

Detection and response evaluation of penile metastasis from urinary bladder carcinoma demonstrated by F-18 FDG PET/CT

Sir,

We report the findings on positron emission tomography-computed tomography (PET-CT) fusion imaging of penile metastasis in a 59-year-old man with a history of transitional cell carcinoma (TCC) of the urinary bladder previously treated with cystectomy and orthotopic neobladder. The patient presented with an indurated ulcer in the base of penis after 4 months of curative resection. He was subjected to PET-CT imaging 45 minutes after intravenous administration of 10 mCi of [F-18] fluorodeoxyglucose (FDG). PET demonstrated intensely hypermetabolic disease in the base and shaft of penis that on fused CT localized to the ulcer in the penis [Figure 1A]. Disease was also noted involving external iliac and inguinal lymph nodes and additional lytic lesion in the left pubic symphysis [Figure 2]. The ulcerated lesion showing FDG uptake was confirmed to be metastatic from TCC. Patient was put on cisplatin and gemcitabine, given every 3 weeks for 6 cycles. Post-treatment PET/CT scan showed complete resolution of the metastatic activity [Figure 1B].

Approximately 300 cases of penile metastases are reported worldwide.^[1] Seventy percent of these metastases have their origin in the genitourinary tract, and the primary tumor is most frequently located in the bladder.^[2] Various mechanisms by which lesions may metastasize to the penis have been reported. Bordeau *et al.* reported 3 cases of penile metastases from TCC of the bladder, in which they assumed that metastatic spread from primary bladder cancer to the penis occurred mainly via the retrograde venous route.^[2] There are also a few reports of TCC seeding outside the urinary tract after iatrogenic procedures (i.e., partial cystectomy, suprapubic cystostomy, pyelotomy, and laparoscopy) as the cause of cutaneous metastasis.^[3-6]

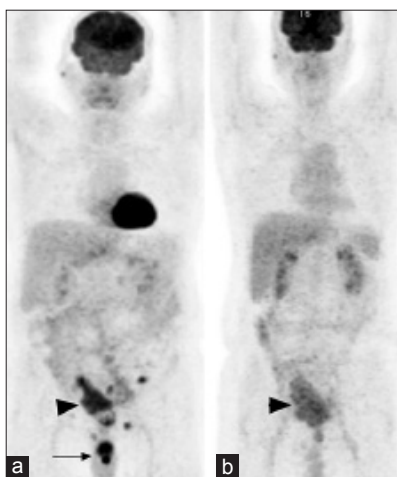


Figure 1: F-18 FDG PET/CT maximum intensity projection image. (a) Intense uptake in the base and shaft of penis (arrow) and physiological uptake in neobladder (arrowhead). Two FDG avid lymph nodes, one left external iliac and one left inguinal, are also visualized. The post-therapy MIP image. (b) Complete resolution of the FDG uptake in the base and shaft of penis as well as in the lymph nodes

The utility of FDG-PET in the evaluation of bladder cancer seems to be limited to the evaluation of distant metastases.^[7-8] This may be due to the fact that interpretation of F-18 FDG PET images is difficult because of urinary excretion of this radiotracer, which accumulates in the kidneys, ureters, and bladder and may conceal or mask pathologic deposits in malignant lesions. Bachor *et al.*^[9] in their study using F-18 FDG PET for pre-operative staging of bladder cancer in 64 patients reported a sensitivity of 67%, specificity of 86%, and diagnostic accuracy of 80% in regional or lymph node staging and found these to be superior to those obtained with conventional imaging methods. Similarly, Kosuda *et al.*^[10] analyzed the contribution of F-18 FDG PET in assessment of the residual or recurrent primary tumor, regional lymph node involvement, and metastasis detection in histologically confirmed residual or recurrent bladder cancer after surgery and/or radiotherapy. They reported that F-18 FDG PET imaging had excellent diagnostic performance in the detection of distant disease, since it correctly identified 100% distant metastatic lesions (lung, bone, and distant lymph node stations.) Recently, Jadvar *et al.*^[11] reported

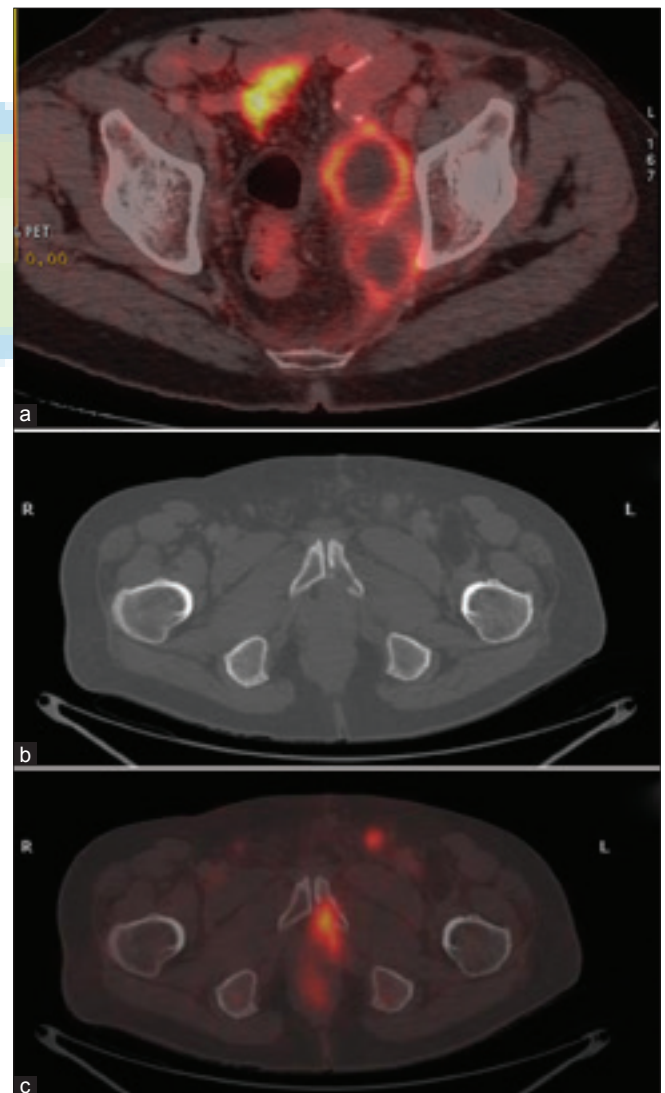


Figure 2: Pre-therapy trans-axial PET/CT images. (a) Intense uptake in the periphery of necrotic left external iliac lymph node. Trans-axial CT image of the pelvis. (b) A lytic lesion in the left pubic symphysis while PET/CT image. (c) FDG uptake in lytic lesion as well as in a left inguinal lymph node

that the information provided by PET-CT changed the management in 17% of their patients. To the best of our knowledge, this is the first reported case of penile metastasis from TCC of the urinary bladder post-cystectomy demonstrated by F-18 FDG PET and also associated solitary bone metastasis. Further response to chemotherapy using FDG PET/CT has also been elucidated in this report.

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