesenteric artery. **[Table/Fig-2]:** Image depicting the final flow in the inferior mesenteric artery after osteoproximal stenting. **[Table/Fig-3]:** Image depicting the gaia-2 coronary wire crossing the occluded superior mesenteric artery. **[Table/Fig-4]:** Image depicting ostial stenting of the superior mesenteric artery: note the flow in superior mesenteric artery after stent placement.

## DISCUSSION

CMI is a rare disease defined as intestinal ischemia caused by stenosis or occlusion of one or more of the following three intestinal arteries: the CA, the SMA and the IMA. Surgical revascularization continued to be the gold standard for the treatment of CMI but endovascular intervention has been gaining popularity because of lesser complication rate [1,2] higher procedural success rate (up to 96%) and a comparable short-term patency rate [3,4].

Individuals with CMI commonly have stenosis or occlusions of at least two or more mesenteric arteries (CA, SMA and IMA), and complete revascularization is the standard treatment. But relieving the symptoms of abdominal pain requires revascularization of at least two of the three major abdominal blood vessels [5]. If residual stenosis is more than 50% of the expected arterial lumen after balloon angioplasty, then it is advisable to stent [6,7]. The trans-femoral approach of revascularising the mesenteric vessels is limited by difficulty in coaxial alignment of the guiding catheter, which in turn leads to insufficient back-up support and aborting the procedure. The brachial artery and recently the radial approach

have been utilized for mesenteric artery revascularisation for over a decade [8,9].

In the present case, first the stenotic IMA was stented followed by successful stenting of the SMA CTO. CA revascularisation was unsuccessful because of absent stump at the ostia and procedure time exceeded 3 hours. We decided to conclude the procedure at that point and attempt the CA revascularisation if symptoms still persisted during follow up. The next important point to be noted in the above case was the site of approach for stenting the abdominal vessels. The trans-femoral approach is limited for endovascular interventions of SMA and IMA in case of occlusion, mainly due to difficulty in coaxial alignment of the guiding catheter. Therefore, approaches via the upper limb may be appropriate because the SMA runs vertically along the abdominal aorta.

Finally, the patient's symptoms improved, and there was weight gain with improvement in the quality of his life within 6 weeks post procedure.

## CONCLUSION

Abdominal angina is an acute emergency which can be treated by percutaneous angioplasty with very good results. And this case is a very good example of endovascular revascularisation done via the brachial artery approach to facilitate the 7F sheath and complete the procedure. We should never hesitate to adopt a trans-radial or trans-brachial approach for the stenting of the abdominal vessels which have an acute angle of origin from the aorta. This case also showed that the endovascular therapy for two of the three major abdominal vessels is sufficient to relieve symptoms in a critically ill patient.

**Conflict of Interest:** All the authors have read the manuscript thoroughly and accepted the final draft. There is no conflict of interest among the authors mentioned above.

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