

## Awake craniotomy for primary brain tumors of eloquent areas

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**Aim:** The aim of this study was to evaluate the safety and efficacy of awake craniotomy (AC) for low grade glioma (LGG) brain tumors in eloquent areas.

**Materials and methods:** 57 patients diagnosed with LGG underwent AC between 2007 and 2014. AC and direct cortical and subcortical macrostimulation were chosen because of the proximity or infiltration of eloquent areas. The common criteria to focus on direct brain mapping was speech areas (48 patients with 2 patients with crossed aphasia) after thoroughly performed neuropsychological examination and motor cortex (9 patients). 4 patients were simultaneously monitored electrophysiologically (SEP, MEP). Besides caution for motor (Broca) and sensitive (Wernicke) speech areas, special intraoperative attention was paid to other functions like: semantic, syntactic, syllabification with phonological troubles and equally hesitation, speech fluency and spacial deficits. The patients preoperative imaging study included MRI (T1 gadolinium enhanced, T2, Flair, DTI with following fiber tracking), fMRI, standard eeg and video and Holter eeg in epileptic cases and standard MR with volumetric estimation after surgery.

**Results:** The aim of the treatment was a widespread resection up to the functional boundaries even

by obtaining a supratotal resection. Tumor resection was complete or subtotal (< 10 ccm of residual tumor) in 36 patients or partial (> 10 ccm of residual tumor) in 21 according to Berger et al. classification. 5 patients underwent repeated surgery because of unsatisfactory resection. In the postoperative period, 2 patients had aphasia which regressed to mild dysphasia during 3 months. 1 patient had speech initiation trouble because of supplementary speech area involvement, which reversed to complete recovery after 6 months. 8 patients had mild transient language disturbances: slowness, articulatory troubles, phonological problems, phonemic paraphasia and sensory deficits which improved after logopedic therapy. 2 patients had hemiparesis (1 completely recovered, 1 persistent due to venous ischemia). No perioperative mortality was reported. 45 patients were diagnosed with WHO GII glioma, 2 patients GI and 10 were diagnosed with high grade glioma.

**Conclusions:** AC is a safe and effective treatment method of LGGs located in eloquent brain areas.

**Key words:** awake craniotomy, primary brain tumors, eloquent brain areas