The Rate of Radial Nerve Palsy of Operatively Treated Humeral Shaft Fractures Using the Anterolateral and Posterior Triceps-Sparing Approaches

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Purpose: No consensus exists on the ideal approach for the operative treatment of humeral shaft fractures. Posterior approaches to the humerus have been associated with radial nerve palsy rates of over 20%. Previous studies on this topic are deficient due to low sample size, lack of a comparison group, no mention of the specific posterior approach used, or lack of reporting on the incidence of preoperative nerve palsies. In addition, there are large discrepancies between different studies with regard to the actual nerve palsy rate. Our purpose was to determine the rate of nerve palsy for patients with surgically treated acute humeral shaft fractures using either the anterolateral or posterior triceps-sparing approaches.

Methods: A retrospective cohort study of adult patients with humeral shaft fractures (AO OTA 12A-C) treated was undertaken. Patients were excluded if they presented with non-acute fractures (>3 weeks), had preexisting chronic nerve injury, or had no examination on presentation. The nerve palsy rate at presentation was then calculated. Subsequently, patients were excluded if they were treated nonoperatively, treated with intramedullary nailing, external fixation, or an approach other than the standard anterolateral or the posterior, triceps-sparing approach to the humerus. In addition, patients were excluded if they presented with a preoperative nerve palsy. Postoperative nerve palsy rates were calculated among the remaining patients. Radial nerve palsy was defined as any perceptible motor weakness on examination in the extensor pollicis longus, extensor carpi radialis brevis and/or longus, or extensor digitorum communis.

Results: 198 patients met the inclusion criteria from 2017 to 2022. After initial exclusion, 151 patients presented with acute OTA12 fractures and met initial inclusion criteria. 25 of 151 (17%) presented with a radial nerve palsy and were excluded. After secondary exclusion criteria were applied, 76 operatively treated patients were identified. The total rate of postoperative radial nerve palsy was 3.9%. There were 0/32 patients treated with the anterolateral approach and 3/44 (7%) patients treated with a posterior triceps-sparing approach who were diagnosed with a postoperative radial nerve palsy.

Conclusion: The large patient cohort of surgically treated humeral shaft fractures shows a low rate of radial nerve palsy. Both approaches demonstrated a low radial nerve palsy rate and can be considered safe to use. Choice of approach should be determined by fracture location and pattern rather than concern for nerve palsy rates. This information can help guide patients when choosing surgical versus nonoperative management.