Radiology Case Reports

Volume I, Issue 4, 2006

Auto-Rejection of Renal Donor-Origin Metastatic Melanoma

J. Scott Kriegshauser, Peter L. Weidenfeld, Daniel N. Wochos, James W. Williams

We report a case of metastatic malignant melanoma discovered in a living related donor shortly after renal transplant and subsequently diagnosed in the recipient. The recipient hepatic metastases were followed with serial computed tomography (CT) during regression/rejection of tumor after cessation of immunosuppression and allograft removal. Correlation made with serial liver mass biopsies.

Introduction

The occurrence of donor-origin malignancy in a transplant recipient is rare. [1-2] With melanoma, the disease can be very aggressive. Sometimes the melanoma can be "cured" following allograft removal and cessation of immunosuppression. [3-8] There are few reports of this in the radiology literature and, to our knowledge, none that provide serial CT imaging over the course of disease progression and regression. [5] We report such a case and provide pathologic correlation from liver mass biopsies.

Case Report

A 46-year-old white male presented to our institution with membranous glomerulonephropathy, diagnosed several years earlier by renal biopsy. He received immunosuppressive therapy with cytoxan and prednisone; however, over a two-year period his renal insufficiency progressed to end-stage renal disease. Refusing any hemodialysis treatment, he received a living related donor renal transplant from his brother, who was a zero match. Surgery was without complication. Soon after surgery, the donor developed neurological deficits. His work-up was positive for metastatic melanoma to brain with an unknown primary site.

Allograft removal was advised, but our patient did not wish to undergo hemodialysis, and therefore opted to keep the donor kidney and undergo surveillance with serial abdomen /pelvic CT scans. Patient did well clinically on immunosuppression therapy. Abdomen/pelvic CT scan at three months post transplant was negative for malignancy, showing only a 1.5-cm benign-appearing cyst within the allograft. CT scans six months post transplant showed no significant change. The next CT exam at one year post transplant, revealed several masses within the allograft (Figure 1), which appeared solid by ultrasound examination. Additionally, several prominent lymph nodes were noted at the hilum and adjacent to the upper pole of the

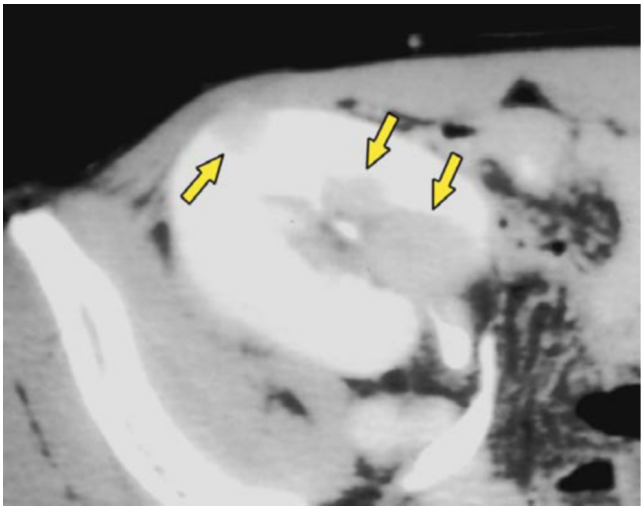


Figure 1. CT one year after transplant showing several new masses within the renal allograft.

Citation: Kriegshauser JS, Weidenfeld PL, Wochos DN, Williams JW. Auto-rejection of renal donor-origin metastatic melanoma. Radiology Case Reports. [Online] 2006;1:44.

Abbreviations: CT, computed tomography, MRI, magnetic resonance imaging,

J. Scott Kriegshauser (Email: skriegshauser@mayo.edu) is from the Mayo Clinic College of Medicine, Department of Radiology, Scottsdale, AZ, United States of America.

Peter Weidenfeld is from Red Rock Radiology, Las Vegas, NV, United States of America.

Daniel Wochos is from the Mayo Clinic College of Medicine, Department of Nephrology, Scottsdale, AZ, United States of America.

James Williams is from the Mayo Clinic College of Medicine, Department of Pathology, Scottsdale, AZ, United States of America.

DOI: 10.2484/rcr.v1n4.44

allograft. Several small, low-density lesions were also appreciated in the spleen. An ultrasound-guided biopsy (18-gauge needle) was obtained from one of the allograft lesions and was positive for malignant melanoma.

The patient underwent exploratory laparotomy with allograft nephrectomy, splenectomy, right hemicolectomy, and liver biopsy revealing diffuse melanoma involving the allograft, liver, spleen, mesocolon and para-aortic lymph nodes. He was started on hemodialysis. CT scans were performed at three month intervals for two years, then at six months intervals thereafter. The first hepatic metastasis visible on CT (Figure 2a), in the lateral left lobe, was seen at the first three month follow-up, after the allograft nephrectomy (approximately 15 months after the transplant .) Other metastases became visible later (Figure 3a). As these metastases were followed with CT, they eventually became calcified and smaller, consistent with remission/rejection (Figures 2 and 3). A biopsy of one of the hepatic metastases was performed approximately 3.5 years after the allograft nephrectomy and cessation of immunosuppressive therapy, showing abundant melanin pigment, but no malignancy. (Figure 4) Trial immunosuppressive therapy was begun and a liver biopsy six months later also was negative for malignancy. After a successful trial of the immunosuppressive therapy for one year, there was no evidence of recurrence and he was cleared for transplant. However, no suitable donor was found. Due to chronic illness and cardiovascular compromise, he was removed from the transplant list about two years later and continued dialysis until

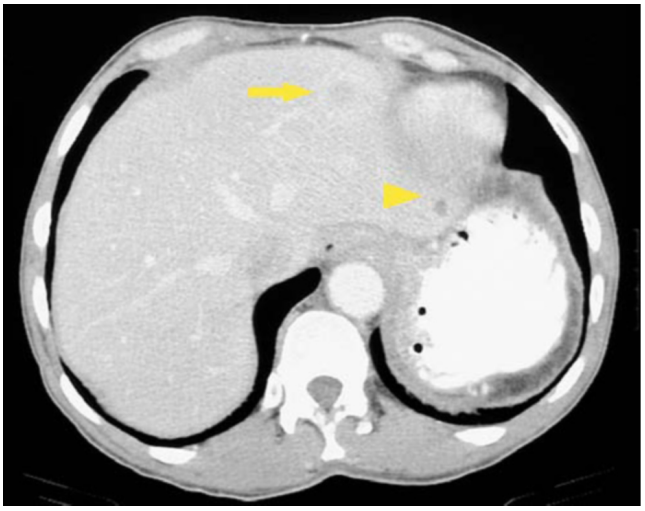
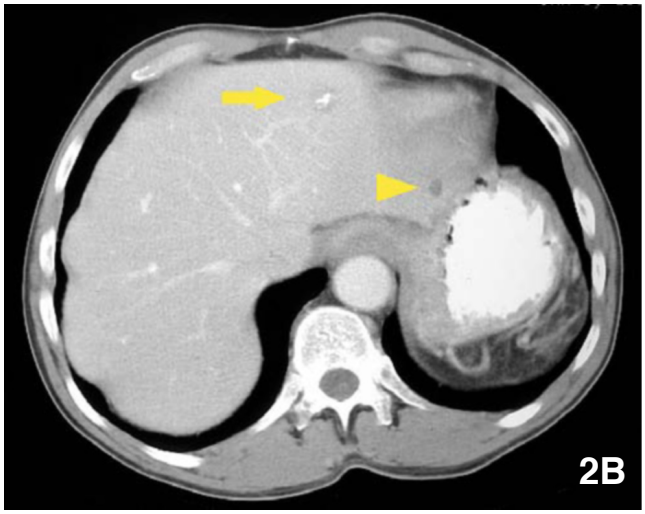


Figure 2A. CT images at the level of a left lobe liver metastasis (arrow) and small incidental cyst (arrowhead). At 15 months after transplant



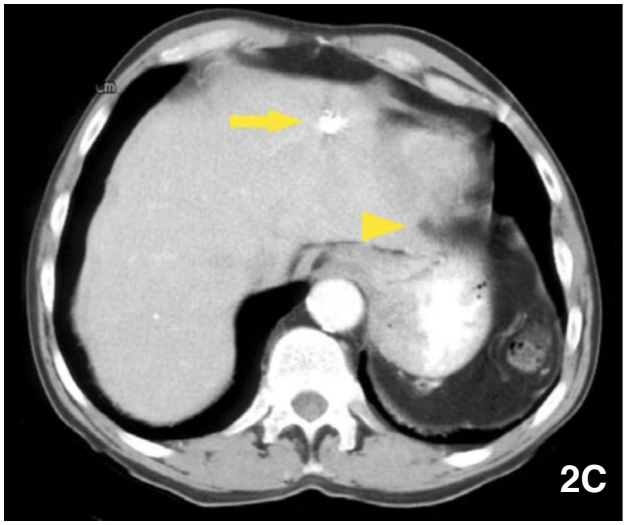
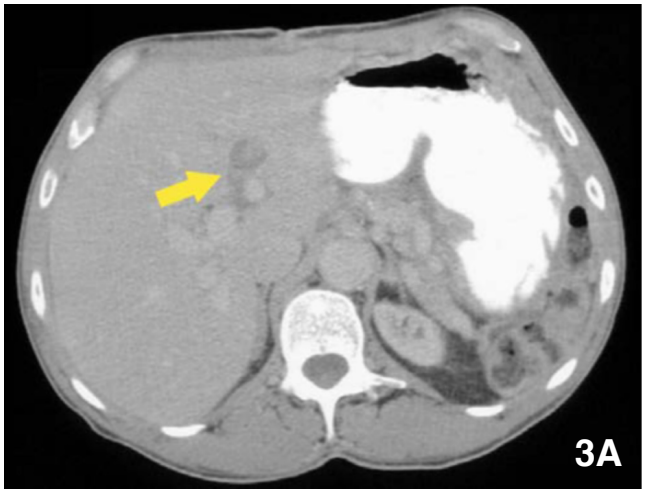
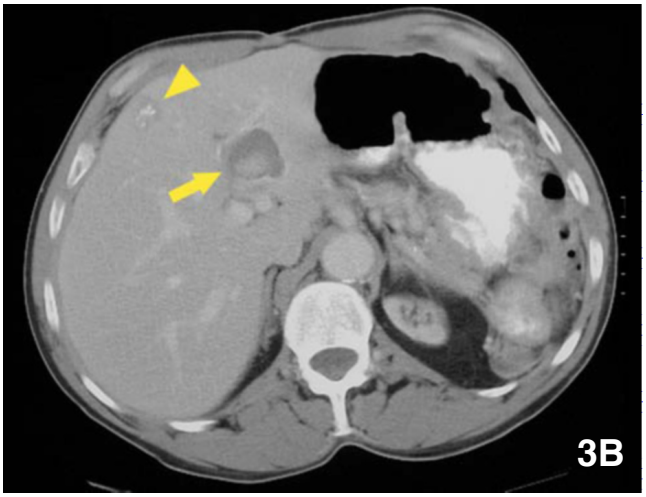


Figure 2. CT images at the level of a left lobe liver metastasis (arrow) and small incidental cyst (arrowhead). **B.** At 30 months after transplant with decreasing size and central calcification within the metastasis. **C.** At 42 months after transplant with complete calcification of the metastasis.





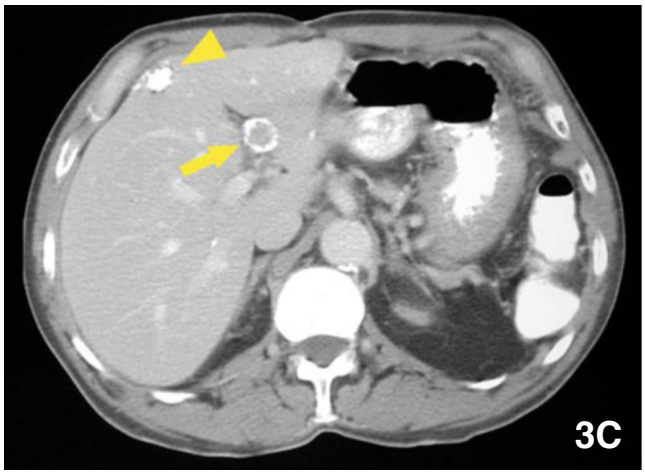


Figure 3. CT images showing a periportal metastasis (arrow) and a peripheral metastasis (arrowhead). **A.** At 18 months after transplant. **B.** At 30 months after transplant showing increased size of the periportal metastasis with rim calcification. Peripheral metastasis now present with calcification. **C.** At 42 months after transplant showing decreased size and increased rim calcification of the periportal metastasis. Peripheral metastasis now completely calcified.

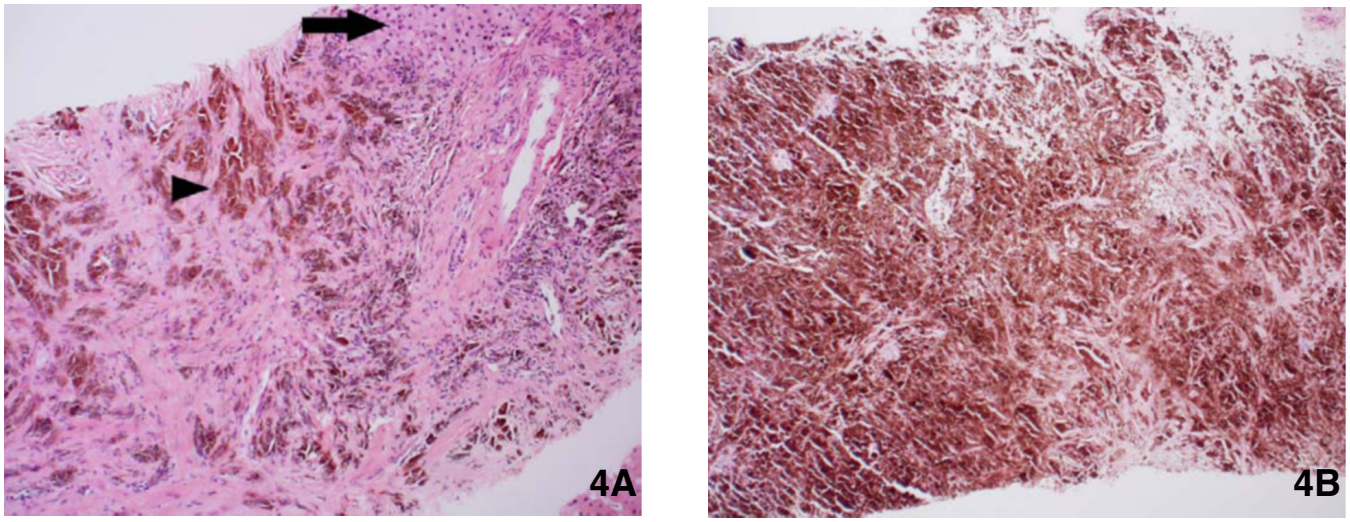


Figure 4. A. Microscopic image showing residual melanin in the liver (arrowhead) surrounded by scarring, but no residual malignancy. Adjacent normal liver (arrow). **B.** In parts of the specimen, the melanin (brown) was abundant.

his death from heart disease three years later. He survived 11 years following the initial surgery for metastatic melanoma.

Discussion

Transplantation of organs with known and undetected donor neoplasms have been well documented in the literature [1-3,9-10] We found only one report in the radiology literature, demonstrating donor-origin metastatic disease to a transplant kidney. [5] Excluding primary brain neoplasm, this occurs rarely; 1.3% of transplants in one study [1] and only 0.5% in another [2]. Clearly, the transplant recipient on immunosuppression therapy provides a "fertile field" for growth and dissemination of foreign tumor cells. When an organ is transplanted from a donor with extracerebral malignancy, the chance of tumor cell transmission is high, calculated at 44% by Penn [3]. This may be even higher with melanoma, with one report showing transmission of tumor cells to 17 of 20 kidney recipients from 11 donors with melanoma. [4]

It is therefore recommended that immediate removal of the allograft be performed with discontinuation of immunosuppression therapy in the hope that any remaining transplanted tumor cells would be rejected by the recipients immune system [3]. However, if allograft removal is initially refused, as in our case, or if allograft removal is not feasible (e.g. liver transplant), the patient needs to be evaluated at regular intervals with CT or MRI. The optimal frequency of radiologic surveillance exams remains unclear. However, it was evident, in our case that significant progression of disease occurred during the 6-month interval from 6 months to one year post transplant. Perhaps, radiologic screening at 3-month intervals should continue for at least the first year post transplant, if not longer.

There are reports of complete remission following allograft removal and cessation of immunosuppression therapy as with our patient, but some patients have required immunotherapy or chemotherapy to eradicate the transmitted melanoma. [4-8] Still, most of the reported patients died from the melanoma. There have been no reports demonstrating the radiographic regression of liver metastases on CT from donor transmitted melanoma, to our knowledge. However, there has been a report of resolution of metastatic nodules on chest x-ray. [7] They did not report any residual calcification. In our case, with regression of the liver metastases, the size decreased and dense calcification developed, similar to old granulomatous disease. Our biopsies proved no active malignancy, even though melanin was still present. Of interest, a year long trial of immunosuppression showed no recurrence radiographically or on repeat liver biopsy, indicating repeat transplantation could be performed successfully. A second successful transplant in such a patient has been reported. [7]

References

1. Birkeland SA, Storm HH. Risk for Tumor and Other Disease Transmission by Transplantation: A Population-based Study of Unrecognized Malignancies and Other Disease in Organ Donors. Transplantation, 2002; 74:1409-1413. [PubMed]

2. Oesterwitz HE, Lucius K. Transmission of Cancer with Cadaveric Donor Kidneys, Transplantation Proceedings, 1991; 23(5):2647. [PubMed]

3. Penn I. Donor Transmitted Disease: Cancer, Transplantation Proceedings, 1991; 23(5):2629-2631. [PubMed]

4. Penn I. Malignant Melanoma in Organ Allograft Recipients, Transplantation, 1996; 61:274-278. [PubMed]

5. Winter TC, Keller PR, Lee FT, Pozniak MA. Donor-Derived Malignancy, J Ultrasound Med, 2001;20:559-562. [PubMed]

6. Elder GJ, Hersey P, Branley P. Remission of Transplanted Melanoma- Clinical Course and Tumour Cell Characterization, Clinical Transplantation, 1997; 11:565-568. [PubMed]

7. Suranyi MG, Hogan PG, Falk MC, Axelsen RA, Rigby R, Hawley C, Petrie J. Advanced Donor-Origin Melanoma in a Renal Transplant Recipient, Transplantation, 1998; 66:655-660. [PubMed]

8. Jeremy D, Farnsworth FH, Robertson MR, et al., Transplantation of Malignant Melanoma with Cadaver Kidney, Transplantation, 1972; 13:619-620. [PubMed]

9. Barroso-Vicens E, Ramirez G, Rabb H. Multiple Primary Malignancies in a Renal Transplant Patient, Transplantation, 1996; 61:1655-1656. [PubMed]

10. Lutz J, Heemann U. Tumours After Kidney Transplantation, Curr Opin Urol, 2003; 13:105-109 [PubMed]