

Original Research Article

Endovascular management of chronic mesenteric ischemia: a single centre experience in Western Rajasthan, India

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ABSTRACT

Background: Chronic mesenteric ischemia (CMI) or mesenteric angina is a condition characterised by inadequate blood supply to bowel as a result of stenosis affecting one or more of the three mesenteric arteries: the celiac artery (CA), the superior mesenteric artery (SMA) and the inferior mesenteric artery (IMA).

Methods: Ten patients with significant lesion, treated with PTA and stenting were selected for study and were followed at 2 weeks, at 2 months then at 6 months after index procedure to see composite of symptomatic improvement, weight gain and revascularization.

Results: On mesenteric angiography, significant ostial stenosis of celiac trunk and superior mesenteric artery in 5 patients, 3 patients had significant ostial stenosis of celiac trunk and ostial stenosis of inferior mesenteric artery and 2 patients had significant stenosis of superior mesenteric artery. Percutaneous transluminal angioplasty (PTA) and stenting was done, final result was good and there was no residual stenosis and dissection. After stenting patients were stable and pain free. There were no post-operative complications. Follow up was done after 2 weeks and 2 months and then at six months. There was no postprandial abdominal pain on follow up and almost all patient had gained weight in 2 months and on 6 months of follow up, no case of repeat revascularization was recorded.

Conclusions: Percutaneous transluminal angioplasty (PTA) and stenting to mesenteric artery is good alternative management of CMI. In present series, all cases were successfully revascularized without residual stenosis and dissection.

Keywords: Chronic mesenteric ischaemia, Percutaneous transluminal angioplasty

INTRODUCTION

Chronic mesenteric ischemia (CMI) or mesenteric angina is a condition characterized by inadequate blood supply to bowel as a result of stenosis affecting one or more of the three mesenteric arteries: the celiac artery (CA), the superior mesenteric artery (SMA) and the inferior mesenteric artery (IMA). Usually manifests as abdominal pain. Although significant stenosis of at least two of these three arteries is classically considered necessary for symptoms of CMI to occur, several case

series include patients with confirmed CMI due to significant stenosis of a single artery.¹⁻³ Most patients with CMI are older than 60 years of age, and women are affected three times more often than men. Atherosclerosis is most common cause of stenosis of the mesenteric arteries. The other causes include Fibromuscular dysplasia, Takayasu disease, polyarteritis nodosa, radiation, thromboangiitis obliterans (Buerger's disease).

Symptomatic untreated bowel ischemia may cause malnutrition, acute bowel ischemia with infarction that is

associated with worst prognosis.⁴ The gold standard therapeutic option is surgical (either a bypass or endarterectomy) with a combined morbidity of 15-47% and a mortality of 0-17%.⁵⁻⁷ Percutaneous transluminal angioplasty (PTA) of the SMA was reported in 1980 by Uflacker et al, Furrer et al.^{8,9} Since then, this procedure has gained acceptance. Endovascular treatment of bowel ischemia was first described in 1980 and subsequently good results were found in two small studies.¹⁰ While surgical revascularization has been the standard treatment for symptomatic patients, recent advances in interventional devices and techniques have made endovascular treatment feasible and effective. Percutaneous transluminal angioplasty with stent placement is now recognized as a minimally invasive means of obtaining good long-term results.

We conducted the evaluation of short term and long term clinical outcome of successful endovascular management of cases of chronic mesenteric ischemia, to our centre. in the department of cardiology, MDM hospital, Dr. S.N Medical College Jodhpur, Rajasthan, India. The patients were followed after 2 weeks, at 2 months then at 6 months after index procedure to see composite of symptomatic improvement, weight gain and revascularization. The objective of the study is to assess short term and long-term outcome of successful endovascular management of chronic mesenteric ischemia.

METHODS

Vascular access was taken from right brachial artery and right femoral artery. The femoral access was used for monitoring and non-selective angiography, while brachial access for delivering balloon and stent. Judkin's right 3.5 6F guiding catheter was used to access the respective mesenteric arteries. Lesion was crossed with High Torque Balanced Middle Weight (BMW). The lesion was predilated with semi-compliant balloon of respective sizes at the average pressure of 10 atm. Herculink peripheral arterial stents were deployed and finally post dilatation done with non-compliant balloon. 10 patients with significant lesion, treated with PTA and stenting were selected for study and were followed at 2 weeks, at 2 months then at 6 months after index procedure to see composite of symptomatic improvement, weight gain and revascularization.

RESULTS

Baseline characteristics

The description of patients involved in this study is shown in Table 1. The mean age of patients in our case series was 63 yrs with male predominance, seventy percent were smoker and 50% were diabetic, most common symptom was pain abdomen which was exacerbated after meal and second most common symptom was weight loss. CT angiography was done in

all cases, showed significant ostial stenosis of celiac trunk and superior mesenteric artery in 5 patients, 3 patients had significant ostial stenosis of celiac trunk and ostial stenosis of inferior mesenteric artery and 2 patients had significant stenosis of superior mesenteric artery.

Table 1: Demographic criteria.

Mean age	Male	Smoker	Diabetes mellites
63 year	70%	70%	50%

In view of patients history and CT finding, a provisional diagnosis of mesenteric angina was made and planned to proceed for mesenteric angiography. This was carried out and revealed significant stenosis.

In view of convincing history of CMI, it was decided to proceed to percutaneous transluminal angioplasty (PTA) and stenting. Final result was good and here was no residual stenosis and dissection. After stenting patients were stable and pain free. There were no post-operative complications. Patients were discharged on the 3rd day on aspirin and clopidogrel, subsequent follow up was done after 2 weeks and 2 months and then at six months. There was no postprandial abdominal pain on follow up and almost all patient had gained weight in 2 months and on 6 months of follow up, no case of repeat revascularization were recorded.

DISCUSSION

Intestinal angina is a rare condition. It is caused by atherosclerotic occlusion or severe stenosis of the mesenteric vessels. Most patients are older than 60 years of age and women are affected three times more frequently than men. The failure to provide an increase in gastrointestinal blood flow, following food intake due to underlying narrowing of mesenteric artery leads to gastrointestinal ischemia and the onset of symptoms of intestinal angina. Because total blood flow to the intestine can vary from 25% when fasting to 35% after eating, symptoms are more prevalent after eating. In most patients, at least two of the three arteries are either completely obstructed or severely narrowed before symptoms of CMI occur.

The conventional treatment consists of open endarterectomy or bypass surgery, which has a 15% to 47% morbidity rate and mortality rate of upto 17%.^{1,7} Endovascular intervention is safer in the short term, with 0% to 11% mortality and 0% to 18% morbidity.¹¹ No prospective controlled trials comparing conventional surgery and endovascular treatment are available. Studies have shown that balloon angioplasty yields a high procedural success, with low morbidity and mortality rates, suggesting that endovascular therapy is an important alternative treatment to surgical revascularization in selected patients. There are limited data describing endovascular stents for the treatment of mesenteric stenosis. In a recent study of 25 patients and

26 arteries treated with primary stenting, technical success was obtained in 96% and relief of symptoms in 88% of patients.⁴ There was no procedural mortality, and the only complications were the development of a pseudoaneurysm, and renal failure. At the Mayo Clinic (USA), 229 patients were treated with open surgery or endovascular intervention over a 14-year period.¹² The morbidity rate was higher and the hospital stay was longer with open surgery, but mortality was not significantly different (2.5% for open surgery versus 3.6% with endovascular treatment). However early restenosis and the need for further intervention is more common in the endovascular group.^{13,14} A recent study of endovascular therapy for chronic mesenteric artery occlusions has reported high technical success rate (87%) with no major complications, making this method of management, an attractive choice.¹⁵

CONCLUSION

Percutaneous transluminal angioplasty (PTA) and stenting to mesenteric artery is good alternative management of CMI. In present series, all cases were successfully revascularized without residual stenosis and dissection. There was no postprandial abdominal pain on follow up and almost all patients had gained weight in 2 months and on 6 months of follow up. No case of repeat revascularization was recorded in present study.

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