Silent Danger: A Rare Case of Asymptomatic Aortocaval Fistula Discovered During Routine Imaging

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Abstract

Background:
Aortocaval fistulas resulting from abdominal aortic aneurysms are rare, representing 3–6% of ruptured cases. These fistulas are often asymptomatic or present with non-specific symptoms related to venous hypertension or high-output cardiac failure. Fortuitous diagnoses in asymptomatic patients are exceedingly uncommon.
Case Presentation:
An 86-year-old woman underwent CT angiography to evaluate left leg circulatory issues. Imaging revealed an aortic aneurysm with a fistula into the inferior vena cava, an enlarged right atrium, and pelvic vein varices. The asymptomatic fistula was treated with endovascular aneurysm repair (EVAR). Postoperatively, the patient developed superior mesenteric artery occlusion and intestinal ischemia, leading to palliative care and death.
Discussion:
Aortocaval fistulas can result from a variety of causes including infection and trauma. Diagnosis is typically achieved through CT angiography. While open surgical repair remains the standard treatment, EVAR is a viable alternative in selected cases. However, the prognosis remains guarded, even with appropriate treatment.
Conclusion:
Aortocaval fistulas are rare and life-threatening conditions that require prompt diagnosis and management, though outcomes are often poor.

Keywords: *EVAR, asymptomatic, AAA, aortocaval fistula, complication*

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Introduction

Aortocaval fistulas caused by abdominal aortic aneurysms are rare and often fatal, accounting for less than 3-6% of ruptured aortic aneurysms (1,2). The first reported instance was described by Symes in 1831, with the first successful repair performed by Cooley in 1955 (3). Most patients exhibit few symptoms, but those who do will generally present with problems related to the shunting of large volumes of arterial blood into the venous system. This can lead to non-specific symptoms such as leg edema and congestive heart failure (3). Aortocaval fistulas can occur in combination with retroperitoneal ruptures (1). There are reports of asymptomatic aortocaval fistulas being incidentally found on imaging for other causes, but these remain extremely rare. (4)

Case Report

An 86-year-old woman presented to radiology for an abdominal aorta CT angiography with lower extremity runoff due to circulatory problems of the left leg, with a suspicion of occlusion in the superficial femoral artery. The patient had a history of an abdominal aortic aneurysm. CTA demonstrated aortic aneurysm (Fig. 1, Panel A) alongside a fistula (Fig. 1, Panel A, arrow) into the inferior vena cava (Fig. 1, Panel A and Fig. 1, Panel B). Furthermore, the patient exhibited a greatly enlarged right atrium and pelvic vein varices (Fig. 1, Panel C, arrow), which was likely caused by increased venous pressure. As the imaging was performed during the arterial phase, the spread of contrast into the venous system was limited to the veins surrounding the fistula, with contrast being constrained to the proximal the left iliac

artery (Fig. 1, Panel C, star). The patient's fistula was not treated emergently, as it was not immediately life-threatening, and was fortuitously discovered during a routine examination. Although the aortocaval fistula was asymptomatic, the patient underwent EVAR eight days later (Fig. 2). In the hours following the procedure, the patient began complaining of abdominal pain. A contrast-enhanced abdominal CTA revealed an occlusion of the superior mesenteric artery alongside intestinal ischemia. Given the patient's poor overall condition, a decision was made to provide palliative care, and the patient passed away the following day.

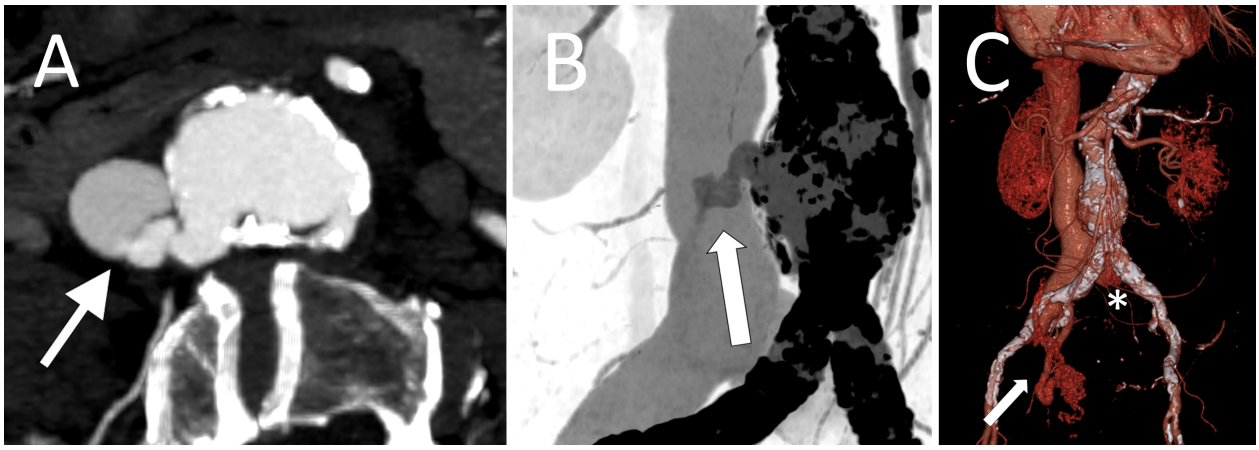

Fig. 1
Panel A: Axial image of an abdominal CTA showing the fistula between the aorta into the inferior vena cava. This is demonstrated by the blush of contrast into the inferior vena cava (arrow).
Panel B: Coronal maximum intensity projection of the abdominal aorta showing the high-velocity contrast entering the inferior vena cava (arrow).
Panel C: 3D VRT reconstruction of an abdominal CTA. One can see that the fistula is the point of origin of the contrast due to the incomplete enhancement of the left common iliac vein (star), suggesting that the contrast flows in the opposite direction of what one would expect to see. Furthermore, there is dilatation of the pelvic veins, suggesting increased pelvic venous pressure (arrow).

Discussion

Eighty percent of aortocaval fistulas are caused by abdominal aortic aneurysms (1). Other etiologies include mycotic aneurysms, Takayasu's arteritis, connective tissue disorders, iatrogenic causes (such as lumbar surgery, inferior vena cava filter placement or endovascular aneurysm repair), radiation exposure, infection and fistulation due to penetrating trauma (1,2,4,5).

Aortocaval fistulas may go unnoticed due to their asymptomatic nature, and are often discovered incidentally during unrelated procedures or imaging, as in the case of our patient (1). When symptoms do occur, they may include pain, a pulsatile audible abdominal mass, lower back pain and shortness of breath (1,2). Most symptoms are related to the shunting of high volumes of arterial blood directly into the venous system, leading to venous hypertension and high-output heart failure (1,2).
Contrast-enhanced CTA is diagnostic in most cases, allowing for the visualisation of contrast passing into the inferior vena cava and obliteration of the fat plane between the aorta and vena cava (1,2,5). Retroperitoneal hematomas are also inconsistently present (2). Another diagnostic clue is an overly dilated inferior vena cava and pelvis veins, as seen in our patient, which if found should always prompt a search for a fistula (2).

During surgical intervention, great care must be taken to avoid dislodging material that could cause a paradoxical embolism (1). The preferred surgical method involves closing the fistula from the aneurysmal sac using monofilament mattress sutures (1). If this is not feasible, ligation of the inferior vena cava and iliac veins may be performed to achieve haemostasis (1). However, this approach can result in complications such as leg oedema, pelvic venous compression syndrome, venous claudication and recurrent deep vein thrombosis (1). Although open surgery is the preferred treatment, in cases such as our patient, endovascular repair is an alternative option. However, the long-term outcomes of EVAR remain uncertain due to the limited number of endovascular repairs, and the lack

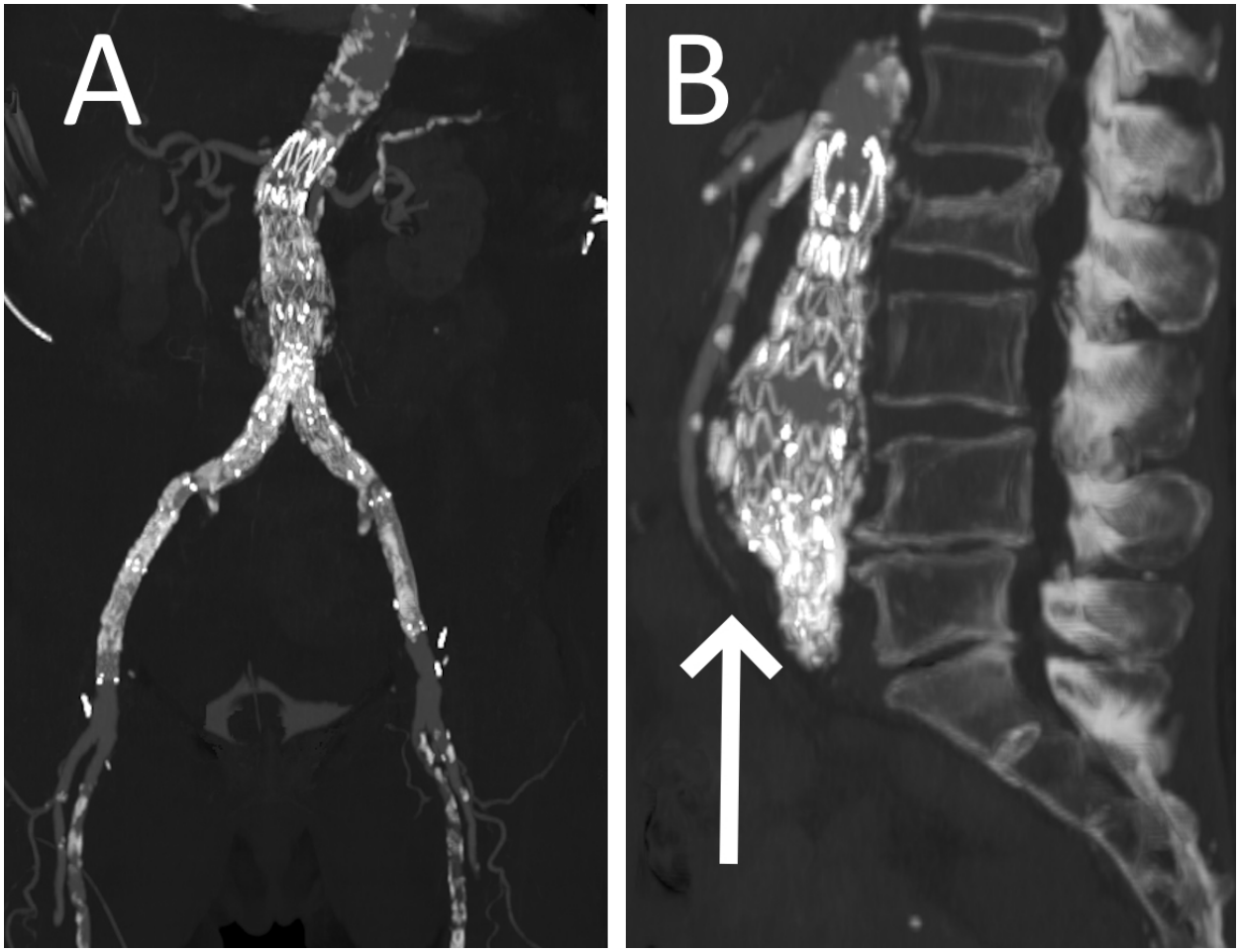

Fig. 2
Panel A: Coronal maximum intensity projection of the abdominal aorta after the placement of the stent within the abdominal aorta and common iliac arteries.
Panel B: Coronal maximum intensity projection of the abdominal aorta showing the point of occlusion of the superior mesenteric artery.

of reported cases with long term follow-up (1).

Conclusion

Aortocaval fistulas are rare, life-threatening pathologies that are very frequently asymptomatic or present with non-specific symptoms related to high-output cardiac failure. Fortuitous discoveries of asymptomatic aortocaval fistulas are extremely rare, with only a few cases reported in the literature. The causes are diverse, ranging from iatrogenic trauma to infection. When identified, surgical repair is the preferred treatment, though endovascular repair is becoming increasingly common. Despite treatment the prognosis remains guarded, as demonstrated in this case.

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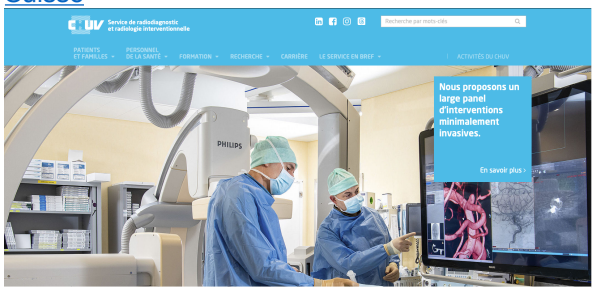

Conflict of interest:

The authors declare that there were no conflicts of interest within the meaning of the recommendations of the International Committee of Medical Journal Editors when the article was written.

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