

## The Impact of Heterotopic Ossification Prophylaxis After Surgical Fixation of Acetabular Fractures: National Treatment Patterns and Related Outcomes

*Adam Boissonneault, MD; Nathan N. O'Hara, PhD; David Anthony Pogorzelski, MSc; Lucas Scott Marchand, MD; Thomas F. Higgins MD; Ida Leah Gitajn, MD; Mark Gage, MD; Roman M. Natoli, MD, PhD; Ishani Sharma, BA, BS; Sarah Pierrie, MD; Robert V. O'Toole, MD; Sheila Sprague, PhD; Gerard Slobogean, MD, MPH*  
Shock Trauma Center, Baltimore, Maryland, UNITED STATES

**Purpose:** The use of heterotopic ossification (HO) prophylaxis after acetabular surgery remains controversial with few guidelines to aid in treatment decisions. This study aimed to describe current national HO prophylaxis patterns among academic trauma centers and determine the association between prophylaxis type and radiographic HO.

**Methods:** We performed a secondary cohort study nested within the multicenter PREPARE trial. We included patients with closed acetabular fractures that were treated via a posterior, combined anterior and posterior, or extensile exposure. Descriptive statistics were used to illustrate the type and distribution of HO prophylaxis utilized among the cohort. In patients with  $\geq 6$  weeks of follow-up, we estimated the effect of prophylaxis on overall HO formation (Brooker classes I-IV) and severe HO formation (Brooker classes III or IV), and the heterogeneity in treatment effect based on outcome risk strata. Logistic regression analyses were performed and odds ratios (ORs) reported with 95% confidence intervals (CIs).

**Results:** 277 patients from 20 different trauma centers met criteria for inclusion in this study. Of the 277 patients, 32 patients (12%) received indomethacin prophylaxis, 100 patients (36%) received XRT prophylaxis (radiation therapy), and 145 patients (52%) received no prophylaxis. Administration of XRT was associated with a 68% reduction in the adjusted odds of overall HO (OR 0.32, 95% CI 0.14-0.69,  $P = 0.005$ ) compared to the no prophylaxis control group. The overall severe HO rate was 8% for the entire cohort. There was no evidence of an overall reduction in severe HO with either indomethacin (OR 0.93, 95% CI 0.13-3.98,  $P = 0.93$ ) or XRT (OR 0.48, 95% CI 0.14-1.50,  $P = 0.22$ ) compared with no prophylaxis. When the sample was stratified by outcome risk, the odds of severe HO did not significantly differ by prophylaxis in the low or medium-risk tertiles. However, XRT was associated with an 83% reduction in the odds of severe HO in the high-risk patient strata (OR 0.17, 95% CI 0.03-0.75,  $P = 0.03$ ).

**Conclusion:** HO prophylaxis patterns after surgical fixation of acetabular fractures have evolved over the last 2 decades. The majority of academic centers included in this study did not administer HO prophylaxis. We found that XRT was associated with a marked reduction in the rate of overall HO and also the rate of severe HO in high-risk patients. Despite these results, it is still not clear if the cost and theoretical risks of XRT prophylaxis outweigh the potential benefit when used universally for all patients.