

Introduction

For patients with end-stage organ disease, solid-organ transplantation provides life-saving therapy. In 2018, a total of 36,529 transplants were performed in the U.S., including 21,167 kidney transplants¹. Kidney transplantation is the therapy of choice for most patients with end-stage renal disease (ESRD), as it significantly improves the patient's quality of life and survival¹. With increasing survival rates after solid-organ transplantation, clinicians are now recognizing the long-term post-transplant complications, such as malignancy². Compared to the general population, transplant recipients are at a two-fold increased risk of developing malignancy³.

Organ transplant recipients are placed on immunosuppressive medications to decrease the likelihood of organ rejection. However, this leaves these patients immunocompromised and more susceptible to contracting an oncogenic viral infection.

In our case study, we aim to highlight a case example of post-transplant malignancy, while referencing existing literature to reiterate the importance of continuous screening and a thorough pathological report.

Clinical History

A 50-year-old woman with a history of lupus nephritis progressed to end stage renal disease, and ultimately underwent a renal transplant. Shortly after the transplant she was diagnosed with post-transplant lymphoproliferative disorder (PTLD).

The patient was successfully treated and continued to receive follow-up physical exams and ultrasounds to ensure the remission status of her PTLD. A follow-up ultrasound eighteen years post-transplant revealed 2 solid masses (1.0 cm and 1.6 cm) in the upper pole of the allograft kidney. Subsequent imaging using computed tomography (CT) indicated a nodule (1.7 cm) at the upper pole.

Due to these imaging findings and the non-functioning graft, an allograft nephrectomy was performed.

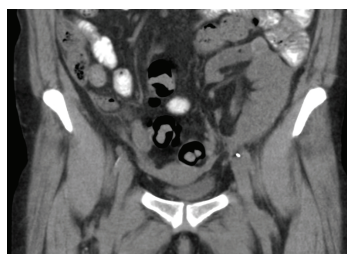


Figure 1: CT image of allograft kidney

Gross Examination

On gross examination the nephrectomy specimen contained four well-circumscribed masses within the renal cortex and medulla; these did not involve the renal sinus. Two of the masses (1.6 x 1.4 x 1.0 cm and 1.9 x 1.7 x 1.6 cm) in the upper pole were speckled, yellow-brown, and located 0.1 cm from the perinephric soft tissue margin. The two other masses were homogenous, pale tan-yellow with one (0.8 x 0.8 x 1.3 cm) in the mid kidney and the other (1.3 x 1.2 x 2.4 cm) in the lower pole located 0.1 cm from the perinephric soft tissue. The remaining kidney parenchyma contained multiple cysts (0.2 to 1.2 cm).

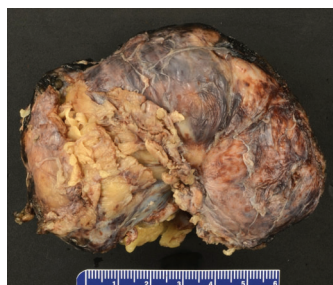


Figure 2: Allograft nephrectomy specimen

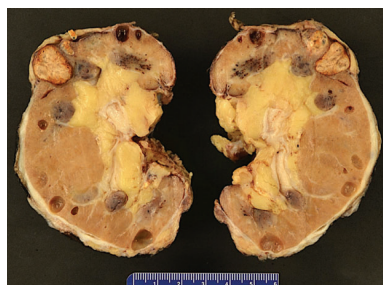


Figure 3: Bivalved kidney

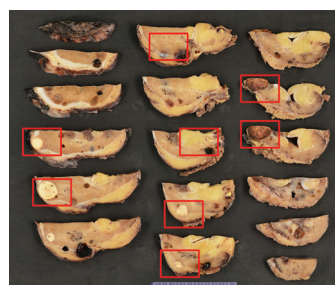


Figure 4: Posterior half of kidney, serially sectioned with section map

Microscopic Examination

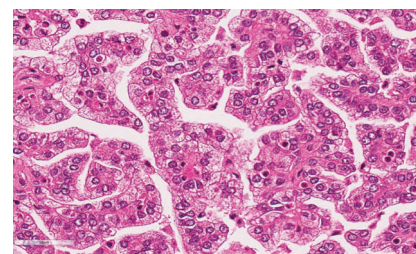


Figure 5: Microscopic photograph of tumor

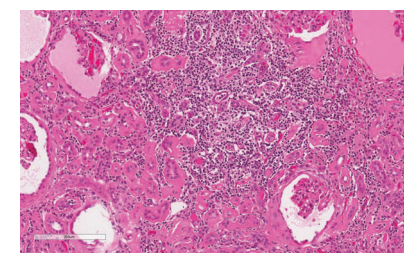


Figure 6: Microscopic photograph of nonneoplastic kidney

Hematoxylin and eosin (H&E) stained sections of the lesion had characteristic features of papillary renal cell carcinoma (RCC), Type 1.

The tumor was staged as pT1a as the size of the masses was less than 4 cm in greatest dimension and they were limited to the kidney. Regional lymph nodes were not identified grossly or microscopically and therefore staged as pNX. As the patient's medical imaging results did not identify any evidence of distant metastasis, the clinical M stage was assessed as M0.

Microscopic analysis also revealed interstitial fibrosis and chronic inflammation in the nonneoplastic kidney, which is suggestive of chronic rejection.

Discussion

This case highlights an important topic in transplant pathology, that being whether the malignancy belonged to the organ donor or the transplant recipient. In post-transplant patients, the development of malignancy may be due to a *de novo* occurrence, recurrence of malignancy, or donor-related malignancy⁵. Donor-related malignancy is very rare with the reported risk being only 0.01- 0.05%⁶. The time range of transmitted malignancy ranges from 2 months to 2 years after transplantation^{5,8}. In our case, the time between the patient's kidney transplant and the RCC presentation was eighteen years suggesting that the cancer was not present at the time of transplant.

Compared to an age-matched general population, kidney transplant recipients have a five to ten-fold increased risk of developing RCC^{3,9}. The majority of these tumors develop in the native kidneys due to the confirmed risk factors associated with ESRD, including acquired cystic kidney disease and chronic hemodialysis^{8,10}. The incidence of RCC in allograft kidneys is less common (0.2–0.5%) and the exact etiology remains unknown^{3,9}.

Concluding Remarks

The incidence of post-transplant malignancy is increasing as more people receive organ transplants². Thus, our case study demonstrates the importance of understanding complications associated with post-transplant immunosuppression, the need for continuous screening with transplant patients, and the significance that histopathology plays in the final diagnosis.

References

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