

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

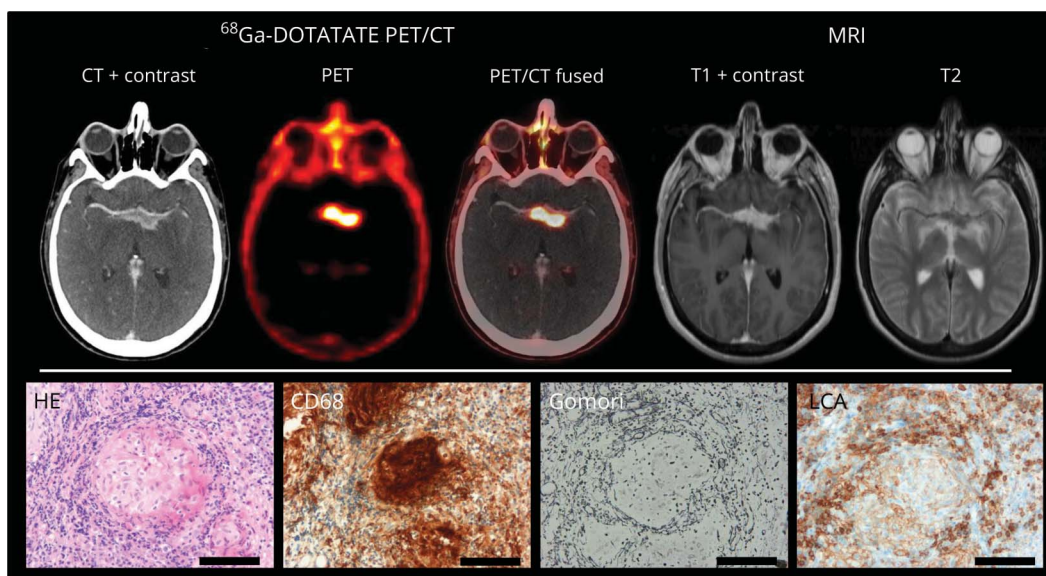
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## Figure $^{68}\text{Ga}$ -DOTATATE PET/CT, MRI, and histology



MRI: Contrast-enhancing lesion in the cavernous sinus with perifocal edema and contact to the chiasm and the blood vessels.  $^{68}\text{Ga}$ -DOTATATE PET/CT: high  $^{68}\text{Ga}$ -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  $\mu\text{m}$ ).

A 45-year-old man presented with increasing visual impairment. MRI showed a nonspecific lesion at the cavernous sinus; an additional  $^{68}\text{Ga}$ -DOTATATE PET/CT showed an extraordinarily high  $^{68}\text{Ga}$ -DOTATATE uptake of the lesion (figure). Stereotactic brain biopsy was performed and revealed an initial manifestation of neurosarcoidosis.  $^{68}\text{Ga}$ -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,<sup>1</sup> 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,<sup>2</sup> 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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### Disclosure

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