Efficacy of transcranial motor evoked potential monitoring during clipping of unruptured intracranial aneurysms

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Introduction
Ischemic complications during aneurysm surgery are a frequent cause of postoperative neurological deficits. Motor-evoked potentials (MEPs) are used in order to minimize the risk of such deficits. The aim of the present study was to evaluate the usefulness of transcranial MEP (tcMEP) monitoring and its impact on morbidity after surgical clipping of unruptured intracranial aneurysms.

Methods
We performed a retrospective analysis of 154 consecutive cases of surgical clippings of incidental intracerebral aneurysms between 2010 and 2016. The monitoring data were reviewed and related to new postoperative motor deficits and postoperative imaging.

Results
Monitoring was successful in all cases. In 15 cases (9.7%) tcMEP amplitudes declined during surgery. In 9 (5.8%) of those cases, the surgical team responded accordantly (change of clip position in 5 cases, retractor removal and nimodipin irrigation in 4 cases). Thereafter, the tcMEPs recovered and the patients had no permanent neurological deficits. In 6 cases (3.8%) tcMEP decline did not induce a reaction from the surgical team and the patients developed a transient motor deficit in 3 cases (1.9%) and a permanent deficit in one case (0.6%).

Fig. 1: The figure shows the overall results of the analysis regarding the reaction of the surgical team on declined tcMEP (= transcranial motor evoked potentials) amplitudes.

Conclusion
Intraoperative tcMEPs during clipping of unruptured aneurysms was able to prevent neurological deficits in 5.8% of cases. The routine use of tcMEP in such cases is recommended.