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LAPAROSCOPIC PARTIAL NEPHRECTOMY IN ALLOGRAFT KIDNEY FOLLOWED BY INTRARENAL URINARY TRACT RECONSTRUCTION AND URETERAL REIMPLANTATION (CLINICAL REPORT)

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This paper presents a clinical case of laparoscopic nephrectomy for a large (10 cm) renal sinus mass in an allograft kidney, followed by intrarenal urinary tract reconstruction with ureteral reimplantation. The surgery had an acceptable oncological outcome, without loss of kidney function. Regardless of the volume and extent of the tumor process, the use of minimally invasive, nephron-sparing treatment techniques takes a leading position in the treatment of renal cancer in kidney recipients. Intrarenal urinary tract reconstruction allows a kidney to be saved even if the tumor is significantly large and/or inoperable.

Keywords: kidney graft masses, transplant, partial nephrectomy.

INTRODUCTION

To date, no objective statistical data on the detection rate of kidney graft cancer (KGC) are reflected in the national and world literature, due to the rare disease incidence. However, a detailed review of one of the largest meta-analyses by Griffith J.J. et al. devoted to solid renal masses in transplant allograft kidneys reflects the incidence of renal cell carcinoma (RCC) in transplant patients, which is from 0.19 to 0.5%. Compared with the non-transplant population (0.017%), this figure is already a 10-fold increase [1–3].

At the moment, the range of methods used for the treatment of renal masses in a kidney graft is similar to the approaches in the treatment of renal parenchymal cancer. The frequency of local recurrence after surgical treatment of a kidney graft is the same as in the population of patients without transplantation. The morphological profile of renal parenchymal cancer in a kidney graft is quite diverse and includes clear cell RCC (45.7%), papillary RCC (42.1%), chromophobe RCC (3%), and other forms of renal cancer (9.1%) [1–3].

Tumors were managed by partial nephrectomy (67.5%), radical nephrectomy (19.4%), percutaneous radiofrequency ablation (10.4%), and percutaneous cryoablation (2.4%). Due to the rarity of this disease, mainly open-access kidney graft resections have been described in the literature; only in 2020 was transperitoneal laparoscopic partial nephrectomy described [4] for a 28×24-mm renal mass in an allograft kidney. Also, literature features single cases of robot-assisted transperitoneal laparoscopic partial nephrectomy for masses in an allograft are described. However, there is no clear standard in the technique of surgical assistance and the type of graft ischemia [5, 6].

Thus, there are currently no clear clinical guidelines for the treatment of renal masses in transplanted allograft kidneys. The clinical cases described are scattered.

It is worth noting the functional and oncological outcomes of organ-preserving operations performed. Of the 80.3% of patients who underwent nephron-sparing interventions, 7.6% returned to dialysis, 6.1% developed tumor recurrence within 2.85 years, 3.6% developed local recurrence over a mean follow-up of 3.12 years [1–3].

This paper presents a clinical case of a renal sinus tumor in an allograft kidney for which laparoscopic partial nephrectomy and subsequent intrarenal urinary tract reconstruction were performed.

An ultrasound examination of the patient (female, 33 years old) revealed a renal tumor of the allograft kidney, which was confirmed by MRI (Fig. 1); the size of the mass was 10.3 × 8.3 cm, without distinct instrumental evidence of distant focal pathology.

The patient's medical history shows that organ transplantation was performed 4 years before the tumor was detected. After transplantation, the patient received immunosuppressive therapy with calcineurin inhibitors, mycophenolate and corticosteroids.

MATERIALS AND METHODS

Laparoscopic nephrectomy with intrarenal urinary tract reconstruction and ureteral reimplantation was performed.

Kidney graft mobilization was the first stage. The second stage was isolation of the right external iliac artery (EIA) (Fig. 2, a), taken on a holder; after mobilization of the mass, the mass resection boundaries were deter-

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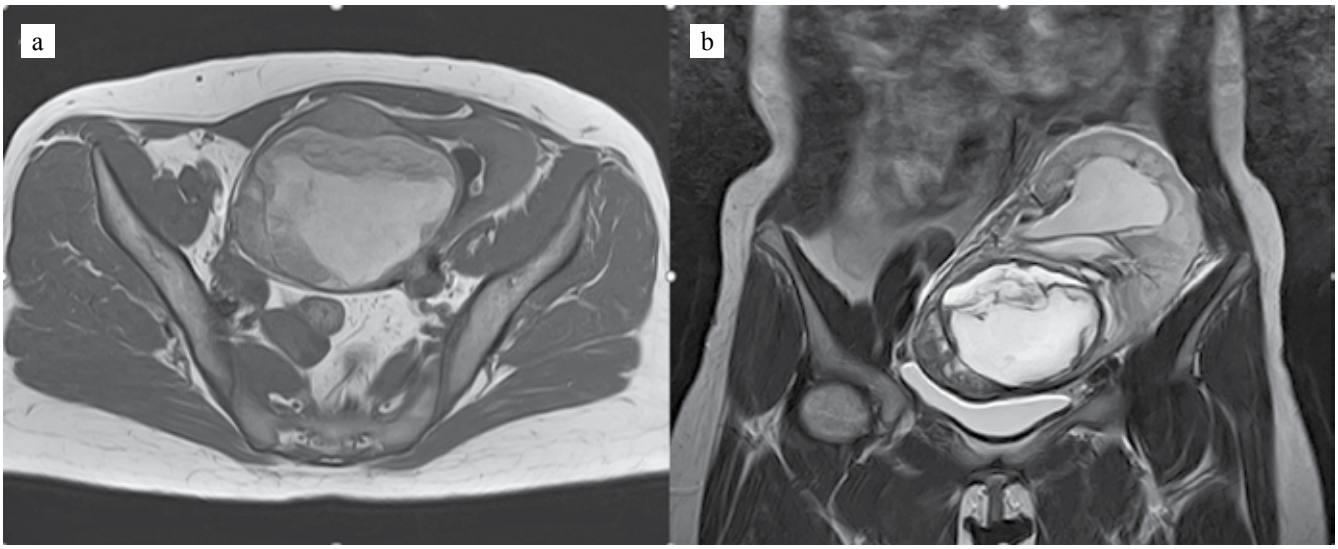

Fig. 1. MRI of an allograft kidney with renal sinus tumor: a, axial image; b, frontal image

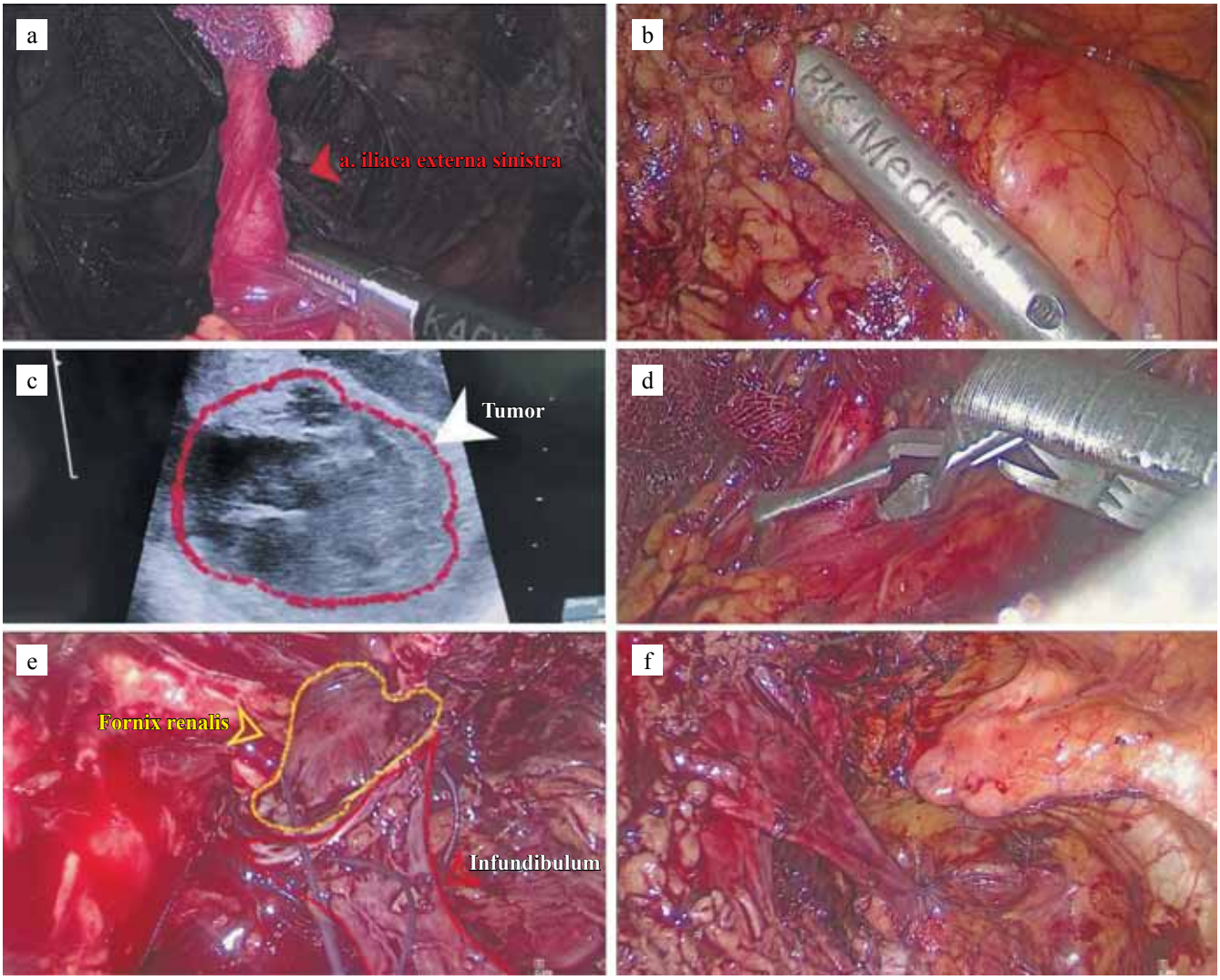

Fig. 2. Stages of laparoscopic partial nephrectomy for allograft tumor and urinary tract reconstruction. a, dedicated right external iliac artery (*a. iliaca externa sinistra*); b, performing intraoperative ultrasound examination; c, defining the tumor borders; d, clamping the external iliac artery; e, suturing the small calyx to the renal papilla with separate nodal sutures; f, view of ureterocystoneoanastomosis

Fig. 3. CT excretory urography on day 2 after surgery

mined (Fig. 2, c) using an ultrasound endoscopic probe (Fig. 2, b); after clamping the EIA (Fig. 2, d), tumor enucleation was performed, while noting the linear calyx defects and complete calyx resection; the renal papilla was separately visualized, the ureter was cut off from the bladder. The small calyx was sutured to the renal papilla with separate nodal sutures (Fig. 2, e), and the linear calyx defects were sutured.

After hemostasis control, additional sutures were used to restore the anatomical shape of the renal graft. The clamp was removed from the EIA, there were no signs of bleeding. Ischemia time was 40 minutes. After that, ureterocystoneoanastomosis was performed (Fig. 2, f). The operation was completed by draining the pelvis and abdominal cavity with drains. The operation time was 380 min.

RESULTS

The postoperative period was uneventful. CT excretory urography on day 2 after the operation (Fig. 3); there was no evidence of urinary leakage.

The drains were removed on day 5 after surgery. Creatinine levels before surgery and on the day of discharge were 174 μmol/l and 130 μmol/l, respectively. The patient was discharged home after 10 days of hospitalization. During the 12-month follow-up, no distant focal pathology was detected during a comprehensive follow-up examination; no progression of renal failure was noted as well.

CONCLUSION

Although laparoscopic nephrectomy, particularly in transplanted kidneys, appears to be less popular than robot-assisted surgeries for kidney cancer, it is a cost-effective method that can be safely performed in experienced hands, even in extremely difficult cases. Intrarenal urinary tract reconstruction allows to save a kidney even if the tumor is significantly large and/or inoperable. In addition, it can also be performed in kidney transplant recipients.

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The authors declare no conflict of interest.

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