Closed Reduction Of Posterior Hip Fracture-Dislocations With An Interposed Posterior Wall Fragment ***Connor Connor C. Park, BS****; Christian G. Falgons, MD; Jonathan G. Eastman, MD; Milton L. Routt, MD; Jonahs Galloway, BS; Samantha Gardner, BS; Stephen J. Warner, MD, PhD; Kathryn A. Barth*

Purpose: Our primary objective was to investigate if the position of an interposed posterior wall fragment relative to the femoral head prior to closed reduction of a posterior hip fracture-dislocation was associated with intra-articular displacement. Secondarily, the initial positioning was assessed in relation to success of a congruent closed reduction.

Methods: At a regional Level I trauma center, patients who sustained isolated posterior wall, posterior column with a posterior wall, or a transverse posterior wall acetabular fracture-dislocation with pre- and post-reduction CT imaging from January 2019 to December 2023 were evaluated. CT imaging was reviewed in patients on initial dislocation. Axial and sagittal imaging were used to assign location of the interposed posterior wall fragment relative to the femoral head. CT scans following closed reduction were analyzed to discern intra- articular displacement.

Results: Of the 44 included patients, 21 (47%) had an intra-articular posterior wall fragment following closed reduction. Interposed posterior wall fragments were medial to the femoral head in all instances in which they were displaced into the joint and in 26.09% of instances in which they remained extra-articular ($p<0.001$).
Fragments were inferior to the femoral head in 95.24% of instances in which they were displaced into the joint and in 34.78% of instances in which they remained extra-articular (OR = 37.5; CI = 4.22, 333.06; $p<0.001$). The average length of interposed posterior wall fragments that were found to be intra-articular was 2.57 cm (SD 1.10 cm) and extra-articular was 3.55 cm (SD 0.98 cm) (CI = –1.6, –0.36; p = 0.003). Fragments were medial to the femoral head 74.19% of the time in incongruent reductions and 30.77% in congruent reductions (OR = 6.47; CI= 1.55, 26.93; p = 0.015).

Conclusion: This study found that smaller, interposed posterior wall fragments that are inferior and medial to the femoral head prior to closed reduction are significantly associated with intra-articular translation. Additionally, this injury pattern carried a high rate of incongruent closed reduction and required surgical intervention in all but one patient. Recognizing this risk, multiple closed reduction maneuvers of this injury pattern should be avoided, and fragment retrieval is anticipated.