

18F positron emission tomography for high-grade glioma

see also [18F positron emission tomography for glioblastoma](#).

The differential diagnosis by 18F-FDG PET between WHO grades III/IV gliomas and brain metastases is limited, since considerable overlap of SUVmax exists between these tumor types ¹⁾

18F-FDG PET also has limited specificity for distinguishing glioma from other nonneoplastic lesions, such as brain abscesses, demyelinating tumefactive ("tumor-like") lesions, fungal infections, and neurosarcoidosis ²⁾ due to increased 18F-FDG metabolism in inflammatory tissue.

The precise definition of the post-operative resection status in high-grade gliomas (HGG) is crucial for further management. We aimed to assess the feasibility of assessment of the resection status with early post-operative positron emission tomography (PET) using [18F]O-(2-[18F]-fluoroethyl)-L-tyrosine ([18F]FET).

25 patients with the suspicion of primary HGG were enrolled. All patients underwent pre-operative [18F]FET-PET and magnetic resonance imaging (MRI). Intra-operatively, resection status was assessed using 5-aminolevulinic acid (5-ALA). Imaging was repeated within 72h after neurosurgery. Post-operative [18F]FET-PET was compared with MRI, intra-operative assessment and clinical follow-up.

[18F]FET-PET, MRI and intra-operative assessment consistently revealed complete resection in 12/25 (48%) patients and incomplete resection in 6/25 cases (24%). In 7 patients, PET revealed discordant findings. One patient was re-resected. 3/7 experienced tumor recurrence, 3/7 died shortly after brain surgery.

Early assessment of the resection status in HGG with [18F]FET-PET seems to be feasible ³⁾.

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Kosaka N, Tsuchida T, Uematsu H et al. 18F-FDG PET of common enhancing malignant brain tumors. *AJR Am J Roentgenol*. 2008;190 (6):W365-W369.

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Omuro AM, Leite CC, Mokhtari K et al. Pitfalls in the diagnosis of brain tumours. *Lancet Neurol*. 2006;5 (11):937-948.

³⁾

Kläsner B, Buchmann N, Gempt J, Ringel F, Lapa C, Krause BJ. Early [18F]FET-PET in Gliomas after Surgical Resection: Comparison with MRI and Histopathology. *PLoS One*. 2015 Oct 26;10(10):e0141153. doi: 10.1371/journal.pone.0141153. eCollection 2015. PubMed PMID: 26502297.

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