

# Do Emergency Department Lateral Hip Radiographs Get the Picture? Comparing Radiographic and Computed Tomography Posterior Tilt Angles

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**INTRODUCTION:** Recent literature has brought to light the posterior tilt angle in femoral neck fractures as a marker for increased risk of failure with percutaneous fixation. However, lateral radiographs of the hip are often taken in the emergency department and are poorly positioned raising the question of what displacement is actually being measured.

**METHODS:** Patients were identified using current procedural terminology codes for either arthroplasty or internal fixation for femoral neck fractures. Radiology files were then reviewed to identify patients with both an injury lateral radiograph of the hip as well as a computed tomography (CT) scan of the injured hip. Patients with pathologic fractures of the proximal femur were excluded. The posterior tilt angle for each hip was measured using a concentric circle in the femoral head and a line parallel to and bisecting the femoral neck by two fellowship trained orthopaedic trauma surgeons. The angle between the center of the circle and the line intersecting the circle was recorded. Paired students t-test were used to compared measurements and intra-class correlation (ICC) was used to determine inter-rater reliability.

## RESULTS:

Sixty-one patients out of 350 were identified to have both a radiographic and CT scan. The average age of the cohort was 75 (SD 8). The average posterior tilt angle on the lateral radiograph was 24.7° (SD 20) and 34.8° (SD 27) on CT scans (Figure 1). The posterior tilt angle with greater on the CT scans in 46 (75%) of the patients. When comparing reviewers, there was no difference in the measurements for either the radiographs (p=0.64) or CT (p=0.68). The ICC for radiographs and CT scans between reviewers was 0.83.

## DISCUSSION AND CONCLUSION:

When reviewing posterior tilt angle in patients with femoral neck fractures, lateral radiographs on average have less posterior tilt when compared to the same angle measured on CT scans. While this study does not predict failure or success of percutaneous fixation of femoral neck fractures, it guides surgeons that using a posterior tilt angle on CT scans should not follow the same 20 degree cut off that has been published for radiographs.

