



Incidental renal cell carcinoma identified during laparoscopic live-related donor nephrectomy

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DECLARATIONS

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Reviewer

John Peters

Incidental renal cell carcinoma identified at laparoscopic donor nephrectomy presents a challenge requiring multidisciplinary input to achieve an optimum outcome.

Case report

A 41-year-old man was admitted to hospital to undergo a left laparoscopic live donor nephrectomy. The recipient was his 49-year-old sister with autosomal dominant polycystic kidney disease, and a history of non-Hodgkin's lymphoma, previously treated with chemotherapy and subsequent stem cell rescue.

Preoperative donor work-up had revealed conventional vascular anatomy, with the left kidney contributing 45% to overall function. In addition, a small (7 mm) hypodense lesion was identified in the left kidney which was felt to be a benign cyst (Figure 1).

The donor underwent an uncomplicated laparoscopic donor nephrectomy. The operative duration was 110 minutes; the kidney was delivered via a Pfannenstiel incision.

During bench preparation of the kidney, it became apparent that the reported lesion was in fact a small solid mass. The decision was made to excise the lesion from the kidney and perform an immediate frozen section. This reported a fully excised papillary renal cell carcinoma (Figures 2a and 2b). The renal defect was closed using a perirenal fat interposition.

The recipient underwent urgent counselling concerning the intraoperative findings regarding the donor kidney. Options discussed were discarding of the kidney or proceeding with transplantation. With the latter she was advised that

there was a small risk of tumour recurrence and the potential implications of this. After extensive discussions with family she elected to be transplanted with the kidney. The cold-ischaemia time was approximately 180 minutes.

Both the recipient and donor were discharged on day 5 without complication. The graft functioned immediately achieving a serum creatinine of 97 $\mu\text{mol/L}$ (estimated GFR 55 mL/min). The subsequent paraffin section report revealed a fully excised type 1 papillary renal cell carcinoma, Fuhrman's Grade 1–2 (T1a).

The case was discussed at local and regional multidisciplinary cancer meetings, and it was elected to perform surveillance of donor and recipient with serial ultrasound scanning.

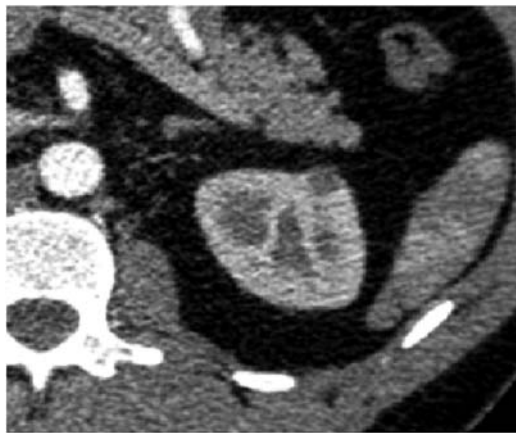
Discussion

Renal transplantation is the preferred option for most patients with end-stage renal failure. Live-related donors are increasingly utilized, and for recipients this is the most attractive and successful intervention in terms of patient and graft survival.^{1,2} Unfortunately, the number of patients receiving transplantation is limited by the availability of organs.³

Our case serves to expand the debate regarding the transplanting of kidneys with small renal tumours excised following donor nephrectomy. It is the first description of a case where the diagnosis was made *intraoperatively* at the time of laparoscopic donor nephrectomy. It follows that with increasing rates of transplantation that this situation may occur more frequently in the future.

Brook *et al.*⁴ have reported the largest series of transplants with previously diagnosed small

Figure 1
Preoperative CT demonstrating small hypodense lesion (15 HU) in left kidney

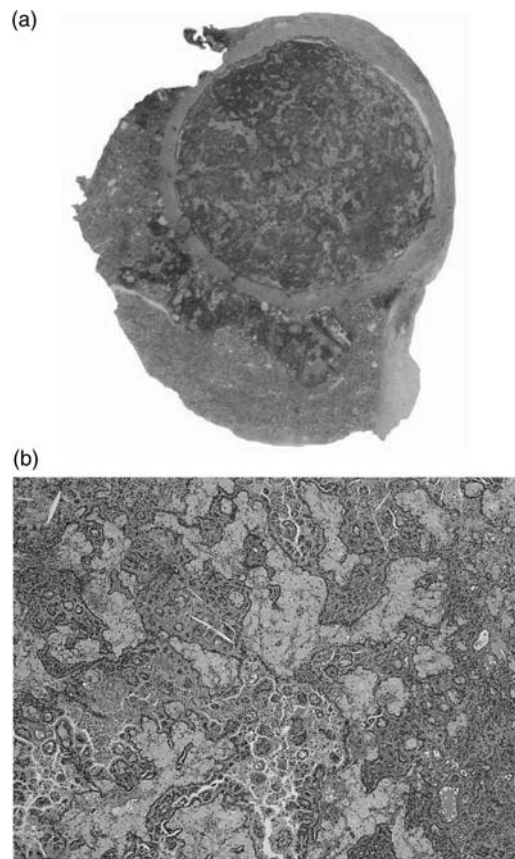


(<3 cm) renal tumours, and compared outcomes to patients receiving kidneys from live unrelated donors as well as dialysis 'waiting-listed' patients. In their series of 43 patients, who were all >60 years old with significant co-morbidities, patient survival was comparable in the two transplanted groups, and significantly better than those who remained on dialysis waiting for transplants. Twenty-five patients had excised clear cell carcinomas, and there were five papillary carcinomas (as in our case). The potential risk of immunosuppression and tumour recurrence did not seem to be a problem in transplanted patients. One of their patients developed a small lesion (1.2 cm) distant from the original resection site, and this was managed conservatively.

A further smaller series followed up five patients who had been transplanted with kidneys containing (back-table excised) small (<2.3 cm) renal masses, three of which transpired to be renal cell carcinomas.⁵ Cancer specific survival was 100% in this series, although median follow-up was only 15 months.

These reported series addressed the concept of using 'marginal' kidneys in high-risk dialysis patients, in whom the morbidity of dialysis was likely to heavily outweigh the risks conveyed by transplanting kidneys previously containing a small tumour. One assumption is that these (subsequently immunosuppressed) patients behave in the same way as non-immunocompromised

Figure 2
a. (low power); and b. (high power) Type 1 papillary renal cell carcinoma (Fuhrman's Grade 1–2), surrounded by a fibrous capsule, but with focal extension through the capsule into the renal parenchyma



patients, in as far as partial nephrectomy has the same cancer-specific survival as radical nephrectomy.⁶

Clearly the follow-up of such donors (and recipients) has yet to be defined, but such strategies should monitor for both local recurrence (e.g. ultrasound) and metastatic disease (intermittent CT) in both donor and recipient, although the likelihood of small 'low-risk' tumours recurring is probably small even in this patient group.

Our case is somewhat different in that the diagnosis was made intraoperatively at the time of laparoscopic nephrectomy. In addition, our recipient may not have been considered to be in the 'high-risk' groups studied above. Obviously

patients in this situation need to be carefully counselled with regard to the implications of proceeding with the transplant. This should be performed in a multidisciplinary fashion, ideally without unduly prolonging the cold-ischaemia time. The risks of continued renal dialysis should, however, not be understated.

In situations such as we describe, transplant clinicians should be prepared to discuss the option of transplantation with recipients, explaining the potential risks of tumour recurrence as well as the alternatives of ongoing dialysis or transplantation from another donor source. While not all patients may be comfortable with transplantation of kidneys, many may choose to proceed and should be provided with the opportunity to do so given the potential benefits and likely small risk.

References

- 1 Fuggle SV, Allen JE, Johnson RJ, *et al.* Factors affecting graft and patient survival after live donor kidney transplantation in the UK. *Transplantation* 2010;**89**:694–701
- 2 Greco F, Hoda MR, Alcaraz A, Bachmann A, Hakenberg OW, Fornara P. Laparoscopic Living-Donor Nephrectomy: Analysis of the Existing Literature. *Eur Urol* (in press)
- 3 Eng M. The role of laparoscopic donor nephrectomy in renal transplantation. *Am Surg* 2010;**76**:349–53
- 4 Brook NR, Gibbons N, Johnson DW, Nicol DL. Outcomes of transplants from patients with small renal tumours, live unrelated donors and dialysis wait-listed patients. *Transpl Int* 2009;**23**:476–83
- 5 Sener A, Uberoi V, Bartlett S, Kramer AC, Phelan MW. Living-donor renal transplantation of grafts with incidental renal masses after ex-vivo partial nephrectomy. *BJU Int* 2009;**104**:1655–60
- 6 Huang WC, Elkin EB, Levey AS, Jang TL, Russo P. Partial nephrectomy versus radical nephrectomy in patients with small renal tumors – is there a difference in mortality and cardiovascular outcomes? *J Urol* 2009;**181**:55–61

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