

## Traction Views Aid in the Assessment of Lateral Wall Integrity in Intertrochanteric Hip Fractures

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**Background/Purpose:** Lateral wall failure may cause catastrophic collapse after internal fixation of hip fractures. A recent publication proposed a threshold value of <20.5 mm of lateral bone at 3 cm below the innominate tubercle as having an increased risk of lateral wall failure. However, the measurement of lateral wall size is affected by rotation at the fracture site and the position of the limb. The typical external rotation of the leg and hip place the fracture off axis to the AP radiograph. We hypothesized that a traction internal rotation view would provide a more accurate assessment of the lateral bone and also would identify fracture extension. The aims of this study were to compare standard and traction radiographs in the assessment of the lateral wall measurement and to determine if traction views changed treatment.

**Methods:** We reviewed a consecutive series of patients with OTA type A1-2 fractures who had standard and traction internal rotation radiographs performed in the emergency department. Our routine practice during this time was to obtain a traction view of the hip in all such patients for preoperative planning. Measurements of the lateral wall depth as per Hsu et al were made of the standard and traction internal rotation views of the affected hip. Additionally, any fracture line extensions were documented. The standard of care at our institution is sliding hip screw (SHS) with intramedullary (IM) nails being used for more unstable 3- or 4-part fractures, in cases of thin lateral walls, or fracture line extension that might predict excessive collapse. We documented the procedure chosen for each patient and any change in procedure based on the traction view. All patients treated with SHSs were followed to union to evaluate for lateral wall failure. All patients were made weight bearing as tolerated postoperatively.

**Results:** We reviewed 74 consecutive patients (mean age 75; 52 F, 22 M). The mean lateral wall depth on the standard radiograph was  $24.4 \pm 8.8$  mm and on the traction view was  $31.8 \pm 9.6$  mm ( $P = 0.0001$ ). 50 patients (68%) were treated with an SHS and 24 (32%) with an IM nail. Seven patients (11%) had distal secondary fracture lines visualized on the traction view that were not seen on the AP view and were treated with an IM nail. 13 patients had <20.5 mm on the standard radiograph and >20.5 mm on the traction view, all of whom were treated with an SHS. No patient treated with an SHS had lateral wall failure in follow-up.

**Conclusion:** Traction internal rotation views allowed for a better assessment of the lateral wall thickness as the plane of the fracture was more visible and the rotational malalignment that comes from external rotation of the limb was corrected. In this series, patients with >20.5 mm of lateral wall depth on the traction radiographs were treated with SHSs with no cases of lateral wall failure. 13% of patients had fracture extension to the lateral wall that was not seen on the AP views that resulted in the use of an IM nail instead of an SHS. We recommend a traction internal rotation view of intertrochanteric fractures if SHS is being considered.