

Using the Equatorial Talar Line as a Radiographic Predictor of Sanders Type III/IV Calcaneus Fracture and Lateral Wall Blowout

*David Keller, DO; Alex Tang, MD; Eric Boe, DO; Kristen Charles Rezk Combs, MD; John Thomas, MD; Richard S. Yoon, MD; Frank A. Liporace, MD; Joshua Langford, MD
Jersey City Medical Center, Jersey City, New Jersey, UNITED STATES*

Purpose: The equatorial talar line (ETL) is a rapid, radiographic parameter to determine severity of facet depression and lateral wall incompetence. 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 as well as the presence of lateral wall blowout.

Methods: 22 depression-type calcaneus fractures were randomly selected, blinded, and further randomized for analysis. Lateral radiographs and CT of the calcaneus were obtained. A blinded, trauma fellowship-trained surgeon, senior resident, and junior resident placed the ETL on each lateral radiograph and recorded the line as either above or below the calcaneal tuberosity. If the line fell above the calcaneal tuberosity, a Sanders type II was predicted whereas if the line fell below the calcaneal tuberosity, a higher-grade, Sanders type III or IV was predicted. Furthermore, if the line fell below the tuberosity, lateral wall blowout was also expected. The same observer also classified each corresponding CT scan (all blinded). All 22 fractures were then randomized again and in a separate session, the same observer repeated the task, totaling 44 measurements for each radiograph and CT scan, respectively. Reliability was calculated via intraclass correlation coefficient (ICC) and a receiver operating characteristic (ROC) curve model was used to calculate predictive sensitivity. Statistical analysis was performed via SPSS 20.0.

Results: In determining the 'above' or 'below' location of the ETL, the calculated ICC was 1.0 between sessions 1 and 2. In classifying the fractures, the calculated ICC was 0.91 between sessions 1 and 2. As a predictor of Sanders fracture type, ROC curve analysis yielded a sensitivity of 0.82. As a predictor of lateral wall blowout, ROC curve analysis yielded a sensitivity of 0.81.

Conclusion: The ETL is a reproducible radiographic parameter that can be reliably utilized to predict between Sanders type II and Sanders type III or IV calcaneus fractures as well as the presence of lateral wall blowout.