Urology Case Reports 33 (2020) 101286

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: http://www.elsevier.com/locate/eucr

Oncology

Open partial nephrectomy for a collision renal cell carcinoma in a transplant kidney: A case report

Andrew Moe [a,b,*], Isaac Thyer [b], Rajalingam Sinniah [a,b,c], Dickon Hayne [a,b]

[a] University of Western Australia Medical School, Perth, Australia
[b] South Metropolitan Health Service, Perth, Australia
[c] PathWest Laboratory Medicine, Perth, Australia

ARTICLE INFO

Keywords:
Partial nephrectomy
Transplant
Collision tumour
Renal cell carcinoma

ABSTRACT

A collision tumour of the kidney is a very rare condition defined by two immediately adjacent but histologically distinct neoplasms that coexist within one organ without histological admixture. We present a collision tumour in a transplant kidney treated with open partial nephrectomy. This case also highlights key surgical principles the enhanced risk of oncogenesis in transplant recipients, and some key principles for surgical resection of a tumour in a transplant kidney.

Introduction

Open partial nephrectomy is an uncommon, but well documented procedure performed for the management of a renal tumour in a transplant kidney. A collision tumour is a rare lesion that is defined by two immediately adjacent but histologically distinct neoplasms that coexist within one organ without histological admixture.[1] Collision tumours of the kidney are exceptionally rare, and may include primary renal cell carcinoma (RCC) or metastases. We report the first case of a collision RCC treated with open partial nephrectomy in a transplant kidney.

Case presentation

A 51-year-old male was referred to the Urology service after a 4.5cm upper pole renal mass was incidentally detected on an MRI pelvis which was performed for hip pain. The patient's renal transplant was performed in 1995 for Alport syndrome and he was taking regular cyclosporine and prednisolone. This transplant kidney was positioned in his right iliac fossa. His baseline creatinine (Cr) was 95 mmol/L. Urinary tract ultrasound and non-contrast computed tomography (CT) abdomen/pelvis were both performed to further characterise the renal lesion.

The patient's case was discussed at the tertiary hospital's Urology multidisciplinary team (MDT) meeting. Ultrasound guided biopsy of the lesion was performed and histopathology demonstrated a papillary RCC. After consultation with the patient's renal physician, a CT of the chest, abdomen and pelvis excluded any radiologically visible metastatic disease. The CT abdomen and pelvis revealed a 4.5 cm partially exophytic, enhancing, upper pole renal mass (Fig. 1).

The patient underwent rigid cystoscopy, retrograde pyelogram and insertion of a JJ stent prior to open partial nephrectomy. The tumour was dissected out with macroscopically clear margins, and a large defect in the collecting system was oversewn with Vicryl. A 19Ch Blakes drain was left in situ. He was admitted to Intensive Care Unit for monitoring, and a post-operative acute kidney injury was managed with intravenous fluid replacement. The patient made a full recovery, and the intra-abdominal drain was removed prior to discharge at post-operative day nine.

On histopathological assessment, the partial nephrectomy specimen contained two distinct tumours; tumour 1 measured 43 x 43 × 46mm; and tumour 2 measured 15 x 15 × 10mm; and are separated by a fibrous pseudo-capsule (Fig. 2; see arrow). Tumour 1 was situated 0.5mm from the parenchymal resection margin; and tumour 2 was situated 3mm from the closest superficial margin of resection. There was no invasion of the renal capsule or perinephric fat.

On microscopic examination, tumour 1 shows the features of papillary renal cell carcinoma, type 1, (PRCC), with the papillary cores covered by a monolayer of small, cuboidal cytologically bland cells with scant amphophilic cytoplasm; and within the fibrovascular cores there are variable numbers of foamy macrophages; (Fig. 3A). Tumour 2 shows the features of clear cell renal cell carcinoma (CCRCC); WHO/ISUP

* Corresponding author. Perkins South, Fiona Stanley Hospital, 102-118 Barry Marshall Parade, Murdoch, WA, 6150, Australia.
E-mail address: Andrew.Moe@health.wa.gov.au (A. Moe).

https://doi.org/10.1016/j.eucr.2020.101286
Received 21 February 2020; Received in revised form 24 May 2020; Accepted 26 May 2020
Available online 30 May 2020

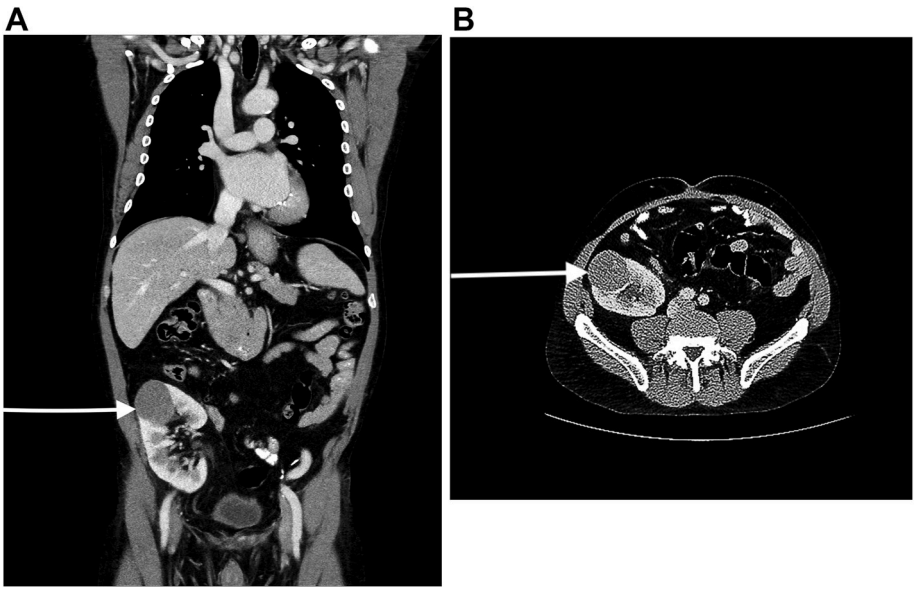

Fig. 1. 1A and 1B: Computed tomography demonstrating a 4.5 cm partially exophytic, enhancing, upper pole renal mass.

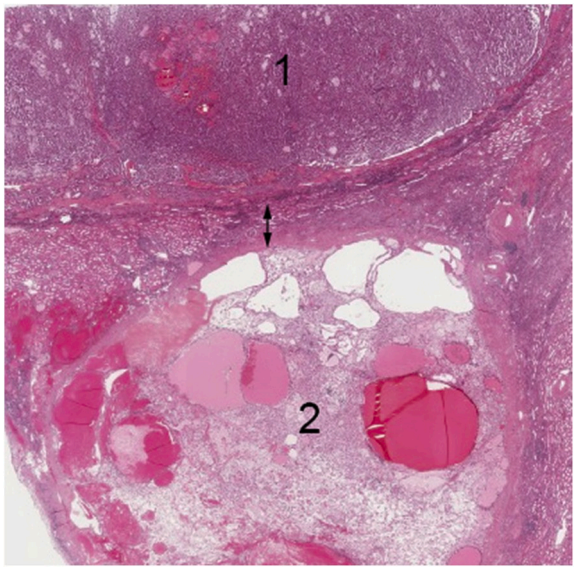

Fig. 2. Tumour 1; the papillary renal cell carcinoma, type 1 is separated from Tumour 2; the clear cell renal cell carcinoma by a fibrous pseudocapsule (→ Haematoxylin and Eosin stain x 0.3).

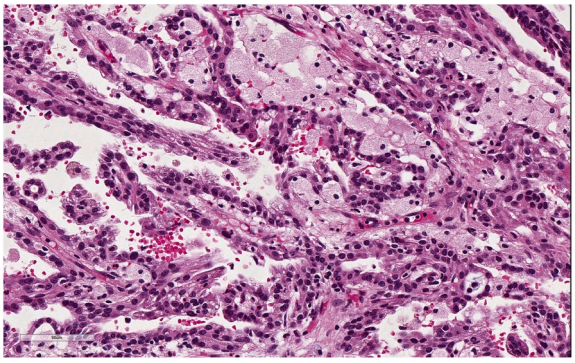

Fig. 3A. Papillary renal cell carcinoma type 1 is comprised of papillae with monolayered cells and foamy macrophages in the stroma (Haematoxylin and Eosin stain x 25).

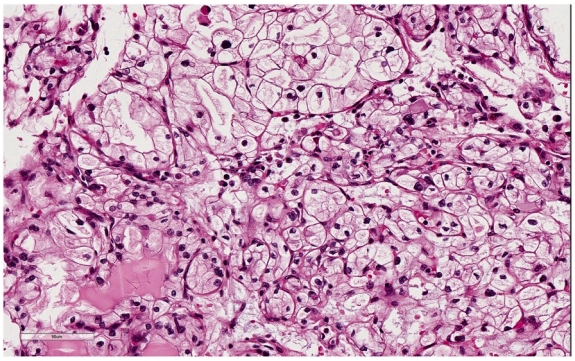

Fig. 3B. The clear cell renal cell carcinoma shows abundant clear cytoplasm, a network of small vessels and small nucleoli (Haematoxylin and Eosin stain x 25).

grade 2; composed of alveolar nests and sheets of clear cells interspersed by delicate vascular network. The tumour cells have well defined cytoplasmic borders, with abundant clear cytoplasm and eccentric nuclei. There is no tumour necrosis, sarcomatoid or rhabdoid differentiation (Fig. 3B).

Discussion

Collision tumours have been described in multiple organs, including the thyroid, brain, adrenal gland, stomach, uterus.[1] Collision tumours are very rare in the kidney, but have been reported to comprise of variants of primary RCC and metastases.[2] Renal cell carcinomas demonstrate histopathological differentiation according to the tumour epithelium of origin. Tumour variants display distinct immunohistochemical staining patterns.[3]

This case is remarkable due to two factors. Firstly, it demonstrates an extremely rare case of a collision tumour containing a papillary RCC and an adjacent clear cell RCC. Secondly, this was surgically resected from a transplant kidney with an open partial nephrectomy.

While this case provides an extremely rare example of a collision tumour, it also emphasises the enhanced risk of oncogenesis associated

with solid organ transplant and immunosuppression. Specifically, people who undergo renal transplantation are at a 3–5 times higher risk of developing cancer than the general population,[4] with the incidence of malignancy up to 20% higher over the first 10 years following transplantation.[5] Renal transplant recipients are 15–100 times more likely to develop RCC than the non-transplant population. The risk of new malignancy following transplantation is attributed to years of immunosuppression, disrupting the immunological anti-tumour surveillance. Secondly, immunosuppression affects host anti-viral activity which may be linked to oncogenesis.[5] Increasing age also contributes to the higher risk of malignancy, as transplant outcomes and longer-term survival continue to improve.

Although the majority of small RCCs are asymptomatic, this case highlights the importance of rapid assessment and referral of transplant patients who display abnormal imaging or present with clinical red flags for malignancy. In patients with donor kidney tumours, prompt review and consideration of contrast imaging and percutaneous renal biopsy are recommended, with nephron sparing surgery offered to avoid dialysis if possible.

Conclusion

A collision tumour of two renal cell carcinomas is extremely rare. Renal transplant recipients are at an increased risk of oncogenesis. For patients with renal masses on a transplant kidney, these can be managed with open partial nephrectomy if there is sufficient renal reserve.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

All authors declare no conflict of interest.

Acknowledgements

We wish to thank Ms Sallyanne Cousans and Mrs Carolyn Brown (PathWest Laboratory Medicine, Fiona Stanley Hospital) for photography and secretarial assistance. We also thank Mr Michael McDonnell (Senior Medical Imaging Technologist) and Ms Michelle Bavcevic (Medical Illustrations Coordinator) for image preparation at Fiona Stanley Hospital.

References

1. Tanveer N, Gupta B, Pathre A, Rajaram S, Goyal N. A rare collision tumour of uterus-squamous cell carcinoma and endometrial stromal sarcoma. *J Clin Diagn Res : J Clin Diagn Res*. 2017;11(2):ED20.
2. Burch-Smith R, Tannir NM, Resetkova E, Tamboli P, Rao P. Collision tumor of the kidney composed of clear cell carcinoma and collecting duct carcinoma: report of a case with unusual morphology and clinical follow-up. *Chin J Canc*. 2014;33(7):351.
3. Sejben I, Szabó Z, Lukács N, Loránd M, Sükösd F, Cserni G. Papillary renal cell carcinoma embedded in an oncocytoma: case report of a rare combined tumour of the kidney. *Canad Urol Assoc J*. 2013;7(7-8):E513.
4. Bieniasz M, Chmura A, Kwapisz M, et al. Renal tumor in allogeneic kidney transplant recipient. *Transplant Proc*. 2016;48(5):1849–1854.
5. Buell FJ, Gross GT, Woodle SE. Malignancy after transplantation. *Transplantation*. 2005;80(2S Suppl):S254–S264.