Imaging microglial activation in tacrolimus-associated CNS vasculitis with translocator protein PET

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Figure 1 MRI and PET

(A) MRI and [^{18}F]GE-180-TSPO-PET reveal a contrast-enhancing lesion in the left gyrus frontalis superior. (B) Periventricular non-contrast-enhancing lesion with focal uptake in PET.

A 67-year-old man developed gradually worsening left-sided spastic hemiparesis under immunosuppressive therapy with tacrolimus after single lung transplantation. MRI revealed 2 diffusion-restricted, T2-hyperintense lesions without and with partial contrast enhancement, respectively (figure 1). Therefore, differential diagnosis mainly included progressive multifocal leukoencephalopathy, atypical CNS lymphoma, and CNS vasculitis. PET with the novel translocator protein (TSPO) tracer [^{18}F]GE-180 showed high focal tracer uptake in both

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(A) Lymphocytic infiltration of small-vessel wall (arrow, hematoxylin & eosin staining). (B) Microglial activation in CD3/43 staining. (C) Reactive astrocytes in glial fibrillary acid protein staining. (D) Infiltration of CD3+ T cells. Scale: 100 μ m.

T2-hyperintense lesions. TSPO is overexpressed in activated microglia.¹ Stereotactic brain biopsy revealed tacrolimus-associated CNS vasculitis with distinct microglia activation, a rarely reported finding² (figure 2). Our case thus suggests that TSPO PET might be a helpful tool for detection of active CNS inflammation³ in patients with suspected CNS vasculitis.

Author contributions

Christoph Mahler: study design, data collection, clinical care to the patient, drafting and revising the manuscript. Marcus Unterrainer: study design, acquisition and analysis of PET scans, critical comments during manuscript revision. Carolin Muth: clinical care to the patient. Rupert Egensperger: acquisition and analysis of histopathology images. Lena Vomacka: analysis of PET scans. Simon Lindner: acquisition and analysis of PET scans. Birgit Ertl-Wagner: acquisition and analysis of MRI scans. Maximilian Patzig: acquisition and analysis of MRI scans. Peter Bartenstein: study supervision and analysis of PET scans. Nathalie Albert: study supervision

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