# Using the Equatorial Talar Line as a Radiographic Predictor of Sanders Type 3 & 4 Calcaneus Fractures and Lateral Wall Blowout

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## Background

- Management of displaced intra-articular calcaneal fractures is difficult due to their complexity, associated soft tissue injuries, and possibly due to the lack of a consistent and reliable imaging parameter to help guide treatment and predict outcomes.

- We present a new technique of analyzing the calcaneal fractures radiographically by utilizing the Equatorial Talar Line (ETL).

- We define the ETL as a line drawn from the most superior portion of the anterior process of the talar head through the back of the talus, across the calcaneal tuberosity
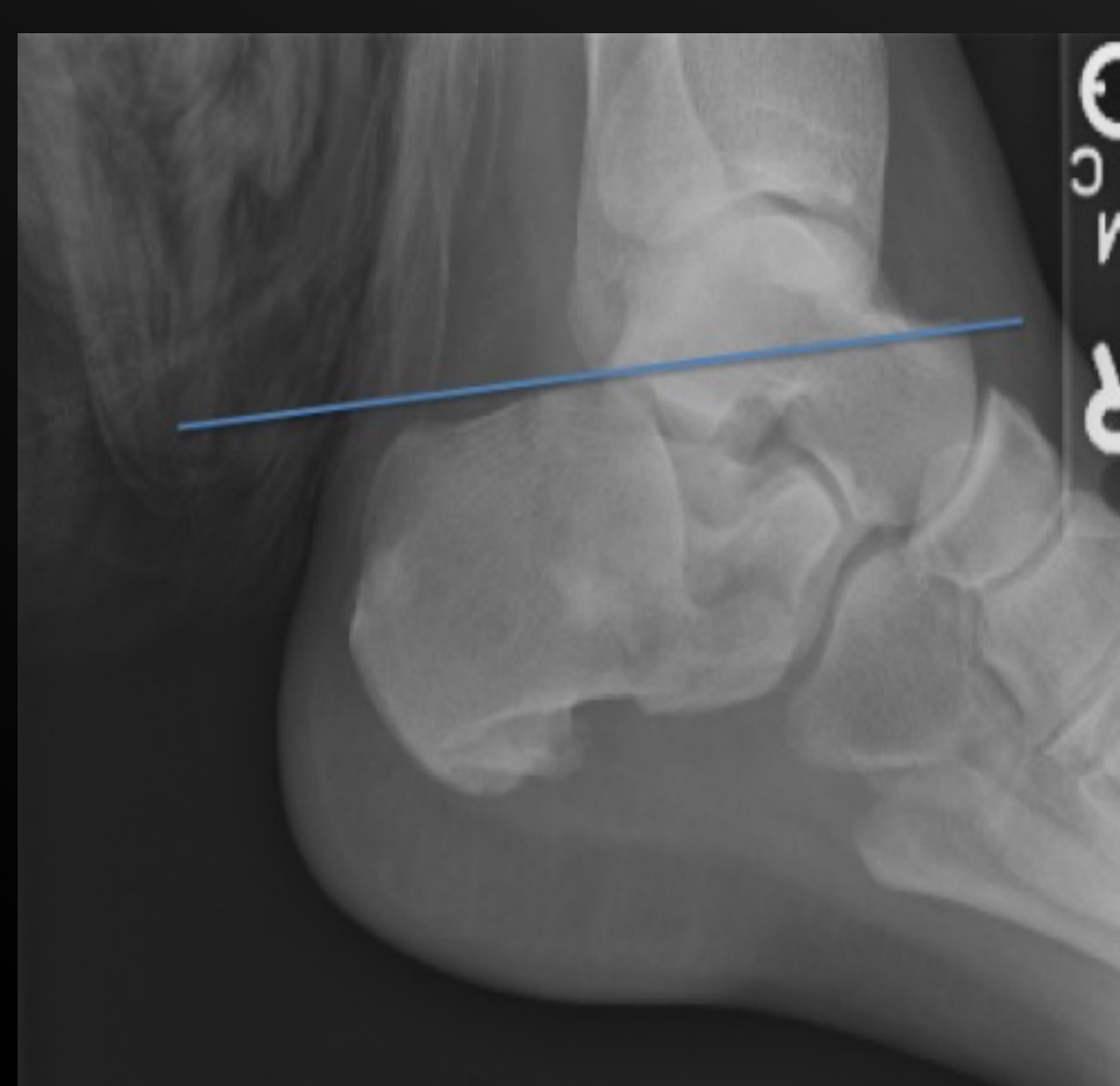
- The purpose of this study was to assess the reliability of the ETL as a sensitive radiographic parameter to predict Sanders Type III and IV fractures and the presence of lateral wall blowout requiring early treatment utilizing medial temporizing external fixation.

## Methods

- Two blinded trauma fellowship trained surgeons, a senior resident, and junior resident placed the ETL on 22 depression-type calcaneus fractures and recorded line as either above (predicted Sanders Type I or II) or below (predicted Sanders Type III or IV) the posterior tuberosity.

## Methods

- The same observer also classified each corresponding CT scan.

- All 22 fractures were then randomized again in separate session and same observers repeated the task

- Reliability was calculated via intraclass correlation coefficient (ICC) and a receiver operator curve (ROC) model was used to calculate predictive sensitivity.

- ETL location "above" calcaneal tuberosity, predictive of Sanders Type I/II Fracture
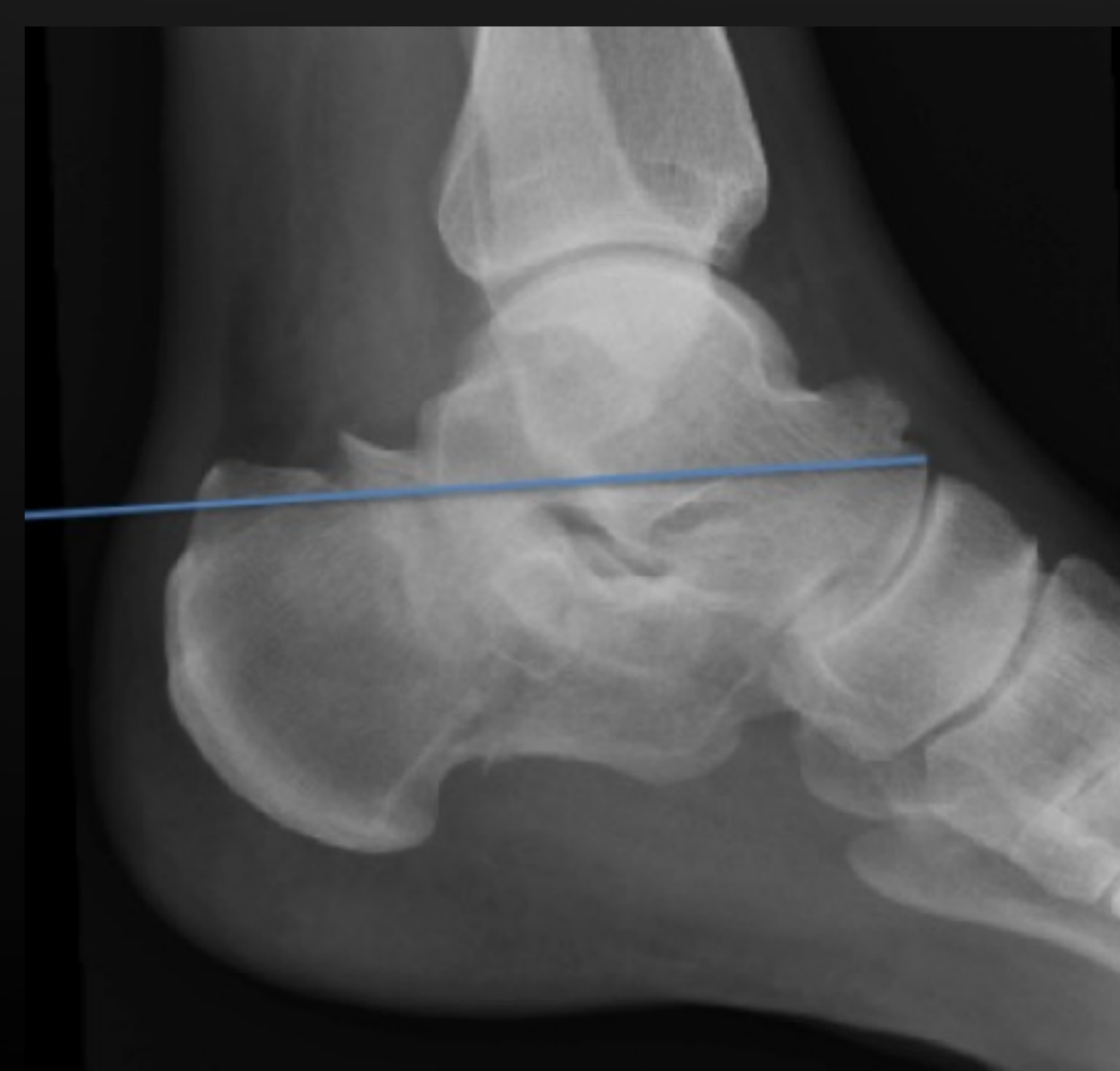
- ETL Location "below" calcaneal tuberosity, predictive of Sanders Type I/II Fracture

## Results

- In determining the 'above' or 'below' location of the ETL, the calculated ICC was 1.0 for each session, as well as between sessions 1 and 2

## Results

- As a predictor of Sanders Fracture Classification Type, the calculated ICC was 0.93 for session 1 and 0.89 for session 2 for an overall ICC of 0.91

### Table 1: Intraclass Correlation Coefficient Data

|  | Location of ETL | Sanders Fracture Classification |
|---|---|---|
| Session 1 | 1 | 0.93 |
| Session 2 | 1 | 0.89 |
| Overall ICC | 1 | 0.91 |

- As predictor of Sanders fracture type, ROC analysis yielded an overall sensitivity of 0.82

- As a predictor of lateral wall blowout, ROC analysis yielded an overall sensitivity of 0.81

## Limitations

- Inter-observer variability

- Improper alignment of ankle during radiographs

- Loss of bony landmarks due to trauma

- Limited sample size

## Conclusions

- **The ETL is a reliable and reproducible radiographic parameter that can be used to predict between Sanders Type II and Sanders Type III or IV calcaneus fractures.**

*The authors have no disclosures to report relevant to this study.*