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Case Report

Ipsilateral leg swelling after renal transplantation as an alarming sign of Iliac vein stenosis



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ABSTRACT

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Iliac vein stenosis is a rare vascular complication of renal transplantation that may compromise allograft function if not recognized and corrected in a timely fashion. Because chronic venous stenosis may remain undiagnosed for several years, a high index of suspicion should be maintained until diagnosing this rare disease. A 56-year-old renal transplant recipient presented with unilateral leg swelling and renal dysfunction 16 years after transplantation. Computed tomography excluded deep vein thrombosis and revealed tight iliac vein stenosis on the side of the renal transplant. Following angiographic confirmation of the stenosis, endovascular treatment was successfully performed with a purposefully designed, self-expanding, venous stent. Ipsilateral leg swelling is an alarming sign for the diagnosis of iliac vein stenosis after renal transplantation. Percutaneous intervention with venous stent placement seems to be a safe and effective treatment of this rare condition.

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Introduction

Vascular complications after renal transplantation occur frequently and can lead to the deterioration of renal function, graft loss, and even death [1]. Iliac vein stenosis is a rare complication after renal transplantation, with only a few cases reported to date [2–4]. Here, we describe a case of iliac vein stenosis that developed 16 years after transplantation in a 56-year-old renal transplant recipient. Written informed consent was obtained from the study participant for publication of this case report and any accompanying images.

Case report

A 56-year-old male with a 16-year history of renal transplantation was admitted for a painless right lower limb edema

that had developed 1 month earlier. The leg swelling waxed and waned over the course of each day without continuous leg pain, chest discomfort, or dyspnea.

The clinical workup revealed pitting edema and a loss of arterial pulsation in the right leg without discoloration or focal tenderness. Laboratory examinations showed normal prothrombin time and activated partial thromboplastin time, with a d-dimer concentration of 0.52 µg/mL fibrinogen-equivalent units (FEU; reference concentration < 0.5 µg/mL FEU). His serum creatinine concentration was measured at 1.34 mg/dL, and his estimated glomerular filtration rate (GFR) according to the Modification of Diet in Renal Disease (MDRD) formula was 55 mL/min/1.73 m², which were slightly changed from his baseline serum creatinine concentration (1.1 mg/dL) and estimated GFR (69 mL/min/1.73 m²).

Radionuclide venography demonstrated a delay in upward drainage at the level of the right common iliac vein, and collateral flow into the left iliac vein. Computed tomography (CT) angiography revealed severe stenosis in the right common iliac vein, with kinking at the bifurcation of the right common iliac artery. Venous flow from the transplanted renal

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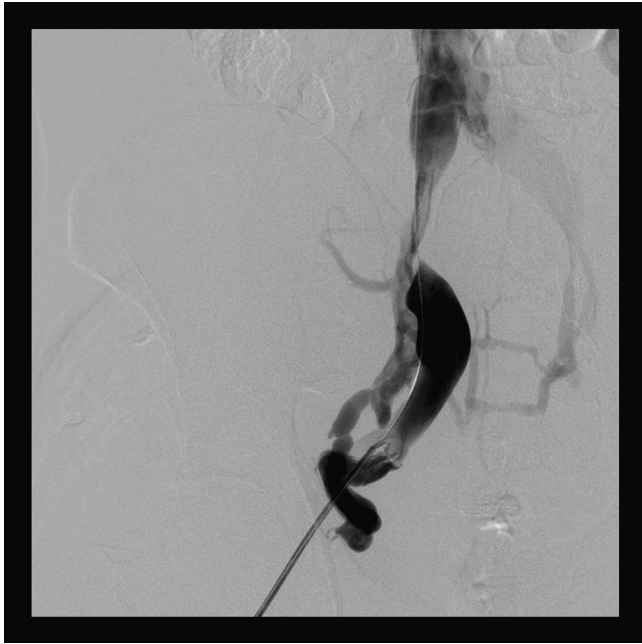


Figure 1. Preangioplasty venography demonstrating high-grade stenosis in the right common iliac vein and collateral flow into the left iliac vein.

vein drained through the right external iliac vein, subsequently collecting in the regional collateral and left iliac veins. Neither extrinsic compression due to perivascular fibrosis nor peritransplant fluid collection, such as hematoma and lymphocele, was detected. CT also excluded thrombosis in the deep venous system and renal transplant vein.

Pelvic venography after puncture of the right groin with 7F sheaths confirmed near-complete occlusion of the right common iliac vein and collateral venous flow (Fig. 1). Thrombolysis or thrombectomy was not necessary because there were no apparent intraluminal clots. A self-expanding 14 mm × 6 cm Zilver Vena stent (Cook Medical, Bloomington, IN, USA) was deployed without using angioplasty balloons, across the area of stenosis. Follow-up venograms demonstrated a brisk flow through the right common iliac vein without collateral filling and a patent renal transplant vein (Fig. 2).

The right lower limb edema rapidly resolved after the intervention, and the patient's serum creatinine concentration stabilized at 0.91 mg/dL 3 days after venous stenting. The patient was free of procedure-related complications and was discharged in a stable condition with only aspirin therapy. After 6 months of follow-up, the patient remained asymptomatic with a functioning graft and the absence of lower limb edema.

According to the patient's medical records, he had received a living related donor kidney transplant 16 years previously for end-stage renal disease secondary to hypertensive nephropathy. Prior to transplantation, the patient had undergone hemodialysis for 14 years via a left-arm arteriovenous fistula, with no prior insertion of femoral dialysis catheters. The transplant kidney had two arteries and two veins, which were terminolaterally anastomosed onto the corresponding right external iliac vasculature. His postoperative course was uneventful, with neither surgical complications nor graft dysfunction requiring dialysis. The patient was discharged with a well-functioning graft and a serum creatinine concentration of 1.1 mg/dL.

Five years after renal transplantation, the patient was admitted to hospital because of an abrupt onset of graft

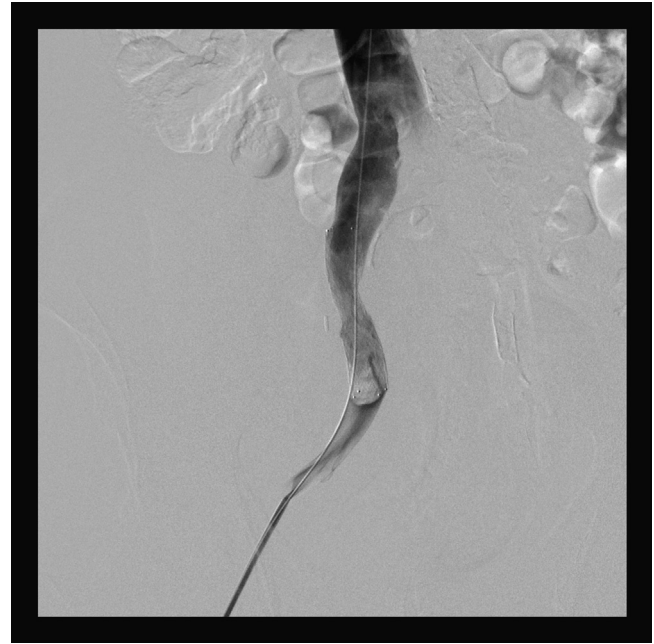


Figure 2. Follow-up venography demonstrating restoration of patent flow into the iliac vein and the absence of collateral venous flow after the successful deployment of a Zilver Vena stent into the distal common iliac vein.

tenderness, decreased urine output, and elevated level of serum creatinine (5.1 mg/dL). Prerenal causes of acute kidney injury were less likely because the fractional excretion of filtered sodium was 1.2%. A Doppler ultrasonography (US) examination of the graft showed that echogenicity and flow in the renal vasculature were within normal limits, with a resistive index of 0.74. US also revealed no signs of abnormal fluid collection or hydronephrosis. When evaluating the renal biopsy to differentiate causes of graft dysfunction, azotemia was rapidly resolved without specific treatment. His serum creatinine concentration was measured as 2.4 mg/dL 2 days after admission and as 1.4 mg/dL at the time of discharge. The exact cause of graft dysfunction remained unknown, but no further diagnostic evaluation was attempted owing to obvious clinical improvement. This episode of acute kidney injury may have been due to chronic venous stenosis and transient thrombosis in the right common iliac vein, although lower extremity edema was not apparent. His serum creatinine level returned to baseline (1.1 mg/dL) 2 weeks after discharge, and remained around the baseline concentration until the development of iliac vein stenosis.

Discussion

Once considered a rare complication of renal transplantation, iliac vein stenosis has been consistently reported since 1972 [5] and shown to be related to May–Thurner syndrome in left-side transplant recipients [6,7]. The risk factors for development of iliac vein stenosis include the prior insertion of femoral dialysis catheters, postoperative fluid collection [8], hematoma [3], urinoma, and lymphocele [9]. Renal transplant vein stenosis has also coincided with acute graft rejection [10], local infection [11], kinking of the renal vein [9], and external pressure/compression by the crossing iliac artery [12]. None of these postoperative complications was observed in our

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