

Analysis of Upper Extremity Peripheral Nerve Involvement and Subsequent Nerve Palsy in Patients following Shoulder Arthroplasty: A Retrospective Cohort Study

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INTRODUCTION:

Peripheral nerve injury is a rare, but potentially devastating complication following shoulder arthroplasty, that is most often the result of iatrogenic perioperative manipulation or direct injury to the nerve. Most present as axillary mononeuropathies or brachial plexopathies, with patients possibly having worse PROs, residual neuropathic pain, sensorimotor deficits, and increased morbidity. The purpose of this study is to describe the patterns of nerve injury and the subsequent longitudinal clinical course of patients with nerve injury after total shoulder arthroplasty (TSA) or reverse shoulder arthroplasty (RSA).

METHODS:

A retrospective review was conducted from a single-center data consisting of patients who underwent TSA or RSA and were subsequently diagnosed with postoperative upper extremity nerve palsy or injury. Inclusion criteria was patients ages 18-90, receiving subsequent TSA or RSA with confirmed postoperative nerve injury, index surgery a minimum of two years prior to study conception. Patients with clinical notes confirming a nerve palsy related to a perioperative nerve block or surgery completed at an outside institution were excluded.

RESULTS:

Overall, 35 patients with either TSA (n = 23) or RSA (n = 12) met inclusion criteria and were found to have a peripheral nerve injury associated with shoulder arthroplasty. The most common neuropathies were musculocutaneous (n=11), radial (n=10), and axillary (n=10). There were five cases of polyneuropathy, along with four cases of pan-brachial plexopathies. Complete symptomatic resolution was found in 74.3% of patients, with an average time to resolution of 7.4 ±7.1 months. There were 9 (25.7%) total unresolved nerve injuries. Overall, 4 cases necessitated surgical intervention, with half of these patients still experiencing residual deficits at time of final follow up. The cohort of patients who underwent RSA had an average humeral distalization of 29.53mm, a lateralization of 9.68mm, an acromiohumeral distance of 42.02mm, and a distance of 62.63mm between the glenoid fossa and greater tuberosity.

DISCUSSION AND CONCLUSION:

The study's findings suggest that nerve palsies following shoulder arthroplasty are an unpredictable surgical risk, as there was a wide distribution of mononeuropathies and brachial plexopathies in the cohort. Almost a quarter of patients experienced persistent nerve injury, and the duration of symptoms prior to complete resolution of neuropathy was prolonged, particularly in those requiring subsequent surgery for nerve palsy. Moreover, patients who had undergone RSA had distalization and lateralization values associated with a higher risk of postoperative nerve palsy after shoulder arthroplasty. Therefore, it is crucial to have a prompt and standardized algorithm for clinical intervention, including early referral to a specialist for radiographic and EMG assessment and possible treatment for patients exhibiting signs of potential peripheral nerve injury after shoulder arthroplasty, especially those with postoperative distalization and lateralization from a preceding RSA.