Comparison of Bracing With Coaptation Splinting for the Initial Treatment of Acute Humeral Shaft Fractures: The COBRAS Trial

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Purpose: The optimal method for initial immobilization of acute humeral shaft fractures remains undefined. This study aimed to compare the efficacy of coaptation splinting versus Sarmiento bracing in optimizing patient comfort, pain control, and functional recovery during the first 2 weeks of nonoperative management. We hypothesized that immediate functional bracing would result in lower pain scores and improved early patient-reported outcomes compared to coaptation splinting.

Methods: A multicenter randomized controlled trial was conducted within one academic institution. Patients with isolated humeral shaft fractures (OTA 12-B) were randomized to either closed reduction and coaptation splinting or immediate Sarmiento bracing in the emergency department. Daily visual analogue scale (VAS) pain scores were collected by phone from day 1 to 10 post-injury, and again on day 14. Secondary outcomes included narcotic pain medication intake, Patient-Reported Outcomes Measurement Information System (PROMIS) scores, degree of angulation on radiographs, and a final patient satisfaction rating on a scale from 0 to 10. Statistical comparisons between groups were performed using t-tests for continuous variables and $\chi 2$ tests for categorical variables.

Results: In total, 46 patients were enrolled, 23 in each group. Pain scores did not differ significantly between groups at any post-injury timepoint ($p>0.05$). PROMIS scores were also similar, with pre-injury values of 89.4 (splint) and 97.1 (brace) and no significant differences at day 7 (51.1 vs 54.8) or day 14 (55.6 vs 58.8; $p>0.05$). Narcotic pain medication requirements were comparable between groups ($p>0.05$). There were no significant differences in the change in coronal angulation ($12.79° \pm 14.79°$ vs $11.72° \pm 9.21°$; $p = 0.830$) or sagittal angulation ($7.32° \pm 6.76°$ vs $4.67° \pm 3.25°$; $p = 0.237$) from the initial postreduction radiograph to the 1-week post-injury radiograph, indicating comparable maintenance of reduction between groups. Final patient satisfaction rating was 5.6 ± 2.8 in the splint group and 5.9 ± 3.0 in the brace group ($p = 0.795$).

Conclusion: Both immobilization protocols provided equivalent pain control, early functional outcomes, maintenance of reduction, and patient satisfaction within the first 2 weeks following acute humeral shaft fracture.