Refracture Rate of Both Bone Forearm Fractures: A Retrospective Comparison of Casting Alone Versus Casting and Extended Functional Bracing

Lisa Soumekh BA*; Walter Huu Truong MD; Tonye Sylvanus MD*
Gillette Children's Specialty Healthcare, St. Paul , MN, United States

Purpose: One of the most common pediatric fractures is a midshaft both bone forearm fracture (BBFF). The gold standard for nonoperative treatment is cast immobilization for 6-8 weeks; however, 5% to 9% refracture (reFx) within 6 months. For this reason, we hypothesized that children who utilized functional bracing for at least 8 weeks after casting will have lower reFx rates compared to those who received casting only. While previous cases series have advocated bracing after casting, there are no comparative studies evaluating efficacy of bracing after cast immobilization.

Methods: This was a retrospective review of children treated nonoperatively following a BBFF sustained between 2000 and 2014. Patients younger than 15 years with diaphyseal radius and ulna fractures were identified based on ICD-9 codes. We excluded distal, elbow, and isolated fractures of the radius or ulna. Analysis of the data was performed using $\chi 2$ and t tests with alpha set at $P < 0.05$. Odds ratio was calculated. Logistic regression analysis on casting plus function bracing <8 weeks was run to determine if age, angulation, translation, or the number of days in brace were associated with reFx. Logistic regression analysis on all included patients was run to determine if age, angulation, translation, sex, or bracing were associated with reFx.

Results: 1549 patients were screened and 426 were included for the study (111 casting only [CO], 259 casting plus functional brace <8 weeks [CFB <8 weeks], and 56 casting plus functional brace ≥8 weeks [CFB ≥8 weeks]). In comparing the 3 groups, CO was the youngest (4.5 years, vs 6.3 and 8.4). In the CFB ≥8 weeks group, the initial translation and angulation of the radius and ulna were significantly greater. Regression analyses, both for those braced and for all included patients, did not demonstrate an association between reFx and their possible predictors. The CO group had 3 reFxs (2.7%), the CFB <8 weeks group had 13 (5%), and the CFB ≥8 weeks group had 1 (1.8%). The 1 reFx in CFB ≥8 weeks was 385 days postinjury. There was no significant difference in reFx rates among the groups.

Conclusion: In our study, prolonged functional bracing (≥8 weeks) decreased the refracture rate from 5% to 2% without statistical significance. There is not a clear association between prolonged functional bracing and a decrease in refracture rate, even when controlling for fracture characteristics, age, and sex of the patients. Contrary to previous cases series, the benefit of bracing seems nominal but larger, prospective study may be needed to definitively answer this question. Cost of bracing may not be justified.