

A Case of Unilateral Leg Edema Due to Abdominal Aortic Aneurysm with Aortocaval Fistula

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Aortocaval fistula (ACF) is a rare complication of abdominal aortic aneurysm (AAA), and its preoperative diagnosis is often difficult. A 71-year-old woman was admitted to our hospital due to unilateral leg edema. Abdominal computed tomography (CT) showed an abdominal aortic aneurysm (AAA), a common iliac aortic aneurysm (CIAA) and ACF was suspected. Digital subtraction angiography (DSA) was performed, enabling us to identify the region of ACF with AAA preoperatively. ACF is associated with high mortality because it is difficult to control venous bleeding from ACF. Detailed preoperative diagnosis of ACF can provide many advantages to control bleeding from ACF during an operation. (Ann Thorac Cardiovasc Surg 2007; 13: 135–8)

Key words: aortocaval fistula, unilateral leg edema

Introduction

Unilateral leg edema is generally associated with venous or lymphatic disease, but is rarely caused by artery disease.^{1–4)} There is a high rate of mortality for aortocaval fistula (ACF), reported to range from 25–50%,¹⁾ because the surgical approach is technically more difficult due to inflammation and adhesion around the ACF. In addition, it is difficult to control venous bleeding from ACF. We report on a patient who developed unilateral leg edema due to an ACF complicating an abdominal aortic aneurysm (AAA).

Case

A 71-year-old woman visited an orthopedic hospital complaining of pain and swelling in her right leg. Three days later, she was admitted to the hospital and diagnosed with deep venous thrombosis (DVT). She rested while receiving an anticoagulant; however, there was no improvement.

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After 7 days, she was transferred to our hospital.

Her past medical history was significant for hypertension and obesity. On admission to our hospital, her blood pressure was 120/64 mm Hg and her heart rate was 82/min. Both a pulsating mass and systolic bruit around the umbilicus was noted. She did not have any signs of congestive heart failure. A physical examination revealed typical edema in her right leg (Fig. 1).

A chest X-ray indicated a cardiothoracic ratio of 60%, but there was no pulmonary congestion or pleural effusion. Abdominal computed tomography (CT) showed an infrarenal abdominal aortic aneurysm (AAA) with a maximum diameter of 68×54 mm and a right common iliac artery aneurysm (CIAA) with a maximum diameter of 72×70 mm. Early enhancement of the inferior vena cava (IVC) is a direct clue as it was seen in the arterial phase, and the right femoral vein was more enhanced than the left femoral vein (Fig. 2). Magnetic resonance imaging (MRI) showed an infrarenal AAA and right CIAA, and the right iliac and femoral vein were enhanced in the early phase (Fig. 3). We performed digital subtraction angiography (DSA) to confirm the diagnosis. DSA concurred with CT and MRI, and revealed the AAA and the right CIAA, as well as communication between the right internal iliac artery and vein (Fig. 4). AAA and CIAA with ACF were diagnosed and emergency surgery was performed. A median long incision was made on the perito-



Fig. 1. Typical edema in the patient's right leg on admission.

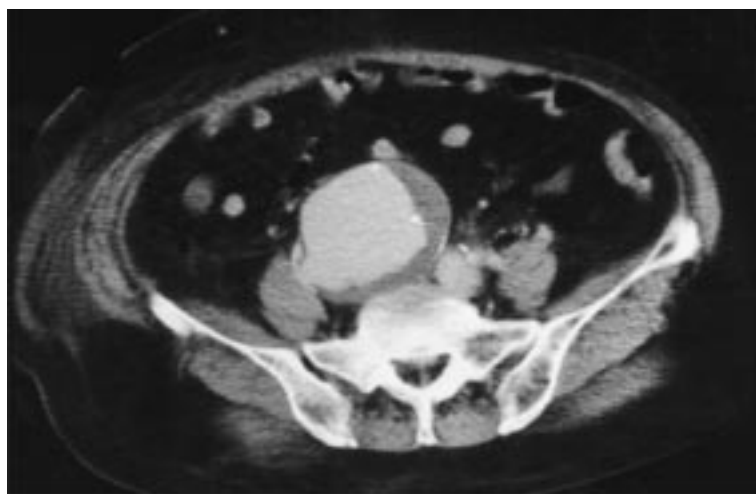


Fig. 2. CT showing CIAA.
The right iliac vein was more enhanced than the left in the early phase.

neal cavity. We observed the AAA under the retroperitoneum, and the right external iliac artery and vein were oppressed; As the aneurism was so big, the surrounding blood vessels, arteries and veins, were pressured and deformed by the CIAA. The right iliac vein was swollen with adhesion around the tissue. The AAA and CIAA were opened longitudinally. The mural thrombus of the aneurysm was extirpated. An ACF measuring 20×10 mm in size in the right external iliac artery was observed. The AAA and CIAA were replaced with a bifurcated prosthetic graft. The right internal iliac vein was compressed manually in order to control the bleeding from the ACF. The ACF and ostium of the external and internal iliac artery were closed with running suture (Fig. 5). Four units of MAP and 6 of FFP were transfused during the operation. The volume of bleeding was 1,305 ml and the returned volume of cell saver was 510 ml. The patient's postoperative course was uneventful.

The postsurgical recovery was event free. DSA performed at 7 postoperative days did not show residual ACF. The leg edema gradually improved without further medication. Three years later the patient is still doing well.

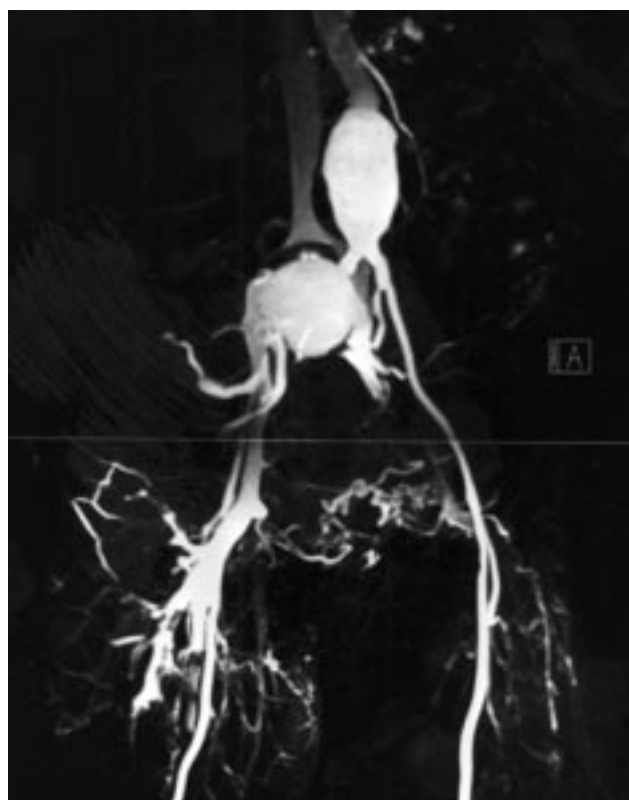


Fig. 3. MRI showing AAA and right CIAA.
The right iliac and femoral vein were enhanced in the early phase.

Discussion

ACF is a rare complication of AAA, and is reported to be associated with 3–6% of all ruptured AAA's.¹⁾ A definite

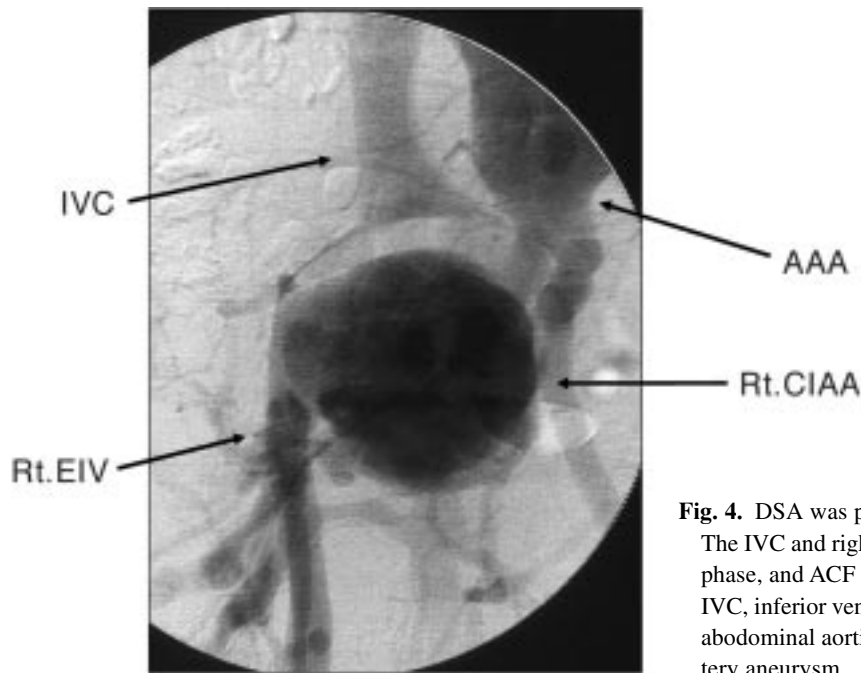


Fig. 4. DSA was performed. The IVC and right iliac vein were imaged mainly in the arterial phase, and ACF was observed at the point of the fistula. IVC, inferior vena cava; Rt.EIV, right external iliac vein; AAA, abdominal aortic aneurysm; Rt.CIAA, right common iliac artery aneurysm.

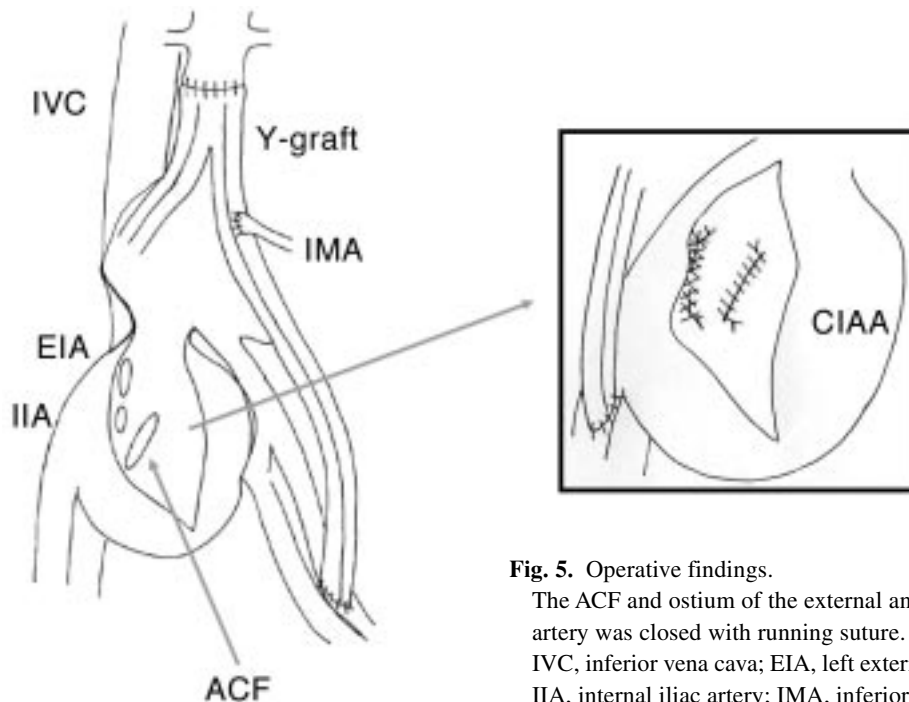


Fig. 5. Operative findings. The ACF and ostium of the external and internal iliac artery was closed with running suture. IVC, inferior vena cava; EIA, left external iliac artery; IIA, internal iliac artery; IMA, inferior mesenteria artery; CIAA, common iliac artery aneurysm; ACF, aortocaval fistura.

preoperative diagnosis is often difficult because the classic diagnostic sign, a pulsatile abdominal mass with bruit and high-output heart failure, is present only in 20–50% of all such cases.¹⁻⁴ Possible reasons for a prompt diagnosis not being made are as follows: (i) there was a de-

creased shunt flow through the ACF due to compression of the IVC by a large aneurysm, and (ii) there was partial obstruction of the ACF by a mural thrombus. In the present case, the patient had a large ACF but no thrombus. She complained of unilateral leg edema without symptoms of

heart failure. This may be due to the finding that shunt flow through the ACF was decreased due to compression of the IVC by the large aneurysm. Unilateral leg edema is generally associated with venous or lymphatic disease. The possibility of aortic disease with ACF should be considered when examining a patient with intractable unilateral leg edema.

The high mortality of ACF is reported as 25–50%,¹⁾ because the surgical approach is technically more difficult due to inflammation and adhesion around the ACF. In addition, it is difficult to control venous bleeding from the ACF. In previous reports, bleeding was controlled by venous compression or the insertion of balloon catheters.¹⁾ In the present case, there was adhesion of the external iliac vein around the ACF. We attempted to control the bleeding by inserting balloon catheters. However, it was difficult to insert the balloon because of the venous bleeding from the ACF. Therefore, the venous bleeding was controlled by manual compression. This was easy and effective because we had used CT, MRI and DSA to identify the location of the ACF before an operation. A detailed preoperative diagnosis assists in selecting the optimal surgical modality.

CT is often the initial imaging method when evaluating AAA because it is a noninvasive technique. Radocha et al.²⁾ reported that an obliteration of the normal anatomic space between the aorta and inferior vena cava is also one of the diagnostic findings of ACF. An early enhancement of the inferior vena cava is a direct clue for diagnosis of ACF. In this case, we observed those findings in the patient's CT, and therefore diagnosed ACF. However, it was difficult to determine the region of ACF from the CT scan. Since we believe that it was very important to determine the region of ACF during the opera-

tion, we performed DSA. It is possible to diagnose ACF from CT or MRI, and thus there might not be a need to perform DSA. However, it may be useful to perform DSA because a detailed preoperative diagnosis of ACF in DSA can provide many advantages to control bleeding from ACF during an operation. The latest 64-slice CT technology has recently become widely used in other examinations. To the best of our knowledge, there has been no report in which ACF was diagnosed by 64-slice CT. This may be useful for understanding the region of ACF.

In conclusion, we have presented a rare case of unilateral leg edema due to AAA with ACF. We performed replacement of a bifurcated prosthesis graft for AAA and CIAA, with direct closure of ACF. It is important to obtain a definite preoperative diagnosis of the locations of ACF.

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