Retrospective Matched Comparison of 2- and 3-Part Proximal Humerus Fractures Treated with Intramedullary Nails versus Locking Plates: A US-Based Experience

Sanjit R. Konda, MD*; Kenneth A. Egol, MD; Christopher G. Herbosa, BS; Blake Immanuel Boadi, BS; Abhishek Ganta, MD*

Purpose: Locking plate fixations are viewed as the standard treatment for proximal humerus fractures in the United States. However, research comparing this fixation with intramedullary nail fixations is scarce in the US. The purpose of this study was to compare outcomes of patients with proximal humerus fractures treated with intramedullary nails (IMNs) or locking plate (LP).

Methods: An IRB-approved registry at an urban Level I trauma center was queried for proximal humerus fractures (OTA 11-A/B/C) in patients >18 years old treated with IMN or LP and minimum 6-month follow-up. Propensity matching (Neer classification, age, sex) was used to match IMN to LP at a 1:2 ratio. The primary measure of function was the American Shoulder and Elbow Surgeons (ASES) standardized shoulder score index. Demographics, injury, radiographic characteristics, Neer classification, 6-month functional outcomes (ASES score, range of shoulder motion), and quality outcomes (healing time, union, complications, reoperation) were also recorded. Univariate analysis comparing IMN and LP was performed using chi-squared, independent Student t-tests, and Mann-Whitney U tests where appropriate.

Results: 20 IMN patients and 40 propensity score matched LP patients were identified and studied. There were 7 (35%) 2-part and 13 (65%) 3-part fractures in the IMN cohort. No differences were seen between the IMN and LP cohorts in ASES score (75.9 ± 15.1 vs 81.4 ± 16.2, P = 0.210), forward elevation (140.3° ± 27.7° vs 150.0° ± 31.3°, P = 0.242), or external rotation (59.5° ± 21.6° vs 53.6° ± 20.7°, P = 0.311). The IMN and LP groups were also comparable in radiographic outcomes including time to healed fracture (3.5 ± 1.7 vs 3.0 ± 0.8 months, P = 0.335), proportion healed (100% vs 100%, P = 1), and malunion rate (5% vs 2.5%, P = 0.653). There were no differences in complications (20.0% vs 7.5%, P = 0.155) or reoperation rate (15% vs 5%, P = 0.186).

Conclusion: IMN fixation of 2- and 3-part proximal humerus fracture patterns results in similar 6-month functional and quality outcomes compared to LP fixation.