



Primary penile lymphoma: the use of PET-CT for accurate staging and response monitoring

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ABSTRACT

Primary penile lymphoma is an extremely rare neoplasm. We present a case of 63-year-old man with painless diffuse penile swelling and retention of urine. Biopsy from the penile swelling demonstrated CD20+ diffuse large B-cell lymphoma. Staging was performed using fluorine-18-fluorodeoxyglucose (FDG) positron emission tomography-computed tomography (PET-CT) and revealed a FDG avid penile mass with enlarged and FDG avid multiple inguinal and aortocaval lymph nodes. A follow-up FDG PET-CT scan after eight cycles of combination chemotherapy showed complete remission of the disease. Thus, FDG PET-CT should be integrated in management protocols of rare primary penile lymphoma.

Primarily lymphoma of the penis is a rare neoplasm with few reported cases in the literature. The disease can present with variable clinical appearances (1). It may also belong to the spectrum of secondary extranodal lymphoma that may be of nodal origin and invade the adjacent extranodal organ, or a hematogenous spread from a nodal site (2). While the role of fluorine-18 fluorodeoxyglucose (FDG) positron emission tomography-computed tomography (PET-CT) in the management of lymphoma has already been established (3), its role in patients with a rare extranodal variant of lymphoma, such as penile lymphoma, remains unclear because of the rarity of the condition. Here, we present a case of primary penile lymphoma where FDG PET-CT was used for accurate staging and treatment response monitoring.

Case report

A 63-year-old man presented with gradual diffuse painless penile swelling of six weeks duration. He also had difficulty in urination and episodes of urinary retention. Biopsy of the penile mass was performed and pathological examination revealed malignant CD20+ diffuse large B-cell lymphoma (DLBCL). Staging was performed using FDG PET-CT and revealed a FDG avid penile mass with enlarged and FDG avid multiple inguinal and aortocaval lymph nodes (Figs. 1, 2). Bladder catheterization was performed before the PET-CT procedure. The patient was treated with eight cycles of combination chemotherapy comprising cyclophosphamide, doxorubicin, vincristine, and prednisolone (CHOP) together with rituximab (R-CHOP regimen) at three-week intervals. Six months later, after completion of chemotherapy, a follow-up whole body FDG PET-CT revealed complete remission of disease activity in the penis and the involved lymph nodes (Figs. 1, 2). The patient was doing well at the 18th month follow-up.

Discussion

Extranodal non-Hodgkin's lymphoma (NHL) may involve organs such as the stomach, gastrointestinal tract, liver, pancreas, thyroid, nervous system, or skeletal system. However, primary penile lymphoma is an extremely rare variety of extranodal malignant NHL (1). The most commonly affected site is the shaft, followed by the glans penis (1). Diffuse penile swelling and nodular ulcers are the most common clinical presentations of this tumor. The patient in this report also presented with diffuse penile swelling. Difficulty in urination and priapism are uncommon clinical features. DLBCL of the penis is the most common histological variant (4), which was the diagnosis in this case.

Physical examination and radiological imaging investigation, including CT, magnetic resonance imaging (MRI) and PET, should be undertaken to stage the disease (5). The FDG PET-CT method is a noninvasive

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hybrid imaging tool used for staging and response evaluation of various metabolically active tumors, including lymphoma. Because of the whole body nature of acquisition, FDG PET-CT can detect previously unknown sites of disease. Guo et al. (6) have previously reported the utility of FDG PET-CT in a case of primary penile lymphoma that presented as malignant priapism. Solav et al. (7) reported a case where penile FDG uptake was incidentally noted during PET-CT in a patient with pyrexia of unknown origin, which turned out to be lymphoma upon histopathological evaluation. In the present case, the baseline PET-CT detected disease in the penis as well as in inguinal and aortocaval nodes. It also ruled out the presence of disease in other sites.

Multiple options, including surgical amputation, radiotherapy, and chemotherapy are available for the treatment of penile lymphoma (8). However, because of the rarity of the condition, current guidelines are lacking. The present patient underwent R-CHOP chemotherapy (9). It is known that FDG PET-CT is an excellent tool for monitoring treatment response after chemotherapy for lymphoma (10). However, such data are lacking for penile lymphoma. In the present case, postchemotherapy FDG PET-CT was also performed, which showed complete remission. The patient was doing well at the 18th month follow-up.

The differential diagnosis for a penile mass includes both malignant and benign lesions. Malignant masses include squamous cell carcinoma of the penis, anterior urethral carcinoma, primary penile sarcoma (epithelioid sarcoma, Kaposi sarcoma, leiomyosarcoma, and rhabdomyosarcoma), penile lymphoma, and metastases to the penis. Benign masses include Cowper's duct syringocele, peri-urethral abscess, Peyronie's disease, partial thrombosis of the corpus cavernosum, penile hemangiomas, and penile root neurofibroma. The FDG PET-CT method has been shown to be particularly useful in differentiating malignant from benign lesions (11). Masses that are FDG avid are usually malignant, which in the present case turned out to be malignant lymphoma. In addition, under physiological conditions, the diameter of lymph nodes in the inguinal region can exceed 1 cm in the absence of malignancy, which makes FDG PET-CT

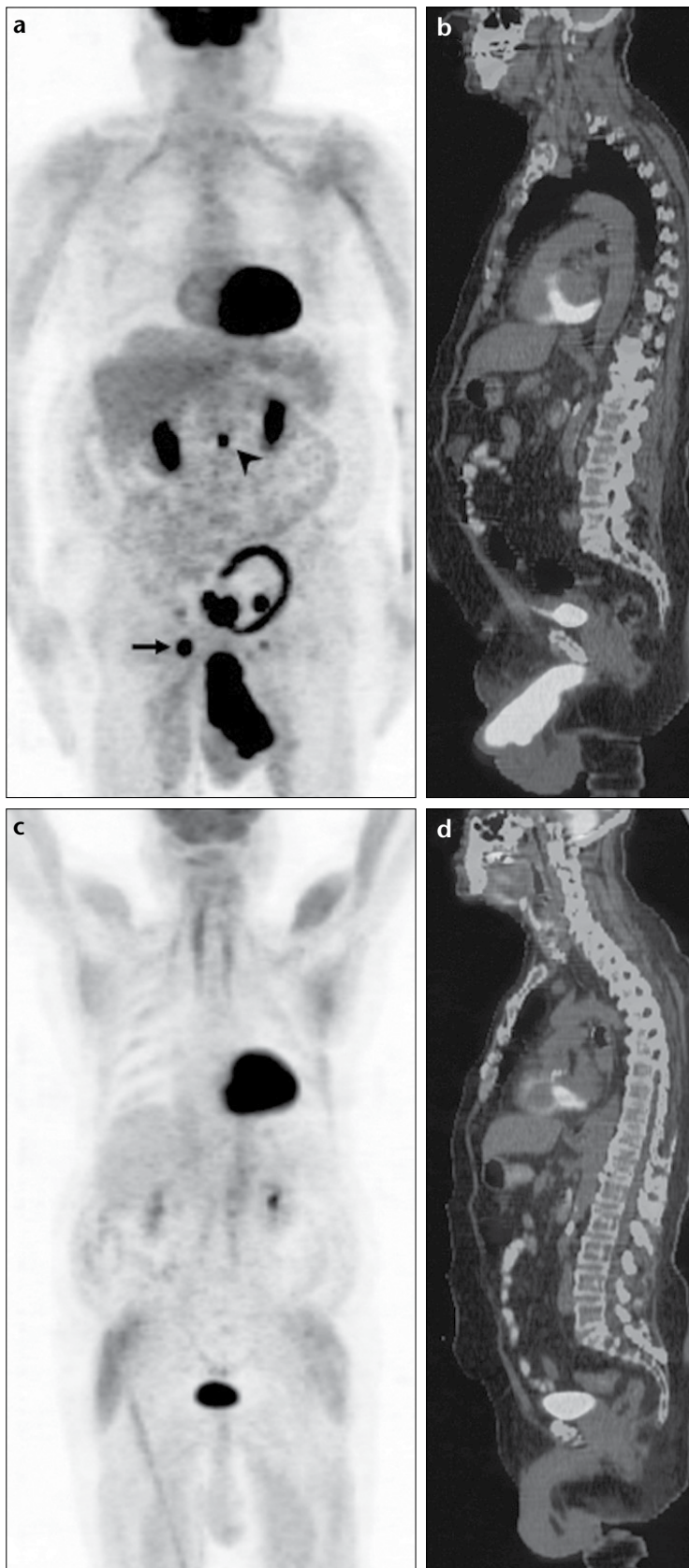


Figure 1. a–d. Baseline whole body FDG PET maximum intensity projection (MIP) image (a) and sagittal PET-CT image (b) show diffusely increased FDG uptake in the penis along with multiple focal areas of increased FDG uptake in region of inguinal (arrow) and abdominal lymph nodes (arrowhead). Postchemotherapy FDG PET MIP (c) and sagittal PET-CT (d) images reveal complete resolution of disease.

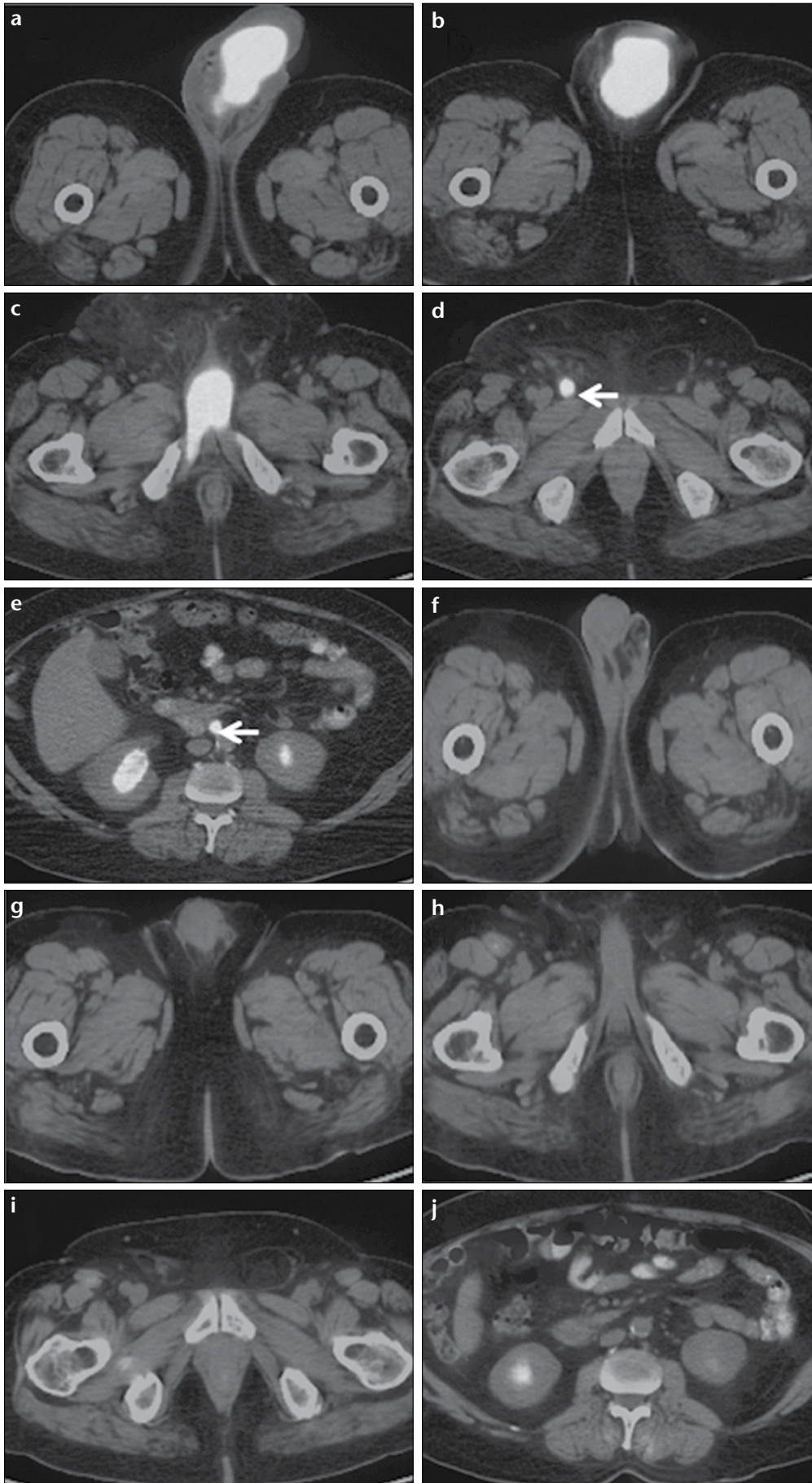


Figure 2. a–j. Baseline transaxial PET-CT images (a–c) show soft tissue mass involving the penis and penile muscles along with FDG avid right inguinal (d, arrow) and aortocaval lymph node (e, arrow). Follow-up transaxial PET-CT images (f–j) after eight cycles of chemotherapy show resolution of the penile and nodal lesions, suggesting complete response to chemotherapy.

advantageous over other cross-sectional imaging techniques, such as CT and MRI, for assessing the lymph node status of penile malignancies. Another important advantage of FDG PET-CT over CT or MRI is in differentiating recurrent or residual lesions from post-therapy changes.

The present report highlights the utility of FDG PET-CT for staging and response monitoring of penile lymphoma. We are of the opinion that FDG PET-CT should be integrated in management protocols of primary penile lymphoma.

Conflict of interest disclosure

The authors declared no conflicts of interest.

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