Case Study of the Month

Renal Autotransplantation Combined with Direct Pyelocystostomy for a Doubled Renal Artery Aneurysm of a Stone Forming Kidney

Guido Fechner*, Stefan Hauser, Stefan C. Müller

Department of Urology, University of Bonn, Germany

Abstract

A 35-yr-old female patient presented with recurrent left-sided calcium oxalate nephrolithiasis in combination with equilateral doubled renal artery aneurysm. Approximately two-thirds of the cumulative renal function were scintigraphically calculated in favour of the affected kidney. After a left-sided nephrectomy, “workbench surgery” with resection of both aneurysms was performed. The renal artery was reconstructed with contralateral internal-iliac artery graft. To allow passage of renal calculi, the kidney was transplanted in the right iliac fossa combined with a wide pyelocystostomy. The patient recovered uneventfully and presented with good physical health and regular serum creatinine 1 yr postoperatively.

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1. Case report

A 35-yr-old female patient presented with recurrent left-sided calcium oxalate nephrolithiasis and a history of frequent extracorporal shock wave lithotripsies. Ultrasound examination accidentally showed an equilateral renal artery malformation. These findings were confirmed by magnetic resonance imaging (MRI), which revealed a doubled renal artery aneurysm (1.5 cm in largest diameter) in the left kidney located at the branching of segmental arteries (Fig. 1). According to a Technetium-99m dimercaptosuccinic acid (DMSA) scintigraphy, the left kidney adduced 69% of the overall kidney function, so left-sided nephrectomy was out of the question. Abdominal x-ray showed multiple left-sided small residual renal calculi. Transarterial delivery of coils was declined by radiologists because the aneurysm was located centrally in the branching region of segmental arteries. Therefore,
an open operative approach was decided. After a median laparotomy a left-sided nephrectomy was performed. Cold perfusion with the “University of Wisconsin” (UW) solution of the renal artery was started and both centrally located aneurysms were resected (Figs. 2 and 3). To cover the vascular defect, the right-sided internal iliac artery was harvested as a free graft after proximal and distal ligation. The graft was sewn on the residual renal artery figuratively as “workbench surgery” to reconstruct all branching segmental arteries (Fig. 4). Then

![Fig. 1 – Magnetic resonance arteriography: Left-sided doubled renal artery aneurysm (1.5 cm in largest diameter) located at the branching of segmental arteries.](image1)

![Fig. 2 – Intraoperative aspect of renal artery aneurysms in situ.](image2)

![Fig. 3 – Resection of the larger aneurysm, “workbench” preparation, probe located in the renal artery.](image3)

![Fig. 4 – (a) Reconstruction with autologous internal iliac artery (fixed by forceps, above); (b) aspect of completed sutures.](image4)
autotransplantation was performed with vascular anastomosis of the renal vessels to the right-sided external iliac vein and artery. To allow the passage of residual renal calculi, the complete ureter was resected in favour of a direct, wide opened pyelocystostomy. The postoperative course was uneventful; therefore, the patient was dismissed on the 10th postoperative day with sufficient perfusion of the renal autograft and a serum creatinine of 0.54 mg/dl. In January 2008 the patient presented in good physical health with recurrent painless stone passages. Serum creatinine was 0.6 mg/dl.

2. Discussion

Kidney autotransplantation is recommended by several authors as alternative to intraarterial stenting in renal artery malformations [1,2]. It is also advocated as a last resource in cases of severe ureteral trauma or extensive ureteral stenosis [3,4]. To our knowledge we report on the first case of autotransplantation for nephrolithiasis in untypical combination with a doubled renal artery aneurysm repair. It remains unclear whether the doubled aneurysm is caused by former shockwave therapy as suggested by Lang et al [5]. Moreover, predisposing factors for vascular malformations are absent in this young patient. Fortunately, the absence of arteriosclerosis allowed us to harvest an autologous vascular graft for aneurysm repair, namely, the right-sided internal iliac artery. This technique has not been described previously. Most notably, successful kidney autotransplantation demands a well-trained urologist with skills in vascular surgery.

Conflicts of interest: The authors have nothing to disclose.

EU-ACME question

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Question:

All the following statements regarding kidney autotransplantation are true, except:

A. A renal scintigraphy is advisable before operative procedure.
B. In kidney autotransplantation a median laparotomy is reasonable.
C. Kidney autotransplantation is not indicated in patients with nephrolithiasis.
D. In renal vascular malformations a magnetic resonance angiography is reliable.

References