

THE CONTRIBUTION OF NEUROPSYCHOLOGY IN AWAKE CRANIOTOMY: PRILIMINARY RESULTS

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Abstract

OBJECTIVE: Aim of the modern oncological neurosurgery is to maximize the extent of tumor resection, with a parallel minimization of postoperative neurological deficits; therefore, localization of “eloquent” cortex is essential. Intraoperative Electrical Stimulation (IES) during awake craniotomy is considered the “gold standard” for functional mapping in tumor surgery. In this report we present our preliminary results from a 30-patients series that underwent awake craniotomy.

MATERIAL-METHOD: During a 2.5-years period, glioma patients (22 left /8 right hemisphere) underwent awake craniotomy for tumor excision. Bipolar IES conducted with the following parameters: amplitude ranged from 2mA to 6mA, frequency was set at 60 Hz, spatial diameter of stimulation was 0.5mm and the time of stimulation was 1-2 for motor and 4-5 seconds for cognitive-language mapping. Motor and language responses detected through motor and language naming tasks, conducted by a neuropsychologist thought out the operation. **RESULTS:** Negative motor (upper/lower limbs, tongue arrest, oculomotor apraxia), positive motor (upper limb, fingers, face twitches) and positive sensory (paresthesias) responses were elicited when stimulating premotor areas, primary motor and somatosensory cortex respectively. Speech arrest, phonemic, semantic and anomic errors, and perseverations were produced when left frontal, temporal and inferior parietal lobule areas were stimulated at cortical and subcortical level. Immediate post-operative assessment showed functional deterioration in 50% of patients; 3 months postoperatively all patients but 2 reached their preoperative status.

CONCLUSIONS: Awake craniotomy allows resection of tumors in eloquent areas with an acceptable risk of permanent post-operative deficit and should be performed in cooperation with expert clinical neuropsychologists.