SHORT REPORT

Young Girl Presenting with Heart failure 5 Years after Laparoscopic Appendectomy. Case Report of an Ilio-iliac AV Fistula

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Appendectomy; Arteriovenous fistula; Heart failure; Late complication

Abstract

Introduction: Secondary arteriovenous (AV) fistulae following appendectomy are very rare.

Report: We report the case of a 15-year-old girl suffering from progressive heart failure and sub-acute abdominal pain caused by an ilio-iliac AV fistula 5 years after a complicated appendectomy. The vessel-wall defects were closed by open surgery and the aneurysmatic iliac vein was gathered.

Discussion: Open fistula repair should be recommended to healthy and/or young patients, especially when they are not fully-grown. Endovascular treatment should be the therapy of choice in high-risk patients or patients with local contraindications against open surgery.

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time after appendectomy. We report the case of a young girl suffering from an ilio-iliac AVF leading to progressive heart failure 5 years after complicated appendectomy.

Report

A 15-year-old girl was admitted to hospital because of progressive heart failure during the past months. Five years ago, a laparoscopic appendectomy was performed which had become complicated by an injury of the right common iliac vein. Bleeding occurred when the appendix was prepared and surrounding inflamed scar tissue was peeled away from the adjacent retroperitoneal tissue. The operation had to be converted to open surgery and the vein was sutured before the appendectomy was completed. At the
time of presentation, the heart rate was 92 beats min\(^{-1}\) at rest and the blood pressure was 115/75 mmHg. On bilateral comparison, the right thigh was slightly swollen. Clinical examination revealed a painful, pulsating and thrilling tumour in the lower right quadrant. All other physical examinations revealed a normal status for the patient’s age. Duplex imaging showed an aneurysm of the external and common iliac vein with a maximal diameter of 54 mm (Fig. 1). A B-mode scan showed an elliptic vessel-wall defect with dimensions of 10 mm and 7 mm (Fig. 2a and b). B-flow imaging revealed an AV flow between the common iliac artery and the common iliac vein (Fig. 2c). The shunt volume was measured by ultrasound volume-flow measurement using a GE Logiq 7 ultrasound system. The measured shunt volume of the AVF was 3.1 L/min.

After interdisciplinary discussion, the patient was prepared for surgery. The AVF was dissected, and the vessel-wall defects were closed by direct suture. The aneurysmatic iliac vein was gathered as far as possible by multiple running sutures. Complete normalisation of the venous diameter was simply not possible, due to massive adhesions of the scar tissue, and possible collateral damage would not have justified further dissection. Designated full anticoagulation was initially not justifiable because of diffuse bleeding from the wound bed at the end of the operation. During the postoperative period, the patient developed a partial thrombosis of the external iliac vein with a remaining lumen diameter of 12 mm. Therefore, anticoagulation had to be elevated stepwise to a full dosage. Except for a mild previously existing swelling of the right leg, there were no clinical signs of impaired venous backflow. Postoperatively, blood pressure remained regular and tachycardia resolved. Compression stockings and full oral anticoagulation were recommended for 6 months. The patient recovered quickly and was discharged from hospital on the 18th postoperative day. Six months following the operation, the patient is healthy without signs of heart failure or impaired venous backflow.

Discussion

In the present case, the AVF became symptomatic many years after the initial surgery. It may be possible that the fistula developed secondarily, due to abrasion of the pulsating vessel walls by suture material. In contrast, it is

Figure 1 Conventional angiography (a) and MR angiography (b) showing an AVF from the common iliac artery to the common iliac vein. The external and common iliac veins are aneurysmatic and venous drainage is also by dilated uterine veins and veins of the minor pelvis.

Figure 2 B-mode imaging (a/b) demonstrating a large hole of 10 mm and 7 mm in the adjoining vessels walls of the common iliac vessels. Intense arteriovenous blood flow is demonstrated by B-Flow imaging (c). CIA/V = common iliac artery/vein, AVF = arteriovenous fistula.
also likely that a small arterial injury was missed at the
time of initial surgery and eventually decompressed into
the iliac vein. With respect to the size of the defect, the
patient was well compensated, which may be due to her
age. Ultrasound revealed the vessel-wall defect rapidly. In
contrast to duplex ultrasound, B-flow imaging, which is not
based on the Doppler effect, was able to show the blood
flow from the common iliac artery into the iliac veins in
high quality (Fig. 2c) without blooming.

Endovascular coiling or the placement of covered stents
is the preferential treatment of AVF of the common iliac
region at present. However, this recommendation is based
on data acquired in adult patients. In children, stents and
alloplastic material should be used with caution. As far as
technically possible, any alloplastic material should be
omitted in patients who are not fully-grown. In this case,
diffuse bleeding from the wound bed prohibited full anti-
coagulation postoperatively. After interdisciplinary discus-
sion, we struck a balance between prophylaxis of
thrombosis and risk of postoperative bleeding by applying
low-molecular-weight heparin only in a prophylactic
dosage. Unfortunately, the patient developed a partial
thrombosis of the iliac vein, which could be treated
conservatively.

In conclusion, the oddity of this disease pattern is the
very late presentation of the symptoms even years after the
causing event. Therefore, one should always be aware of
the typical symptoms in context with the medical history to
acquire the diagnosis of this very rare type of AVF. Open
fistula repair should be recommended to healthy and/or
young patients, especially when they are not fully-grown.
Endovascular treatment should be the therapy of choice in
high-risk patients or patients with local contraindications
against open surgery.

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