High Flow Priapism on ^{18}F FDG PET/CT in a Patient with Urothelial Carcinoma: Case Report

A. Ouboukdir, J. Benouhoud, H. Lachhab, C. Waffar, and Y. Ghannam

ABSTRACT

We studied a 52-year-old man diagnosed with a high-grade urothelial carcinoma of the upper urinary tract treated with nephroureterectomy and chemotherapy who presented a benign high-flow priapism with intensive ^{18}F -fluorodeoxyglucose (FDG) uptake as an unusual finding in the positron emission tomography (PET)/computed tomography (CT) that also showed mediastinal and lumbo-aortic node involvement and liver metastases. Upon examination, the patient had a painless erection that lasted for five days with no episode of recurrence at two-month follow-up.

Keywords: ^{18}F -FDG uptake, high-flow, PET/CT, priapism.

Submitted : May 04, 2021

Published : May 26, 2021

ISSN: 2593-8339

DOI: 10.24018/ejmed.2021.3.3.861

A. Ouboukdir*

Hassan II Oncology Hospital, Oujda, Morocco.

(e-mail: amine1ouboukdir@gmail.com)

J. Benouhoud

Anoual Petscan, liberal sector, Casablanca, Morocco.

H. Lachhab

Department of urology, UHC Ibn Rochd, Casablanca, Morocco.

C. Waffar

Department of Urology, UHC Ibn Rochd, Casablanca, Morocco.

Y. Ghannam

Department of Urology, UHC Ibn Rochd, Casablanca, Morocco

**Corresponding Author*

I. INTRODUCTION

Priapism is defined as a prolonged and persistent penile erection lasting longer than four hours and unrelated to sexual activity, it is categorized as ischemic (low flow) priapism and non-ischemic (high flow) priapism [1]. Literature reports a very few case reports and the observation of this type of dysfunction on ^{18}F -fluorodeoxyglucose (FDG) positron emission tomography (PET)/computed tomography (CT) is rare.

We report on the case of a benign high-flow priapism discovered incidentally during the performance of a FDG PET/CT scan in a 52-year-old patient for assessment of the extension of his urinary tract carcinoma.

II. CASE PRESENTATION

A 52-year-old man who was a chronic smoker presented with macrohematuria and lower back pain, CT scan of the abdomen showed a mass lesion in the collecting system of right kidney, an infiltration into right renal cortex and a lateral caval lymphadenopathy with negative complementary extension assessment tests. Right nephroureterectomy and lymph node dissection were performed, histopathological findings showed a high-grade urothelial carcinoma affecting the upper urinary tract with a clinical stage of T3N2M0. Thereafter, gemcitabine plus carboplatin as first-line adjuvant

chemotherapy had been provided and the patient showed good clinical response.

At two months he presented with chest pain and marked loss of weight, FDG PET/CT was performed and showed an unusual intense and diffuse FDG increased uptake of the penis (Fig. 1), an increased uptake of the tracer in mediastinal, lumbo-aortic lymph nodes and the liver (Fig. 2), and an hypermetabolism of the right spermatic vein satellite to his penile hypermetabolism, which supports the origin of a high flow priapism (Fig. 3).

Fig. 1. Whole body fluorodeoxyglucose positron emission tomography/computed tomography maximum intensity projection images show uptake in the mediastinum, the abdomen, and the penis.

Fig. 2. Thoracic axial computed tomography (a) and positron emission tomography/computed tomography (b) showing several mediastinal lymph nodes with hypermetabolism. Abdominal axial computed tomography (c) and positron emission tomography/computed tomography (d) showing two hypermetabolic foci in the liver with hypermetabolic lumbo-aortic lymph nodes.

Fig. 3. Pelvic axial computed tomography (e), positron emission tomography/computed tomography (f), sagittal computed tomography (g) and positron emission tomography/computed tomography (h) showing an intense and diffuse uptake of FDG in the cavernous and spongiosus bodies of the penis.

Upon examination, the patient had a painless erection without any mass, ulceration or swelling of the penis. Because of his metastases, a second-line palliative chemotherapy regime was started by his physician and the patient's priapism resolved spontaneously after five days, with no episode of recurrence at two-month follow-up.

III. DISCUSSION

FDG PET/CT has been considered limited in the initial investigation of urinary tract carcinomas because detection of the primary tumor is difficult due to renal excretion and accumulation of the tracer in the urinary tract [2]. However, it retains all its usefulness in diagnosis of recurrent and metastatic carcinomas after treatment, mainly nodal and distant metastasis [3], as was the case in our patient.

FDG is a marker of carbohydrate metabolism and is therefore not specific for tumor, inflammatory or infectious lesions, an increased blood flow also exhibit increased uptake of this tracer as the case of a high-flow priapism [4]. However, a histological confirmation of persistent lesions by biopsy should be performed so as not to miss a malignant origin.

High-flow nonischemic priapism is the outcome of an exaggerated arterial flow into the cavernous artery, it can be idiopathic or secondary to perineal or penile blunt trauma resulting in an arteriocavernous fistula, urethral and cavernous interventions, spinal cord injuries, sickle cell anemia, and after adrenergic α -blocker use [4]. This type of priapism is usually self-limiting, and the recommended first line therapy is observation, as was the case in our patient.

IV. CONCLUSION

In conclusion, we demonstrated the benefit of performing FDG PET/CT not only in the assessment of urinary tract carcinomas, but also showed a benign priapism as an unusual finding in this imaging modality and allowed its management within the time limits.

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