Images — pT3a clear-cell renal cell carcinoma in a renal allograft managed effectively with open partial nephrectomy

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Introduction

Primary renal cell carcinoma (RCC) post-kidney transplantation can occur in either the native kidney(s) or renal allograft, although their occurrence is significantly rarer in the latter. Immunosuppressive therapy is known to increase the incidence of various malignancies in patients on these regimens due to their effects on the immune system and their role in anti-cancer immune surveillance.[1] Neoplasms can develop as the result of accidental transplantation from donor with undetected primary cancer, recurrence or undiagnosed metastases, or de novo.[2] As well, these tumors tend to be more aggressive, confer a poor prognosis, and are associated with a higher rate of recurrence than the same tumors in the general population.[3]

We present a case of a large pT3a clear-cell RCC found incidentally in a renal allograft.

Case report

A 49-year-old male is referred for further evaluation of an incidentally noted solid renal mass of the left iliac fossa renal allograft found on routine ultrasound in June of 2017. The patient denied any flank, abdominal, or pelvic pain. There was no history of voiding dysfunction or gross hematuria. He underwent renal transplant from a deceased donor in 1997 for end-stage renal disease (ESRD) secondary to focal segmental glomerulosclerosis (FSGS). His serum creatinine had remained stable at 170 µmol/L. In 2007, he was diagnosed with an 8.4 cm RCC of his right native kidney and underwent radical nephrectomy for a pT2 clear-cell RCC, Fuhrman nuclear grade 4 tumor with negative surgical margins. There had been no evidence of local or distant recurrence since.

Routine renal ultrasound revealed a 4.9 cm lobulated, solid mass with internal vascularity involving the upper pole of the allograft. Computed tomography (CT) scan was used to further characterize the mass. This demonstrated a 5.4x4.1x4.2 cm solid, enhancing lesion of the upper pole with 50% endophytic component and close approximation to the renal hilar fat (Fig. 1). The renal vein and external iliac vein were patent. No local lymphadenopathy or metastatic disease was appreciated. A chest radiograph was normal. His serum creatinine was stable at 173 µmol/L with estimated glomerular filtration rate (eGFR) 36 mL/min/1.73m^2 indicating moderate renal impairment.

The patient subsequently underwent an uneventful CT-guided percutaneous biopsy of the renal mass. Histopathology demonstrated clear-cell RCC, Fuhrman nuclear grade 2. He was planned for open left partial nephrectomy of the transplant kidney with all benefits, risks, and potential complications reviewed.

In October 2017, the patient underwent an uneventful open left renal allograft partial nephrectomy for a 5.4 cm mass extending deep into the renal sinus fat. The kidney and associated tumor were identified. Dissection was performed around the renal artery and vein until control of the renal hilum was achieved. He received 12.5g of intravenous mannitol. Following en bloc clamping of the renal hilar vessels, the mass was excised in completion. The tumor extended quite deep into the kidney and sinus fat in the interpolar region. Deep margin on histopathology was negative for tumor. Following complete excision, the defect was repaired in multiple layers. Vascular clamps were removed and hemostasis was controlled. A Jackson-Pratt surgical drain was placed and secured. Blood loss was about 200 ml and cold ischemic time was about 20 minutes.

At followup, final surgical histopathology demonstrated pT3a clear-cell RCC, Fuhrman nuclear grade 2 (pT3aN0M0). Renal sinus fat was involved with tumor. The surgical margins were negative. No evidence of acute graft rejection was present. He had evidence of urine leak from the surgical defect and was discharged home with Jackson-Pratt drain and Foley catheter on resumption of a regular diet and unin-

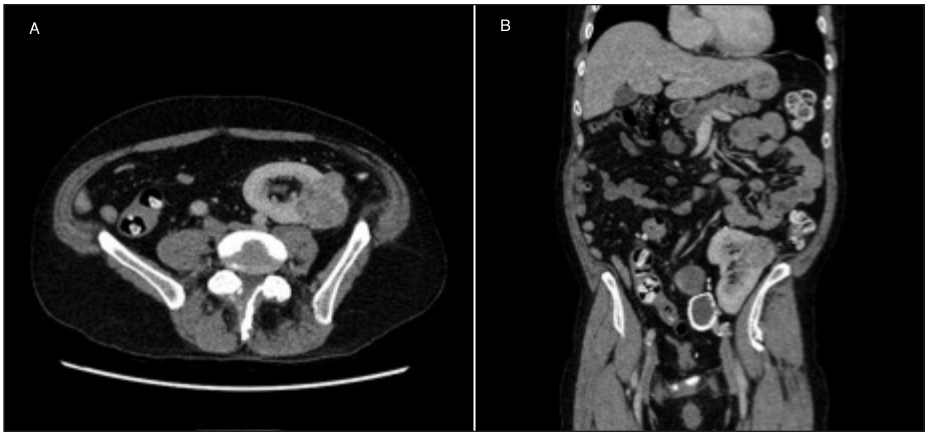

Fig. 1. Contrast-enhanced computed tomography CT (CECT) with ***(A)*** axial and ***(B)*** coronal imaging illustrating a 5.4 cm enhancing solid lesion arising from the upper pole of the left iliac fossa renal allograft.

hibited mobilization. Postoperatively, his serum creatinine climbed to 266 µmol/L and he continued to have elevated output from his drain. He was re-admitted to hospital and arranged for cystoscopy and left retrograde pyelography, which confirmed urine extravasation from an interpolar calyx. A double-J ureteric stent was placed, along with a urethral catheter. Immediately, drain outputs subsided. The patient was discharged home with catheter in place. His drain was removed a few days later. The stent was removed via cystoscopy at four weeks postoperatively. On followup renal ultrasound in July 2018, there was no evidence of local tumor recurrence or other solid organ metastasis. His chest radiograph was clear. His serum creatinine stabilized at 212 µmol/L with eGFR 31 mL/min/1.73m^2 and he remained dialysis-free 11 months post-partial nephrectomy.

Discussion

In a recent systematic review, Boissier et al reported on the recurrence of RCC in patients with ESRD undergoing renal transplantation following prior management for RCC and found that 5–16% of RCC cases in renal allografts were stage pT3. Clear-cell RCC represented the main histological subtype. Cancer-specific survival ranged from 75–100% at five years. Tumor recurrence was similar between those patients managed with transplantation and those who remained on dialysis. Prognostic factors for recurrence included stage, Fuhrman grade, histological subtype, and solid/cystic component of the initial tumor.[4]

The development of RCC in the renal allograft is a rare event and poses a dilemma for the managing urologist. Aggressive management with transplant nephrectomy would necessitate a return to hemodialysis, while a conservative nephron-sparing approach presents the risk of tumor recurrence in the setting of ongoing immunosuppression. Indeed, nephron-sparing surgery with partial nephrectomy has been demonstrated as a safe and effective option for patients presenting with localized tumors without impairing graft function. In a study by Ribal et al, three patients with tumor in the renal allograft undergoing partial nephrectomy were all managed successfully with this nephron-sparing approach and were tumor-free at followup, ranging from 0.5–6 months.[5] In the case we have presented, a pT3a tumor was managed effectively via a nephron-sparing approach, demonstrating its safety and effectiveness in managing these tumors.

Competing interests: The authors report no competing personal or financial interests related to this work.

This paper has been peer-reviewed.

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