Positron emission tomography for intracranial meningioma

MET PET/CT showed a high sensitivity compared with FDG PET/CT for detection of newly diagnosed WHO grades I and II intracranial meningiomas. Both FDG and MET uptake were found to be useful for evaluating tumor proliferation in meningiomas [1].

Although positron emission tomography has not been routinely used in the diagnostic workup and follow-up of patients with meningiomas, it can be useful in cases of skull base meningiomas that are frequently difficult to visualize by using standard CT and MR imaging techniques [2].

Primary intracranial meningioma is typically reported as having low FDG uptake, because glucose metabolism in meningioma is similar to that of surrounding tissue [3].

There have been a few isolated reports describing the imaging features of metastatic meningioma on FDG-PET imaging. Ghodsian et al., described a moderately hypermetabolic sacral metastatic mass by FDG-PET/CT. This was a Grade III malignant meningioma on histology [4].

Meirelles et al., described a pulmonary meningioma that manifested as a solitary pulmonary nodule and had very high metabolic activity on PET scan. The current case also showed avid uptake of FDG; the SUV was >7 in each pulmonary lesion. The uptake was more avid in the periphery and slightly less in the centre of both lesions, corresponding to the central areas of low density on CT. It was useful to note that there were no other foci of abnormal FDG uptake elsewhere to suggest other metastases. It is reassuring to note that 10 months after the PET/CT with clinical follow-up, the patient remains asymptomatic with no evidence of local or distant spread. The diagnosis of pulmonary metastatic meningioma was confirmed histologically by CT-guided percutaneous biopsy, which has been previously reported [5].

In 2007, Rutten et al., described the combination of CT and MRI as limited in the diagnosis of local skull involvement from adjacent intracranial meningioma. In their study, the authors demonstrated that skull base tumors could be clearly visualised with 18F-tyrosine PET, even after radiation therapy [6] [7].

Meningiomas are also known to have high somatostatin receptor density allowing for the potential use of octreotide brain scintigraphy to help delineate extent of disease. This may be particularly useful in distinguishing residual tumor from postoperative scarring in subtotally resected/recurrent tumors [8].

68Ga-DOTATATE PET for meningioma diagnosis

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