Serendipitous discovery of peritoneal mesothelioma

Adam Jaster, MD, and Jason Wachsmann, MD

We present the case of a 64-year-old patient with a history of Birt-Hogg-Dube syndrome, polycystic kidney disease treated with renal transplantation in May 2013, and multiple types of skin cancers, including malignant melanoma. He presented for lymphoscintigraphy for sentinel lymph node identification of the melanoma. Subsequent biopsy of the right axillary sentinel lymph node yielded a diagnosis of epithelial type malignant mesothelioma without a known primary tumor. Follow-up positron emission tomography with 2-deoxy-2-(fluorine-18) fluoro-D-glucose integrated with computed tomography (F-18 FDG PET/CT) demonstrated several suspicious hypermetabolic abdominal masses that were later confirmed to be epithelial-type mesothelioma via percutaneous biopsy.

Malignant mesothelioma is a rare tumor that originates from the cells lining the mesothelial surfaces, including the pleura, peritoneum, pericardium, and tunica vaginalis. The most common subtype of mesothelioma is the pleural form (1). Malignant peritoneal mesothelioma (MPM) accounts for about 12.5% to 25% of malignant mesotheliomas and typically occurs in middle-aged men with a variety of abdominal symptoms (2). MPM is a very aggressive tumor that may present as either a localized or diffuse form. The diffuse form typically is more aggressive and has a worse prognosis (3).

CASE REPORT

A 64-year-old man presented to his dermatologist for a new skin lesion in the anterior chest wall. He had a history of Birt-Hogg-Dube syndrome, polycystic kidney disease treated with renal transplantation in May 2013, and multiple types of skin cancers, including malignant melanoma. Shave biopsy of the new lesion demonstrated melanoma. Subsequent lymphoscintigraphy performed with 55.5 Mbq of Tc-99m sulfur colloid showed a right axillary sentinel lymph node. The pathologic evaluation of this lymph node unexpectedly revealed malignant mesothelioma, epithelial type. The patient then underwent computed tomography (CT) of the chest, which was negative for thoracic mesothelioma. In an attempt to locate the primary lesion, a whole body

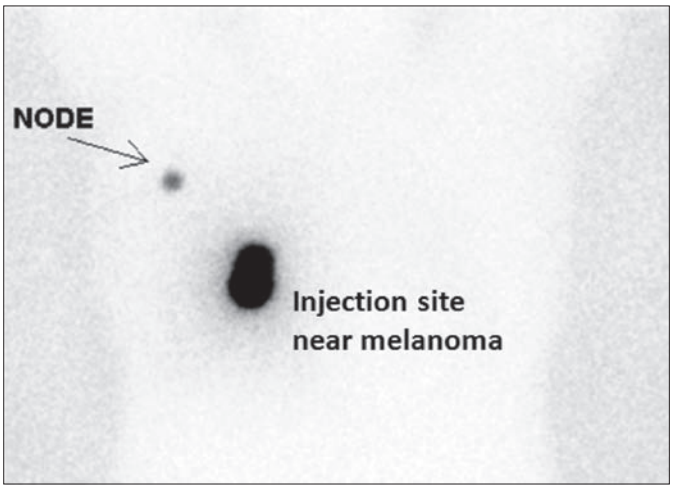

Figure 1. Lymphoscintigraphy performed with 55.5 Mbq of Tc-99m sulfur colloid showed a right axillary sentinel lymph node (arrow).

2-deoxy-2-(fluorine-18)fluoro-D-glucose positron emission tomography (F-18 FDG PET) integrated with CT was performed. This showed abnormal radiotracer uptake within two separate regions of the anterior abdominal wall, as well as the right inguinal region. Uptake related to the excisional biopsies of the melanoma and previously described right axillary sentinel lymph node were also noted *(Figure 2)*. After a diagnosis of MPM was made via percutaneous biopsy of an anterior abdominal wall mass, a review of prior imaging was performed. Magnetic resonance imaging (MRI) of the abdomen from November 2005 depicted an enhancing anterior periumbilical mass *(Figure 3)*.

DISCUSSION

The main risk factor for MPM is asbestos exposure; however, it is believed that this association is not as strong as the one between asbestos exposure and pleural mesothelioma

From the Division of Nuclear Medicine and Molecular Imaging, Department of Radiology, University of Texas Southwestern Medical Center, Dallas, Texas.

Corresponding author: Jason Wachsmann, MD, Department of Radiology, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, TX 75390-8896 (e-mail: Jason.Wachsmann@UTSouthwestern.edu).

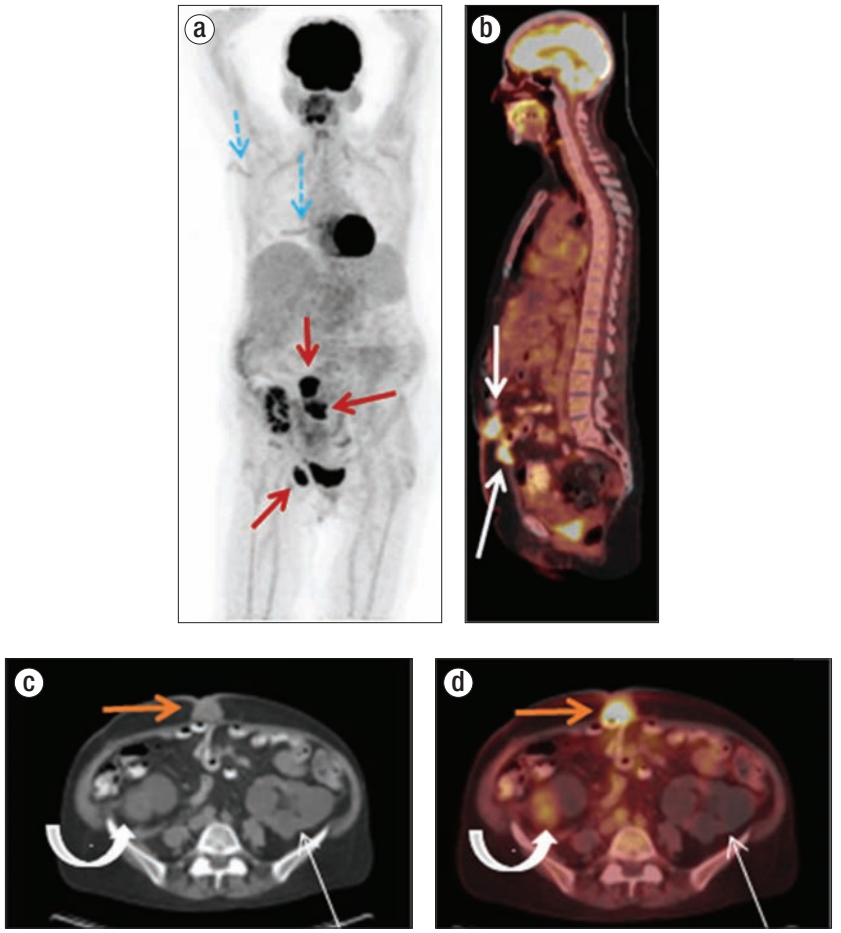

Figure 2. (a) Whole-body MIP image from an F-18 FDG PET/CT demonstrates abnormal radiotracer uptake within the two separate regions of the anterior abdominal wall as well as the right inguinal region (solid red arrows). Linear uptake in the right back and axilla (blue dashed arrows) corresponds to the melanoma excision and axillary node dissection sites. **(b)** Sagittal whole-body image from the same patient shows abnormal focal radiotracer uptake in two separate areas of the anterior abdominal wall (white arrows). **(c)** Transaxial CT and **(d)** FDG-18 PET/CT images at the level of the superiorly located abdominal wall mass show abnormal radiotracer uptake in the midline anterior wall on FDG-18 PET/CT, which corresponds with the anterior abdominal wall mass seen on CT (orange arrow). Also shown in these images are a right renal transplant (curved arrow) and polycystic left kidney (thin arrow).

(4, 5). Other proposed risk factors include simian vacuolating virus, familial Mediterranean fever, and mesothelioma susceptibility syndrome with *BRCA* germline mutations. Classically this tumor has a rapidly fatal course with a median survival time of 6 to 12 months. Since the disease is rare, information regarding the exact incidence, natural history, and risk factors is limited. Our patient had a history of Birt-Hogg-Dube syndrome, which is a genetic syndrome that classically involves an increased incidence of renal carcinoma, spontaneous pneumothorax, pulmonary cysts, and various skin lesions. However, the syndrome does not have a known association with mesothelioma.

The preliminary staging evaluation of peritoneal mesothelioma and subsequent follow-up imaging can be performed with CT, MRI, or FDG-PET. The evaluation of peritoneal mesothelioma by FDG-PET had an accuracy of 82% in a large study that retrospectively evaluated 60 patients with this disease. This study also demonstrated that in 15 of these patients with a post-treatment negative FDG-PET study, subsequent follow-up exams accurately detected disease recurrence or further disease absence in all cases (6). Multiple other case reports have utilized FDG-PET to assist in diagnosis, staging, and monitoring of therapy (7, 8).

MPM is classically a very rare and aggressive tumor involving the peritoneum. Of all documented mesotheliomas, it is second to pleural mesothelioma with an incidence of 10% to 30%. The estimated incidence of this disease is 200 to 400 cases annually. Our case did not follow the classic route in the workup of MPM.

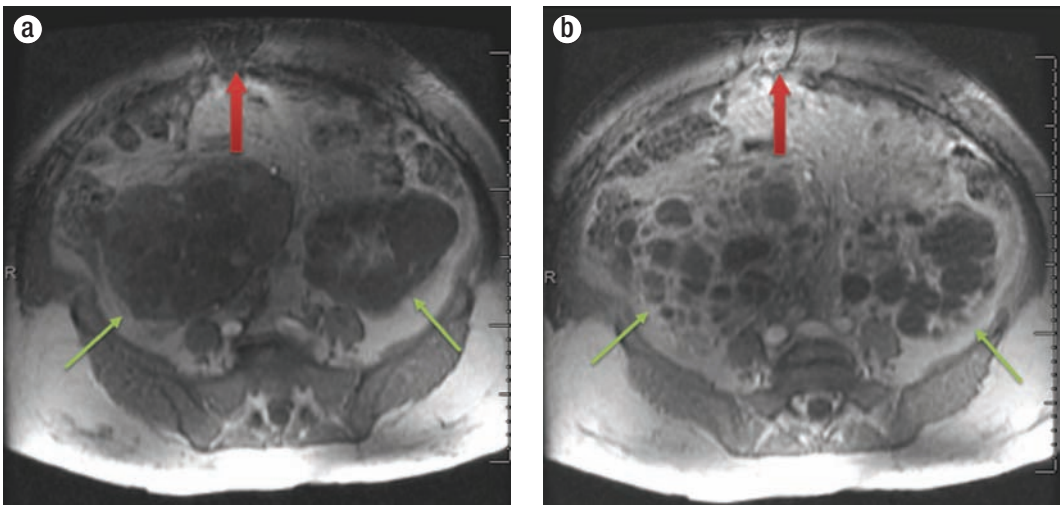

Figure 3. (a) Precontrast and **(b)** postcontrast transaxial spoiled gradient echo MR images from November 2005, which depict an enhancing anterior periumbilical mass that was biopsied in September 2014 and proven to be epithelial-type peritoneal mesothelioma (red arrow). Changes of polycystic kidney disease are also shown in these images (green arrows).

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