Case report - Aortic and aneurysmal

Diagnosis of an ilio-iliac arteriovenous fistula by multidetector row computed tomography and surgical repair

Tomoyuki Goto*, Takeshi Enmoto, Kazumi Akimoto

Department of Cardiovascular Surgery, Nantan General Hospital, 25, Yagi, Nantan, Kyoto 629-0197, Japan

Department of Radiology, Nantan General Hospital, Kyoto, Japan

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Abstract

An 82-year-old man presented with typical signs and symptoms of an arteriovenous fistula (AVF) associated with an aortoiliac aneurysm, such as a pulsatile abdominal mass, continuous bruit, thrill, and high output heart failure. Multidetector row computed tomography (MDCT) confirmed the presence of an AVF between the right common iliac artery aneurysm and vein. We subjected the patient to surgical repair of the AVF combined with graft replacement, which proved successful.

Keywords: Ilio-iliac arteriovenous fistula; Multidetector row computed tomography

1. Introduction

According to the most relevant literature, a preoperative accurate diagnosis of arteriovenous fistula (AVF) associated with an aortoiliac aneurysm was possible in 0–50% of the cases [1], because typical symptoms are relatively uncommon (63%) [2]. Multidetector row computed tomography (MDCT) is a useful imaging modality to promptly detect the fistula [3].

We herein report the case of a patient with an AVF associated with an aortoiliac aneurysm that was diagnosed preoperatively by MDCT and which was successfully repaired.

An 82-year-old man complained of general fatigue and sweating on holiday. Two days later, he was referred to our institute because he presented a pulsatile abdominal mass, continuous bruit, thrill, high output heart failure, and bilateral leg edema without abdominal pain. Electrocardiography showed sinus tachycardia. Ultrasound cardiology showed mild tricuspid regurgitation. MDCT revealed a 3-cm long infrarenal abdominal aortic aneurysm as well as a 6-cm right and 4.5-cm left common iliac artery aneurysm (Fig. 1). Remarkable was the early appearance of contrast medium in the dilated inferior vena cava, indicating the presence of an AVF. Volume rendering by MDCT demonstrated that AVF was 2.5 cm long and located at the upper-posterior wall of the aneurysm sac. Bleeding from the AVF was controlled by digital compression. The fistula was closed directly using 4-0 prolene horizontal mattress stitches with Teflon felt. The abdominal aorta was replaced with an 18 × 10 mm bifurcated graft. The distal grafts were anastomosed to the right external iliac artery and the left common femoral artery due to the presence of bilateral arteriosclerosis obliterans. The right internal iliac artery was closed directly and the left one was obstructed spontaneously. The inferior mesenteric artery was reconstructed with the left leg of the graft.

At the emergency operation, the aneurysm was approached through midline laparotomy. The infrarenal abdominal aorta, bilateral external iliac arteries, and left common femoral artery were exposed and then the vessels were clamped following heparin administration. We found the AVF between the right common iliac artery and vein by opening the aneurysm pouch. The AVF was approximately 3 cm long and 1 cm wide, and located at the upper-posterior wall of the aneurysm sac. Bleeding from the AVF was controlled by digital compression. The fistula was closed directly using 4-0 prolene horizontal mattress stitches with Teflon felt. The abdominal aorta was replaced with an 18 × 10 mm bifurcated graft. The distal grafts were anastomosed to the right external iliac artery and the left common femoral artery due to the presence of bilateral arteriosclerosis obliterans. The right internal iliac artery was closed directly and the left one was obstructed spontaneously. The inferior mesenteric artery was reconstructed with the left leg of the graft.

The postoperative course was uneventful except for a systemic rash the patient developed as a reaction to antibiotics. The postoperative MDCT revealed a patent graft and no presence of AVF.

2. Comment

Ilio-iliac AVFs are very rare complications of aortoiliac aneurysms. Even aortocaval fistulas are found at surgery in 1% of abdominal aortic aneurysms and 4% of ruptured ones [4]. The classical clinical symptoms of AVF are: high output heart failure, abdominal pain, abdominal bruit and thrill, a pulsatile abdominal mass, and regional venous hypertension (leg edema, hematuria).
Surgical mortality of AVF is as high as 22–51% according to the literature [5] because of hemorrhagic shock, high output heart failure, renal failure and massive blood loss during the operation, while several reports of endoluminal repair for AVF have shown good early results [6]. However, this technique involves a number of problems. First, there is a risk of type II endoleaks from venous bleeding into the aneurysm sac. These may result in continued aneurysm expansion and need an additional procedure in the long term. Second, this technique cannot be used in every patient. For example, if the external iliac artery is affected by arteriosclerosis obliterans, this technique involves the risk of intraluminal obstruction. In our patient, we could not select an endoluminal repair because of the presence of arteriosclerosis obliterans.

Early diagnosis and surgical treatment are essential to reduce the surgical mortality of AVF. Preoperative diagnosis offers many advantages regarding surgical treatment. It is possible to reduce venous bleeding from the AVF by accurate digital compression or insertion of balloon catheters [7]. Moreover, a lot of blood and an autotransfusion system can be prepared and excessive manipulation of the aneurysm, which may cause a pulmonary embolism through AVF, can be avoided. However, in nearly half of the cases, diagnosis of AVF cannot be established before the operation, because the clinical presentation is variable and depends on the size and location of the fistula. Skinner et al. reported that the classical diagnostic signs mentioned above were present only in 20–50% of the cases [8]. If the AVF is not detected preoperatively, the risk of surgical mortality will be higher.

MDCT is a valuable imaging modality to obtain a precise and prompt diagnosis of AVF, especially when clinical symptoms are not typical [3]. Furthermore, different computerized reconstruction techniques by MDCT such as maximum intensity projection, volume rendering and virtual angioscopy provide accurate location and size of AVF easily. Recognition of that helps us to plan a surgical treatment of AVF, particularly control bleeding from the fistula. In the present case, though the size of AVF was quite large (3 cm), we could manage bleeding from the fistula by digital compression because of understanding the accurate location and size of AVF. If digital compression is difficult, for example AVF is bigger or located deeper in aneurysm sac, it should be considered to clamp inferior vena cava or to insert an occlusion balloon from femoral vein preoperatively [7].

We reported a case of surgical repair of an ilio-iliac arteriovenous fistula caused by a ruptured common iliac aneurysm. Prompt detection of the fistula by MDCT and early surgical repair were the key to improve the patient’s outcome.

References


