Top five rules to avoid neurovascular injury during total shoulder arthroplasty

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Abstract
Prevention of neurovascular injuries during approaches for shoulder arthroplasty involves general knowledge of the anatomical course of adjacent neurovascular structures and their proximity to various landmarks. This allows the surgeon to navigate about the shoulder while protecting or circumventing structures known to be at risk during a particular surgical approach. Adjunctive devices and monitoring methods can be helpful in difficult and even routine cases to minimize the incidence of nerve injuries. Most important is a thorough initial physical examination with documentation of neurovascular status, review of prior operative notes, and pursuing additional studies as deemed necessary.

Authors’ Key Points:

Strategies for avoiding neurovascular injury during shoulder arthroplasty include:

- Careful preoperative assessment and documentation of neurovascular function
- Identification of the coracoid process and staying lateral to the conjoint tendon
- Routine use of the “tug test”
- Consider the utility of neuromonitoring
- In difficult cases, use of a modern nerve stimulator can be helpful and applicable in primary and revision cases

The Checkpoint Nerve Stimulator/Locator can be used in several key aspects of shoulder arthroplasty

- Checkpoint is an alternative to neuromonitoring and potentially a more feasible way to test and document nerve integrity
- Checkpoint is helpful in revision cases where dissection around the brachial plexus is necessary or when dissecting through extensive scar tissue
- Checkpoint can be used in revision shoulder procedures to identify the deltopectoral interval
- Checkpoint can be used to confirm location and function of the axillary nerve, the most commonly injured nerve in shoulder arthroplasty surgery
- Threshold testing of the axillary nerve can provide valuable information regarding nerve function to help avoid over-tensioning of axillary nerve and to guide decisions about implant sizing
- Checkpoint can be useful in providing documentable, functional measurement of nerve integrity throughout the procedure and prior to closure

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