Neuromonitoring During Surgical Treatment of Thoracic Outlet Syndrome

Jeremy S McCallister, AuD, CNIM, DABNM; Ralph Ierardi, MD, FACS, ARDMS; Sonya Tuerff, MD, FACS, ARDMS

**METHODS**

- Alerts occurred in 82 (67%) of the procedures.
- 169 isolated or concurrent “alert events” were noted.
- 98% of the alerts involved the brachial plexus followed by the phrenic nerve (2%).
- No long thoracic nerve or ulnar nerve SSEP alerts were noted.
- The overall rate of new deficits was 2.4%.

**RESULTS**

- Multimodality neuromonitoring is an efficacious, sensitive and specific adjunct to supraclavicular surgical treatment of TOS. Intraoperative neuromonitoring can prompt the surgeon to react immediately to early signs of evolving neurologic injury and thereby avoid or mitigate longterm neurologic deficits. Unresolved alerts primarily occur during or immediately after rib removal. Stimulated EMG is a good prognostic indicator of post-operative phrenic nerve function. The post op injury rate associated with this study group (2.4%) compares favorably with other studies which have documented injury rates as high as 37%.

- Stimulated EMG was used in many of these procedures to identify neural elements and to verify conduction in the presence of unresolved MEP changes.
- Phrenic nerve is commonly stimulated immediately prior to closing to verify conduction since it is difficult to isolate and verify Diaphragm function with motor evoked potentials.
- Closing stimulation thresholds of 5.9 mA or below were prognostic of intact phrenic Nerve conduction for the patients involved with this study.

**DISCLOSURES**

- Clinical Manager, SpecialtyCare, 3100 West End Avenue, Suite 800, Nashville, TN 37203
- The primary author provides intraoperative neuromonitoring for both of the co-authors at Christiana Care Health System in Newark Delaware.