Continuous subcortical monitoring improves surgical and functional outcome during resection of motor eloquent brain tumors

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Introduction
Intraoperative motor evoked potentials (MEP) have increased patient’s safety and extent of resection in patients with motor eloquent brain tumors. Subcortical stimulation has emerged as an additional tool that may improve functional and oncological outcome even more. However, it is mainly used as a mapping tool. The present study aims to evaluate the benefit of continuous subcortical mapping compared to standard subcortical mapping.

Methods
We analyzed 42 patients with motor eloquent brain tumors consecutively operated between January 2013 and August 2014. In the control group 21 patients were operated only with the use of transcranial or direct cortical MEP monitoring with intermittent subcortical mapping. In the study group 21 patients were operated with the additional use of continuous subcortical monitoring by using the tip of the ultrasonic aspirator as a stimulation probe. The motor status was evaluated preoperatively, 5 days and 3 months after surgery.

Results
4 and 1 patients had a transient motor deficit in the control and study group, respectively. 4 and 2 patients had a permanent motor deficit in the control and study group, respectively. Gross total resection was achieved in 14 and 18 cases in the control and study group, respectively. Subtotal resections were achieved in 8 and 3 cases in the control and study group, respectively.

Conclusion
Continuous subcortical monitoring using the ultrasonic aspirator as a stimulation probe for the resection of motor eloquent brain lesions seems to improve functional and surgical outcome.

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