Four-channel electromyography of the facial nerve in vestibular schwannoma surgery: sensitivity and prognostic value for short term facial function outcome

Published in Otology & Neurotology Vol. 26, No. 1, January 2005, 114-120

Objective: To evaluate the short-term facial prognostic value of a four-channel facial electromyographic device in vestibular schwannoma surgery.
Study Design: Eighty-nine vestibular schwannomas operated on and intraoperatively monitored by a four-channel facial electromyographic device between October 2002 and September 2003 were included in this prospective study. Detection was performed in frontal, orbicularis oculi, orbicularis oris, and platysma muscles.
Main Outcome Measure: Facial function grading at postoperative Days 1, 8, 30, and 180 (House-Brackmann classification).
Setting: Tertiary referral center.
Results: Postoperative facial function at Day 180 was assessed as Grade 1 or 2 in 80%, as Grade 3 or 4 in 16%, and as Grade 5 or 6 in 4% (n = 80). The postoperative facial function was related to the intraoperative nerve stimuli thresholds (range, 0.01-3 mA for a response > 100 μV) near the brainstem and the proximal-to-distal ratio of the stimulation threshold. A proximal threshold between 0.01 and 0.04 mA had a positive predictive value of 94% for good facial function (Grade 1 or 2). The proximal threshold was lower in patients with improving or stable facial function in comparison with those with a delayed deterioration between Days 8 and 30. The stimulation threshold at the adhesion zone was related to the immediate facial function outcome. The maximal electromyographic response was detected in the frontal muscle or the platysma in 27% of cases and in orbicularis oris and oculi in 73% of cases.
Conclusion: A four-channel device may enhance electromyographic sensitivity. Determination of stimulation threshold below 0.05 mA yields facial prognostic information.