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Pseudoaneurysm in the iliac fossa after renal transplantation—treatment with ultrasound-guided thrombin injection

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Abstract

We report the case of a 57-year-old female who developed a large pseudoaneurysm of the right circumflex iliac artery 15 months after renal transplantation. Minimal invasive treatment was successfully performed with ultrasound-guided thrombin injection using the B-flow mode.

Key words: Renal transplant—Pseudoaneurysm—Ultrasound-guided thrombin injection—B-flow

Complications following renal transplantation occur in about 10% of patients [1, 2]. Medical causes are acute tubular necrosis, acute and chronic rejection of the allograft, and cyclosporine nephrotoxicity [1]. Surgical complications include urologic problems (ureteral obstruction, hematoma, abscess, urinoma, lymphocele) and vascular problems (stenosis or thrombosis of the renal artery, arteriovenous fistula, thrombosis of the renal/iliac vein, and pseudoaneurysm) [2–4]. Pseudoaneurysms are typically at the anastomotic site or within the allograft [5, 6]. We report a patient presenting with a pseudoaneurysm of the right circumflex iliac artery 15 months after renal allotransplantation.

Case report

A 57-year-old female presented with a pulsatile mass in her right lower abdomen. Renal transplantation in the right iliac fossa had been performed 15 months earlier because of terminal renal failure following IgA nephropathy. No adverse occurrences were reported. Renal allograft function was not compromised.

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B-mode ultrasonography (US) showed a hypoechoic, centrally anechoic lesion next to the upper pole of the renal allograft (Fig. 1a). The maximum diameter was 4.9 cm. Color-coded Doppler sonography (CCDS) (Fig. 1b) and B-flow US (Fig. 1c) showed a pulsatile flow pattern in the central anechoic part of the lesion. Diagnosis was a partially thrombosed pseudoaneurysm. The origin of the pseudoaneurysm could not be demonstrated by means of US. Subsequent magnetic resonance angiography allowed us to locate the pseudoaneurysm in the peripheral part of the right circumflex iliac artery adjacent to the upper pole of the renal allograft (Fig. 1d).

Minimal invasive treatment by means of percutaneous ultrasound-guided thrombin injection (UGTI) was performed. After local disinfection a 21-G needle was advanced into the pseudoaneurysm under US guidance in B-flow mode. Injection of nearly 1 ml thrombin (Beriplast; 500 IE) was performed under US guidance after adequate placement of the needle close to the neck of the pseudoaneurysm. B-flow US showed within seconds the cessation of perfusion of the pseudoaneurysm, resulting in complete thrombosis (Fig. 2). No adverse reactions occurred. Complete cessation was also confirmed by CCDS. Follow-up sonography performed 1 day and 4 weeks later did not show recurrence of perfusion within the former pseudoaneurysm.

Discussion

Pseudoaneurysms represent one of the most frequent vascular complications with renal transplant. Nevertheless, the incidence of pseudoaneurysms after renal transplantation is lower than 1% [7]. Late vascular complications after renal transplantation are very rare; they usually result from infection or failure of the arterial anastomosis [8].

When located at the anastomotic site pseusoaneurysms are commonly due to suture rupture, anastomotic leakage, or vessel wall ischemia [9]. Within the allograft,

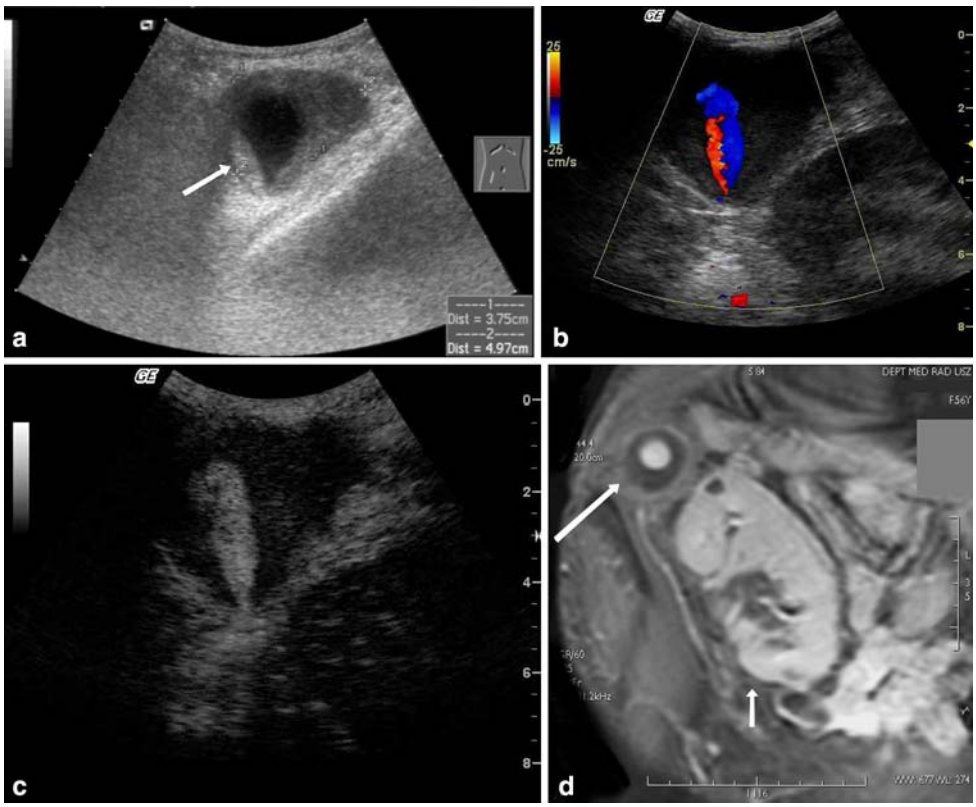

Fig. 1. Pseudoaneurysm in the iliac fossa. **a** B-mode ultrasonography. Mass lesion (*arrow*) with anechoic central portion adjacent to the renal transplant. (**b**) Color-coded Doppler sonography and (**c**) B-flow demonstrate perfusion within the pseudoaneurysm. (remark: Fig. 1a is result of the initial examination; Fig. 1b and 1c were taken immediately before treatment) **d** Magnetic resonance angiography showing both the renal allograft (*short arrow*) and the pseudoaneurysm (*long arrow*).

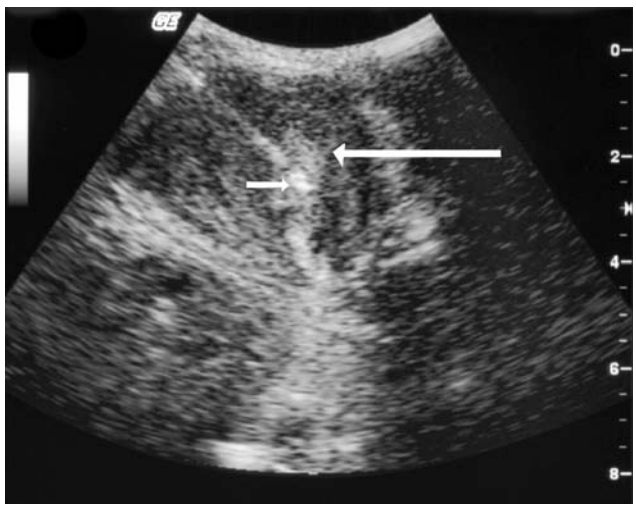

Fig. 2. B-flow ultrasonography. Percutaneous ultrasound-guided thrombin injection followed by immediate complete thrombosis (*long arrow*) of the pseudoaneurysm. The needle is still within the no longer perfused hyperechoic area (*short arrow*).

pseudoaneurysms occur mostly of arcuate arteries following needle biopsy or mycotic infection [9]. In our case one has to presume an intraoperative lesion of a peripheral branch of the arteria circumflexa iliaca profunda as the origin of the pseudoaneurysm.

UGTI as a treatment option for pseudoaneurysms has been reported to be an efficient and secure procedure [10]. There are few cases where surgical repair is necessary, mainly when the pseudoaneurysm is not accessible for percutaneous treatment or when the pseudoaneurysm is complicated by infection. UGTI is efficient even in the presence of anticoagulation with phenprocoumon or heparin.

Complications of thrombin injection are rare [11, 12]. When located in the proximal part of an extremity, arterial embolization distal to the pseudoaneurysm occurs in 0%–4% of cases [13, 14]. Other reported complications are anaphylaxis [15] and generalized urticaria [16] after using bovine thrombin and infection of the thrombosed pseudoaneurysm with formation of abscess [13].

B-flow, a markedly improved echo amplitude imaging technique with a high spatial resolution, has been described as a suitable diagnostic method with some advantages compared to CCDS in the treatment of femoral pseudoaneurysms, such as the absence of angle dependency, the absence of Doppler artifacts, and the absence of vessel wall overwriting [17]. For more than 2 years B-flow has been the imaging modality of choice at our department when performing UGTI.

In conclusion, even in an unusual location, UGTI seems to be a fast, safe, and reliable option for the treatment of a pseudoaneurysm if performed in the regular way. Clinical as well as US follow-up examination

confirmed successful therapeutic management in our patient.

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