Facial nerve monitoring

Facial nerve monitoring is an excellent model, since electrical and mechanical evoked potentials can be directly presented to the surgeon in real-time through an acoustic loudspeaker display.

Despite routine use of intraoperative neuromonitoring in Vestibular schwannoma surgery, its application in predicting long-term facial function is limited.

The greater superficial petrosal nerve (GSPN) is especially important in anterior transpetrosal approach (ATPA) as the most reliable superficial landmark of Kawase triangle. The GSPN can be considered as the superficial lateral border of anterior petrosectomy on the middle fossa to avoid internal carotid artery (ICA) injury. Although experienced operators can find the GSPN, its confirmation is not always easy to achieve.

Tomio et al., introduce GSPN confirmation methods using facial nerve monitoring. In 10 cases, antidromic GSPN stimulation and free running electromyography facial muscle electromyography (EMG) monitoring were performed.

Facial nerve evoked-EMG by antidromic GSPN stimulation confirmed the location of the GSPN course with precision in all cases. Free-running facial muscle EMG informed the mechanical stress of facial nerves through the GSPN. There was no postoperative facial palsy or dry eye in these cases.

GSPN confirmation and preservation are not always easy to achieve. These monitoring methods are useful for the confirmation of the GSPN, which is a landmark for safe extradural anterior petrosectomy, and for the preservation of the GSPN itself [1].

Case series

2015

Twenty-four grade IV acoustic neuromas (54 % larger than 4 cm) were completely removed from October 2008 to November 2013. Nine patients (37.5 %) had HB I/II and 15 (62.5 %) had HB III-VI. The poor prognosis group had a higher latency than the good prognosis group (p = 0.045). Lower proximal amplitude was detected in the poor prognosis group (p = 0.046). Lower proximal-to-distal amplitude ratio was also detected in the poor prognosis group (p = 0.052). Amplitude ratio cut-offs of 0.44 and 0.25 were able to predict poor prognosis with sensitivity of 0.73 and 0.4 and specificity of 0.78 and 1, respectively (p = 0.046).

Lower proximal amplitude and proximal-distal amplitude ratio were previously reported as predictors of poor facial function in different sizes of vestibular schwannomas. We observed that the same applies specifically for large-sized, completely removed, grade IV tumors. Additionally, we describe a difference in proximal latency time between the good and poor prognosis groups, which was not previously reported [2].

[1]

Tomio R, Akiyama T, Ohira T, Horikoshi T, Yoshida K. Usefulness of facial nerve monitoring for confirmation of greater superficial petrosal nerve in anterior transpetrosal approach. Acta Neurochir (Wien). 2014 Oct;156(10):1847-52. doi: 10.1007/s00701-014-2162-1. Epub 2014 Jun 27. PubMed PMID: 24969175.

[2)]

Duarte-Costa S, Vaz R, Pinto D, Silveira F, Cerejo A. Predictive value of intraoperative neurophysiologic monitoring in assessing long-term facial function in grade IV vestibular schwannoma removal. Acta Neurochir (Wien). 2015 Nov;157(11):1991-8. doi: 10.1007/s00701-015-2571-9. Epub 2015 Sep 7. PubMed PMID: 26347044.

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