Case Report

Endovascular Repair of Iliac Artery Pseudoaneurysm Complicating Renal Transplantation

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Abstract

Objective: Pseudoaneurysm of the arterial anastomosis is an uncommon complication following renal transplantation.

Material and method: A month after a cadaveric kidney transplant, a 44-year-old man had increased serum creatinine; routine Doppler ultrasound and computed tomography scans showed a pseudoaneurysm of the external iliac artery at the anastomosis to the recipient renal artery and thrombosis of the iliac artery (14 mm long) after the pseudoaneurysm.

Results: The patient was treated by two wallgraft endoprostheses at the level of the arterial anastomosis, sacrificing the transplant. The non-functioning organ was left in situ and the patient returned to regular haemodialysis.

Conclusion: Endovascular stent grafting is a valuable therapeutic option for extrarenal pseudoaneurysm after kidney transplantation.

ABBREVIATIONS

CDU: Colour Doppler Ultrasound (US)

INTRODUCTION

Late vascular complications of kidney transplant surgery are significant non-immunological causes of allograft loss, arising in 3-15% of patients [1]. Arterial/venous stenosis and/or thrombosis and arteriovenous fistulas secondary to renal biopsy account for their majority, whereas pseudoaneurysms are < 1% [2,3]. A defective suture technique [4] and local infection are the main causes of iliac artery pseudoaneurysms in such patients. Infection at the anastomotic site results in disruption of the anastomosis and pseudoaneurysm formation. Though mostly asymptomatic, these pseudoaneurysms can cause fever and anaemia [5], compression of adjacent structures [6], renal graft dysfunction and loss [2], and acute haemorrhage due to rupture [3-6].

CASE PRESENTATION

A 44-year-old man with end-stage renal disease secondary to polycystic kidney disorder had been receiving periodic haemodialysis for 8 years when he underwent cadaveric renal transplantation at our institution. The procedure was performed by an extra-peritoneal approach to the external iliac vessels. The donor renal artery was anastomosed end-to-side to the recipient external iliac artery using a Carrel patch and the renal vein was anastomosed end-to-side to the recipient external iliac vein. The ureteroneocystostomy was performed by the Lich-Gregoir technique using a double-J catheter. Immunosuppression was with methylprednisolone, tacrolimus, everolimus, and basiliximab. There were no signs of rejection and the postoperative course was uneventful. The patient was discharged with a serum creatinine level of 1.1 mg/dL. One month after transplantation he was readmitted for progressive renal failure. Infection was excluded by blood and urine cultures. A colour Doppler ultrasound (US) scan disclosed a round, 3 cm hypoechoic lesion with turbulent pulsatile flow arising from the external iliac artery at the level of the anastomosis. The pseudoaneurysm was confirmed by angiography, which also documented iliac artery thrombosis (14 mm long) after the pseudoaneurysm (Figure 2). Treatment was by two percutaneous wallgraft endoprostheses (Boston Scientific...
Corporation, Natick, MA) 10 mm in diameter and 50-70 mm in length that were deployed in the external iliac artery across the arterial anastomosis. Informed consent was obtained from the patient prior to the procedure. Vascular access was through the ipsilateral femoral artery under local anaesthesia and no sedation. Stent placement resulted in exclusion of the donor renal artery and graft loss (Figure 3). The endovascular treatment recanalized the iliac artery. The non-functioning transplant was left in situ. The patient received intravenous broad-spectrum antibiotics pre- and postoperatively. The patient returned to regular haemodialysis, and immunosuppression was gradually withdrawn. Follow-up was at 1, 6, and 12 months, and annually thereafter by clinical and duplex US examination. After 5 years the patient is stable and still on periodic haemodialysis.

DISCUSSION

Vascular complications after a kidney transplant are potentially life and limb-threatening. Pseudoaneurysms - intrarenal or extrarenal - are uncommon and involve different aetiologies and prognoses. Intrarenal pseudoaneurysms due to needle biopsy of the transplanted kidney arise in 5.6% of transplant patients and resolve spontaneously without specific treatment and merely need monitoring by US [7]. Extrarenal pseudoaneurysms may form at the anastomosis site as a complication of vessel reconstruction or due to infection [2-8]; albeit predominantly asymptomatic, the most common symptoms include progressive renal failure, signs of ischaemia in the ipsilateral lower limb, abdominal pain, prolonged fever, and/or anaemia [9-10]. In our patient the asymptomatic pseudoaneurysm was diagnosed on routine haematological and US follow-up and confirmed by angiography. US is a valuable imaging modality for pseudoaneurysms, which are depicted by colour Doppler as a chaotic, pulsatile flow pattern. Communication with the supplying artery is usually documented, as in our patient. Treatment is indicated in case of symptomatic pseudoaneurysms, aneurysm diameter > 2.5 cm, size increase at follow-up and infectious aetiologies [11], to prevent rupture and loss of graft function. The gold standard for the management of extrarenal pseudoaneurysms in presence of infection is immediate transplant nephrectomy and pseudoaneurysm resection [11]. Surgical treatment of pseudoaneurysms often leads to graft loss [12]. However, a graft salvage technique for intraoperative management of vascular complications has recently been described by Mekeel and co-workers [13]. The method involves rapid graft nephrectomy and preservation in cold University of Wisconsin solution, which allows for controlled and precise back-table repair of the vascular injury avoiding prolonged warm ischaemia. Endovascular stent grafting is an effective therapeutic option for extrarenal pseudoaneurysms after kidney transplantation. It is safe and easy to perform and is associated with good early and long-term outcomes [6]. However, the landing zone is often insufficient for a covered stent, since the pseudoaneurysm commonly arises at the level of the anastomosis. Stent placement to exclude the pseudoaneurysm can result in exclusion of the donor renal artery and graft loss [12] as in our patient. A technique using covered kissing stents to repair complex anastomotic pseudoaneurysms and ensuring flow preservation in the transplanted organ has recently been
described [14]. Coil embolization and US–guided thrombin injection can be used to treat aneurysms at anatomically suitable sites [15]. Endoluminal treatment avoids many of the complications associated with open repair and general anesthesia. In line with other authors [14,15], we feel that endovascular placement of a wallgraft endoprosthesis is an effective method to treat extrarenal pseudoaneurysms after kidney transplantation. It is a safe and easy procedure with good early and long-term results, especially in patients where open surgery involves high risks and when nephrectomy is not required. Prospective studies are needed for a thorough evaluation of this treatment option.

REFERENCES


