Teaching NeuroImages: Advanced imaging of neurosarcoidosis with ^{68}Ga -DOTATATE PET/CT

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Figure ^{68}Ga -DOTATATE PET/CT, MRI, and histology

MRI: Contrast-enhancing lesion in the cavernous sinus with perifocal edema and contact to the chiasm and the blood vessels. ^{68}Ga -DOTATATE PET/CT: high ^{68}Ga -DOTATATE uptake. Hematoxylin & eosin staining: noncaseating epithelioid granulomas. CD68 staining: tightly packed epithelioid macrophages. Gomori staining: incipient perigranulomatous fibrosis surrounded by leukocyte common antigen (LCA)-positive lymphocytes (magnification $\times 20$, bars 100 μm).

A 45-year-old man presented with increasing visual impairment. MRI showed a nonspecific lesion at the cavernous sinus; an additional ^{68}Ga -DOTATATE PET/CT showed an extraordinarily high ^{68}Ga -DOTATATE uptake of the lesion (figure). Stereotactic brain biopsy was performed and revealed an initial manifestation of neurosarcoidosis. ^{68}Ga -DOTATATE targets the somatostatin receptor (SSR), which is expressed by tumor cells in malignancies such as neuroendocrine tumors and meningioma, but also by activated macrophages,¹ as present in neurosarcoidosis. Targeted radionuclide therapies using SSR ligands labeled with beta-emitting isotopes might offer additional therapeutic options in patients with treatment-refractory neurosarcoidosis,² as also effectively applied in SSR-positive malignancies.

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Author contributions

Dr. Unterrainer: study design, data collection, drafting and revising the manuscript. Dr. Ruf: acquisition and analysis of histopathology, revision of manuscript. Dr. Ilhan: analysis of PET/CT scan, revision of manuscript. Dr. Vettermann: analysis of PET/CT scan, revision of

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manuscript. Dr. Holzgreve: study design, data collection, revision of manuscript. Dr. Cyran: analysis of PET/CT and MRI scans, revision of manuscript. Dr. Tonn: data collection, revision of manuscript. Dr. Bartenstein: study supervision and analysis of PET scans, revision of manuscript. Dr. Albert: study design, data collection, drafting and revision of manuscript.

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