Inferior mesenteric artery aneurysm in the setting of celiac and superior mesenteric artery occlusion

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ABSTRACT

Inferior mesenteric artery (IMA) aneurysm is a rare type of visceral aneurysm. We present the case of a 77-year-old woman with an IMA aneurysm in the setting of chronic complete occlusion of the origins of her celiac artery and superior mesenteric artery. The patient was managed successfully with surgical excision of the IMA aneurysm with an end-to-side anastomosis of the IMA to the left common iliac artery. The case report is followed by a discussion based on a literature review of the few previously reported occurrences of IMA aneurysm. (J Vasc Surg Cases and Innovative Techniques 2019;5:197-9.)

Keywords: Visceral aneurysm

Inferior mesenteric artery (IMA) aneurysms are rare, and few cases have been reported in the past. We describe a patient with IMA aneurysm in the setting of chronic celiac artery (CA) and superior mesenteric artery (SMA) occlusion in hopes of adding to the literature repertoire. Consent for this case report was obtained.

CASE REPORT

A 77-year-old woman with known history of hypertension, bilateral lower extremity deep venous thrombosis, and pulmonary embolism as well as known chronic atherosclerotic CA and SMA occlusion was being medically managed with warfarin (Coumadin). Previously attempted stent placement approximately 4 to 5 years before consultation was aborted when the patient fell off the table in the angiography suite. She presented with complaints of 10-pound weight loss secondary to food phobia after noticing 4 to 5 months of postprandial abdominal pain lasting 30 to 60 minutes, along with sweating and urgent watery diarrhea.

Computed tomography angiography and abdominal aortography were performed and revealed the known CA and SMA occlusion at their respective ostia (Fig 1). The 4- × 2-cm IMA aneurysm begins 1 cm distal to the IMA takeoff from the aorta with a narrowed neck between the aorta and aneurysm, which was likely to be the cause of the symptoms of mesenteric ischemia (Fig 2, *A*). The IMA and marginal artery of Drummond were diffusely tortuous and dilated, providing extensive collaterals to the CA and SMA tributaries (Fig 2, *B*). There were no suitable bypass targets for the CA and SMA tributaries.

The patient underwent a laparotomy with resection of the thin-walled fusiform IMA aneurysm through a transperitoneal approach (Fig 3), followed by a tension-free reimplantation of the IMA to the left common iliac artery in an end-to-side fashion using 5-0 Prolene. Use of prosthetic material was avoided. The narrowed IMA stump off the aorta was oversewn in two layers using 4-0 Prolene. Because the CA and SMA artery tributaries had extensive IMA-dependent pulsatile collaterals and the proposed bypass targets were small and not suitable for bypass, a CA or SMA bypass was not performed. Excluding the narrow neck proximal to the IMA aneurysm after reimplantation of the IMA would increase flow to the IMA and the collaterals to the CA and SMA tributaries. Intraoperative bowel ischemia time was minimal. Pathologic examination showed degenerative changes in the vessel wall with calcifications.

After an uncomplicated postoperative course, she was discharged home. Follow-up during the postoperative period and at the 2-year mark showed complete relief of preoperative symptoms.

DISCUSSION

Visceral artery aneurysms are rare, representing <5% of all aneurysms,[1] and the IMA is by far the least common vessel affected by visceral aneurysmal disease (<1%).[2,3] Despite being rare, there has been an increase in detection in recent years because of increased use of various diagnostic modalities.[1] It most commonly occurs close to the takeoff of the IMA from the aorta and appears to be more common in men than in women.[3] A previous report found patients who ranged from 9 to 84 years old.[2,4]

Etiology is typically secondary to hypertension and atherosclerosis, with other causes being infectious or inflammatory in nature.[2-4] Close to half of previously reported cases involve the occlusion of both the CA and SMA, as in our patient.[5] The pathophysiologic process includes the increased blood flow through the IMA resulting in increased turbulence and arterial dilation. In these

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Author conflict of interest: none.

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The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

2468-4287

https://doi.org/10.1016/j.jvscit.2018.07.001

Fig 1. Sagittal view of computed tomography angiography showing celiac artery (CA) and superior mesenteric artery (SMA) stumps with occlusion noted at their respective ostia.

scenarios, the IMA is the sole provider of splanchnic blood flow through extensive collateralization.

Physical examination findings may include a pulsatile abdominal mass and presence of symptoms ranging from none to abdominal or back pain or, in an emergent setting, rupture (11 previously reported cases) and

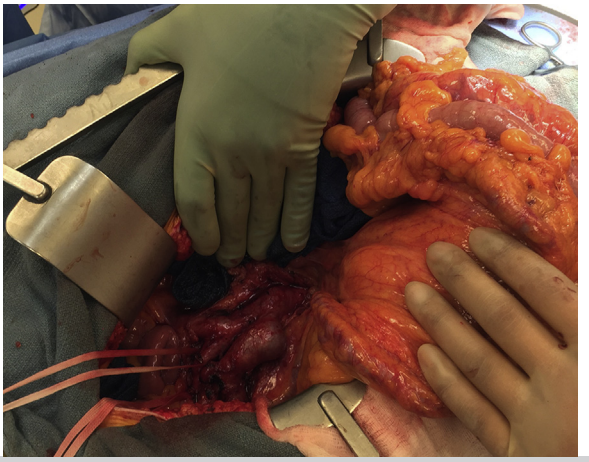

Fig 3. Intraoperative photograph showing the inferior mesenteric artery (IMA) aneurysm. Vessel loop is around the left common iliac artery.

hemorrhagic shock.[3] Workup includes ultrasound, computed tomography angiography, and angiography. Because of the risk of rupture and subsequent high risk of death from hemorrhage and risk of mesenteric ischemia in the case of occluded CA and SMA, operative interventions are indicated for treatment of IMA aneurysms. If a patient has a patent CA and SMA, the IMA could be ligated. However, if the IMA is the sole provider of blood flow to the intra-abdominal organs, as is commonly seen in the setting of an IMA aneurysm, aneurysmectomy followed by bypass grafting or reimplantation is required. Reimplantation was performed to the left common iliac artery in this case to avoid tension on the anastomosis. Morimoto et al[5] also performed their anastomosis to the left common iliac artery because of calcified aorta in a patient with Behçet

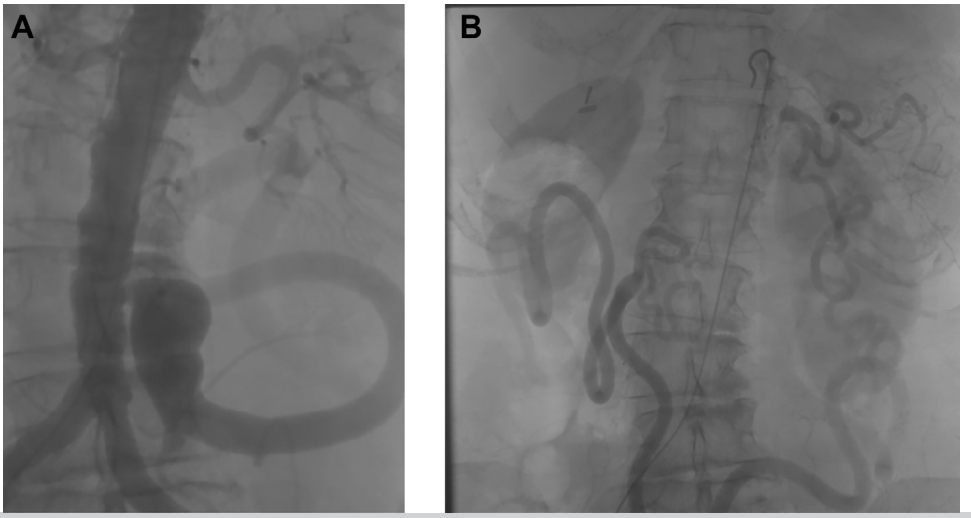

Fig 2. A, Abdominal aortogram with 4- × 2-cm inferior mesenteric artery (IMA) aneurysm ~1 cm distal to its takeoff from the aorta. Narrowed segment between aorta and aneurysm. **B,** Abdominal aortogram outlining the diffusely tortuous and dilated marginal artery of Drummond providing extensive collaterals to the celiac artery (CA) and superior mesenteric artery (SMA) tributaries.

disease. There have been mixed reports with regard to bypassing the CA and SMA in cases in which they are occluded. The theoretical value in revascularization of the CA and SMA is to prevent future recurrence of IMA aneurysms, although in our patient, her age pushed us toward avoiding further bypass grafting, especially with the small caliber of her mid SMA, which would have been our distal bypass target. This also prevents any risk of graft infections. In cases in which the CA and SMA were occluded and bypass grafting was performed, there has been documented postoperative regression of the collateral vessels, including the middle colic artery and marginal artery.[1]

In considering endovascular techniques, such as stent placement and coil embolization, one must note the risk of aneurysmatic sac reperfusion as well as challenging stent placement because of the dilated IMA's being tortuous in this setting.[6] Moreover, long-term outcomes are unknown.[5] One previous report of transarterial embolization of an IMA aneurysm resulted in death from rupture.[2] In the case of prohibitive risk of abdominal surgery and general anesthesia, it would be reasonable to attempt endovascular techniques.

CONCLUSIONS

In our patient with an IMA aneurysm alongside complete occlusion of the CA and SMA, we performed an excision of the aneurysm and reimplanted the IMA to the left common iliac artery without bypassing the CA and SMA because of good collateralization and poor-caliber distal bypass targets. Because of the rarity of IMA aneurysms, especially in the setting of occluded CA and SMA, it is difficult to study this group of patients to determine whether they would definitively benefit from also bypassing the CA or SMA or both.[7] Certainly, in a younger patient with good bypass targets, it is perhaps more prudent to perform the additional bypasses to prevent recurrence of the IMA aneurysm.

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Submitted Feb 15, 2018; accepted Jul 7, 2018.