IMAGES IN UROLOGY

18F-fluorocholine uptake into pagetic vertebrae in prostate cancer patients: two cases


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A 70-year-old man was diagnosed in March 2014 with adenocarcinoma of the prostate, Gleason 8 (4 + 4); an abdominal CT scan revealed degenerative changes in L2/L3 and a bone scintigram showed suspicious uptake in the cervical column. An 18F-fluorocholine PET/CT (18F-FCH PET/CT) scan was done as the initial staging study to rule out distant disease, and, at the level of the prostate, it clearly showed a focal deposit of 18F-FCH that was more expressive in the posterior portion of the left prostatic lobe, relating to tumor pathology. A greatly intense deposit in practically the entire C2 was identified at the level of the bone. The CT showed an important alteration in the bone matrix (fig. 1) that could be consistent with viable tumor tissue. Likewise, important degenerative changes were seen in L2/L3 with no significant radiopharmaceutical increase.

Due to the suspicion of metastatic bone disease in C2, the patient was referred to the Radiotherapeutic Oncology Department, and he provided previous cervical CT and MR

Figure 1  Transaxial views of initial 18F-FCH PET-CT staging. 18F-FCH increase of marked intensity in almost all of C2 in which the CT shows important bone matrix alteration.
results from December 2010 taken at another center. Given the alteration in size, increased density, and change in signal, respectively, it was concluded that a primary possibility was Paget disease in all the C2 components.

A 61-year-old man, diagnosed in 2009 with adenocarcinoma of the prostate, Gleason 8 (4 + 4), and treated through radical prostatectomy, now presented with biochemical recurrence with rising PSA values and suspicious lesions identified in L4/L5 and the distal third of the right femur in February 2014 (fig. 2). An \(^{18}\)F-FCH PET/CT study was carried out to confirm those lesions, clearly showing a marked intensity in L4 with an important alteration in the bone matrix and involvement in the entire vertebral body (fig. 3). Given these findings, the recommendation was made to rule out Paget disease. The patient had a CT that revealed a pronounced alteration in the bone density that affected the entire L4 vertebral body that was most likely related to Paget disease.

Paget disease is a pathology that affects the process of bone remodeling, producing an increase in the process, resulting in greater bone neoformation; the bone is altered in relation to its size and it is more vascularized and weaker. It typically affects men (3:2) in the western countries that are above the age of 50 years.\(^1\)

It is known that there is \(^{18}\)F-FDG uptake in Paget disease, but the increase in \(^{11}\)C/\(^{18}\)F-choline uptake can vary. In a study by García et al.\(^2\) in which they compared \(^{11}\)C-choline and \(^{18}\)F-FDG uptake in prostate cancer patients with high PSA values, they presented a case of Paget disease with \(^{18}\)F-FDG uptake in the iliac bone with no \(^{11}\)C-choline uptake.

Nevertheless, other authors (Nanni and Fanti, and Giovacchini et al.)\(^1,3\) have presented cases of prostate cancer patients with \(^{11}\)C-choline uptake in both monostotic and polyostotic Paget disease.

In conclusion, the clinical cases presented herein illustrate the necessity of taking into account \(^{18}\)F-choline uptake in relation to Paget disease in prostate cancer patients.

**Ethical responsibilities**

Protection of persons and animals. The authors declare that the procedures followed conformed to the ethical standards of the responsible committee on human experimentation and were in accordance with the World Medical Association and the Declaration of Helsinki.

Data confidentiality. The authors declare that they have followed the protocols of their work center in relation to the publication of patient data.
Right to privacy and informed consent. The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the corresponding author.

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Conflict of interest
The authors declare that there is no conflict of interest.

References