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Double partial nephrectomy in allograft transplanted kidney

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ABSTRACT

A 61-year-old female presented with an incidental anterior mid pole renal mass on ultrasound. She had previously undergone live directed donor renal transplantation 13 years prior. As the 10 year survival of living transplant recipients increases, malignancy presentations will continue to rise. Nephron sparing surgery in renal allografts is sparse due to difficult operative dissection and complicated hila vascular control. We present the use of manual atraumatic graded bowel clamp pressure around the resected tumour as a viable option to safely perform partial nephrectomy in a transplanted kidney.

Introduction

Transplant recipients are twice as likely to develop a malignancy compared to the rest of the population. However, the risk of renal cell carcinoma (RCC) in this population is only mildly elevated at 4.6% compared with 3% in the general population. Only 10% of these tumours occur in the allograft. End stage kidney disease and chronic immunosuppression is known to pre-dispose native kidneys to malignancy. However, the aetiology of malignancy in allografts is poorly understood with no consensus on treatment.[1]

Historically, radical nephrectomy (RN) was considered first line treatment due to the potential for rapidly progressive RCC in an immunosuppressed patient. This placed patients back on dialysis with associated mortality and morbidity. Nephron sparing surgical (NSS) approaches are considered risky due to the hostile operative environment. However, sparse case report data indicate technical feasibility.[2] We present a novel technique to perform off clamp NSS in a transplant recipient presenting with two tumours in an allograft kidney.

Case report

A 61-year-old women presented with an incidental anterior mid pole renal mass on ultrasound. She had previously undergone live directed donor renal transplantation 13 years prior into the right iliac fossa. This was uncomplicated and her serum creatinine post-transplant ranged between 95 and 110μmol/L. Maintenance immunosuppressive therapy included tacrolimus, mycophenolate and low dose prednisolone (3mg daily). Her background included steroid induced insulin-dependent diabetes mellitus and osteopenia. She was independent with all activities of daily living.

A computed tomography (CT) scan identified two enhancing renal lesions which were partly exophytic with some cystic components. The larger 3cm lesion was located in the anterior mid-pole region and the smaller 1.5cm lesion was located in the anterior upper pole region of the transplanted kidney (Fig. 1). No metastatic spread was found on staging. An open dual partial nephrectomy of the allograft kidney was planned.

The patient was positioned supine and a 10cm incision was made through the previous Gibson incision. Dissection to the renal parenchyma was performed exposing the anterior and upper pole of the kidney. Intraoperative ultrasonography was used to identify both tumours (Fig. 2). Dissection of the hilum was not performed due to adhesions, short hilar vessels and to limit trauma to the transplanted vessels. Dual partial nephrectomy using cold cut and diathermy achieved excision of both tumours. A curved bowel clamp was utilised to apply local graded manual pressure directly underneath the tumour site during the resection of the tumour and subsequent renorrhaphy closure to minimise haemorrhage (Fig. 3A/B). A 2-0 V-loc suture was used for renorrhaphy closure. There was approximately 500mL of blood loss. The postoperative course was uncomplicated and the patient was discharged day 6 with a serum creatinine of 111μmol/L. The histopathology

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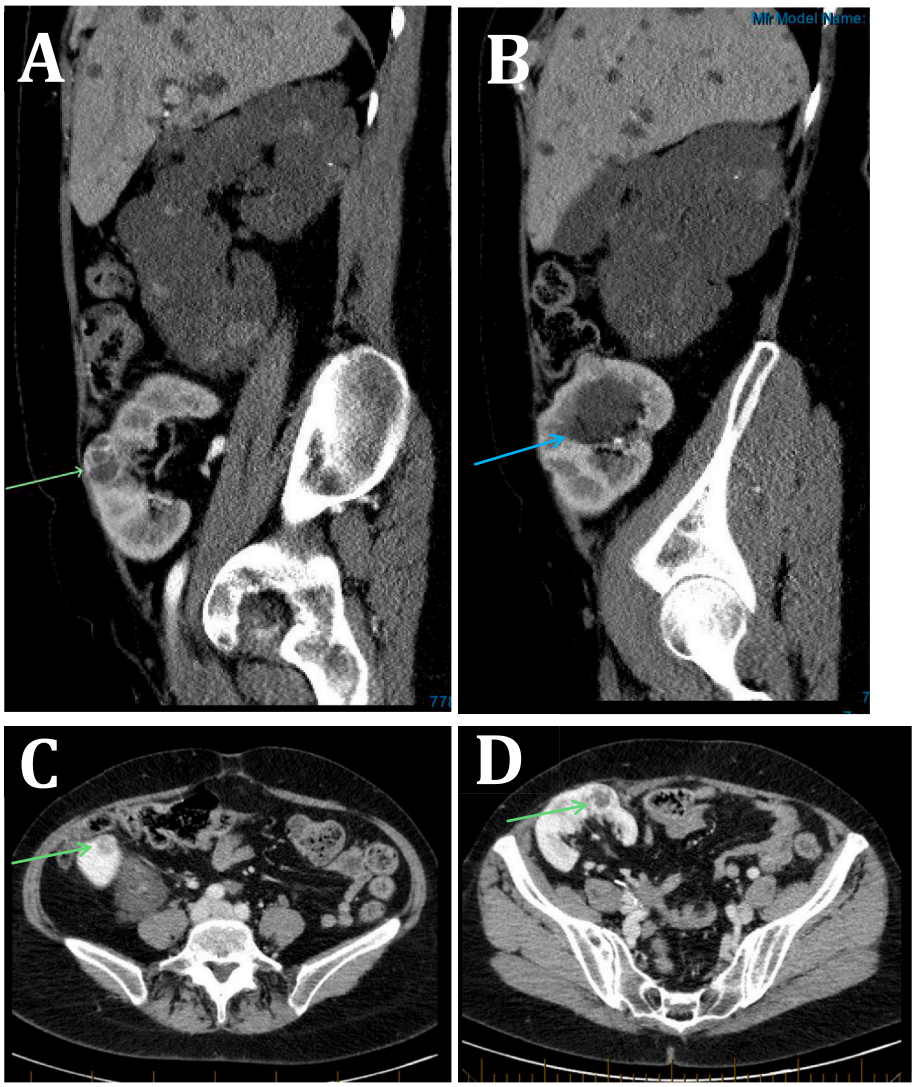

Fig. 1. Pre-operative planning CT scan of the abdomen and pelvis with intravenous contrast. A – sagittal view showing an enhancing, complex anterior mid-pole 3cm allograft lesion (green arrow). B – sagittal view showing cystic components of the allograft lesion (blue arrow). C – axial view showing an enhancing anterior 1.5cm upper pole solid allograft lesion (green arrow). D – axial view showing an enhancing, complex anterior mid-pole 3cm allograft lesion (green arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

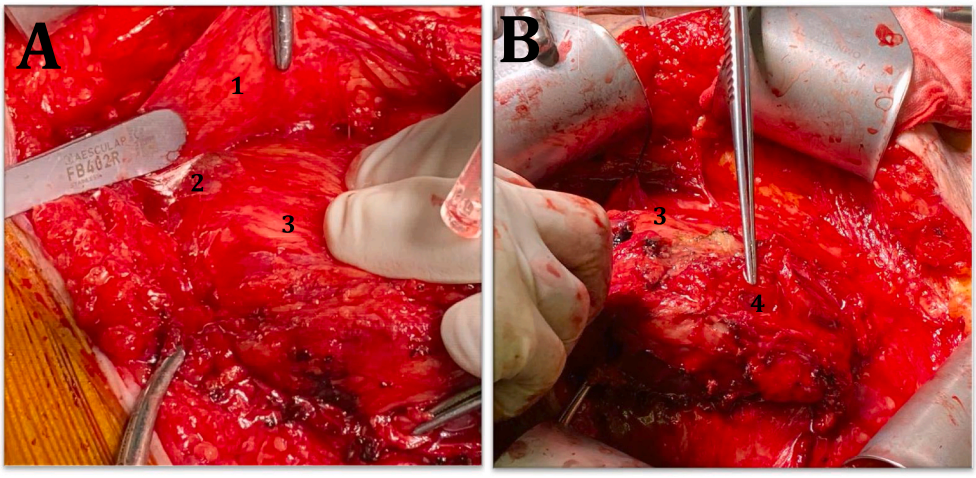

Fig. 2. Dissection to the allograft kidney. A – superior portion of kidney with peritoneal reflection (1), bulging upper tumour (2) and healthy renal parenchyma (3) B – inferior portion of kidney with lower pole tumour (4) and healthy renal parenchyma (3).

revealed Grade 3 clear cell RCC with negative margins at both sites and at one month follow up the patient remained well (Fig. 3C/D). The maintenance immunosuppressants were not altered before or after surgery.

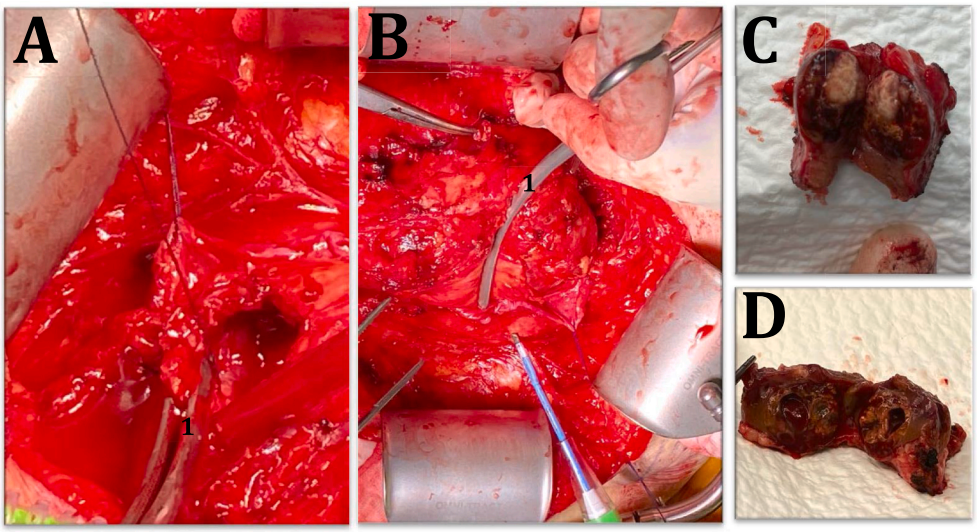

Fig. 3. Nephron sparing resection of allograft tumours. A – novel use of soft bowel clamp (1) to the upper pole tumour. B – The same is shown in for the lower pole tumour. C – upper pole allograft tumour resected. D – lower pole allograft tumour resected.

Discussion

Transplant recipients are living longer than ever before. According to the 2018 Australian and New Zealand Scientific Registry of Transplant Patients, the 10 year survival for living transplant recipients has increased from 84% to 88% compared to the previous decade. This will likely see increasing presentations of malignancy within the allograft. Although the aetiology for RCC in allografts is not completely understood, theories exist within the literature. A recent study from Germany examined 1655 transplant patients for approximately 12 years.[3] Twenty-six cases of RCC after transplantation were diagnosed. Post-transplant RCC was significantly associated with longer durations of pre-transplant haemodialysis ($p = 0.007$), post-transplant immunosuppression with cyclosporine ($p = 0.029$) and/or mycophenolate ($p = 0.020$) and with post-transplant prednisolone ($p = 0.042$). Cyclosporine A and mycophenolate usage were also independent risk factors for RCC development. The patient in our study had been on mycophenolate and prednisolone for over 10 years.

The literature on nephron sparing surgery in renal allografts is sparse and mostly limited to patients with T1a allograft masses.[2] Traditionally all other masses are managed with full RN of the allograft kidney. The European Organisation for Research and Treatment of Cancer (EORTC) randomised trial 30904 is the only multi-centre international randomised control trial which compared NSS and RN in 541 non-transplant patients with small (≤5 cm) singular renal tumours.[4] NSS was shown to reduce post-operative moderate renal dysfunction (eGFR <60) by 21% (95% CI, 13.8–28.3) when compared with RN with no difference in cancer-specific survival or oncological clearance. Re-operation rates in NSS was slightly higher compared to RN (4.4% compared with 2.4%) with bleeding accounting for 71% of surgical take-back. Although this study was completed in native kidney disease, results suggest NSS is a viable alternative.

Partial nephrectomy of the renal allograft is a challenging procedure due to adhesions. Severe adhesions make kidney mobilisation, hilum control and parenchymal resection difficult. We present the use of manual atraumatic graded bowel clamp pressure around the resected tumour as an alternative to hilum vascular control. As shown in Fig. 3A/B close proximal clamping of the parenchyma surrounding the tumour during resection provides tamponade pressure and allows safe resection of the tumour until haemostatic sutures and/or cautery can be attended. This eliminates the need to dissect out the renal hilum of the allograft and provides zero global ischemia to maximise nephron sparing.

Immunosuppressive adjustment reduces allograft malignancy without compromising rejection. The CONVERT trial randomised 830 renal allograft recipients 6–120 months post-transplant to remain on calcineurin inhibitiors (CNI) or convert CNI to mammalian target of rapamycin (mTOR) inhibitor.[5] Conversion to an mTOR inhibitior was associated with a lower incidence of all malignancy (12% compared with 21% p=<0.001) with no significant difference in biopsy confirmed acute rejection. The patient in our case would therefore benefit from conversion of CNI to mTOR inhibitor.

Conclusion

Partial nephrectomy is a safe and viable option to consider in the management of small renal masses in the transplanted kidney. The use of manual atraumatic graded bowel clamp pressure around the resected tumour is an alternative to hilum vascular control and can facilitate safe effective resection.

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Declaration of competing interest

Nil.

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References

1. Penn I. Primary kidney tumors before and after renal transplantation. *Transplantation*. 1995;59(4):480–485.
2. Chambade D, Meria P, Tariel E, et al. Nephron sparing surgery is a feasible and efficient treatment of T1a renal cell carcinoma in kidney transplant: a prospective series from a single center. *J Urol*. 2008;180(5):2106–2109.

3. Kleine-Döpke D, Oelke M, Schwarz A, et al. Renal cell cancer after kidney transplantation. *Langenbeck's Arch Surg*. 2018;403(5):631–641.
4. Van Poppel H, Da Pozzo L, Albrecht W, et al. A prospective randomized EORTC intergroup phase 3 study comparing the complications of elective nephron-sparing surgery and radical nephrectomy for low-stage renal cell carcinoma. *Eur Urol*. 2007; 51(6):1606–1615.
5. Schena FP, Pascoe MD, Alberu J, et al. Conversion from calcineurin inhibitors to sirolimus maintenance therapy in renal allograft recipients: 24-month efficacy and safety results from the CONVERT trial. *Transplantation*. 2009;87(2):233–242.