Cost Comparison Between Open Reduction and Internal Fixation and Non-Operative Management for Ulnar Diaphyseal Fractures

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Purpose: Providing value-based care has become increasingly important; therefore, there is a need for cost-benefit assessments to inform surgical decision-making. Prior studies have reported on earlier functional recovery and reduced complication rates for patients with ulnar diaphyseal fractures treated with open reduction and internal fixation (ORIF) compared to nonoperative treatment. This study aimed to complete a cost analysis comparing the differences in direct and indirect costs between ORIF and nonoperative treatment relative to the improvement in functional outcome scores for patients with isolated ulnar diaphyseal fractures.

Methods: This is an a priori planned secondary analysis from a large randomized controlled trial comparing ORIF (plate and screws) with nonoperative treatment (below-elbow casting) for ulnar diaphyseal fractures. A cost analysis was completed using data on costs and outcomes from the trial, including both direct costs of care (implant costs, hospital stay, readmissions, complications) as well as indirect costs (time off of work). Change in the Disabilities of the Arm, Shoulder, and Hand (DASH) functional outcome scores was used to quantify effectiveness, with a minimal clinically important difference (MCID) of 10 used as a threshold for clinically significant improvement. Costs and outcomes were captured over a 1-year period. A Monte Carlo model was used to generate incremental cost-effectiveness ratios, using a probabilistic sampling strategy.

Results: In total, 99 participants were included across 11 participating sites (mean age: 41.0 years; male: 73%). Overall average direct and indirect costs for the ORIF group were $21,332.95, while overall average costs for the nonoperative group were $23,470.19. Overall change in the DASH score for the ORIF group was 13.8, while the overall change for the nonoperative group was 6.9 points. When combined, this resulted in an incremental cost-effectiveness ratio of $325.05 per point improvement in DASH, or $3,250.51 less costly to obtain a clinically important improvement in a DASH functional outcome score with ORIF.

Conclusion: Using traditional thresholds, ORIF of isolated ulnar diaphyseal fractures would be considered a cost-effective treatment option. This study supports a shared decision-making approach that includes consideration for early functional benefit and cost savings with ORIF.