Idiopathic Inferior Mesenteric Arteriovenous Fistula: A Rare Cause of Pulsatile Abdominal Mass

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Abstract Inferior mesenteric arteriovenous fistula (AVF) is an extremely rare vascular abnormality which may be idiopathic or secondary to previous trauma or surgery, and it may result in portal hypertension or ischemic colitis if left untreated. Imaging can help accurately diagnose visceral AVFs and create a vascular map to display the feeding artery and draining vein before the surgery; however, multidetector computed tomography (MDCT) angiography of inferior mesenteric AVF is not well documented in the literature. In this article, the authors report a case of inferior mesenteric AVF in a 48-year-old woman evaluated for left-sided abdominal pain and diagnosed preoperatively by MDCT angiography. Surgical excision of the AVF was successfully performed, and the postoperative course was uneventful.

Keywords Arteriovenous fistula · Inferior mesenteric artery · Multidetector computed tomography · Abdominal mass

Introduction

Inferior mesenteric arteriovenous fistulas (AVFs) are extremely rare, with only 21 cases being reported to date [1–8].

Knowledge of the multidetector computed tomography (MDCT) angiographic features of inferior mesenteric AVF will aid in establishing prompt diagnosis and treatment, so its hazardous complications, including portal hypertension and bowel ischemia will be avoided. Nearly half of the cases reported were iatrogenic and due to the previous interventions, e.g., abdominal surgery or liver transplant. Herein, we report a case of idiopathic inferior mesenteric arteriovenous fistula with a review of the literature.

Case Report

A 48-year-old woman with a palpable mass and 6 months history of left lower abdominal pain presented to our hospital with worsening of her symptoms. She had 2 years history of hypertension which had been under control with oral medication, and no history of previous abdominal trauma or surgery was given. On arrival, apart from a palpable abdominal mass in left lower quadrant, no relevant finding was noted on physical examination and laboratory findings were unremarkable.

MDCT angiography demonstrated a large fistulous connection between the inferior mesenteric artery and vein. The involved vessels were enlarged and tortuous, with a diameter of 8 mm at the origin of the inferior mesenteric artery and 39 mm at the most dilated part of the inferior mesenteric vein (Fig. 1). There was no evidence of portal hypertension, and the bowel wall had normal appearance. 3D volume-rendered image (Fig. 2) was used to create a vascular map for comprehensively displaying the feeding artery, draining vein, and the AVF itself.

The patient subsequently underwent laparotomy. The feeding artery and draining vein of the AVF were evident during the operation. The involved vessels were ligated proximal and

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Fig. 1 Contrast-enhanced axial CT image shows a dilatation of the vessel (star) at the level of the origin of inferior mesenteric artery (curved arrow). The tubular contrast-enhancing structure (double arrow) arises from the round dilatation of the vessel; both are part of an arteriovenous communication between the inferior mesenteric artery and vein

distal to the fistulous point, and the patient was discharged in good general health condition.

Discussion

Inferior mesenteric AVFs are extremely rare, and to the best of our knowledge, 21 cases have been reported in the literature so

Fig. 2 Oblique coronal 3D volume-rendered image shows the enlarged and tortuous inferior mesenteric AVF (star) arising from the inferior mesenteric artery (curved arrow) and draining into the inferior mesenteric vein (double arrow) and then the portal vein (open arrow). The short and dashed arrows and the arrowhead depict the left gastric and superior mesenteric arteries and the celiac artery, respectively

far. AVFs are usually secondary to previous operation, trauma, neoplasms, rupture of an arterial aneurysm into the adjacent vein, or idiopathic. Among the reported cases of inferior mesenteric AVF, ten had a history of abdominal surgery [1, 6] and one occurred after a remote blunt trauma [7]. AVF was idiopathic in the remaining ten patients [2–5, 8], as was the case in our patient.

The presenting symptom in majority of cases included abdominal pain and/or mass. It is suggested that increased blood flow through an inferior AVF can cause portal venous hypertension, and decreased arterial flow to the bowel wall will result in nonocclusive ischemic colitis secondary to steal phenomenon. Clinical signs and symptoms attributable to either portal hypertension, including splenomegaly, ascites, and bleeding esophageal varices or ischemic colitis, including diarrhea and lower gastrointestinal bleeding were present in all five patients in the literature. The latter consisted of four patients with idiopathic AVF [2] and one with traumatic AVF [7]. In our patient, portal hypertension or ischemic colitis was detected neither in the preoperative assessment nor during the operation.

Ultrasound can be useful in the diagnosis of AVFs by showing high-velocity and low-resistance arterial flow at the feeding artery, turbulent flow at the junction of the artery and vein, and arterialized flow at the draining vein. CT and magnetic resonance angiography could also be helpful in establishing the diagnosis of AVFs and typically show early contrast filling of the involved vein during the arterial phase. In our case, some relatively characteristic imaging findings of inferior mesenteric AVF were evident on MDCT angiography, i.e., a dilated feeding artery arising from the inferior mesenteric artery and draining into the inferior mesenteric vein at the confluence of the portal vein (Fig. 2). This case illustrates the role of MDCT angiography as a non-invasive imaging modality in the accurate preoperative diagnosis of the inferior mesenteric AVF and in providing a road map for the surgical procedures. Hence, awareness of the imaging features of inferior mesenteric AVF is crucial for the proper management.

Digital angiography, in many facilities, is reserved for those cases with questionable results or for patients in whom percutaneous embolization is advocated. There are two potential treatments for visceral AVFs, including intra-arterial embolization and open surgery. Upon review of the literature, we found that four cases of inferior mesenteric AVF were properly treated by embolization [2]. Nevertheless, visceral AVFs with a diameter of more than 8–9 mm are not good candidates for angiographic procedures because of the risk of the distal migration of embolic agents, as was the case in our patient; thus, she had been better suited for open surgery. Our patient subsequently

underwent an open surgery and was uneventfully discharged.

Conflict of Interest The authors declare that they have no conflict of interest.

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