Case Report

Small Cell Carcinoma Prostate: A Case Report with Findings on 18-F FDG PET/CT

Abstract

Small-cell carcinoma of the prostate (SCCP) is a rare and very aggressive malignancy with neuroendocrine differentiation. In contrast to conventional prostate adenocarcinoma, SCCP is an aggressive carcinoma and portends to have a poor prognosis. Around 50% of these patients have metastatic disease at the first clinical presentation. We report the findings of 18-F fluorodeoxyglucose positron emission tomography/computed tomography in a case of histologically proven SCCP with an unusual finding of the left internal mammary lymph node.

Keywords: *18-F fluorodeoxyglucose positron emission tomography/computed tomography, neuroendocrine carcinoma prostate, small cell carcinoma prostate*

Sulochana Sarswat, Kalpa Jyoti Das, Seema Kaushal[1], Abhinav Singhal, Aparna Sharma[2]

Departments of Nuclear Medicine and [2]Medical Oncology, National Cancer Institute (NCI-AIIIMS), Jhajjar, Haryana, [1]Department of Pathology, AIIMS, New Delhi, India

Introduction

Small-cell carcinoma of the prostate (SCCP) is a rare and aggressive malignancy with a median survival rate of 1–2 years from the time of diagnosis.[1] It accounts for 0.5%–1% of the prostatic malignancies, half of which unveil as a *de novo* malignancy with pure malignant neuroendocrine cells, around 25%–50% of cases are mixed with a conventional prostatic adenocarcinoma, and rest 25%–40% of the cases are initially diagnosed as prostatic adenocarcinoma and recur as small-cell carcinoma after hormonal therapy. Unlike adenocarcinoma of the prostate, the serum prostate-specific antigen (PSA) levels remain low in patients with SCCP. In accordance with neuroendocrine tumor, SCCPs are often positive for neuroendocrine markers such as chromogranin A, synaptophysin, and neuron-specific enolase (NSE). Similar to small cell carcinoma of the lung, TTF-1 is often positive in SCCP. Owing to the aggressive nature, 75% of cases are at advanced stage at the time of diagnosis.[2] SCCP also has a tendency to systematically metastasize and most commonly metastasize to lymph nodes, liver, bone, and lungs.[2] About 10% of these cases may be associated with paraneoplastic syndrome.[3]

18-F fluorodeoxyglucose positron emission tomography/computed tomography (18-F FDG PET-CT) is not routinely recommended in prostate adenocarcinoma due to low glycolytic activity. Unlike adenocarcinoma, SCCP is FDG avid and present as hypermetabolic lesions and 18-F FDG PET-CT can help detection of nodal and visceral metastases.[4-6]

Here, we present the case of small-cell carcinoma prostate, where 18-F FDG PET-CT revealed metabolically active primary in the prostate with metastases to pelvic node, bones, and lungs. An unusual site of FDG avid left internal mammary node was also picked up by the 18-F FDG PET-CT scan.

Case presentation

A 57-year-old male presented to the hospital with lower urinary tract symptoms of frequency, urgency, and hesitancy in passing urine. On digital rectal examination, the prostate was found to be bulky. Serum PSA level was low (0.02 ng/mL). The patient underwent transurethral resection of the prostate (TURP) and histopathological examination revealed features of small cell neuroendocrine carcinoma. The tumor cells were positive for pancytokeratin, synaptophysin, and insulinoma associated

How to cite this article: Sarswat S, Das KJ, Kaushal S, Singhal A, Sharma A. Small cell carcinoma prostate: A case report with findings on 18-F FDG PET/CT. Indian J Nucl Med 2024;39:126-8.

Address for correspondence:
Dr. Kalpa Jyoti Das, Assistant Professor (Nuclear Medicine) National Cancer Institute (NCI), Jhajjar, Haryana, India.
E-mail: kalpadass@rediffmail.com

Received: 06-11-2023
Revised: 06-12-2023
Accepted: 18-12-2023
Published: 29-05-2024

Access this article online

Website: www.ijnm.in

DOI: 10.4103/ijnm.ijnm_122_23

Quick Response Code:

protein 1 (INSM-1) [Figure 1]. The patient was referred to the nuclear medicine department for a staging 18F-FDG PET-CT scan, which showed a metabolically active soft-tissue density mass lesion involving almost the entire prostatic parenchyma with invasion of bilateral seminal vesicles [Figure 2]. 18-F FDG PET-CT also picked up a solitary left lung nodule and multiple disseminated lytic lesions in the visualized axial and appendicular skeleton. Furthermore, a metabolically active left internal mammary lymph node was detected.

Discussion

SCCP is a rare high-grade malignant entity that morphologically resembles its counterpart in the lung.[3] SCCP is of clinical importance because of its aggressive nature, rapid progression, and resistant to hormonal therapy with a very poor prognosis.[7] Patients frequently present with symptoms of prostatism as observed in our case too. SCCP can metastasize to sites uncommon for adenocarcinoma prostate.[8] SCCP often leads to osteolytic bone lesions in contrast to osteoblastic bone metastases observed in conventional adenocarcinoma prostate. Although 18-F FDG PET-CT is not routinely recommended in prostatic adenocarcinoma, it has a role in the detection of metastatic disease in SCCP which is a common presentation in this variant of prostate cancer and also in monitoring treatment response. In the present case, 18-F FDG PET-CT revealed multiple hypermetabolic osteolytic bone lesions and a solitary lung nodule. 18-F FDG PET-CT also revealed a metabolically active left the internal mammary lymph node, which is an unusual finding for SCCP. Although the internal mammary lymph node was not subjected to histopathological examination, in view of other distant metastases and given the propensity of SCCP for widespread metastases, it was deemed as suspicious for metastatic lesion.

Given the increasing incidence of SCCP, it is pertinent to keep a high level of suspicion for SCCP and be familiar with its pattern of metastatic involvement.

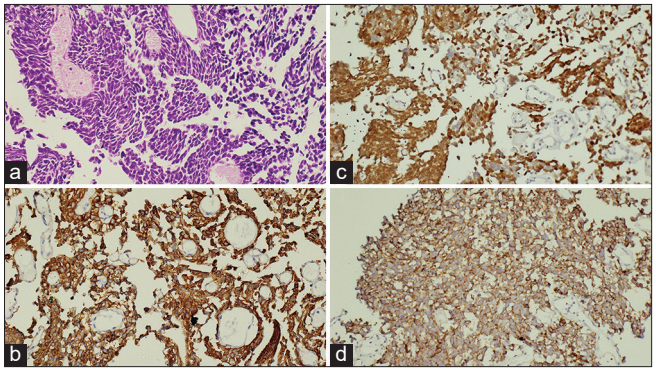

Figure 1: Biopsy from the prostatic parenchyma showing a): Ovoid to round tumor cells with stippled chromatin (H&E 20x), b) Tumour cells showing cytoplasmic and membranous positivity for Synaptophysin (20x), c) Tumour cells showing cytoplasmic and membranous positivity for INSM1 (20x), d) Tumour cells showing perinuclear dot like positivity for pancytokeratin (20x).

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.

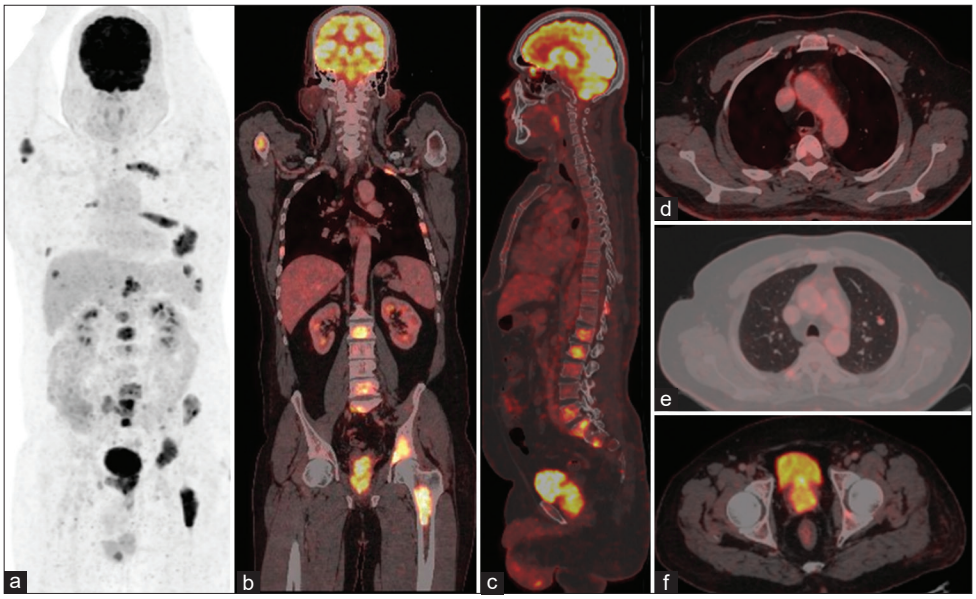

Figure 2: 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18-F FDG PET-CT) images – (a) MIP PET image, (b) Coronal fused PET-CT image, (c) Sagittal fused PET-CT image showing FDG avid prostatic primary and extensive skeletal metastases, axial section fused PET-CT images, (d) Left internal mammary lymph node in the second intercostal space (blue arrow), (e) FDG avid lung nodule in the left lung upper lobe, and (f) FDG avid prostatic primary invading into the urinary bladder

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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