Motor evoked potentials during spine surgery

MEPs and SSEPs are susceptible to the effects of intraoperative environmental factors. For MEPs, volatile anesthetic agents suppress excitability of the motor cortex, resulting in diminished amplitudes [1)].

A total of 345 patients who underwent Intraoperative Neurophysiological Monitoring in Spine Surgery with motor evoked potentials (mMEP) monitoring were included, and Kim et al. from Seoul National University Hospital,Republic of Korea, retrospectively reviewed their demographic/clinical parameters, and mMEP recording results according to lesion locations.

Multivariate logistic regression analysis revealed that preoperative Medical Research Council (MRC Muscle Scale) grade of the weakest muscle <3 was significantly associated with failure of baseline mMEP generation in both cervical and thoracic lesions. In addition, high intramedullary T2 signal intensity on spine MRI for cervical lesions and male sex for thoracic lesions were also significantly associated with baseline mMEP generation failure. Moreover, the failure of baseline mMEP generation was a significantly associated factor for poor functional outcome in patients with thoracic lesions.

Sex, radiological abnormality, and preoperative functional status were associated with baseline mMEP generation failure during spine surgery with different patterns according to lesion location. Moreover, baseline mMEP generation failure in thoracic lesion could be associated with risk of postoperative deficits.

The risk of baseline mMEP recording failure could be evaluated based on preoperative clinical parameters [2)].

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Calancie B, Klose KJ, Baier S, Green BA. Isoflurane-induced attenuation of motor evoked potentials caused by electrical motor cortex stimulation during surgery. J Neurosurg. 1991 Jun;74(6):897-904. PubMed PMID: 2033449.

2)
Kim JS, Jang MJ, Hyun SJ, Kim KJ, Jahng TA, Kim HJ, Kim SM, Park KS. Failure to generate baseline muscle motor evoked potentials during spine surgery: Risk factors and association with the postoperative outcomes. Clin Neurophysiol. 2018 Aug 22;129(11):2276-2283. doi: 10.1016/j.clinph.2018.08.001. [Epub ahead of print] PubMed PMID: 30218942.