Auto-Rejection of Renal Donor-Origin Metastatic Melanoma

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

Discussion
Transplantation of organs with known and undetected
donor neoplasms have been well documented in the litera-
ture [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 neo-
plasm, 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 extra-
cerebral 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 transmis-
sion 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 immu-
osuppression therapy in the hope that any remaining
transplanted tumor cells would be rejected by the recipients
immune system [3]. However, if allograft removal is ini-
tially refused, as in our case, or if allograft removal is not
feasible (e.g. liver transplant), the patient needs to be evalu-
ated 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 pro-
gression of disease occurred during the 6-month interval
from 6 months to one year post transplant. Perhaps, radi-
ologic 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 allo-
graft removal and cessation of immunosuppression therapy
as with our patient, but some patients have required immu-
notherapy or chemotherapy to eradicate the transmitted
melanoma. [4-8] Still, most of the reported patients died
from the melanoma. There have been no reports demon-
strating the radiographic regression of liver metastases on
CT from donor transmitted melanoma, to our knowledge.
However, there has been a report of resolution of meta-
static 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 biop-
sies proved no active malignancy, even though melanin was
still present. Of interest, a year long trial of immunosup-
pression showed no recurrence radiographically or on re-
peat liver biopsy, indicating repeat transplantation could be
performed successfully. A second successful transplant in
such a patient has been reported. [7]

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