

# Intraoperative neurophysiological procedure for localizing cranial motor nuclei during brain stem surgery

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## Abstract

**INTRODUCTION:** A comprehensive technique was developed for continuous monitoring of the brain stem motor function during surgery for removal of space-occupying lesions in the fourth ventricle and brain stem. Standard surgical approach is always a great challenge for a neurosurgeon due to a highly sensitive anatomy which involves high mortality (Pollack IF, et al. 1993). That is why a brainstem mapping (BSM) has an important role in order to identify structures distorted by tumors. Also, intraoperative monitoring for the corticobulbar tract (CBT) MEP monitoring is usually performed, a method which neurophysiologically locates cranial motor neurones (CMN) on the floor of the 4th ventricle. **METHODOLOGY:** Monopolar stimulation technique has been used to stimulate the facial colliculus and the motor nuclei of cranial nerves IX/X and XII in 14 patients undergoing removal of brainstem tumors as described elsewhere (Liscic RM et al. Croat Med J 2000). The motor nuclei of these cranial nerves are located relative to specific anatomic landmarks. These landmarks were missing because of the distorting effect of the tumor. Different points of the floor of the fourth ventricle were electrically stimulated while EMG responses were recorded with electrodes inserted in the orbicularis oculi and oris muscles, the lateral posterior pharyngeal wall, and the intrinsic muscles of tongue. Mapping was performed before and after tumor resection.

**RESULTS:** In all patients, electrical stimulation at the facial colliculus and/or hypoglossal triangle on the floor of the 4th ventricle resulted in selective EMG responses recorded from the ipsilateral facial and tongue muscles (Fig. 1). EMG latencies (mean  $\pm$  SD) were measured, but these latencies are not a subject of current presentation.

**CONCLUSION:** BSM may be helpful for resecting the tumor. BSM is a mapping technique, not a monitoring one. BSM is able to map cranial motor nuclei, but unable to monitor functional integrity of these during surgery of the 4th ventricle. CBT-MEP monitoring is more critical for preserving functional integrity of the cranial nerves.

## Biography

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