

ABSTRACT

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Early Recurrence Detection of Glioma Using 18F-Fluorocholine PET/CT: GliReDe Pilot Study.

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OBJECTIVE: The aim of this study was to analyze the usefulness of 18F-fluorocholine PET/CT in the early diagnosis of tumor recurrence, increasing the diagnosis confidence of MRI.

METHODS: Patients with a previous gross total resection of glioma and the first suspicious or doubtful for recurrence MRI were prospectively included and subjected to 18F-fluorocholine PET/CT. An independent and combined assessment of 18F-fluorocholine PET/CT and multimodal MRI was performed classifying the studies as positive or negative for tumor recurrence. Final diagnosis (recurrence or not) was obtained by histological confirmation or clinical and imaging follow-up. The relation of SUVmax and tumor-to-background ratio with progression, the diagnostic performance of imaging techniques, and their concordance (κ Cohen) were analyzed.

RESULTS: Twenty-four studies on 21 patients were assessed. Recurrence was diagnosed in 20 cases. PET/CT was positive in 23 cases (3 false positive), whereas MRI was positive in 15 cases (1 false positive). MRI was false negative in 6 cases. There was no false negative on 18F-fluorocholine PET/CT. Accuracy of PET/CT versus MRI was 87.5% and 70.8%, respectively. The combined evaluation of both techniques did not show any advantage with respect to PET/CT results alone. The concordance between both imaging techniques was low ($\kappa = 0.135$; $P = 0.375$). SUVmax and tumor-to-background ratio were related to recurrence (areas under the curve of 0.844 [$P = 0.033$] and 0.869 [$P = 0.022$], respectively).

CONCLUSIONS: 18F-fluorocholine PET/CT was helpful for increasing the diagnostic confidence in the cases of MRI doubtful for recurrence in order to avoid a delayed diagnosis.

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