

Axillary Nerve Monitoring During Arthroscopic Shoulder Stabilization

Content

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PURPOSE: This study evaluated the ability of a novel intraoperative neurophysiologic monitoring method used to locate the axillary nerve, predict relative capsule thickness, and identify impending injury to the axillary nerve during arthroscopic thermal capsulorrhaphy of the shoulder.

TYPE OF STUDY: Prospective cohort study.

METHODS: Twenty consecutive patients with glenohumeral instability were monitored prospectively during arthroscopic shoulder surgery. Axillary nerve mapping and relative capsule thickness estimates were recorded before the stabilization portion of the procedure. During labral repair and/or thermal capsulorrhaphy, continuous and spontaneous electromyography recorded nerve activity. In addition, trans-spinal motor-evoked potentials of the fourth and fifth cervical roots and brachial plexus electrical stimulation, provided real-time information about nerve integrity.

RESULTS: Axillary nerve mapping and relative capsule thickness were recorded in all patients. Continuous axillary nerve monitoring was successfully performed in all patients. Eleven of the 20 patients underwent thermal capsulorrhaphy alone or in combination with arthroscopic labral repair. Nine patients underwent arthroscopic labral repair alone. In 4 of the 11 patients who underwent thermal capsulorrhaphy, excessive spontaneous neurotonic electromyographic activity was noted, thereby altering the pattern of heat application by the surgeon. In 1 of these 4 patients, a small increase in the motor latency was noted after the procedure but no clinical Deficit was observed. There were no neuromonitoring or clinical neurologic changes observed in the labral repair group without thermal application. At last follow-up, no patient in either group had any clinical evidence of nerve injury or complications from neurophysiologic monitoring.

CONCLUSIONS: We successfully evaluated the use of intraoperative nerve monitoring to identify axillary nerve position, capsule thickness, and provide real-time identification of impending nerve injury and function during shoulder thermal capsulorrhaphy. The use of intraoperative nerve monitoring altered the heat application technique in 4 of 11 patients and may have prevented nerve injury.

LEVEL OF EVIDENCE: Level II, prospective cohort study.