Potential for overlooked melanoma in solid organ donors with a severely dysplastic nevus

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INTRODUCTION

Current or recent malignancy is a contraindication to organ donation because of the risk of transmission. Given the profound organ shortage in the United States, transplant surgeons frequently consider potential deceased organ donors with a remote history of malignancy. However, a diagnosis of melanoma, at any time, is an absolute contraindication to organ donation.[1] Melanoma is one of the cancers most commonly transmitted from donor to recipient, which is likely related to its pathophysiology. The behavior of melanoma can be modulated by immunity; melanoma can remain dormant in the donor and then reactivate in the recipient because of the intense immunosuppression required to prevent rejection.[2] The first described case of melanoma transmitted from donor to recipient occurred in 1961 when part of a melanoma was purposefully transmitted from a daughter to her mother with the hope the mother would develop antibodies against the melanoma that could be transmitted back to the daughter. Melanoma developed in the mother, and she died about a year later.[3,4] Buell et al[5] reported that melanoma initially present in the donor has a 74% transmission rate and a 58% mortality rate for organ transplant recipients. There are several reports of donor-derived melanoma being transmitted to some or all of the subsequent organ transplant recipients.[1,5,6] Because melanoma transmission is a significant risk, all potential donors undergo skin evaluation before organ allocation.

In contrast, potential organ donors with a history of basal cell carcinoma or cutaneous squamous cell carcinoma are commonly considered appropriate organ donors, but guidelines for organ donors with a history of dysplastic nevi are lacking.[1] Here we present a case of a deceased organ donor with a dysplastic nevus identified just before organ donation. Our center accepted the liver for transplantation in a patient with hepatitis C complicated by hepatocellular carcinoma. Consent for organ donation was confirmed, and the typical predonation evaluation commenced with anticipated donation of the liver and both kidneys.

CASE REPORT

The deceased organ donor

The donor was a 51-year-old man with brain death from an ischemic right middle cerebral artery stroke with hemorrhagic conversion, which required a right hemicraniectomy and resulted in brain death. He had a remote history of cutaneous squamous cell carcinoma and recently received a diagnosis of basal cell carcinoma, which was excised 3 weeks before the stroke.

Histopathology

During routine predonation evaluation of the donor, 2 concerning skin lesions were identified. Both underwent biopsy with immediate frozen section analysis, and the superior lesion was interpreted as a compound melanocytic nevus, whereas the inferior was described as a pigmented seborrheic

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keratosis. Based on these benign diagnoses, the organs were procured and transplanted into the recipients.

As is normally the case, permanent section analysis was not available until the posttransplant period. In the final pathology report, the superior lesion was reported as a severely dysplastic compound melanocytic nevus, and the inferior lesion had a final interpretation as a dysplastic compound melanocytic nevus. Based on concern for the discordance between the frozen and permanent sections, and the possibility of a misdiagnosed melanoma in situ, dermatopathology slide review was requested. During this secondary review, dermatopathology confirmed the diagnosis of dysplastic nevi and ruled out donor melanoma.

DISCUSSION

The diagnoses from frozen sections were available before organ allocation, but the final biopsy results were not available until well after transplantation. Notably, the final diagnosis differed from the frozen section. Had the final biopsy been positive for melanoma, the transplanted organs would likely have to be removed from their respective recipients if possible. The current recommendation for renal transplants with donor-related melanoma is to stop immunosuppression and remove the transplanted kidney. In non—renal transplant patients with life-sustaining organs, reduction of immunosuppression and immediate retransplantation is challenging, but it is the only option.[3]

Many standardized practices are in place to prevent donor-transmitted melanoma. In our local Organ Procurement Organization, procurement coordinators perform a physical examination on all potential donors, including a head-to-toe skin evaluation. The staff performing these examinations have training in the evaluation of irregularly shaped, raised, or discolored skin lesions. Their training consists of an annual online module with images of various lesions. Any concerning cutaneous findings are primarily evaluated by a physician at the donor hospital. If the physician is not comfortable making the diagnosis, a dermatology consultation is obtained before the decision to biopsy. In smaller hospitals with limited access to dermatology services, photographs are sent to the organ procurement organization's clinical operations manager or medical director for review.

Differentiating a dysplastic nevus from a melanoma on visual inspection is challenging, and a biopsy is frequently required. However, even after histopathologic examination, there can be poor interobserver diagnostic agreement. The concordance rate among experienced dermatopathologists in distinguishing dysplastic nevi from conventional melanocytic nevi or melanoma is in the range of 77%.[7] Our case highlights the difficulty in diagnosing melanocytic tumors using frozen section pathology. In this case, the cytologic atypia present in the permanent sections was not apparent in the frozen sections.

Currently no guidelines exist that are germane to organ donors with dysplastic nevi. Our case suggests that pigmented lesions should be evaluated by a dermatologist (on site or via teledermatology) and biopsied in situations of uncertainty before organ allocation. Melanoma can lay dormant for many years before being fully manifest clinically, and micrometastatic melanoma can also present in an occult fashion. In an immunocompetent donor, these dormant cells may be undiscovered for years. Once the affected organ is transmitted to the recipient, the resulting immunosuppression serves as a catalyst for reversion from dormancy.[3] Extreme precautions should be taken to prevent melanoma micrometastases or dormant cells from transfer during transplantation.

The case highlights a near miss that fortunately had a favorable outcome. Unfortunately, because of time constraints placed on the donation process by the donor's family, there is rarely time to await permanent biopsy results before organ allocation, although this should be the goal. Additionally, misdiagnosis can most likely be reduced by increasing involvement of dermatologists and dermatopathologists in evaluation of suspicious lesions.

REFERENCES

1. Morris-Stiff G, Steel A, Savage P, Devlin J, Grifiths D, Portman B, et al. Transmission of donor melanoma to multiple organ transplant recipients. *Am J Transplant*. 2004;4(3):444-446.
2. Katabathina VS, Menias CO, Tammisetti VS, et al. Malignancy after solid organ transplantation: comprehensive imaging review. *Radiographics*. 2016;36(5):1390-1407.
3. Strauss DC, Thomas JM. Transmission of donor melanoma by organ transplantation. *Lancet Oncol*. 2010;11(8):790-796.
4. Scanlon EF, Hawkins RA, Fox WW, Smith WS. Fatal homotransplanted melanoma: a case report. *Cancer*. 1965;18:782-789.
5. Buell J, Beebe T, Trofe J. Donor transmitted malignancies. *Ann Transplant*. 2004;2004(9):53-56.
6. Stephens JK, Everson GT, Elliot CL, et al. Fatal transfer of malignant melanoma from multiorgan donor to four allograft recipients. *Transplantation*. 2000;70(1):232-236.
7. Duncan LM, Berwick M, Bruijn JA, Byers HR, Mihm MC, Barnhill RL. Histopathologic recognition and grading of dysplastic melanocytic nevi: an interobserver agreement study. *J Invest Dermatol*. 1993;100:318S-321S.