Injury Predictive Value of Nerve Monitoring in Thyroidectomy

Cernea CR, Brandão LG, Hojaj FC, De Carlucci Jr, D, Brandão J, Cavalheiro B, Sondermann A
Department of Head and Neck Surgery – University of Sao Paulo Medical School – Sao Paulo, Brazil

Nerve monitoring during thyroidectomy was introduced by Premachandra, in 1992\(^1\). The method of vocal fold monitoring utilizing electronic sensors built in endotracheal tubes was popularized by Randolph\(^2\), in 2001, who recommended its use in all thyroid operations. However, some authors have questioned some aspects of routine nerve monitoring, like efficacy and cost benefit relationship\(^3\,4\,5\,6\).

Objectives: 1. To evaluate the efficacy of a nerve monitoring (NM) system in a series of patients submitted to thyroidectomy; 2. To analyze the negative-predictive-value (NPV) and positive-predictive-value (PPV) of the method.

Method: NIM\(^\circ\) System efficacy was prospectively analyzed in 447 patients submitted to thyroidectomy between 2001 and 2008 (366 female/81 male; 420 Caucasian/47 non-Caucasian; 11 to 82 year-old - median: 43 year-old). There were 421 total thyroidectomies and 21 partial thyroidectomies leading to 868 nerves at risk. The gold standard to evaluate inferior laryngeal nerve function was early postoperative videolaryngoscopy, which was repeated after 4 to 6 months in all patients with abnormal endoscopic findings.

Results:
At the early evaluation, 858 nerves (98.8%) presented normal videolaryngoscopic features postoperatively. 10 paretic/paralyzed nerves (1.2%) were detected (2 unexpected unilateral paresis, 1 unexpected bilateral paresis, 1 unexpected unilateral paralysis, 2 unexpected bilateral paralysis and 1 expected unilateral paralysis). At the late videolaryngoscopy, only 2 permanent nerve paralysis were noted (0.2%), with an ultimate result of 99.8% functioning nerves. NM showed absent or markedly reduced electrical activity at the end of the operations in 25/858 nerves (2.9%), including all 10 endoscopically compromised nerves, with 15 false-negative results. There were no false-positive results. Therefore, NPV was 40.0% and PPV was 100%.

Conclusions: In the present series, nerve monitoring had a very high positive-predictive-value, but had a low negative-predictive-value for the detection of recurrent nerve injury during thyroidectomy.

References