

Intraoperative neurophysiological monitoring during resection of brainstem cavernous malformations Ehab Shiban Dr.; Maria Wostrack; Bernhard Meyer MD; Jens Lehmberg MD

Department of Neurosurgery, Technische Univirsität München, Munich, Germany



### Introduction

Removal of brainstem cavernous malformations is one of the most difficult procedures in neurosurgery. Intraoperative monitoring is used to avoid impending damage to these highly eloquent structures. However, data of neurophysiological monitoring during these procedures is lacking.

# Methods

- Consecutive patients with brainstem cavernous malformations who underwent surgical removal from June 2007 to December 2012 were retrospectively analyzed
- Transcranial Motor evoked potentials (MEP) and somatosensory evoked potentials (SSEP) were performed in all cases
- The monitoring data were reviewed and related to new postoperative motor deficit and postoperative imaging
- Clinical outcomes were assessed during followup

### Results

- 19 consecutive cases of brain stem cavernomas were identified
- Median age 47 years (range 27 81)
- 10 Female, 9 male
- Multiple cavernomas in 4 cases
- Median modified Rankin Score 2 (range 1 3)





#### **Clinical condition Clinical condition** SSEP same worse MEP same worse Stable TP = 9 FP = 3Stable TP = 10FP = 3 FN = 4TN = 2 Loss Loss FN = 3 TN = 2 SSEP MEP Sensitivity 76% 69% Specificity 40% 40% PPV 76% 75% NPV 40% 33%



## Conclusions

- Continuous MEP and SSEP monitoring do not provide sufficient monitoring during brainstem cavernous malformations surgery as high rates of false positive and false negative results are encountered
- Lateral approches ( when possible) yield better clinical outcome