Clinical Outcome Correlation to Coronal and Sagittal Angle Deformity in Humeral Shaft Fractures Treated Nonoperatively: A Secondary Analysis of a Multicenter Randomized Controlled Trial

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Purpose: This study aimed to correlate clinical outcomes with coronal and sagittal angle deformity in patients treated nonoperatively for humeral shaft fractures.

Methods: This is a prespecified secondary analysis from a large, multicenter randomized controlled trial study comparing operative (plate and screws) with nonoperative treatment (functional bracing) for humeral diaphyseal fractures. Patients were included if they were 18 years or older with displaced humeral diaphyseal fracture (AO/OTA 12-A, B, C) amenable to both treatment and presentation within 21 days from injury. Patients were excluded if there was an open fracture, multiple injuries, or nerve injury requiring repair. All operative patients had anatomical reductions and only the nonoperative cohort was taken into consideration for this analysis. Angle deformity, DASH (Disabilities of the Arm, Shoulder and Hand), SMFA (Short Musculoskeletal Function Assessment) Function and Bothersome Index, and VAS (visual analog scale) pain score were obtained from participants.

Results: There were 65 eligible patients (22 women, 43 men). Mean age at fracture was 45.1 years (standard deviation 16.1). Mean angle deformity at 4 months were: coronal 12.8° (0-34°) and sagittal 5° (0-20°). Mean outcomes at 1 year were: DASH 11.1 (17.5), SMFA Function Index 7.9 (13.5), SMFA Bothersome Index 9.7 (15.8), VAS pain score 0.8 (1.8). There was no correlation between angle deformity and outcomes. Further analysis stratifying results by gender showed that women had significantly worse outcomes than men.

Conclusion: This large randomized controlled trial study showed no correlation between angle deformity and outcomes for humerus shaft fractures treated nonoperatively for coronal angle deformity 0-34° and sagittal angle deformity 0-20°. Women had significantly worse outcomes than men with similar angle deformities.