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# Safety and therapeutic impact of stereotactic biopsy in very elderly patients with brain tumors

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## Abstract

**Objective:** There is a lack of data regarding the benefit-risk ratio and therapeutic value of brain biopsy in very elderly patients with brain tumors. This study aimed to evaluate the safety of stereotactic biopsy in patients aged  $\geq 80$  years and assess the impact of the procedure on subsequent therapeutic management and overall survival (OS).

**Methods:** The authors retrospectively analyzed the medical records of all patients aged  $\geq 80$  years who underwent stereotactic biopsy for a newly diagnosed intracerebral tumor during a 15-year period at a single institution.

**Results:** During the period, 2350 stereotactic brain biopsies were performed, with 209 biopsies (8.9%) in 208 patients aged  $\geq 80$  years. Histological diagnosis was obtained in 96.2% of cases. Biopsy results differed from the suspected diagnosis in 23 patients (11.1%). After biopsy, 1.9% of the patients experienced persistent neurological deficit. After histopathological diagnosis, 80.7% of the cases received adjuvant treatment. Only a Karnofsky Performance Status (KPS) score  $\geq 70\%$  was a significant predictor of receiving complete adjuvant treatment (OR 24.3, 95% CI 7.0-84.1;  $p < 0.001$ ). The median OS from biopsy was 5.6 months (IQR 2.4-13.5 months). Grade 4 glioma, KPS score  $< 70\%$ , and tumor contrast enhancement on MRI predicted a shorter OS. Receiving complete first-line adjuvant therapy predicted a longer OS. In patients with grade 4 glioma, those exhibiting a methylated O 6-methylguanine-DNA methyltransferase (MGMT) promoter demonstrated significantly prolonged survival compared with patients with an unmethylated MGMT promoter ( $p < 0.001$ ).

**Conclusions:** Stereotactic biopsy for very elderly patients with brain tumors has a high diagnostic yield and a favorable safety profile, ultimately impacting patients' therapeutic management and OS. Nonetheless, it is crucial to consider the patient's prebiopsy condition. Specifically, a KPS score  $\geq 70\%$  was identified as a key factor in the decision-making process for biopsy in this population.

**Keywords:** brain biopsy; complications; diagnostic yield; glioblastoma; lymphoma; old patients; overall survival; tumor.

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