Penile Metastasis from Renal Cell Carcinoma: Diagnosis and Posttreatment Response Seen on Fluorodeoxyglucose Positron Emission Tomography–Computed Tomography

Abstract

We present fluorodeoxyglucose positron emission tomography–computed tomography (FDG PET-CT) findings in an extremely rare case of penile metastasis from renal cell carcinoma. A 66-year-old male, a known case of renal cell carcinoma, underwent FDG PET-CT. The scan showed metabolically active cervical lymph nodes, lytic skeletal lesions, deposit in the left adrenal gland, and nodules in the bilateral lungs, indicating metastatic disease. In addition, a hypermetabolic lesion was seen in the corpus cavernosum of the shaft of the penis, suggestive of penile metastasis. Follow-up PET-CT after tyrosine kinase inhibitor therapy showed reduction in size and metabolic activity of all previously seen lesions including penile lesion, suggestive of favorable response to therapy.

Keywords: *Fluorodeoxyglucose positron emission tomography–computed tomography, penile metastases, renal cell carcinoma, tyrosine kinase inhibitor*

Prathamesh Vijay Joshi, Rajesh Saoji[1], Mukta Kulkarni, Kritik Kumar

Departments of Nuclear Medicine and PET-CT and [1]Surgical Oncology, Kamalnayan Bajaj Hospital, Aurangabad, Maharashtra, India

A 66-year-old male, a case of left renal cell carcinoma, had undergone radical nephrectomy a year ago. The histopathology evaluation had revealed clear cell type of renal cell carcinoma with sarcomatoid differentiation. During clinical follow-up, he complained of left arm pain and bilateral neck swellings. Ultrasonography revealed multiple, bilateral cervical lymph nodes with loss of fatty hilum, suggestive of metastatic lymphadenopathy. Fluorodeoxyglucose positron emission tomography–computed tomography (FDG PET-CT) was advised to evaluate the whole-body status of disease. After overnight fasting, 7 mCi of FDG was injected intravenously and whole-body FDG PET-CT was performed 60 min later. Intravenous CT contrast was not administered due to deranged kidney function.

The PET-CT [Figure 1a, maximum intensity projection image] showed metabolically active bilateral cervical lymph nodes (green arrow), lytic skeletal lesion in the left humerus shaft (short black arrow), lytic skeletal lesion in the left acetabulum (long black arrow), deposit in the left adrenal gland (blue arrow), and nodules in the bilateral lungs, indicating metastatic disease. In addition, an ill-defined, FDG-avid lesion was seen in the left corpus cavernosum of the shaft of the penis causing deviation of septum to right [red arrow in Figure 1a and 1c]. On questioning, the patient admitted of having mild dysuria; however, no penile pain, hematuria, or cutaneous ulceration was reported. In setting of multiple visceral metastatic diseases seen at other sites, biopsy was avoided and this FDG-avid penile lesion was interpreted as penile metastasis.

The patient was treated with tyrosine kinase inhibitor (TKI) therapy with oral pazopanib. Post-TKI therapy, the patient reported gradual relief of bone pain along with reduction in cervical lymphadenopathy. Follow-up PET-CT was performed 6 months after initiating TKI therapy. The follow-up PET-CT [MIP image, Figure 1b] showed significant morphological and metabolic reduction in all previously seen lesions including penile lesion [red arrow, Figure 1d], suggestive of favorable response to therapy.

Penile metastases are extremely rare with <500 cases reported.[1] Common

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How to cite this article: Joshi PV, Saoji R, Kulkarni M, Kumar K. Penile metastasis from renal cell carcinoma: Diagnosis and posttreatment response seen on fluorodeoxyglucose positron emission tomography–computed tomography. Indian J Nucl Med 2020;35:165-6.

Address for correspondence:
Dr. Prathamesh Vijay Joshi, Department of Nuclear Medicine and PET-CT, Kamalnayan Bajaj Hospital, Beed Bypass Road, Aurangabad - 431 010, Maharashtra, India.
E-mail: drprathamj@gmail.com

Received: 01-01-2020
Accepted: 14-01-2020
Published: 12-03-2020.

Access this article online

Website: www.ijnm.in

DOI: 10.4103/ijnm.IJNM_1_20

Quick Response Code:

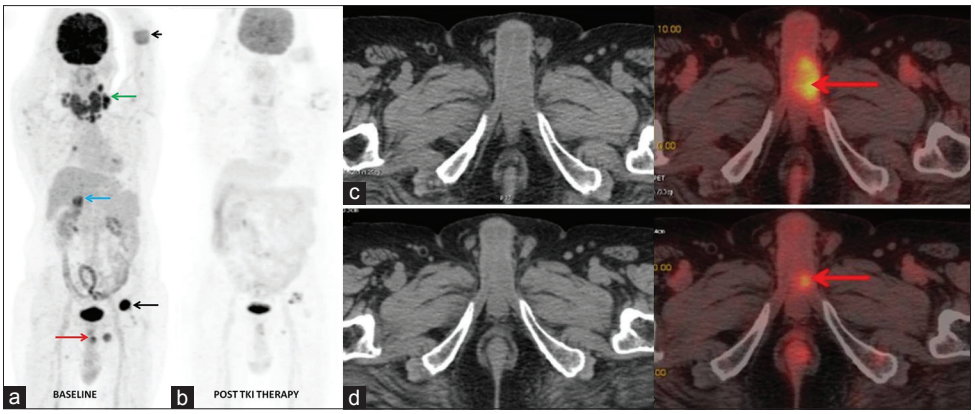

Figure 1: Positron emission tomography–computed tomography (a: maximum intensity projection) showed metastatic disease in cervical lymph nodes (green arrow), skeletal lesion in the left humerus (short black arrow), lesion in the left acetabulum (long black arrow), deposit in the left adrenal gland (blue arrow), and nodules in the bilateral lungs. In addition, an ill-defined, fluorodeoxyglucose-avid lesion was seen in the shaft of the penis causing deviation of septum to right (red arrow in a and c). Follow-up positron emission tomography–computed tomography after tyrosine kinase inhibitor therapy (maximum intensity projection: b) showed significant morphological and metabolic reduction in all previously seen lesions including penile lesion (red arrow d)

primaries that metastasize to the penis include bladder, prostate, colon, rectum, and kidney.[2-4] Clinical presentation mainly includes penile pain, palpable nodules, and priapism. Increased penile size, cutaneous ulceration, dysuria, and hematuria may also occur.[5]

Penile involvement in any primary malignancy indicates grave prognosis as it indicates disseminated disease. The median survival of such patients varies from 6 months to 2 years.[6,7] However, significant advances have been made in the last decade since the introduction of different TKIs such as sunitinib, pazopanib, and sorafenib.[8] In our case, significant reduction in disease activity was observed after TKI therapy.

Our case highlights the role of whole-body imaging and exquisite sensitivity offered by FDG PET-CT in diagnosing rare occurrence of penile metastasis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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