Chronic Abdominal Pain – A Radiological Solution

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Abstract
Chronic mesenteric ischaemia is not an uncommon disorder. It is associated with high morbidity and mortality. It presents with chronic abdominal pain and the diagnosis is often missed because of nonspecific clinical findings and limitations of diagnostic studies. Although surgery has been considered to be the mainstay of treatment, it is associated with significant morbidity. We report two cases of chronic mesenteric ischaemia managed effectively with endovascular therapy with no morbidity and good long term pain relief.

Introduction
Chronic abdominal pain remains a diagnostic enigma. Patients are often over investigated and eventually labeled as having functional abdominal pain, when investigations like endoscopy and ultrasonography of abdomen are normal. Mesenteric ischaemia should be suspected in elderly patients with chronic abdominal pain and in those with other high risk factors. We report two patients with chronic abdominal pain secondary to mesenteric ischemia who were managed successfully without surgery.

Case 1
A 67-year old hypertensive lady with ischaemic heart disease (IHD) and hyperlipidaemia on antiplatelets, statins, amlodipin and nitrates presented with chronic abdominal pain of 7 years duration. The pain usually started 1-1 ½ hrs after meals and initially occurred after eating solids and subsequently even on consumption of liquids. At the time of presentation to us her pain was severe and she was scared to eat or drink (sitophobia). She had lost 15 kg of weight. She gave history of one episode of self-limiting bloody diarrhea with abdominal pain needing hospitalization. She had been extensively investigated elsewhere with upper gastrointestinal scopy, colonoscopy, multiple ultrasonographies with doppler and computed tomography of the abdomen, which were normal. Her amylase and lipase levels during attacks of pain were documented to be normal. She was labeled as suffering from depression and was on antidepressants. On examination she was pale, had muscle wasting with severe glossitis and stomatitis. Her abdominal examination was normal. She had hypochromic microcytic anaemia with hemoglobin of 8 gm/dl. In view of classical symptoms, mesenteric ischaemia was suspected and magnetic resonance angiography was done. This revealed marked short segment narrowing of celiac, occlusion of superior mesenteric and stenosis of both renal arteries. In view of the short segment narrowing and with the aim of attempting a therapeutic intervention, a digital subtraction angiography (DSA) was done. It showed complete occlusion of superior mesenteric artery (SMA) with heavy calcification, critical stenosis (>80%) of celiac, common hepatic artery (CHA) and inferior mesenteric artery (IMA) (Fig.1A and 1B). Celiac artery was stented with 5mm x 15mm Genesis stent, CHA with 5 mm x 12 mm Cordis Genesis stent and IMA ostium with 3mm x 13mm Cordis Cypher stent after balloon dilatation (angioplasty) at 8-10 atmospheric pressure (atm)(Fig. 2A and 2B). Post stenting angiograms revealed significantly improved flow through the vessels with retrograde filling of the SMA territory through IMA via the artery of Drummond, which appears more dilated than the IMA (Fig.3A and 3B). She underwent a coronary angioplasty 6 months later for a left anterior descending artery block when...
she presented with unstable angina. On follow up of 2 ½ yrs, she remains asymptomatic with improvement in quality of life and weight gain of 10 kgs.

**Case 2**

A 50-year old lady presented with post prandial upper abdominal pain of 6 months duration occurring 1 ½ – 2 hrs after meals. She had diabetes, hyperlipidaemia and IHD for which she was on oral hypoglycemic (glimipride), antiplatelets, statins and nitrates. She had lost 8 kg of weight. Investigations including biochemical tests, ultrasonography of abdomen with doppler and upper gastrointestinal endoscopy done elsewhere were normal. Clinically she was averagely nourished and her abdominal examination was unremarkable. Multi Detector Computed Tomography (MDCT) showed significant narrowing at the origin of SMA (Fig.4) and IMA. DSA revealed significant stenosis (>70%) of SMA and IMA (Fig.5A and 5B), which were stented with Genesis Palmaz blue stent (6mm x 15 mm after balloon dilatation at 10 atm) and Duraflex coronary stent (2.75mm x 11 mm after balloon dilatation at 12 atm) respectively. Post stenting angiograms revealed good flow through the vessels (Fig.6A and 6B). She remains asymptomatic on 2 years of follow up.

**Discussion**

The incidence of chronic mesenteric ischaemia (CMI) has increased significantly over the past decades due to rising number of elderly population with atherosclerotic disease. We are likely to see a similar phenomenon in India. SMA is the most commonly involved vessel followed by celiac artery. We had not considered other rare causes of CMI such as Fabry’s disease, antiphospholipid antibody syndrome, Behcet’s disease, thromboangiitis obliterans, Takayasu arteritis, Crohn’s disease and external compression as there was obvious atherosclerosis and its related disorders in both the patients.
Severe stenosis or complete occlusion of two of the three major splanchnic arteries (CA, SMA and IMA) needs to occur before symptoms are evident because of formation of rich collateral vascular supply. Most patients present with severe postprandial pain, approximately 60-90 minutes after meals. They often, develop sitophobia and weight loss and are chronically malnourished requiring repeated hospitalizations, as was seen in our first patient. History of vascular involvement of other organs is usually present. They may develop irreversible bowel ischaemia. Typically symptoms are out of proportion to signs. Both our patients had a normal abdominal examination.

The diagnosis is often missed even after extensive investigations including ultrasonography and doppler have all proved to be negative, as was seen in our first patient. She had been misdiagnosed as suffering from depression after being symptomatic for 7 years. Though DSA is the gold standard, MDCT and MR angiography are the emerging non-invasive modalities that can confidently detect atherosclerotic changes.
In the first patient, CMI was missed on CT abdomen done elsewhere, as it was not a MDCT, which gives two-dimensional multiplanar and three-dimensional display of the mesenteric vasculature of the small intestine. Also, a recent study has shown that MDCT plays a major role in detection of stenosis of the abdominal arteries in patients with suspected CMI. It has been observed that MR angiography is 95-97% accurate for characterizing proximal mesenteric vessel disease. During MR angiography, thrombosis is most often identified with a flush aortogram, since complete occlusion of the SMA usually occurs within 1 to 2 cm of its origin and collateral pathways almost always fill the vessel distal to the obstruction. This collateralization, such as retrograde filling of the SMA or CA via the Arc of Riolan or the Artery of Drummond, is characteristic of chronic ischemia as was demonstrated in our first patient (Fig.3A and 3B).

In the past, management of mesenteric ischaemia included medical treatment, with the control of risk factors and use of antiplatelets and anticoagulants. Surgery in the form of endarterectomy or bypass grafting was the only option available in patients whose pain could not be controlled with medical management. In a series of 25 and 59 patients respectively, Sharafuddin MJ et al. and Silva J A et al., demonstrated that angioplasty and stenting of clogged mesenteric vessels could be performed successfully to restore blood flow to the intestines and relieve pain in about 90% of patients, without major complications. Also, these groups of patients often have multiple atherosclerosis related co-morbidities and major surgery carries a significant risk of complications with an operative mortality of 7 - 10%. Our patients also had multiple co-morbidities. Further, the presence of short segment ostial stenosis of mesenteric blood vessels made them suitable for angioplasty and stenting. Angioplasty, alone was not preferred, as recurrence with atherosclerosis is known. Van Wanroji et al reported a technical success rate of 95% with primary patency of 81% at maximum follow up of 76 months (mean 19 months) following endovascular stenting for CMI. To date, there has been only one case reported from India with successful stenting. However no follow up was provided. Our patients, who were followed for 2½ years showed good pain relief with no procedure related morbidity.

Chronic mesenteric ischaemia should be considered in patients who present with the triad of chronic postprandial abdominal pain, weight loss and sitophobia. MDCT/MR angiography of abdomen should be performed to confirm the diagnosis, as these modalities are available in India. Further, expertise for mesenteric stenting is also now available. Percutaneous stent placement is technically feasible in those with a suitable vascular anatomy and offers good long term relief of pain as was demonstrated in our patients.

References