**Caliceal fistula in kidney transplantation**

**The role of magnetic resonance imaging**

**Abstract** Caliceal fistula is a rare complication of renal transplantation, which often raises some diagnostic problems. We report the case of a patient in which this complication occurred and in whom the diagnosis could be clearly demonstrated by using magnetic resonance imaging (MRI). On the T1-weighted images, a perirenal collection was depicted by a low signal intensity. On T2-weighted images, the collection appeared with a high signal intensity, and a linear hyperintensity was observed on the internal graft’s labium at the level of the inferior pole corresponding to a caliceal fistula arising from the lower pole of the graft. In this setting, the use of MRI is compared with the other diagnostic techniques (sonography, CT scan, nephrogram, scintigraphy). MRI constitutes a progress in imaging of the renal graft by its high definition and the lack of nephrotoxicity. Its place remains, however, to be more precisely defined in the evaluation of a renal graft’s complications.

**Keywords** Kidney transplantation · Magnetic resonance imaging · Caliceal fistula · Urologic complications

**Introduction**

Caliceal fistula is a rare complication of renal transplantation that can lead to graft dysfunction or loss. We report the case of a patient who developed, on postoperative day 15, a caliceal fistula of ischemic origin. The diagnosis was established by magnetic resonance imaging (MRI). The use of this diagnostic technique in this setting constitutes to our knowledge the first case described in the literature. By reviewing the literature, the utility of MRI in determining the origin of some renal graft complications is discussed.

**Case report**

A 49-year-old man with end-stage renal failure secondary to glomerulosclerosis was transplanted with a cadaveric right kidney. The renal graft had two arteries on an aortic patch. During the bench exploration of the graft, a collateral providing the irrigation of the lower pole of the kidney was found to have been transected. Reconstruction was performed with interrupted surgilene 7/0 stitches.

In the recipient, the graft was placed in the right iliac fossa using the external iliac vessels. Ureterovesical anastomosis was done by an extravesical ureteroneocystostomy. Ischemia lasted 36 h 43 min. HLA-A, -B, and -DR mismatch was, respectively, 2, 1, 1. Postoperative immunosuppression consisted of triple therapy...
comprising Mycophenolate mofetil, Tacrolimus, and steroids. Low molecular weight heparin was administered for 1 week to prevent thrombosis of the vascular reconstruction. Graft function was delayed, and two sessions of hemodialysis were required.

On postoperative day 2, the wound started to ooze and there was a slight scrotal edema but no leak, and no collection could be demonstrated either by sonography or by dimercaptosuccinic acid (DMSA) scintigraphy. Urea and creatinine levels in the oozing fluid did not correspond to serum levels. Nevertheless, a bladder catheter, which had been removed on day 2, was replaced due to bladder retention and left in place from the 3rd to the 9th postoperative day. Concomitantly, oozing stopped spontaneously.

The patient was discharged on the 13th postoperative day with a creatinine level of 2.6 mg/dl. Two days later, he was readmitted with oliguria and abdominal pain; the creatinine had increased to 7.8 mg/dl. Sonography showed a collection at the lower pole of the graft, with hydronephrosis of the renal pelvis; a bladder catheter was inserted. Cystography revealed no abnormalities.

A MR examination was performed. A gradient-echo, T1-weighted sequence with an acquisition time of 5.45 min and a HASTE T2-weighted, on breath hold with a acquisition time of 45 s, were realised on the axial plane.

MR urographic and angiographic sequences, the last performed with three-dimensional (3D) dynamic acquisition after intravenous injection of a double dose of paramagnetic contrast medium (gadolinium 0.2 mmol/kg), useful to depict the integrity of the urinary tract and the vascular anastomosis and to evaluate the graft’s function, were not obtained due to a strong sensation of claustrophobia presented by the patient and leading to a precocious interruption of the examination. On the acquired images, a perirenal collection more developed around the inferior pole of the renal graft was depicted. The collection presented a low signal intensity on the T1-weighted images and a high signal intensity on the T2-weighted images, confirming its water component (Figs. 1, 2).

On the T2-weighted images, a linear hyperintensity was observed on the internal graft’s labium at the level of the inferior pole. This image was considered as an urinary fistula due to a necrosis of the lower pole of the kidney involving the inferior calyx.

The perirenal collection was thus interpreted as an urinoma. Further confirmation by urographic and angiographic acquisitions could not be obtained due to the patient’s claustrophobia.

A percutaneous nephrostomy catheter was placed under ultrasound guidance. The nephrostogram confirmed the urinary leak emerging from the calyx located in the infarcted lower pole of the kidney (Fig. 3). An abdominal CT was also performed and showed after injection of contrast material through the nephrostomy catheter, a leak of contrast material within the collection around the graft through an opening at the level of the lower pole of the kidney.

The bladder catheter was removed 1 day after the placement of the nephrostomy catheter. A control nephrostogram, done 21 days after the insertion of the nephrostomy catheter, showed the complete healing of the urinary leak. The catheter was removed 2 days later.

The patient was discharged from the hospital 27 days after his admission with a daily diuresis of about 3 l and a serum creatinine level of 1.7 mg/dl.