

Clinical and Radiographic Outcomes of 67 Consecutive Humeral Shaft Fractures Treated with Plate Osteosynthesis Through a Triceps-Sparing Posterior Approach

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Background/Purpose: The optimal treatment for humeral shaft fractures continues to be debated and likely depends on several injury- and patient-related factors. The triceps-sparing posterior approach to the humerus offers several intuitive advantages, including the ability to visualize and protect the radial nerve, access to a flat diaphyseal surface for plate fixation, adequate exposure for application of two orthogonal plates, and visualization of distal humerus for metaphyseal fixation and avoidance of the olecranon and coranoid fossa. In the current investigation, we sought to determine the clinical and radiographic outcomes following plate fixation of humeral shaft fractures utilizing the triceps-sparing posterior approach to the humerus. We hypothesized that this technique would result in a high rate of union and a low rate of secondary nerve palsies as the approach provides ample visualization of the fracture as well as the radial nerve.

Methods: A retrospective review from a single surgeon's cases at one institution was performed collecting demographics, operative reports, clinical follow-up, and radiographs from a consecutive series of humeral shaft fractures (OTA 12-A, 12-B, or 12-C) treated with plate fixation between 2005 and 2014. All cases were treated via a posterior, triceps-sparing approach for open reduction and fixation using a 3.5-mm extra-articular locking compression (LCP) distal humerus plate (DePuy Synthes) in combination with a 3.5-mm reconstruction plate (Fig. 1). Postoperative radiographs were assessed for angular deformity and time to union. Clinical outcomes, including range of motion and strength testing, were also reviewed.

Results: Four of the 67 patients were lost to follow-up before their 6-week follow-up. In the remaining 63 patients with radiographic follow-up, the average radiographic time to union was 15.5 ± 11.1 weeks and there was 1 case of delayed union (1.6%). There were no cases of malunion and no instances of implant failure. 17 of 67 patients (25.4%) presented with a primary radial nerve palsy following injury, and 14 of the 17 of the preoperative radial nerve palsies fully resolved at an average of 7 months following injury. Two additional patients developed radial nerve palsies postoperatively (2 of 67, 3.0%). One of the patients with postoperative nerve palsy had a full recovery, and the other was lost to follow-up after 6 months. By the time of the latest clinical follow-up appointment, 50 of 61 patients (82.0%) had full range of motion of the elbow, symmetrical to the contralateral, uninjured side.

Conclusion: This is a large consecutive series of humeral shaft fractures treated with locked compression plating through the posterior approach by a single surgeon. The results of this study indicate that using the triceps-sparing posterior approach to the humerus is an

effective technique that achieves a high union rate and a low incidence of secondary radial nerve palsy.

