Lateral Ankle Instability: The Predictive Value of Ankle Stress Radiographs vs MRI

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DISCLOSURES

The authors have no conflicts to disclose.
BACKGROUND

• Chronic lateral ankle instability in ≤ 20% of sprained ankles

• Sequelae of instability: synovitis, osteochondral lesions, chondromalacia, loose bodies, ankle arthritis ...

• Mechanical instability (vs. functional instability) may have limited rehabilitation potential with nonoperative treatment

• Reliable identification of pts w/ mechanical instability is important in directing effective treatment
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BACKGROUND

• Making the diagnosis:
  o History: recurrent sprains, ankle giving out
  o Physical exam: + anterior drawer test; + inversion stress test
  o Stress radiography: increase in talar tilt and anterior drawer distance
  o MRI: torn or attenuated ligaments
  o Arthroscopy: visualized instability

• However, a standardized diagnostic algorithm is not well-established.

PURPOSE

To assess the utility of stress radiography & MRI to objectively diagnose mechanical ankle instability.
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METHODS

- Retrospective chart review on all pts w/ Telos (Hungen, Germany) stress radiographs January 2008 – August 2013
- Talar tilt & anterior drawer distance measured for each stress radiograph
- MRI reports reviewed for lateral ligament quality
- Operative reports reviewed for ankle stability

103 pts w/ subjective instability
54 males
49 females
Avg age: 40 y

38 patients (37%) taken to OR
20 (53%) w/ intra-op instability requiring lateral ligament repair
30 (79%) w/ pre-op MRI
RESULTS

• 30 pts w/ pre-op MRI taken to OR

• As talar tilt ↓, ligaments less likely to be torn

• Significant association b/t ligament tear & talar tilt ≥ 6° degrees (p < 0.01)

↑ talar tilt compared to contralateral side
RESULTS

- Stratification by radiologic description of MRI findings ("attenuated," "thickened," or "torn" ligaments all classified as "abnormal")

- ATFL appearance on MRI did not correlate with intra-operative stability (p = 0.31)
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RESULTS

Talar Tilt Measurements for Ankles Found to be Stable and Unstable at the Time of Surgery

Ligament Appearance on MRI

- Abnormal
- Intact
- Unavailable

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Stress XR Predicts Instability

- If intra-op stability considered gold standard, talar tilt of $\geq 6^\circ$ on stress XR significantly predicted ligament incompetence ($p < 0.01$).

Sensitivity & Specificity

- Sensitivity of stress XR to identify ligament incompetence was 90%.
- Specificity = 61%

MRI Not Predictive of Instability

- MRI reports described lateral ligaments as “intact,” “thickened,” “attenuated,” or “torn.”
- No correlation b/t radiologist’s description of ATFL on MRI & intra-operative stability ($p = 0.31$).
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CONCLUSIONS

• Stress XR predicts intra-op ligament incompetence when $\text{talar tilt} \geq 6^\circ$.
• No correlation b/t MRI findings & intra-op stability.
• The dynamic nature of stress radiographs may be better suited to diagnosing mechanical instability than a static MRI.
• Physical exam remains important in work-up of ankle instability, but stress radiography may be a more objective tool.
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FUTURE DIRECTIONS

• Use stress XR to stratify patients into functional v. mechanical instability
  o Does PT resolve instability in functional group?
  o Does PT fail to resolve instability in mechanical group?

• Evaluate relationship b/t cartilage injury and degree of instability

• Further evaluate subgroup of patients w/ isolated CFL injury
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REFERENCES