## Novel Utilization of H-Plates in Treatment of Posterior Wall Components of Acetabular Fractures

Anjali Malhotra, Doriann Marie Alcaide, Nigel Blackwood, Jared Ross Halstrom, Robin Maria Litten, Ryan McIlwain, Clay A Spitler, Joseph Johnson

INTRODUCTION:
Posterior wall acetabular fractures are challenging to treat due to frequent comminution, high contact forces, and associated femoral head injuries, leading to post-traumatic arthritis and total hip arthroplasty (THA) conversion rates up to 28%. Traditional fixation methods include buttress plating, lag screws, and spring plates. H-plates (Johnson & Johnson Institute; West Chester, PA) are, stiffer, thicker, and wider than spring plates, have become commonly used at the authors' institution for comminuted fragments and no prior studies describe their clinical use. The goal is to analyze outcomes of posterior wall acetabular fracture fragments fixed with H-plates in comparison to previously described methods. The hypothesis is that H-plates provide comparable outcomes to other fixation methods.

METHODS: A retrospective review was conducted at a Level 1 trauma center from 2018 to 2023. Adult patients with acetabular fractures (AO/OTA 62) treated with ORIF of a posterior wall component using free screws, spring plates, or H plates were included. Patients with less than three months of follow-up were excluded.
Primary outcomes included conversion to total hip arthroplasty (THA), revision ORIF, reoperations, and dislocations. Secondary outcomes included surgical site infection (SSI) and mortality. Patients were grouped by fixation method and outcomes were compared between fixation with H plate, Spring plate and screws.
RESULTS: Of 343 patients, 102 (29.7%) had fixation of posterior wall fracture components with H plates. The average age was of 38.7 (18-84), with 69.7% being males and follow up of 250 days (90-972). When comparing H plates with all other fixation methods there were no significant differences with regards to rates of THA conversion (5.9% vs 11.6%, P=0.104), revisions (0 vs 0.8%, P=0.356) or reoperations (3.9% vs 4.1%, P=0.922). When comparing H plates, spring plates, and independent screws as separate groups for fixation, THA conversion rate was lower with H plates (5.3% vs 16.7% vs 10.4%, P = 0.042). Revision fixation (0.0% vs 0.0% vs 1.9%;p=0.172) and reoperations (4.2% vs 4.4% vs 2.8%, P=0.810) were not significantly different. Age (OR 1.105, p<0.001), spring plate (OR 11.63, p < 0.001 and free screw use (OR 4.2, p = 0.028) increased risk for THA conversion.
DISCUSSION AND CONCLUSION: H-plate use was associated with lower rate of conversion to total hip arthroplasty compared to other fixation options. Future prospective research should focus on evaluating the outcomes of different fixation choices for acetabular fractures with posterior wall components.