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Case report

Penile squamous cell carcinoma: How to identify metastatic inguinal lymph nodes in ^{18}FDG PET/CT?

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Abstract

Penile cancer (PC) is a rare neoplasm accounting for 2% of all cancers among men. With this highly lymphophilic tumor, inguinal node metastases are the most relevant prognostic factor and are associated with decreased survival. The PC evaluation presents a major challenge for therapeutic strategy. Here, we report the case of a 73-year-old man who was discovered with a process of the glans. The histopathological results concluded to be a penile squamous cell carcinoma (PSCC). An MRI scan showed a penile tumor process classified as T4Nx, with the presence of hypertrophic inguinal lymph nodes, which were not clearly suspicious. He was operated by total penectomy followed by perineostomy. The tumor was classified as pT3Nx. An 18F-fluorodeoxyglucose (118FDG) positron emission tomography / computed tomography (PET/CT) was requested to explore the metabolic pattern of these lymph nodes. 18FDG-PET/ CT demonstrated suspicious bilaterally hypermetabolic inguinal nodes, in favor of their metastatic nature and a non-specific hypermetabolism of the penile root. The decision of the urologist was to complete with an inguinal lymphadenectomy.

Keywords: penile carcinoma, squamous cell carcinoma, ^{18}FDG, PET/CT, metastatic lymph nodes.

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1. Introduction

Penile squamous cell carcinoma (PSCC) is an uncommon tumor, accounting for 2% of men's malignancies, that mostly affects less developed countries. It has a silent course and an aggressive behavior affecting male health survival [1]. PSCC is known to be a highly lymphophilic tumor. Consequently, the primary prognostic factor is inguinal lymph nodes metastases, which contribute to a poor survival rate [2]. Otherwise, in only 70% of individuals with palpable inguinal nodes histological evidence shows metastatic invasion. Conversely, up to 25 % of patients with clinically impalpable inguinal lymph nodes develop metastases [3]. Therefore, accurate lymph node metastasis (LNM) evaluation in patients with PSCC presents an essential challenge for therapeutic strategy.

Inguinal lymphadenectomy has been considered so far to be the most exact means of staging. Nevertheless, it is associated with a high morbidity rate. Hence, noninvasive prediction of patients' LNM status can significantly improve patient survival. In the literature, ^{18}FDG-PET/CT has shown encouraging results in lymph node staging and identifying distant metastasis in patients with PSCC due to the often hight pattern on FDG absorption, so that even small lesions can be identified.

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2. Case report

Here we report the case of a 73-year-old man who consulted urgently for a penile discharge, with discovery on clinical examination of a tissue process of the glans. An MRI scan showed a penile tumor process classified as T4Nx, with the presence of hypertrophic inguinal lymph nodes, which were not clearly suspicious. A biopsy was performed and the histopathological diagnosis concluded to be a squamous cell carcinoma of the penis. He was operated by total penectomy followed by perineostomy. The tumor was classified as pT3Nx (Fig. 1).

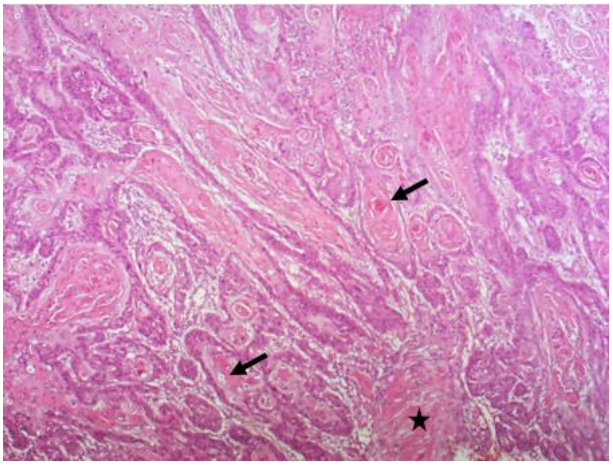

Fig.1. Well-differentiated squamous cell carcinoma showing large keratine pearls (arrows). Note the invasion of the smooth muscle (asterisk) (HE x 50).

An 18F-fluorodeoxyglucose (^{18}FDG) positron emission tomography/computed tomography (PET/CT) was requested to explore the metabolic pattern of these lymph nodes. ^{18}FDG-PET/ CT demonstrated suspicious bilaterally hypermetabolic inguinal nodes (SUVLbm max = 5.8 on the right and 4.17 on the left) in favor of their metastatic nature and a non-specific hypermetabolism of the penile root (SUVLbm max=8). The rest of the examination was free of metabolic abnormalities (Fig. 2). The decision of the urologist was to complete with an inguinal lymphadenectomy. Unfortunately, the patient refused to undergo any further surgery.

3. Discussion

The clinical guidelines of the EAU (European Association of Urology) and the recommendations of the 2013 CCAFU (Comité Cancérologie de l'Association Française d'Urologie) include ^{18}FDG PET/CT as a diagnostic tool to detect possible pelvic node metastases and distant metastases [4].

The major indication for ^{18}FDG PET/CT in the initial staging and therapeutic assessment of PSCC patients is the prognostically crucial identification of metastatic lymph nodes due to the significant potential morbidity of systematic lymphadenectomy [5]. An extra advantage increasing diagnostic security offered by PET/CT is the screening patients with whole body imaging ensuring the identification of suspicious distant lesions [6].

Palpation is the first step in the noninvasive assessment of potential lymph node involvement. In terms of N staging, ultrasound is regarded as unreliable while CT imaging has also shown poor results. This phenomenon can be explained in part by the reactive changes that lymph nodes encounter because of the penile carcinoma. Additionally, even in the absence of cancer, the diameter of lymph nodes in the inguinal region might exceed 2 cm under physiological conditions [7].

As a result, ^{18}FDG PET/ CT data facilitated the detection of lymph node malignancy without relying on a size-based classification scheme, which is the case with CT and MRI. It is also important to note that ^{18}FDG PET/CT results appear to get more accurate as the pre-test probability of metastatic involvement increases [8].

Sher et al. found in a study including thirteen patients with penile cancer that 18FDG PET/CT had a high sensitivity of 94% (15 of 16 metastatic lymph nodes) and no false-positive findings. PET/CT failed to detect only one among the 16 lesions, which was found to be a lymph node micro-metastasis. Most of the metastatic lesions showed high FDG uptake [9].

In a meta-analysis carried out by Sadeghi et al [10], the specificity of ^{18}FDG PET/CT for diagnosing inguinal lymphnodes lesions was 92.4%, meaning that hypermetabolic inguinal lymph nodes are very likely to be true positives.

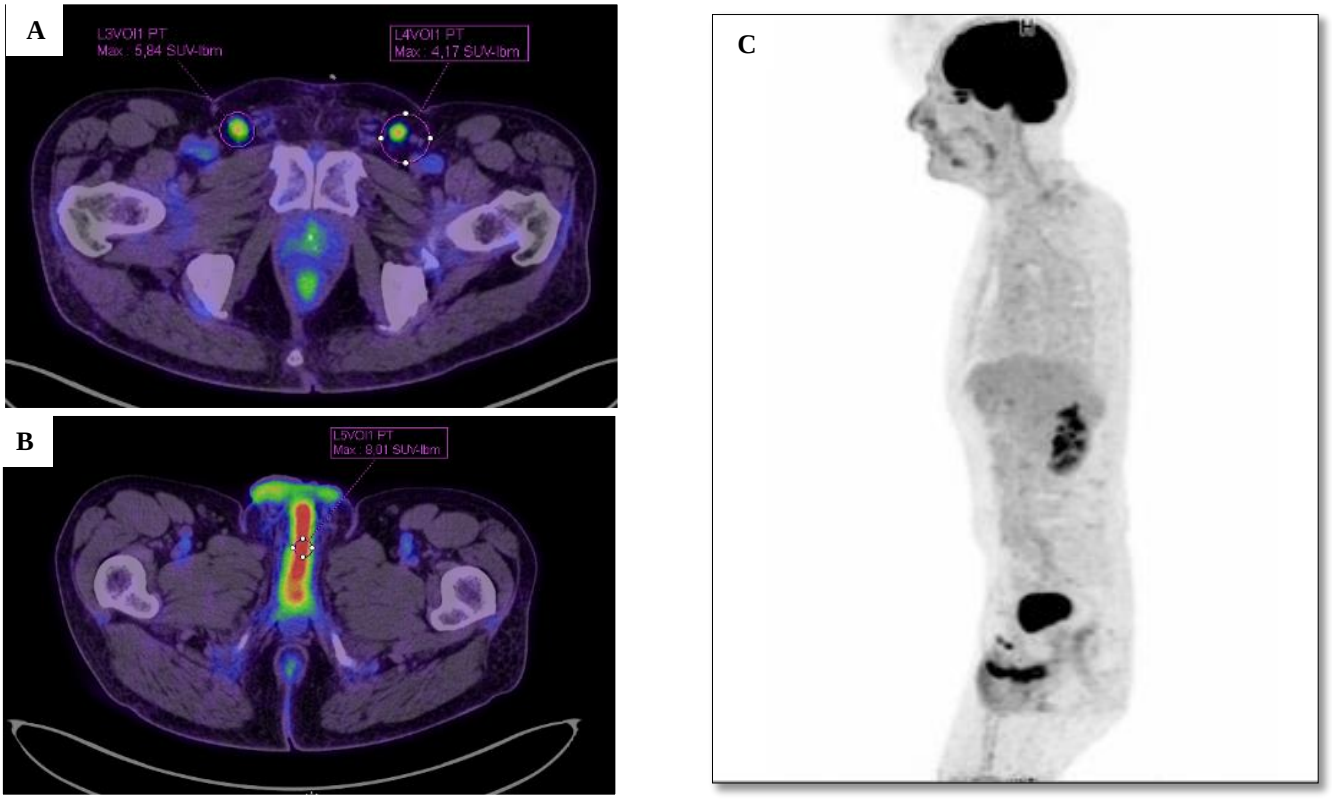

Fig.2. A- bilaterally hypermetabolic inguinal nodes (SUVLbm max = 5.8 on the right and 4.17 on the left ; B- Non-specific hypermetabolism of the penile root (SUVLbm max=8) ; C- MIP (sagittal projection) showing bilateral inguinal hypermetabolic lymph nodes (arrows) without any distant metabolic abnormalities

Conclusion

Studies particularly reporting the accuracy of ^{18}FDG PET/CT in penile cancer are scarce, given the low prevalence of penile cancer. However, we draw the conclusion that ^{18}FDG PET/CT is a very useful preoperative tool for exact penile cancer staging, providing thereby the clinician with appropriate treatment plans.

Consent of patient

Written informed consent was obtained from the patient for participation in this study.

Consent for publication

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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None.

Conflict of Interest Disclosures

All authors declare that they have no conflict of interest.

Authors' contribution

All authors listed have significantly contributed to the investigation, development and writing of this article.

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