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Perioperative seizure in patients undergoing brain mapping under awake craniotomy for language-related eloquent region gliomas: a prospective study

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Abstract

Background: Awake craniotomy (AC) is standard of care for lesions of eloquent brain areas. One important complication during AC is occurrence of intraoperative seizure (IOS), reported to occur among 3.4-20% of the patients. In this study, we report our experience with IOS during AC for resection of gliomas of the language eloquent regions and evaluate the predisposing factors and consequences.

Methods: Patients who underwent AC for language related regions of the dominant hemisphere from August 2018 to June 2021 were enrolled. The rate of IOS during AC and relationship between predisposing factors and IOS were evaluated.

Results: Sixty-five patients were enrolled (mean age: 44.4±12.5 years). Among 6 patients with IOS (9.2%), only one needed conversion to general anesthesia (GA) due to repeated seizures; while in the remaining 5, AC accomplished successfully despite one seizure attack in the awake phase. Tumor location (especially premotor cortex lesions, P=0.02, uOR:12.0, CI: 1.20-119.91), higher tumor volume (P=0.008, uOR: 1.9, CI: 1.06-1.12) and a functional tumor margin during surgery (P=0.000, uOR: 3.4, CI: 1.47-12.35) were significantly linked with IOS.

Conclusions: Occurrence of IOS was associated with a longer ICU stay after surgery and worse immediate neurological outcome, but had no impact on the late neurological status. IOS can usually be managed during AC without need to converting to GA. Those with larger tumors, frontal premotor lesions and positive brain mapping are susceptible to IOS. Early neurological deterioration observed after IOS, seems to be transient with no major long-term consequence on the neurological outcome.