

¹⁸F-FDG PET/CT for Monitoring Response to Therapy of Choroidal Metastasis

¹⁸F-FDG PET/CT and choroidal Metastasis

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Abstract: A 38-year-old woman with metastatic breast carcinoma reported seeing “halos and flashes” in her left eye. Funduscopic exam revealed an elevated mass in the choroid of the left globe consistent with metastasis. Subsequent ^{18}F -FDG PET/CT revealed focal uptake in the nasal aspect of the left choroid of the eye corresponding to the mass seen on the funduscopic exam. Through correlation with the PET/CT, the lesion was retrospectively identified on the MRI. ^{18}F -FDG PET/CT post-radiotherapy showed complete response and thus supports that this imaging modality can be used for diagnosis and monitoring response. History of breast cancer and visual symptoms should trigger the nuclear medicine physician to take extra care in reading the initial slices of the PET/CT scan through the orbits in order to make this challenging imaging diagnosis.

Introduction: ^{18}F -fluorodeoxyglucose-positron emission/computed tomography (^{18}F -FDG PET/CT) has been increasingly utilized for follow up and monitoring response for patients with breast cancer (1,2). A large study found that 47% of orbital metastases are from breast cancer but less than 1% of breast cancers metastasize to the orbit (3,4). The most common site of orbital metastasis is the choroid (88%) (3). While very rare at initial staging, orbital metastases from breast cancer typically develop years after diagnosis with one study reporting a median of 8.5 years after diagnosis (4).

Case Report: A 38-year-old woman with infiltrating ductal carcinoma (IDC) underwent neo-adjuvant chemotherapy followed by bilateral mastectomy and radiation. Staging ^{18}F -FDG PET/CT demonstrated no distant metastases. Three years later, the serum tumor marker increased. ^{18}F -FDG PET/CT then revealed widespread metastatic disease in lymph nodes, lungs, bone, skin, and left choroid.

^{18}F -FDG PET/CT showed focal FDG activity with maximum standardized uptake value (SUV_{max}) 5.0 in the nasal choroid of the left eye consistent with choroidal metastasis (Fig. 1 A and B). MRI fluid attenuation inversion recovery (FLAIR) sequence demonstrated subtle thickening of the left nasal choroid (Fig.1 C).

Radiation therapy is the treatment of choice for choroidal metastases from breast cancer, and this patient underwent intensity modulated radiation therapy (5). ^{18}F -FDG PET/CT and MRI three months after radiation therapy demonstrated resolution of the lesion (Figure 2 A, B and C). Fundoscopy demonstrated flattening and regression of the choroidal mass with residual atrophic pigmentary changes in the overlying retinal pigment epithelium as typically seen following radiation therapy (Fig. 2 D).

Discussion: Since breast cancer is the most common etiology of orbital metastasis, technologists must ensure that the orbits are included in the field of view for all breast cancer patients. Physiologic uptake in extraocular muscles and the small size of choroidal metastases can make the diagnosis challenging. Therefore, the history of breast cancer and visual symptoms should trigger the nuclear medicine physician to take extra care in reading the initial slices of the PET/CT through the orbits.

Conclusion: ^{18}F -FDG PET/CT can detect and monitor response to therapy of choroidal metastasis.

DISCLOSURE

No potential conflict of interest relevant to this article was reported.

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Figure legends:

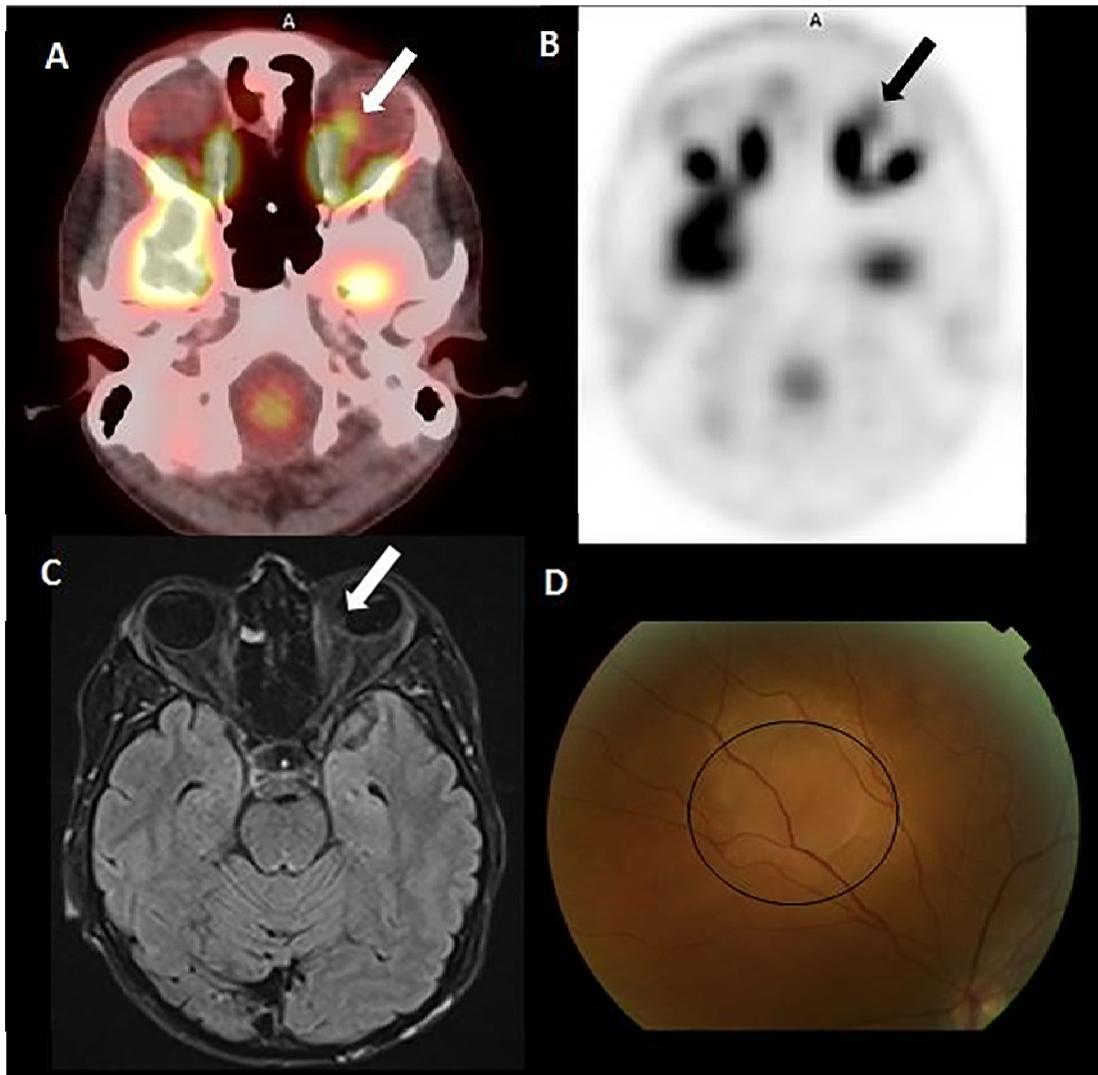


Figure 1: Axial ^{18}F -FDG PET (A), fused PET/CT (B) and MRI axial FLAIR (C) showed focus of FDG-uptake and thickening in the left nasal choroid (arrows). Photograph of the fundus (D) revealed an elevated 6 mm lesion in the left nasal choroid (circle).

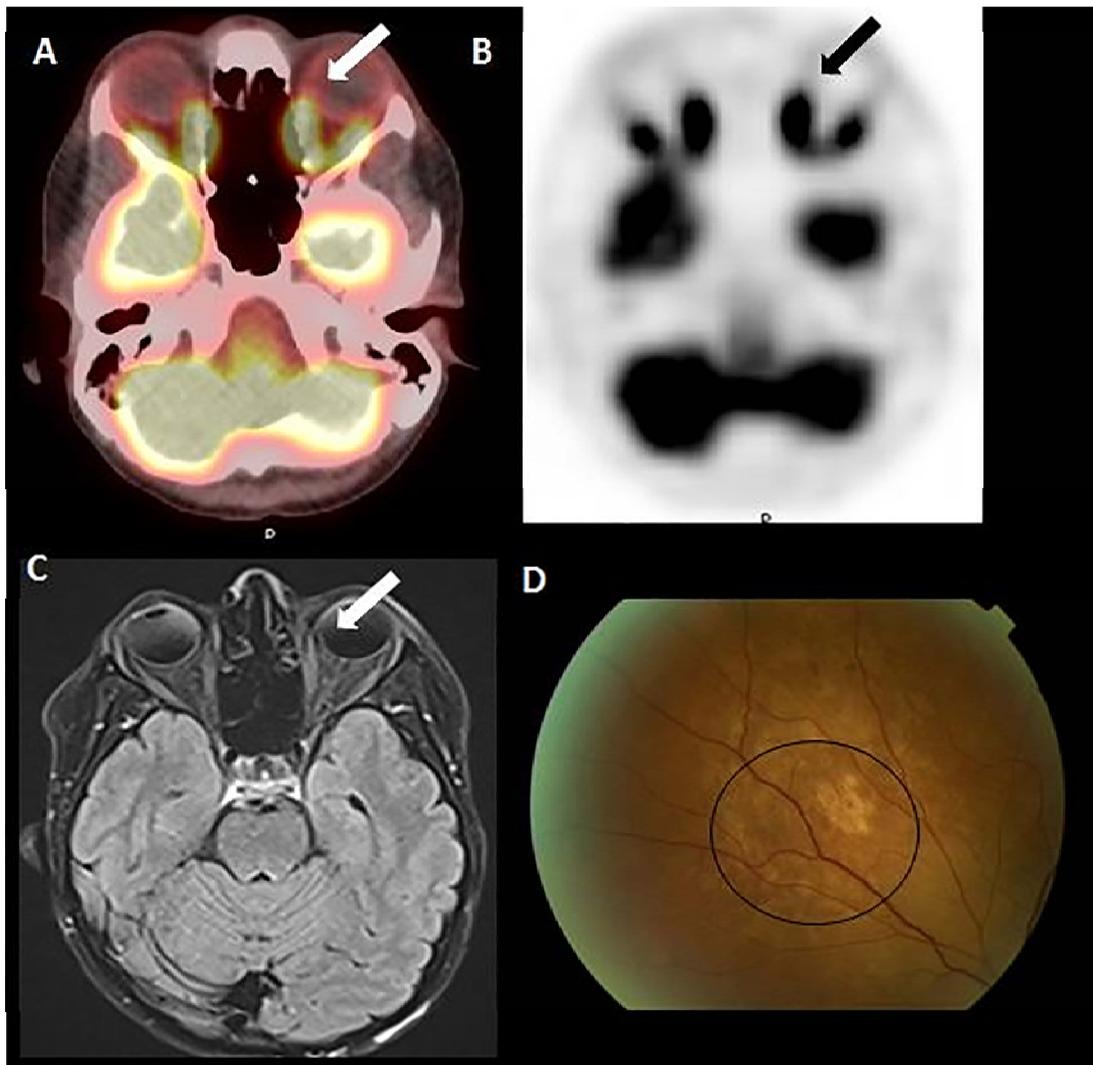


Figure 2: Axial ^{18}F -FDG PET (A), fused PET/CT (B) and MRI axial FLAIR (C) showed resolution of focus of FDG-uptake and choroidal thickening in the left nasal choroid (arrows). Photograph of the fundus (D) revealed regression of the choroidal mass (circle).