



Advanced imaging findings in stroke-like migraine attacks after radiation therapy (SMART) syndrome

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Main text

A female 60-year-old long-term survivor of high-grade glioma presented with progressive migraine-like left-sided cephalgia and expressive aphasia for three days. Ten years ago, a left temporo-occipital *IDH*-wildtype glioblastoma was treated with radiochemotherapy per EORTC 26981/22981 (TMZ/RT → TMZ; 60 Gy in 30 fractions) resulting in complete remission on follow-up imaging (A). On admission, repetitive EEG was negative for patterns on the ictal-interictal continuum. Brain MRI revealed faint gyriform contrast-enhancement (arrowheads) and enlarged vessels (arrows) in gadolinium-enhanced T1-weighted imaging, left temporo-occipital edema adjacent to radiation-induced white matter-hyperintensity on T2-weighted imaging with corresponding diffusion restriction, and temporo-occipital elevation of the left cortical blood volume (CBV) of the previously irradiated left temporo-occipital brain region in comparison to the contralateral hemisphere in perfusion MRI sequences

(5.6 mL/100 g vs. 3.1 mL/100 g; B). [¹⁸F]fluorethyltyrosine ([¹⁸F]FET)-PET detected corresponding gyral tracer uptake with moderate signal intensity and increasing time-activity-curves, not typical for tumor recurrence (C) [1]. Diagnosis of *stroke-like migraine attacks after radiation therapy* (SMART) syndrome was given [2]. Under supportive therapy, symptoms and imaging abnormalities fully resolved within 6 weeks (D). ([¹⁸F]FET)-PET 1 year after symptoms showed complete regression of the gyral tracer uptake. SMART syndrome represents a rare, delayed complication of brain-directed radiotherapy involving impaired cerebrovascular autoregulation [3]. Symptoms are characteristically transient in nature, and diagnosis rests upon distinct clinico-radiographic findings as well as exclusion of differentials. To our knowledge, this is the first case demonstrating [¹⁸F]FET-PET imaging in a patient with ongoing SMART syndrome, which could potentially improve diagnostic accuracy by exclusion of important differentials such as tumor recurrence.

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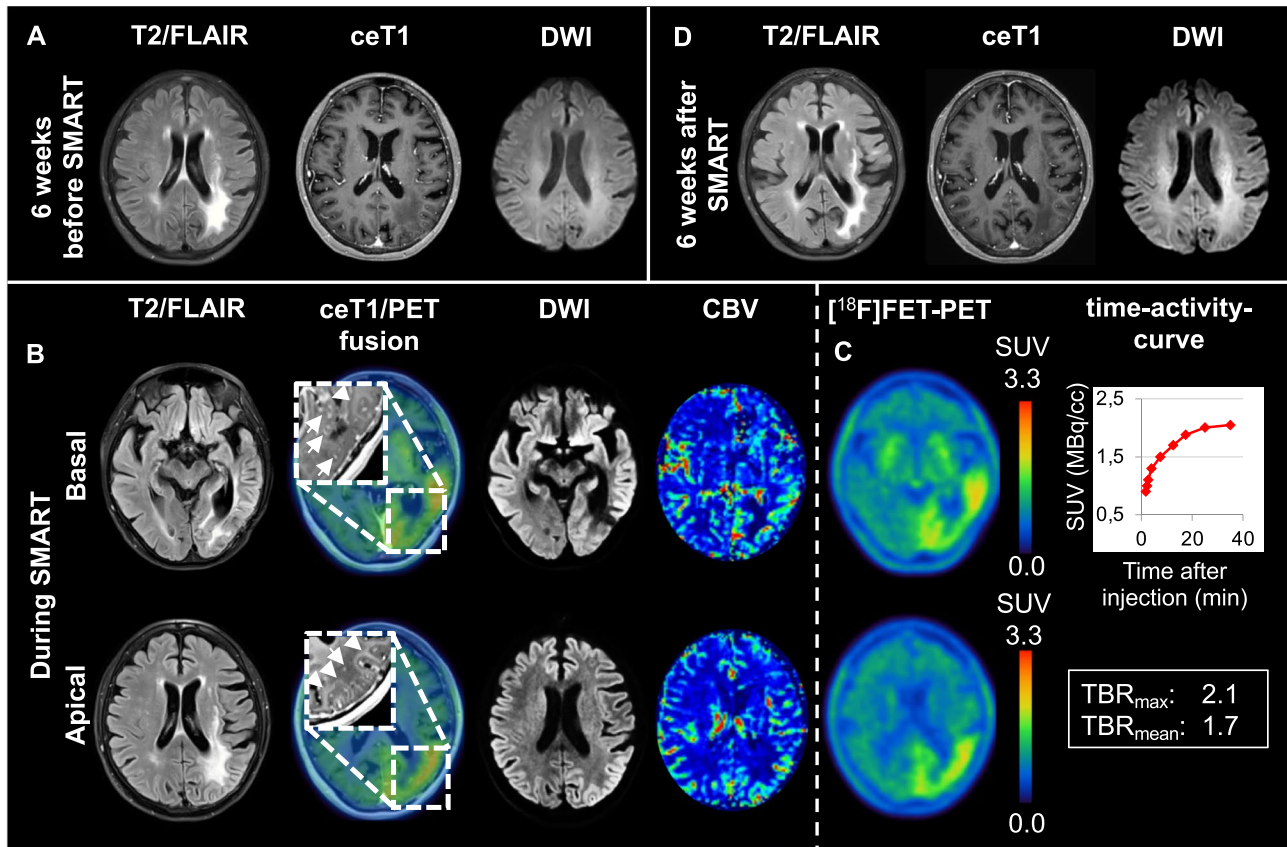
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Data availability All data can be made available upon reasonable request to the corresponding author.

Declarations

Ethics approval and consent to participate The patient consented to participate in the study, and informed consent to disclose was obtained.

Competing interests The authors declare no competing interests.

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