

Plate versus Nail: A National Surgeons Quality Improvement Program Database Comparison of Operative Techniques for Repairing Humeral Shaft Fractures

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INTRODUCTION:

Humeral shaft fractures are common injuries. While they can often be managed conservatively, more severe injuries may require surgery, typically either open reduction and internal fixation (ORIF) with a plate and screws or intramedullary nailing (IMN). Both of these operative techniques are widely used; however, best practices remain equivocal. The aim of this study is to compare outcomes between ORIF with a plate and screws and IMN in the setting of humeral shaft fractures.

METHODS: This study drew data from the American College of Surgeons National Surgeons Quality Improvement Program (ACS NSQIP) database between 2016-2020. Patients undergoing surgical fixation of humeral shaft fractures, either via IMN or plate fixation, were identified via CPT code. Multivariate regression was performed to assess 30-day postoperative outcomes between the two operative approaches.

RESULTS:

A total of 3,424 patients with humeral shaft fractures were included, 2,517 undergoing plate fixation while 907 underwent IMN. Patients undergoing plating had reduced odds of experiencing any complication (OR 0.607; $p < 0.001$), fewer Clavien-Dindo grade IV complications (OR 0.525; $p = 0.042$), and lower 30-day mortality (OR 0.198; $p < 0.001$). They also had lower odds of delayed (greater than 7 days) hospital stays (OR 0.409; $p < 0.001$), 30-day readmission (OR 0.481; $p < 0.001$), and fewer adverse discharges (OR 0.459; $p < 0.001$).

DISCUSSION AND CONCLUSION: Plate fixation for humeral shaft fractures is associated with better postoperative outcomes relative to IMN. Plate fixation was associated with reduced complications and lower mortality. These patients also experienced a better hospital course, with reductions in delayed hospital stays, readmissions, and adverse discharges. Our findings suggest that, when appropriate, plate fixation should be the preferred operative technique for managing these fractures.

