UIJ UroToday International Journal®

Nephron-Sparing Surgery in Renal-Cell Carcinoma in a Second Allografted Kidney: A Rare Case Report

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Submitted October 4, 2013 - Accepted for Publication December 1, 2013

ABSTRACT

Renal cell carcinoma in a renal allograft kidney is a rare entity. We report a case of localized renal-cell carcinoma in a second allograft kidney, which we have managed successfully by nephron sparing surgery. The histopathology was clear-cell carcinoma with negative margins.

INTRODUCTION

Renal transplant recipients are at an increased risk of malignancy compared to the general population. This is thought to be due to the immunosuppressive therapy used in these patients. Renal-cell carcinoma (RCC) accounts for 4.6% of post-transplant malignancies, 10% of which occur in the allograft kidney [1,2]. Less than 45 cases are reported in the literature. There is no definite treatment consensus for the management of RCC in the renal allograft [3]. Nephron-sparing surgery, whenever feasible, should be attempted to preserve function in the allograft kidney. We report a case of renal-cell carcinoma in a second allograft kidney that was treated by partial nephrectomy.

CASE REPORT

A 48-year-old male patient presented with dull aching pain in the left lower abdomen over a 2-month duration. He had been hypertensive for 25 years and diabetic for 15. There were no other urinary complaints. Twenty years previously, he underwent live-related kidney transplantation for end-stage kidney disease (ESRD) secondary to interstitial nephritis. In the early postoperative period, allograft nephrectomy was done for renal artery thrombosis. Two months later he underwent a second live-related renal transplant, which was placed in left iliac fossa. At presentation he had a urine output of 1.5-2 liters/day. His serum creatinine was 2 mg% with an estimated glomerular filtration rate (GFR) of 35.1 mL/min. The reason for impaired allograft function could be due to chronic graft rejection.

On examination, an ill-defined, non-tender mass was palpable in the left iliac fossa. A plain computed tomography (CT) scan of the abdomen and pelvis revealed a well-defined heterogenous mass of 6 cm x 7 cm arising predominantly from the anterior cortex of the upper pole of the allografted kidney. Gadolinium-enhanced magnetic resonance imaging (MRI) showed a heterogeneously enhancing exophytic mass arising from the upper pole of the transplanted kidney. The patient was on single-drug immunosuppression (prednisolone, 40 mg once daily) before the diagnosis of the renal tumor. The same immunosuppression was continued after the diagnosis. With a diagnosis of a renal tumor in a transplanted kidney, nephron-sparing surgery was planned.

Intraoperatively, a 6 cm x 7 cm exophytic mass confined to the upper pole of the transplanted kidney was identified. Upper polar partial nephrectomy was done with a 0.5 cm margin without clamping renal vessels. Haemostasis was achieved by suture ligation of the bleeding vessels, and the opened calyceal system was repaired with an absorbable suture. Intraoperative frozen sections of the resected margins were tumor free. The operative time was 120 minutes, with blood loss of 150 mL. Histopathology of the tumor revealed clear-cell renal

KEYWORDS: Renal-cell carcinoma, nephron-sparing, allografted kidney

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CITATION: *UroToday Int J*. 2013 December;6(6):art 71. http://dx.doi.org/10.3834/uij.1944-5784.2013.12.06

Figure 1. MRI of the axial plane.

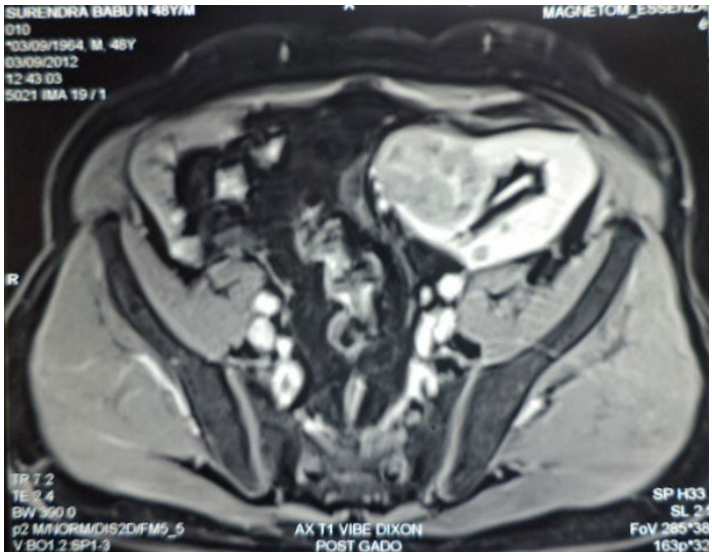


Figure 2. MRI of the saggital plane.

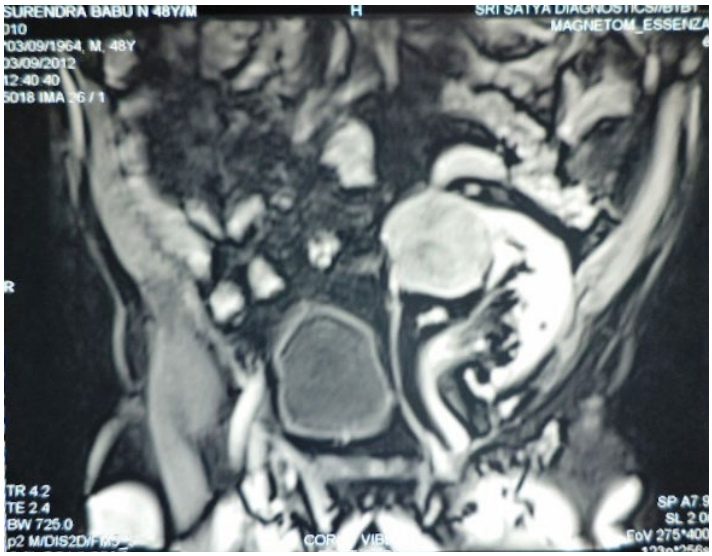


Figure 3. Perioperative photograph.

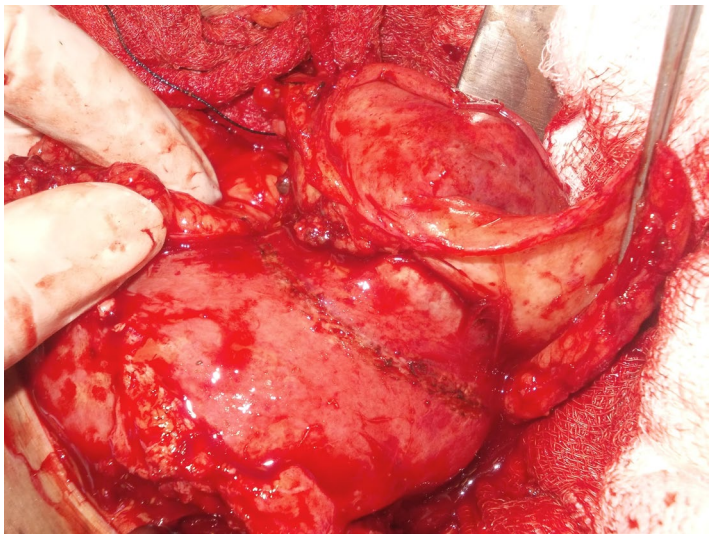
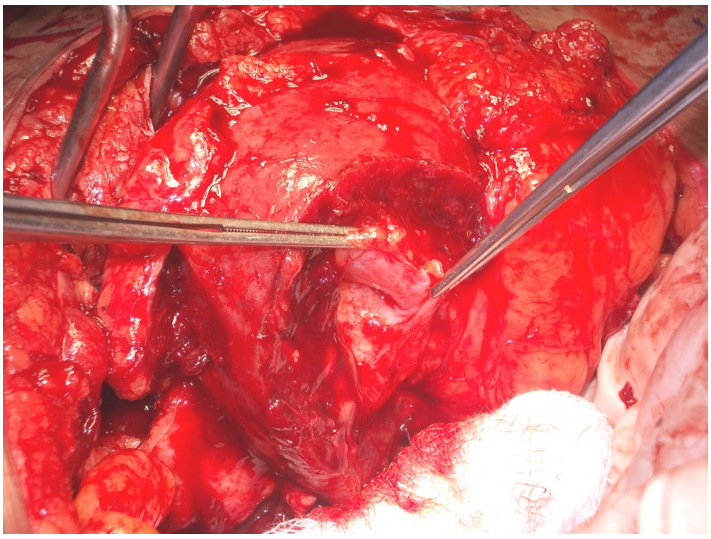


Figure 4. Perioperative photograph.



carcinoma PT1, Fuhrman grade II. The postoperative period was uneventful. Postoperative serum creatinine was 2.2 mg/dl, with a GFR of 31.9 mL/min.

In follow-up, his serum creatinine gradually increased to 4.8 mg% at 6 months. He was started on maintenance hemodialysis at 6 months. Ultrasound done at the 1-year follow-up showed no evidence of tumor recurrence in the allografted kidney and native kidney.

DISCUSSION

Renal transplantation requires prolonged immunosuppression, which increases the risk of infection and malignancies in transplant recipients. Renal-cell carcinomas in transplant recipients occur predominantly in native kidneys. Allografted

tumors are less common and can develop de novo or as consequences of transmission of occult malignancy from the donor [1-5].

Michael Leveridge et al. reported 8 cases of (0.2%) renal-cell carcinoma (RCC) in the allografted kidney in a total of 3,568 patients who underwent renal transplants between 1966 and 2009 [6]. Barama et al. reported 5 cases of RCC in renal allografts [7]. All tumors were less than 4 cm and were found incidentally on routine ultrasound. Chambade et al. reported 7 allograft cancers in their database of 2,050 recipients (0.34%) [8]. Our patient developed renal-cell carcinoma after the second renal transplant and, to our knowledge, renal-cell carcinoma in the second allograft is not reported in the literature.

A majority of the reported allografted kidney tumors are incidentally detected on routine ultrasound screening [7]. However, our patient presented with lower abdominal pain, which led to further investigation. In the literature, the time of diagnosis posttransplant varied from 4 to 20 yrs [6-8].

Regular screening of allografted and native kidneys by ultrasound will enable the diagnosis of renal tumors at an early stage. Graft evaluation by CT and/or MRI is necessary to confirm the tumor diagnosis and extent, and to evaluate the feasibility of nephron-sparing surgery [9].

As the role of partial nephrectomy in renal-cell carcinoma is established, the same indications can be applied for the management of tumors in allografted kidneys where it is essential to preserve graft function and thereby prevent/delay dialysis. Partial nephrectomy can be done without clamping the renal pedicle, as managed in our case. Barama et al. performed partial nephrectomy in 5 patients without clamping renal vessels [7]. Alternatives to partial nephrectomy are radiofrequency ablation and cryoablation [8].

The histopathology in our patient revealed clear-cell carcinoma. In the Michael Leveridge et al. and Chambade et al. series, the commonest histology was papillary renal-cell carcinoma [6-8]. In view of the small numbers published in the literature, it is difficult to comment on the predominant histology in this group of patients.

The immunosuppression protocols for transplant recipients found to have malignancy is controversial. mTOR inhibitors, which are used as targeted therapy in renal-cell carcinoma, are also used for immunosuppression in transplant recipients. The mTOR inhibitor rapamycin is an approved immunosuppressor in transplant patients. Unlike calcineurin inhibitors, rapamycin does not increase the risk of malignancy [8].

CONCLUSION

Nephron-sparing surgery is a safe and feasible option for renal-cell carcinoma in allografted kidneys. This will delay and/or prevent hemodialysis requirements in this group of patients. Regular follow-up by annual ultrasound is required to detect recurrence in the allografted kidney.

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