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Interesting image

^{18}F FDOPA uptake in brain metastasis of breast cancer

Captación de ^{18}F FDOPA en metástasis cerebral de un cáncer de mama

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To date, few studies have been carried out for the investigation of the potential roles of [^{18}F]-L-dihydroxyphenylalanine (^{18}F FDOPA) in the evaluation of metastatic brain lesions from breast cancer.[1] In their recent report, Lizarraga et al. show that ^{18}F FDOPA positron emission tomography (PET) is able to distinguish recurrent or progressive brain metastases from late or delayed radiation injury.[1] ^{18}F FDOPA PET has shown a sensitivity and a specificity equal to 81% and 84% respectively in the detection of relapse of secondary brain tumor after treatment[1] that is higher as compared to that of 2-deoxy-2-(^{18}F) fluoro-D-glucose (^{18}F FDG) PET (65% and 80% respectively).[2]

In Fig. 1(a) and (b) we report the axial ^{18}F FDOPA PET image (a) showing an increased uptake of the radiotracer in two newly diagnosed mesial metastatic lesions (SUV max 3.2 and 17 mm maximum diameter, white arrow in c; SUV max 4.2, 13 mm maximum diameter, black arrow in c) and in another lesion located in left motor cortex (b, SUV max 2.3 and 9 mm diameter, black arrow in d) in a 53-years-old patient with a two years history of HER-2 positive lobular breast cancer.

The pathological TNM stage was T2a (25 mm diameter) and N1. After two years, the patient developed weakness with associated headaches. The patient was subjected to an MRI and subsequently to a ^{18}F FDOPA PET for re-staging purposes (Fig. 1). In particular, the axial T2 weighted magnetic resonance (MR) images (c and d) showed hyper intense brain lesions that corresponded to the areas of focal ^{18}F FDOPA uptake (arrows). To note that in (c) the lesion located in the anterior cingulate cortex (white arrow) was characterized by a T2 hyper intense oval area with a pattern that was consistent with a hemorrhagic lesion.

In (e) is shown the axial slice of a ^{18}F FDOPA brain PET scan performed in another subject with a brain metastasis from breast cancer as shown in MR T1 images (f). The patient presented a single brain metastasis after three years from the diagnosis of breast cancer (T3a N1 M0) with an elevated proliferative index (Ki-67 equal to 70%). After neoadjuvant chemotherapy, the patient was subjected to quadrantectomy and axillary dissection that revealed a ductal infiltrative cancer, G3 according to Elston–Ellis score, positive for estrogen and progesteron receptors, Ki-67 equal to 70%, Her-2 positive.

Since at the time of diagnosis the brain lesion was 2.5 cm, the treatment strategy consisted in stereotactic radiosurgery. MR images had shown a contrast enhancement of the brain lesion (arrow) while PET images had shown a focal ^{18}F FDOPA uptake (SUV max 4.4 and 23 mm maximum diameter) that was consistent with a relapse (e).

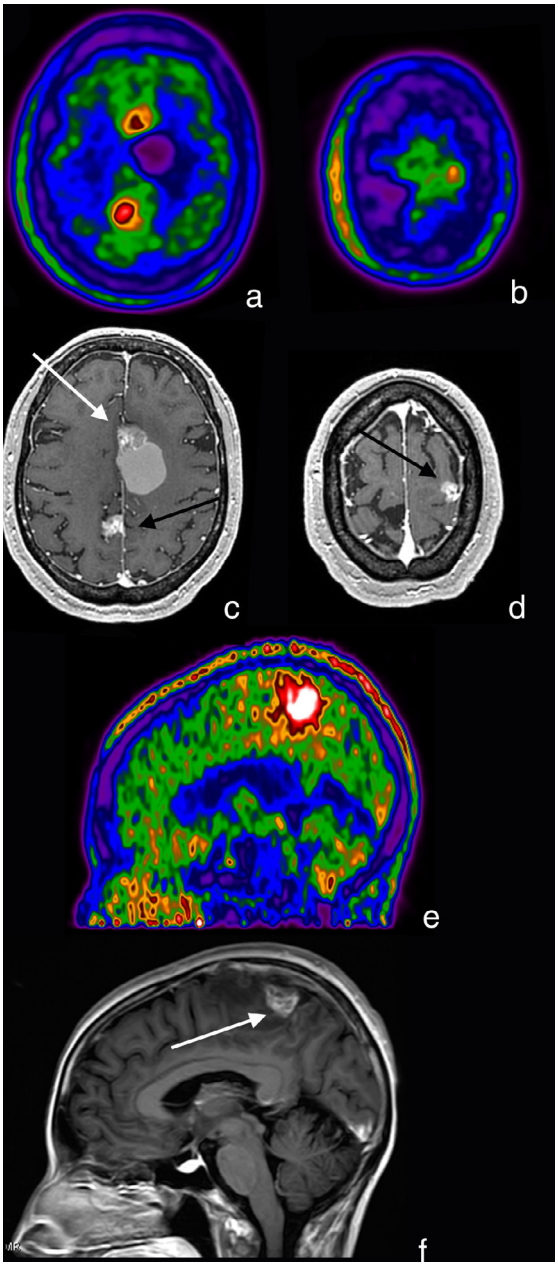

Fig. 1.

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In both cases, according to a similar report of our group in this field, ^{18}F FDOPAPET has been performed by means of a 3D-mode standard technique in a 256×256 matrix after the injection of (210 MBq) of the radiolabeled compound. A low-ampere CT scan of the head for attenuation was performed. PET acquisition started 15 min after the injection.[3]

Together with the papers previously cited, the report of these cases suggests that ^{18}F FDOPA could be considered in addition to conventional imaging for the metabolic evaluation of brain metastatic lesions both at staging and re-staging.

Conflict of interest

The authors declare that they have no conflict of interests.

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