Accuracy and Measurement Error of the Medial Clear Space: Implications for the Assessment & Management of Ankle Fractures

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Disclosure

No Conflict to Disclose

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Our Disclosures are in the final mobile app.

We have no potential conflicts with this presentation.
Background

- Measurement of the medial clear space (MCS) is commonly used to assess deltoid ligament competency and mortise stability when managing ankle fractures. Lacking knowledge of the true anatomic width measured, previous studies have been unable to measure accuracy of measurement.

- The purpose of this study is to determine MCS measurement error and accuracy and any influencing factors.
Material and methods

- Using three normal trans-tibial ankle cadaver specimens, deltoid and syndesmotic ligaments were transected and the mortise widened and affixed at a width of 6 mm (specimen #1) and 4 mm (specimen #2). The mortise was left intact in specimen #3.

- Radiographs were obtained of each cadaver at varying degrees of rotation.

- Radiographs were randomized and providers measured the MCS using a standardized technique.
STUDY PARTICIPANT PROFILE (N=48)

- 21 PGY 1-3 Physicians
  - 21 orthopaedic

- 9 Staff Physicians
  - 6 orthopaedic
  - 3 radiology

- 18 PGY 4-5 Physicians
  - 17 orthopaedic
  - 1 radiology
Measurement Error Among 48 Surgeons in Determining Medial Clear Space

Specimen #1 - True MCS of 6.03 mm

Specimen #2 - True MCS of 4.09 mm
Measurement Error Among 48 Surgeons in Determining Medial Clear Space

Specimen #3 - True MCS of 1.7 mm

![Graph showing measurement error in degree of ankle obliquity on radiograph with 95% confidence interval.](image-url)
Results

- Lack of accuracy as well as lack of precision in measurement of the medial clear space compared to a known anatomic value was present for all three specimens tested.

- There was no significant differences in mean delta with regard to level of training for specimens #1 and #2; however, with specimen #3 staff physicians showed increased measurement accuracy as compared to trainees.
Conclusion

- Accuracy and precision of MCS measurements are poor.

- Provider experience does not appear to influence accuracy and precision of measurements for the displaced mortise.

- This high degree of measurement error and lack of precision should be considered when deciding treatment options based on MCS measurements.
References:


