Objectives

- Discuss anatomy of syndesmosis and methods to test stability
- Review various techniques for reduction and fixation
- Review current literature on syndesmotic injury and repair
Anatomy

- Tibiofibular clear space
- Tibiofibular overlap
- Medial clear space

 Syndesmotic injury

- Weber B/C
- Lauge-Hansen
- Maisonneauve injuries
Syndesmotic stress testing

- External rotation
  - Mortise view with ankle in neutral
  - ER stress applied
  - Medial clear space widening
  - Tibiofibular clear space increased
  - Tibiofibular overlap decreased

Murphy C, Pfeiffer T, Zlotnicki J, Haggerty P, Russell J, Hogan M, Debaki R, Musahl V. Significant Increases In Sagittal Translation And Transverse Rotation Of The Fibula Occur With Sequential Disruption Of The Syndesmosis. 2017 ISAKOS Biennial Congress

Syndesmotic stress testing

- Cotton test
  - Direct lateral translation
  - Widened tibiofibular clear space
  - Decreased tibiofibular overlap

Syndesmotic stress testing

- Modified Cotton test
- Fibular translation in sagittal plane
  - Not well studied
  - Increased AP translation with stress (up to 1cm) versus 1.5 mm with ML translation with Cotton

Murphy C, Pfeiffer T, Zlotnicki J, Haggerty P, Russell J, Hogan M, Debaki R, Musahl V. Significant Increases In Sagittal Translation And Transverse Rotation Of The Fibula Occur With Sequential Disruption Of The Syndesmosis. 2017 ISAKOS Biennial Congress

Syndesmotic reduction

- 52% malreduction of the syndesmosis noted on CT after using plain radiographic measurements for reduction

FOOT & ANKLE INTERNATIONAL 2009
Malreduction of the Tibiofibular Syndesmosis in Ankle Fractures. Gardner et al

- 16% malreduction of the syndesmosis with direct visualization

FOOT & ANKLE INTERNATIONAL 2009
Direct Visualization for Syndesmotic Stabilization of Ankle Fractures. Miller et al.
Syndesmotic reduction


Can We Tell if the Syndesmosis Is Reduced Using Fluoroscopy?
Koenig SJ, Tornetta P 3rd, Merlin G, Bogdan Y, Egol KA, Ostrum RF, Wolinsky PR. JOT 2015;29(9)

• Clamps
  – Type
  – placement

A Reliable Method for Intraoperative Evaluation of Syndesmotic Reduction
Hobbs D. Summers, MD, Micah K. Stuckler, MD, and Michael D. Steuer, MD
J Orthop Trauma 2013;27:196–200

Forceps Reduction of the Syndesmosis in Rotational Ankle Fractures
A Cadaveric Study
Hein Plaatink, MD, Thomas Beijer, MD, Jessica Geerts, BSc, Geert van Eemeren, MD, and J. Lawrence Snyder, MD
JBJS 2012;94:2256-61
Syndesmotic fixation

- Screws vs suture button
- # screws
- # cortices
- Screw removal?

Conclusions

• Fix the fractures first and then evaluate
• Use the uninjured side as a template
• Both screw fixation and suture fixation of the syndesmosis can work
• Number of cortices does not change stability
• Open syndesmotic reduction can reduce the rate of malreduction
Thank You!