Poor diagnostic accuracy of transcranial motor and somatosensory evoked potential monitoring during brainstem cavernoma resection.

Microsurgical resection of brainstem cavernomas carries a high risk of new postoperative morbidity such as cranial nerve, motor and sensory deficits as well as functional deterioration. Intraoperative monitoring is used to avoid impending damage to these highly eloquent tracts. However, data on neurophysiological monitoring during resection of brainstem cavernomas are lacking.

Consecutive patients with brainstem cavernomas who underwent surgical removal from June 2007 to December 2014 were retrospectively analysed. Transcranial motor-evoked potential (MEP) and somatosensory-evoked potential (SSEP) monitorings were performed in all cases. The evoked potential (EP) monitoring data were reviewed and related to new postoperative motor and sensory deficits and postoperative imaging. Clinical outcomes were assessed during follow-up.

Twenty-six consecutive patients with brainstem cavernoma underwent 27 surgical resections within this study. MEP and SSEP monitoring was technically feasible in 26 and 27 cases, respectively. MEP sensitivity and specificity were 33 and 88 %, respectively. MEP positive and negative predictive values were 28 and 78 %, respectively. SSEP sensitivity and specificity were 20 and 81 %, respectively. SSEP positive and negative predictive values were 20
and 81 %, respectively. In continuous MEP and SSEP monitoring during brainstem cavernoma microsurgery, high rates of false-positive and -negative results are encountered, resulting in low positive and relatively high negative predictive values. Careful interpretation of the intraoperative monitoring results is essential in order to avoid potentially unjustified termination of brainstem cavernoma resection.