

Case Report

Surgical Repair of Ruptured Abdominal Aortic Aneurysm with Non-Bleeding Aortocaval Fistula

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We present a case of an aortocaval fistula (ACF) without bleeding because a clot was covering the fistula. A 60-year-old man was diagnosed as having a ruptured abdominal aortic aneurysm (AAA) and an aorto-caval fistula, by enhanced computed tomography (CT). After the aneurysm had been opened, the fistula was detected, but there was no bleeding because it was covered with clot. After graft repair, bleeding from the fistula occurred when the clot was removed by suction. Direct closure of the fistula was achieved after bleeding was controlled by digital compression.

Keywords: ruptured abdominal aortic aneurysm, aortocaval fistula

Introduction

Aortocaval fistula (ACF) is a rare complication of abdominal aortic aneurysm (AAA), and it is important to control bleeding from the fistula during surgery. We present a case of ACF without bleeding because a clot was covering the fistula.

Case Report

A 60-year-old man was admitted to our hospital with acute abdominal and lumbar pain. He had a history of atrial fibrillation, hypertension, dyslipidemia, and obesity (body mass index: 30.1 kg/m²). On arrival at our hospital, his blood pressure was 68/45 mmHg and heart rate was 98/min. There was no elevation of the jugular venous pressure or pitting edema of the legs. The patient was 175 cm tall and weighed 95 kg, making examination of the abdomen difficult. The results of laboratory tests were unremarkable.

Computed tomography (CT) confirmed a 7 × 8 cm infrarenal AAA with evidence of retroperitoneal bleeding and a fistula running between the right lateral wall of the AAA and the inferior vena cava (IVC). The IVC was compressed by hematoma (Fig. 1).

The patient was transferred to the operating theater as soon as possible after informed consent was obtained. A standard midline approach was employed to expose the infrarenal AAA. After the aorta and common iliac arteries had been clamped, the aneurysm was opened longitudinally. There was a defect in the aneurysm wall, which was 2 cm in diameter, and located 2 cm above the abdominal aortic bifurcation. We assessed that the closure of the ACF was unnecessary because bleeding from the IVC was absent because a clot was covering the fistula. Routine repair was done with an infrarenal bifurcated prosthetic graft, after which bleeding from the fistula occurred because the clot was removed by suction. The fistula was closed by direct suture using the aneurysm wall as reinforcement after bleeding was controlled by digital compression (Fig. 2). The patient's postoperative course was uneventful. He was discharged at 20 days after surgery and was well at the 1-year review.

Discussion

Most AAAs are asymptomatic, but the prognosis is
Abdominal or back pain, a pulsatile mass, and an abdominal bruit, but making a definite diagnosis of ACF can be difficult because the classic triad is only present in 20%–50% of patients. Other findings associated with an ACF include hematuria, elevation of the jugular venous pressure, pulmonary edema, ascites, pulsating varicose veins, and edema of the lower limbs. A large shunt can cause high-output congestive heart failure. Brewster and colleagues reported that decompensated congestive heart failure occurred in 35% of ACF patients with a large shunt. Our patient only had the symptoms of abdominal and lumbar pain, and he lacked the characteristic physical findings associated with an ACF. Congestive heart failure did not occur because the flow through the fistula was minimal or absent due to its small size and compression of the IVC by retroperitoneal hematoma.

Emergency surgery for ACF is often performed without a correct preoperative diagnosis. In such cases, massive bleeding from the IVC can occur during surgery. Although ruptured AAA can be diagnosed by plain CT, enhanced CT is useful for detection of an ACF. In the present patient, accurate preoperative diagnosis was important. If we had not detected the ACF before surgery, we might have missed it during the operation because of lack of bleeding. In that case, massive bleeding from the fistula would have occurred after the IVC pressure increased postoperatively.

The mortality rate of ACF patients is reported to be high at 10%–36%. The outcome of surgery is dependent on prevention of bleeding through the fistula from the IVC. In previous cases, bleeding was controlled by digital venous compression, IVC clamping, and inflation of a balloon catheter. Maeda, et al. reported that digital grave and a fatal outcome is common when rupture occurs. AAA may rupture into the retroperitoneal space, the abdominal cavity, or an adjacent organ such as the duodenum or the IVC. ACF is an uncommon complication that has been reported to occur in 0.22% to 6.04% of ruptured AAAs.

The classic diagnostic signs of AAA with ACF are abdominal or back pain, a pulsatile mass, and an abdominal bruit, but making a definite diagnosis of ACF can be difficult because the classic triad is only present in 20%–50% of patients. Other findings associated with an ACF include hematuria, elevation of the jugular venous pressure, pulmonary edema, ascites, pulsating varicose veins, and edema of the lower limbs. A large shunt can cause high-output congestive heart failure. Brewster and colleagues reported that decompensated congestive heart failure occurred in 35% of ACF patients with a large shunt. Our patient only had the symptoms of abdominal and lumbar pain, and he lacked the characteristic physical findings associated with an ACF. Congestive heart failure did not occur because the flow through the fistula was minimal or absent due to its small size and compression of the IVC by retroperitoneal hematoma.

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Fig. 1 (A) Computed tomography (CT) reveals a 7 × 8 cm infrarenal abdominal aortic aneurysm (AAA) with evidence of retroperitoneal bleeding. (B) Coronal CT image shows a fistula (arrow) running between the right lateral wall of the AAA and inferior vena cava (IVC). (C) The IVC (arrow) is compressed by a hematoma.

Fig. 2 Operative findings. The ACF was closed with a running suture after the graft replacement. IVC: inferior vena cava; ACF: aortocaval fistula
compression of a fistula is as effective as IVC clamping for the prevention of bleeding. In their case, the ACF was less than 15 mm in diameter, so bleeding was easy to control by digital compression of the fistula. On the other hand, Delaney, et al. suggested that IVC clamping reduces the risk of embolization due to atheroma, thrombus, or air from the open aneurysmal sac. In our case, closure of the ACF was achieved by suturing with digital compression because the fistula was small and there was no intraoperative bleeding.

**CONCLUSION**

We presented a rare case of ruptured AAA with non-bleeding ACF. It is important to make a definite preoperative diagnosis of ACF and probe the aneurysm wall because there may be no bleeding from a small fistula.

**DISCLOSURE STATEMENT**

Satoshi Unosawa and co-authors have no conflicts of interest.

**REFERENCES**