Interesting image

FDG PET/CT imaging in prostate adenocarcinoma presenting as isolated brain metastases of unknown origin

Imagen FDG PET/TAC de adenocarcinoma de próstata presentada como metástasis cerebral aislada de origen desconocido

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A 75-year-old man was admitted to the hospital due to forgetfulness, gait instability and right hand apraxia during 2-weeks. A CT of the brain revealed a solitary mass lesion in the right parieto-occipital region (Fig. 1). The patient underwent craniectomy and excisional biopsy. The pathological diagnosis of the lesion was consistent with metastatic adenocarcinoma. FDG PET/CT images were performed for the detection of the primary tumor localization and metastatic evaluation. FDG PET/CT images showed abnormal intense FDG uptake in the left lobe of the prostate and no other abnormal FDG uptake was observed elsewhere in the body except physiologic uptake in the muscle in the bilateral femoral region (Fig. 2). PET/CT images of brain demonstrated cranietomy defect and a hypometabolic area in the right parieto-occipital region due to excisional biopsy (Fig. 2). The serum PSA was found to be 13.42 ng/mL (normal <4 ng/mL). Transrectal ultrasound-guided biopsy confirmed the diagnosis of prostate adenocarcinoma (Gleason score: 4+5 = 9). The patient was treated with a whole brain radiotherapy for a total dose of 30 Gy in 10 fractions and hormonal treatment with subcutaneous luteinizing hormone releasing hormone agonist goserelin. At 12 months follow-up, his PSA down to 0.46 ng/mL.

Prostate cancer metastasizes most commonly to the pelvic lymph nodes and to the axial skeleton. Brain metastases from prostate adenocarcinoma are rare presentation with an incidence of <1%. However, isolated brain metastases as the first clinic manifestation of prostate adenocarcinoma without other systemic involvement is exceedingly rare, with fewer cases reported in the literature.

FDG PET/CT has a low sensitivity in prostatic adenocarcinoma due to the low metabolic activity of this type of cancer and to the urinary excretion of FDG with tracer activity in the ureters and bladder, making it difficult to distinguish local cancer lesions and lymph node metastases. Although the sensitivity of FDG PET/CT in detecting prostate cancer is limited, a previous study found that patients with higher histologic Gleason grades and those with lymph node and/or bone metastases have a tendency to have higher FDG accumulation in the prostate tumors. A high and focal FDG uptake as in our case may be indicative of malignancies.

FDG PET/CT whole-body imaging is a valuable tool in detecting the primary tumor of patients with unknown primary cancer and

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Fig. 1. ACT of the brain revealed a solitary mass lesion in the right parieto-occipital region with central necrotic and surrounding prominent vasogenic edema (arrow).
Fig. 2. Maximum intensity projection, coronal fusion PET/CT and CT images (A), and transaxial fusion PET/CT and CT images (B) showed increased metabolic activity ($SUV_{\text{max}}$: 21.1) in the left lobe of the prostate (arrows). No other abnormal FDG uptake was detected elsewhere in the body except physiologic uptake in the muscle in the bilateral femoral region (A and C) (arrowheads). Transaxial fusion PET/CT and CT images of brain (D) demonstrated craniectomy defect and a hypometabolic area in the right parieto-occipital region due to excisional biopsy (arrow).

indicated its use in an early phase of the diagnostic passageway to optimize patient management. FDG PET/CT can also identify additional sites of metastases that can alter the patient’s management, which probably improves survival time and at the same time can serve as a guide for biopsies. FDG PET/CT can be considered as the first diagnostic process for patients presenting brain metastasis with an unknown primary tumor.

Conflicts of interest

There are no conflicts of interest.

References