

Case Report

Successful Endovascular Treatment in a Case of Severe Chronic Mesenteric Ischemia

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Submitted: 31 October 2022

Accepted: 23 November 2022

Published: 25 November 2022

ISSN: 2333-7095

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Abstract

Chronic mesenteric ischemia (CMI) is an uncommon entity occurring in patients with severe stenosis of at least 2 of the 3 mesenteric vessels. It produces abdominal pain and nutritional status deterioration. Although open revascularization has been the standard of treatment, recent evidence shows that endovascular interventions achieve good long-term results with lower morbidity and mortality. This report describes a case of a 70-year-old woman with severe CMI who was treated with endovascular stents. At 6 months, patient continues free of symptoms. This case report elucidates the benefits of endovascular treatment for patients with CMI and highlights the recent paradigm shift.

Keywords

- Chronic mesenteric ischemia
- Endovascular treatment
- Superior mesenteric artery

BACKGROUND

Chronic mesenteric ischemia (CMI) is characterized by postprandial abdominal pain due to an increased demand in gut perfusion when there is severe stenosis of at least 2 of the 3 mesenteric vessels [1]. Although mesenteric artery occlusion is relatively frequent in autopsies only a minority of these patients will develop symptoms. The purpose of CMI treatment is to relieve abdominal pain, improve nutritional intake, and prevent bowel infarction. In line with this, there is consensus that all patients with symptomatic CMI should undergo revascularization [2]. We report a case of CMI to provide further insight into the symptoms and treatment modalities.

CASE PRESENTATION

A 70-year old woman was referred to our institution for severe abdominal pain after eating and an unintentional weight loss of 20Kg in the last year. Physical examination was unremarkable. The low level of total protein and albumin-to-globulin ratio in blood test put on evidence the chronic nutritional deficiency. Computed tomography angiography (CT angiography) revealed a chronic severe occlusion of the superior mesenteric artery (SMA) from its origin to 4cm distally and the development of a collateral circulatory pathway via the inferior mesenteric artery. It also evidenced a severe blockage of the celiac trunk at its origin (Figure 1). Based on these findings an angiography through the left brachial artery was performed. It demonstrated a chronic total occlusion of the SMA at its origin. Lesion was crossed with a hydrophilic nitinol guide wire 0.014" and dilated by a small non-compliant balloon. Telescoping stents were deployed in the SMA covering the large occlusion using two balloon-expandable covered intraluminal stents. The angiogram after stent implantation showed 100% patency of the SMA (Figure 2). Post-

procedural period was uneventful. The patient reached correct tolerance to normal diet in 1 day, and was discharged on the 3th postoperative day. At 6 months of follow-up, patient continues free of symptoms and the stent patency was demonstrated by a CT angiography (Figure 3).

DISCUSSION

Historically, open revascularization has been the cornerstone of CMI treatment. However, some recent studies have shown

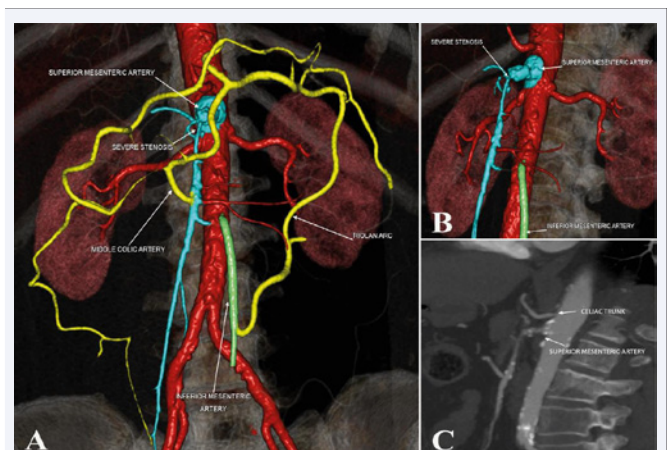


Figure 1 A: Computed tomography angiography (CT angiography) showing a nearly complete blockage of the superior mesenteric artery (SMA) and a collateral circulatory pathway via the inferior mesenteric artery.

B: CT angiography revealing a chronic nearly total occlusion of the SMA from its origin to 4cm distally.

C: A CT angiography revealing a simultaneous severe occlusion of the celiac trunk and SMA.

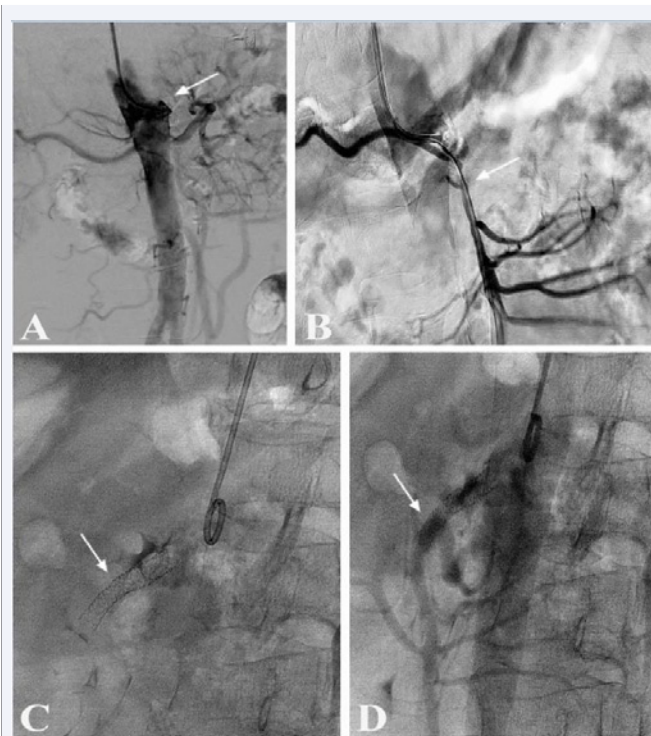


Figure 2 A: An angiogram showing a chronic total occlusion of the SMA at its origin.

B: A guidewire 0.014" across the occlusion in the SMA.

C: Telescoping stents covering the large occlusion of the SMA. **Figure 2D.** An angiogram showing 100% patency of the SMA after stents implantation.

based on the encouraging results of endovascular treatment, the American College of Radiology and the Society for vascular surgery recommend angioplasty and stenting as the first-line treatment [4,5].

The celiac trunk, SMA, and inferior mesenteric artery are the three vessels involved in CMI with a decreasing order of frequency [6]. Although patients usually present with multiple mesenteric vessel disease, there is no consensus regarding the potential advantages from revascularizing more than one obstructed artery [2]. Celiac trunk stents have been shown to have lower primary patency than SMA stents whereas inferior mesenteric artery is avoided by most authors [1,7]. In line with this, most studies prioritize recanalization of the SMA as in the present case. In addition, a wide variety of stents are currently available, unfortunately, there is scarce data on which type of stent (covered or uncovered) has the best results [8]. However, balloon-expandable covered intraluminal stents seem to be the optimal stent choice as demonstrated in other anatomic locations [9]. Furthermore, Oderich et al., showed that covered stents were associated with less restenosis, recurrence, and reinterventions that bare metal stents in patients with CMI [10].

In conclusion, endovascular treatment should be preferred over open surgery as it has lower mortality and morbidity. In addition, although SMA is the most relevant artery associated with CMI, vessel(s) to revascularize must be consciously selected according to the anatomy and physiology of each patient.

CONSENT FOR PUBLICATION

Informed consent was obtained from the patient for permission to describe her clinical course in a case report.

REFERENCES

1. Goldman MP, Reeve TE, Craven TE, Edwards MS, Corriere MA, Hurie JB, et al. Endovascular Treatment of Chronic Mesenteric Ischemia in the Setting of Occlusive Superior Mesenteric Artery Lesions. *Ann Vasc Surg.* 2017; 38: 29-35.
2. Wolk S, Kapalla M, Ludwig S, Radosa C, Hoffmann RT, Weitz J, et al. Surgical and endovascular revascularization of chronic mesenteric ischemia [published online ahead of print, 2022 Feb 19]. *Langenbecks Arch Surg.* 2022; 407: 2085-2094
3. Alahdab F, Arwani R, Pasha AK, Razouki ZA, Prokop LJ, Huber TS, et al. A systematic review and meta-analysis of endovascular versus open surgical revascularization for chronic mesenteric ischemia. *J Vasc Surg.* 2018; 67: 1598-1605.
4. Huber TS, Björck M, Chandra A, Clouse WD, Dalsing MC, Oderich GS, et al. Chronic mesenteric ischemia: Clinical practice guidelines from the Society for Vascular Surgery. *J Vasc Surg.* 2021; 73: 87S-115S.
5. Expert Panels on Vascular Imaging and Gastrointestinal Imaging; Ginsburg M, Obara P, et al. ACR Appropriateness Criteria® Imaging of Mesenteric Ischemia. *J Am Coll Radiol.* 2018; 15: S332-S340.
6. Sundermeyer A, Zapenko A, Moysidis T, Luther B, Kröger K. Endovascular treatment of chronic mesenteric ischemia. *Interv Med Appl Sci.* 2014; 6: 118-124.
7. Malgor RD, Oderich GS, McKusick MA, Misra S, Kalra M, Duncan AA, et al. Results of single- and two-vessel mesenteric artery stents for chronic mesenteric ischemia. *Ann Vasc Surg.* 2010; 24: 1094-1101.
8. Terlow LG, Moelker A, Abrahamsen J, et al. European guidelines on

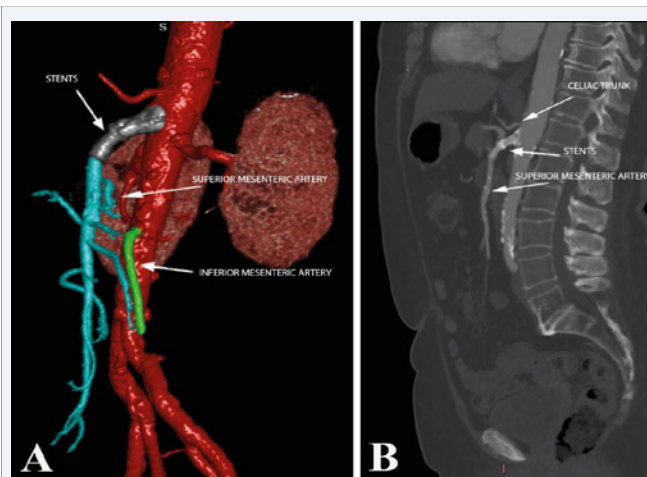


Figure 3 A CT angiography showing the resolution of superior mesenteric artery occlusion six months after stenting.

that endovascular interventions achieve lower perioperative morbidity and mortality rates than open surgery [1]. For example, a recent meta-analysis concluded that the endovascular approach is associated with better perioperative outcomes than the open approach with comparable 3-year survival. Consistent with these findings, there has recently been a shift toward an endovascular first approach for CMI [2-4]. Furthermore,

chronic mesenteric ischaemia - joint United European Gastroenterology, European Association for Gastroenterology, Endoscopy and Nutrition, European Society of Gastrointestinal and Abdominal Radiology, Netherlands Association of Hepatogastroenterologists, Hellenic Society of Gastroenterology, Cardiovascular and Interventional Radiological Society of Europe, and Dutch Mesenteric Ischemia Study group clinical guidelines on the diagnosis and treatment of patients with chronic mesenteric ischaemia. *United European Gastroenterol J.* 2020; 8: 371-395.

9. D'cruz RT, Leong SW, Syn N, Tiwari A, Sannasi VV, Sidhu HRS, et al. Endovascular treatment of cephalic arch stenosis in brachiocephalic arteriovenous fistulas: A systematic review and meta-analysis. *J Vasc Access.* 2019; 20: 345-355.
10. Oderich GS, Erdoes LS, Lesar C, Mendes BC, Gloviczki P, Cha S, et al. Comparison of covered stents versus bare metal stents for treatment of chronic atherosclerotic mesenteric arterial disease. *J Vasc Surg.* 2013; 58: 1316-1323.