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Received 13 July 2000.
Accepted 31 August 2000.

RENAL CELL CARCINOMA DETECTED IN A CADAVERIC DONOR AFTER ORTHOTOPIC LIVER AND CONTRALATERAL RENAL TRANSPLANTATION IN TWO RECIPIENTS

FOUR-YEAR FOLLOW-UP

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Background. **Although rare, renal cell carcinoma has been found during renal recovery for cadaveric organ transplantation. Previously, we reported this incidence to be 0.9%. In one cadaveric donor, the liver and left kidney had been transplanted before the discovery of renal cell carcinoma (T1) in the right kidney.**

Methods. **We retrospectively reviewed the medical records of two patients who had received cadaveric allografts from a donor with a known renal cell carcinoma.**

Results. **Both patients have been followed for 4 years with blood chemistries and chest x-ray every 3 months for year 1, every 4 months for years 2 and 3, and every 6 months thereafter. They also underwent allograft ultrasound every 6 months and an annual CT scan of the abdomen. Both patients have shown no evidence of metastatic disease throughout their follow-up.**

Discussion. **In the rare instance that a patient receives an organ from a cadaveric donor with a known renal cell carcinoma, it is mandatory to follow these patients closely observing for both allograft recurrence and metastatic disease.**

The transference of malignancy from cadaveric donor to transplant recipient is a rare but recognized complication of organ transplantation. This occurrence was first reported with the transference of malignancy in renal allografts (*1*, *2*). Since these reports, patients with a known malignancy have been excluded from consideration as organ donors. Penn reviewed 270 transplant recipients who had received organs from donors with a known malignancy (*3*). Of these, 117 (43%) developed tumor recurrence.

In a recent review at our center, we determined the incidence of renal cell carcinoma discovered at the time of cadaveric renal recovery to be 0.9% (5/553) (*4*). Fortunately, this occurrence is rare and the majority of malignancies are discovered before organ transplantation with all recovered organs being discarded. Several studies have documented the transplantation of organs from cadaveric donors who were subsequently found to have renal cell carcinoma after organ transplantation. Pliskin et al. (*5*) reported that a cadaveric renal allograft was transplanted before the discovery of a renal cell carcinoma in the contralateral kidney. The transplant recipient was fully counseled regarding the potential risks and elected to keep the kidney. The patient has undergone follow-up with serial CT scans and has been without evidence of malignancy. Sack et al. (*6*) reported on a cadaveric heart transplant recipient who received an organ from a patient who was subsequently found to have renal cell carcinoma. The transplantation procedure was in progress at the time of discovery of the renal tumor and too far along to be aborted. Postoperatively, the patient was followed for tumor development. Twelve months after transplantation, the patient was found to have metastatic renal cell carcinoma.

In July of 1996, organs were recovered from a 60-year-old black male deceased secondary to a cerebrovascular accident with associated intracranial hemorrhage. The donor's abdominal organs were recovered and deemed appropriate for transplantation. The donor's liver and left kidney were transplanted at Louisiana State University Health Science Center (Shreveport, LA). While the right kidney was being prepared for transplantation at a separate institution, a right renal mass was noted and biopsied. Pathology returned as renal cell carcinoma (1.0×0.6 cm, grade 1, T1). The donor had no evidence of nodal or metastatic disease.

The recipient of the cadaveric liver was a 50-year-old black female with polycystic liver and polycystic kidney disease (normal renal function). The patient had been

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placed on the liver transplant list secondary to incapacitating abdominal pain and girth. The patient was fully counseled on her case and given the option of organ explantation and immediate retransplantation. The patient elected to keep her allograft and has been followed for 4 years. The patient has maintained good liver function on an immunosuppressive regimen of Neoral, Cellcept, and prednisone without evidence of malignancy. Routine follow-up of this patient included blood chemistries and chest x-ray every 3 months for year 1, every 4 months for years 2 and 3, and every 6 months thereafter. An ultrasound of the transplanted allograft was performed every 6 months as was an annual CT scan of the abdomen.

The recipient of the cadaveric left kidney was a 65-year-old black male with end-stage renal disease secondary to hypertension. He had been on hemodialysis for 2 years before transplantation. After transplantation, the patient's creatinine stabilized at 2.0. The patient was counseled on his case and given the option of organ explantation and return to hemodialysis. The patient elected to continue with his renal allograft and has been followed for four years. The patient has stable renal function on an immunosuppressive regimen of Prograf, Cellept, and prednisone without evidence of malignancy. Follow-up was as described above.

The management of recipients of solid organ allografts recovered from donors with a known malignancy has not been established. We recommend offering the patient immediate allograft removal and transplantation with a new organ if necessary, as this is theoretically the only means of eradicating transferred solid organ micrometastasis. This, however, does not eliminate the theoretical risk of tumor cells transferred by the peripheral blood. Both of our patients elected to keep their allografts after being fully counseled and have been followed closely using the previously outlined protocol.

Penn reported a series of renal recipients who were received transplants of organs from donors with renal cell carcinoma (*7*). In 15 recipients, the tumor was small (<2 cm) and completely excised before transplantation. Fourteen recipients received the contralateral (no evidence of tumor) kidney from a donor with renal cell carcinoma. None of these patients developed tumor recurrence at mean follow-up times of 79 and 55 months. Penn concluded that renal allografts with small tumors that are completely excised before transplantation may be tranplanted with rare risk of local recurrence or metastasis, but patients should still undergo close follow-up. Our case confirms that small renal tumors have a low propensity for metastasis.

The length of follow-up for these patients should continue throughout the life of the patient. There have been case reports of late developing malignancies in transplanted allografts. Kunisch-Hoppe et al. (*8*) reported on a case of metastatic renal cell carcinoma arising in the renal allograft 6 years after transplantation, which was proven to be of donor origin by molecular analysis. Feldman et al. described the late development of renal cell carcinoma in a patient 13 years after transplantation, which was treated with enucleation and also proven to be of donor origin (*9*). Although these cases most likely represent de novo malignancies and not transferrence, patients who receive organs from donors with known malignancies are at a higher risk for the development of allograft tumors.

This case emphasizes the importance of excluding cadaveric donors with known malignancy. Measures to prevent the transplantation of organs bearing malignant tumors have been well described (*1*, *6*, *10*). Extensive examination of the organ and biopsy of any suspicious lesion should be performed during organ recovery. The use of abdominal ultrasound or intraoperative ultrasound may prove beneficial in detecting nonclinical malignancies. Sack et al. (*6*) also emphasizes the importance of preoperative tumor screening of older organ donors, who with advancing age are more likely to harbor malignancy.

In the rare instance of organ transplantation from a cadaveric donor with a known malignancy, the case should thoroughly be reviewed with the patient. If the patient elects to keep the allograft, close follow-up is necessary, and the patient should be observed for metastatic disease as well as allograft tumor development. Detecting the development of a malignant lesion early may allow for a potential cure and possibly an organ-preserving procedure.

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Received 17 July 2000.
Accepted 12 September 2000.