

# Ankle Ligament Injury:

## "Don't Worry- It's Only a Sprain"


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& SPINE CENTER
OF THE ROCKIES

# Outline

I. Epidemiology
II. Classification and Types of Sprains
III. Anatomy
IV. Clinical Assessment and Imaging
V. Non-operative and Operative Treatment
VI. Chronic Instability
VII. Medial and Syndesmosis Sprains

# Epidemiology

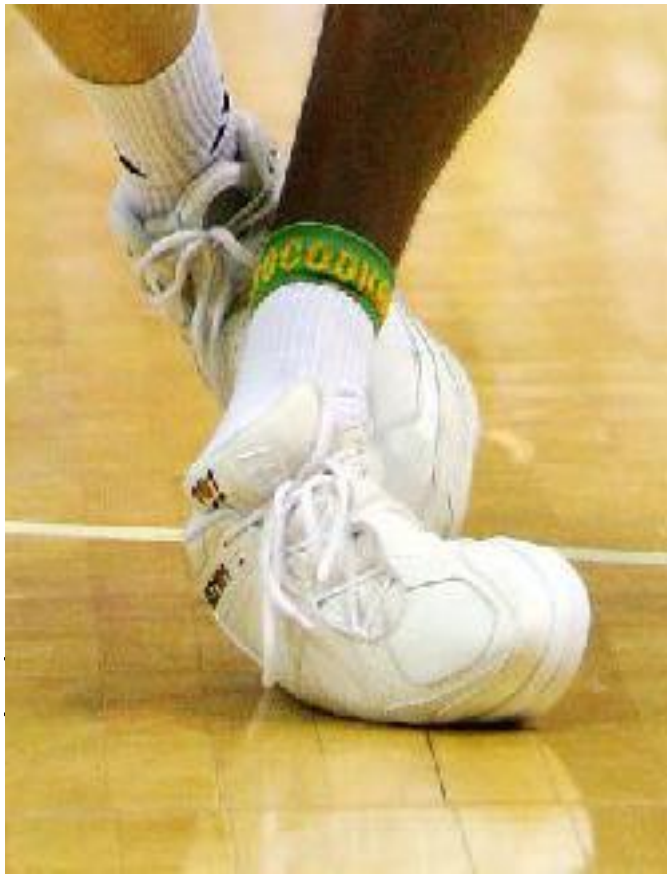
- The most common sports injury: up to 40% B-ball
- Sports- Account for ~50% of All ankle sprains
- Stairs- 27%, Level surface- 7%
- Equal Male to Female Ratio
- Peak incidence between 15 and 19 years of age

# Epidemiology

- Two Million per year in the US alone
- US Annual aggregate health care cost of $2 Billion
- Considerable time and productivity lost
- Long-term disability up to 60% of patients

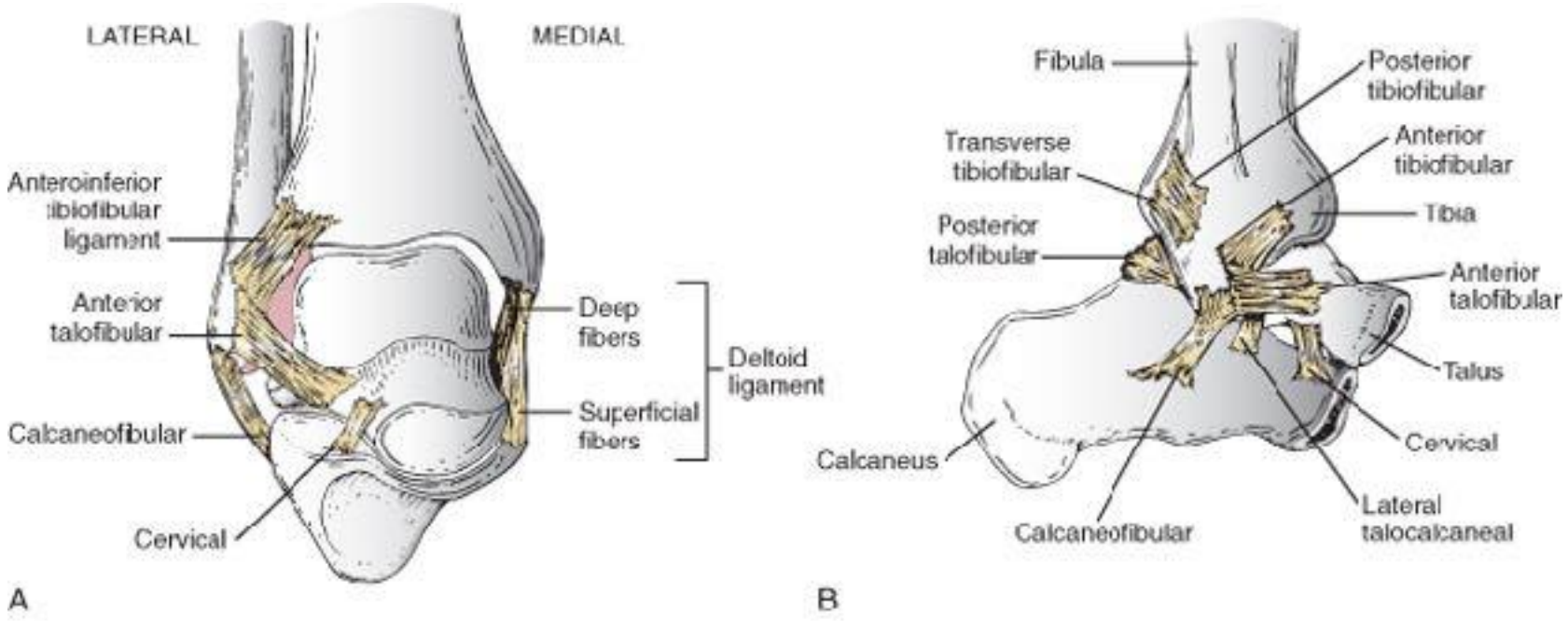
# Classification

- Grades I – III (poor clinical correlation)
- Stability:
  - Functional (stable)
    - Subjective “giving way”
    - Proprioceptive and muscular deficits
  - Mechanical (unstable)
    - Objective anatomic laxity
- Types
  - Lateral ligaments (most common 85%)
  - Medial (Deltoid)
  - Syndesmotic (High)
- Others (Posterior, Sub-Talar, Retinacular)

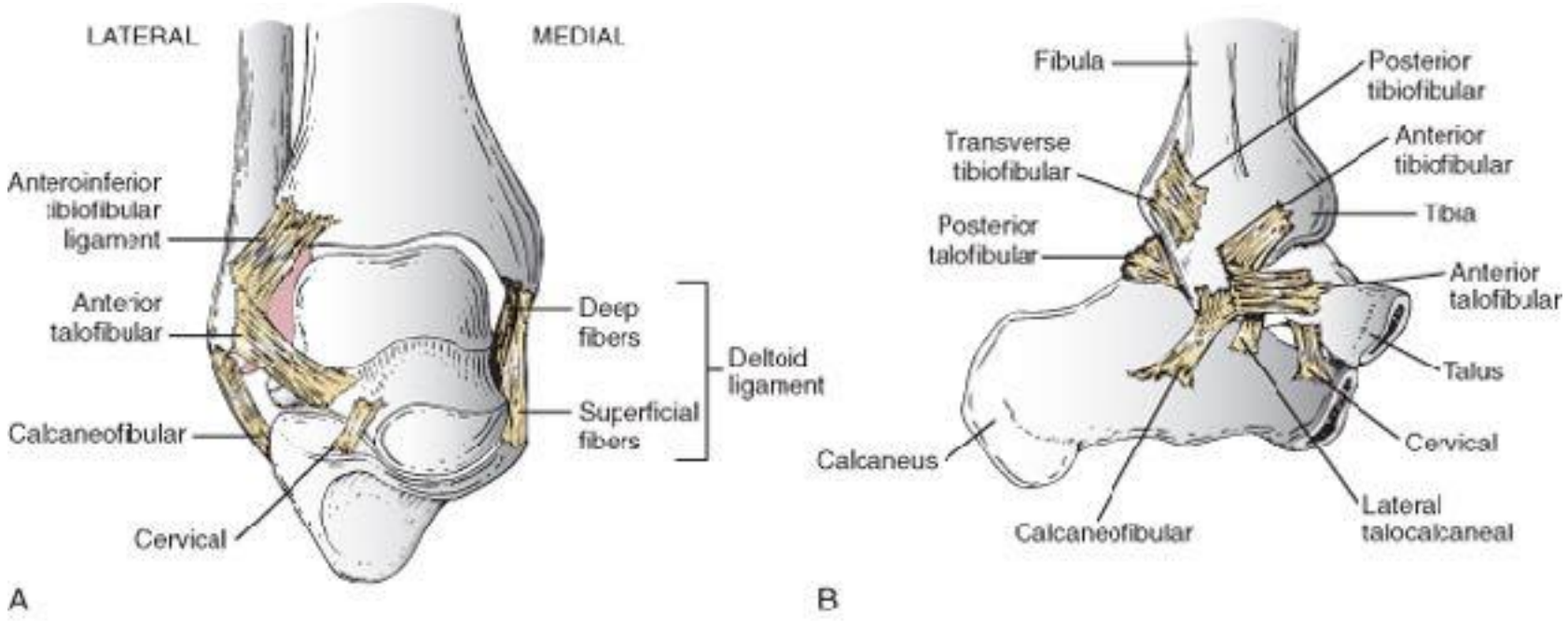


# Anatomy

- Static (ligaments and bony configuration-30%)
- Dynamic Restraints (Peroneal tendons)
- Lateral Ligaments:
  - **ATFL**, CFL, PTFL (foot position = function)



- Medial:
  - Deep and superficial Deltoid
- Interosseous (Syndesmosis)
  - Anterior, Posterior, IOL
- Subtalar
- Combination + Extent = SEVERITY of the Injury



# Clinical Assessment

- History: position of foot and mechanism
- Patient's description of pain location
- Degree of swelling and ecchymosis
- Point tenderness

# Clinical Assessment

- Stability testing
  - Drawer (ATFL) and Tilt (CFL) tests
  - Deltoid testing
  - Syndesmosis testing (ER and Squeeze)
- Peroneal tendons

# Radiologic Exam

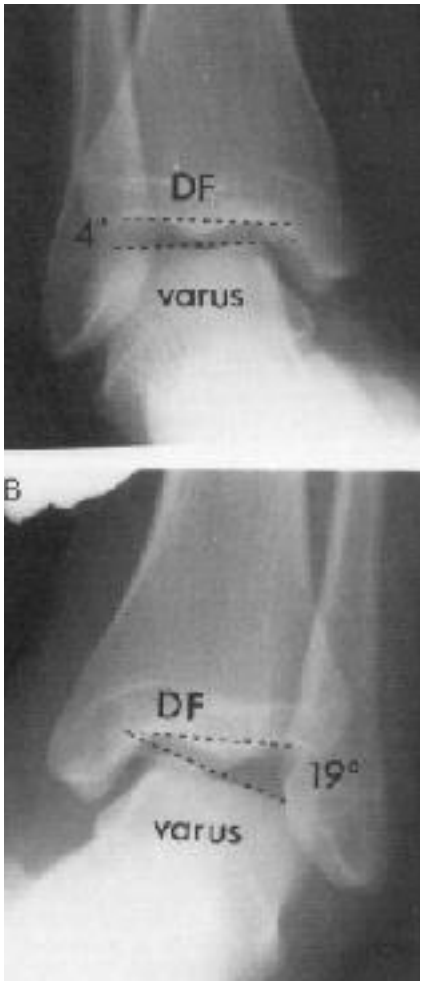
- 3-View Ankle X-Ray (standing if possible)
  - Avulsion “fractures” often present
- Rule out other fractures
  - Lateral process Talus (snowboarders)
  - Posterior Tibia (malleolus) = ? more severe
  - Anterior process Calcaneus
  - Osteochondral lesions (OCD or OLT)
- Syndesmosis widening or Fibular shortening
  - Consider Weight bearing Comparison films
- Medial clear space widening
  - BEWARE of NWB/ER films !!

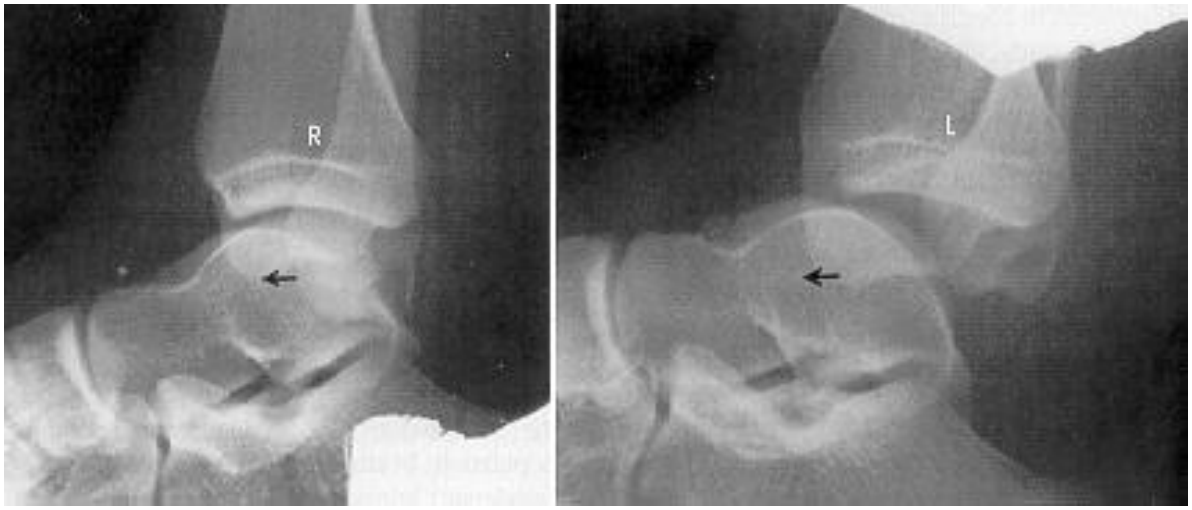
# Stress Views
(dynamic imaging)

Stable →

Unstable →

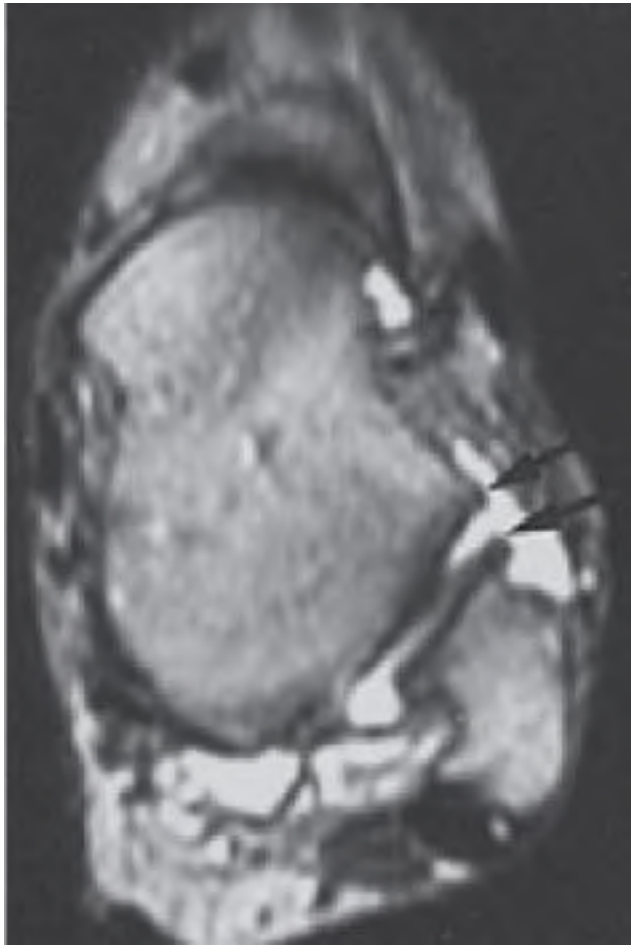
- Stress Radiographs (NOT used routinely)



# MRI

- Very sensitive (But BEWARE)
  - "Absent ligament, complete Rupture…."
  - Contusions or Bony edema
- Best use: Chronic Pain or Chronic Instability
- I often wait 6-8 weeks =~20%

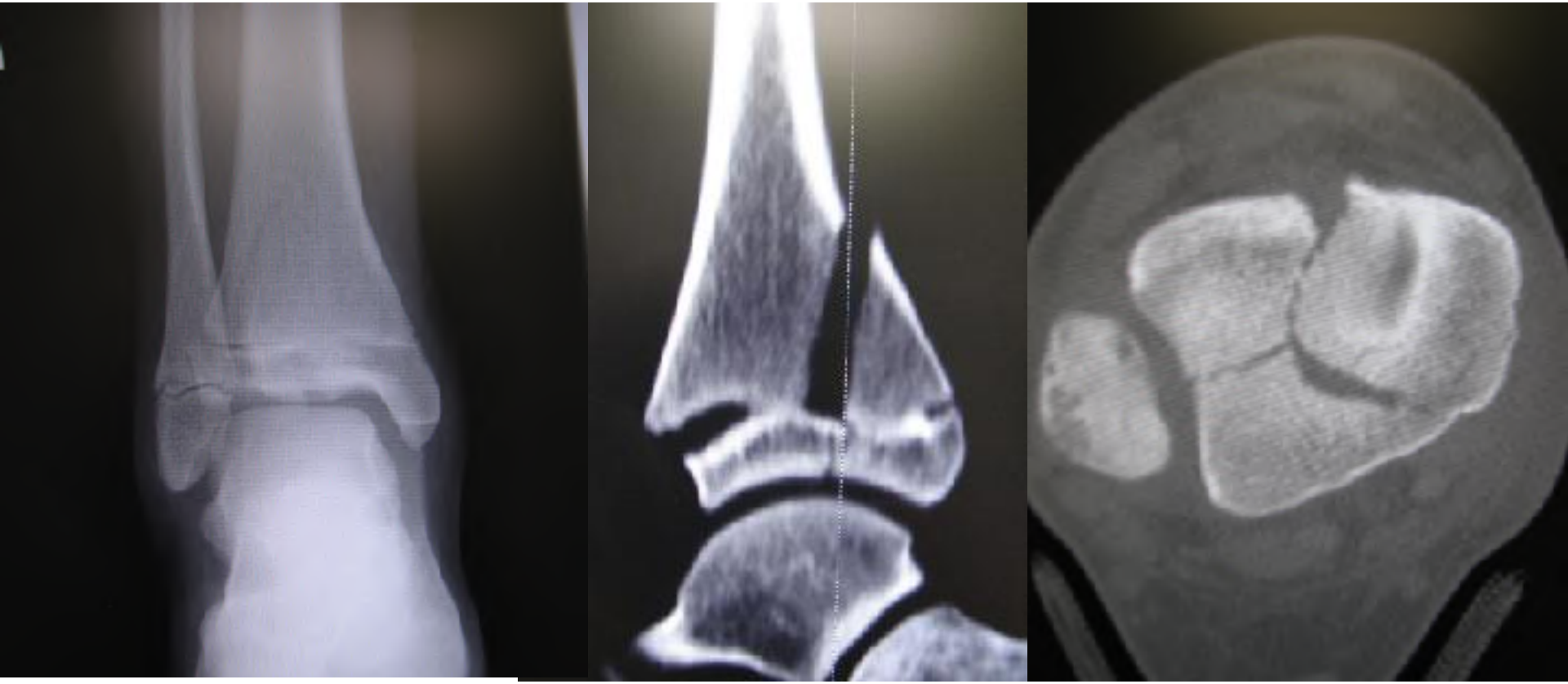


# MRI


# MRI

- Very helpful in evaluating associated pathology
  - Peroneal tendons
  - Cartilage damage (OCD)
  - Syndesmosis injury
  - Deltoid injury
  - Subtalar injury

# CT



# Treatment

- Non-Surgical Treatment is the Mainstay of Management

- Both Stable (GR I-II) and Unstable (GR III) sprains
- Some exceptions
- RICE
- Some form of Immobilization
  - In Neutral Dorsiflexion
  - Brace, Boot, or Cast
- Weight Bearing as soon as tolerated

- Functional Treatment/Rehabilitation

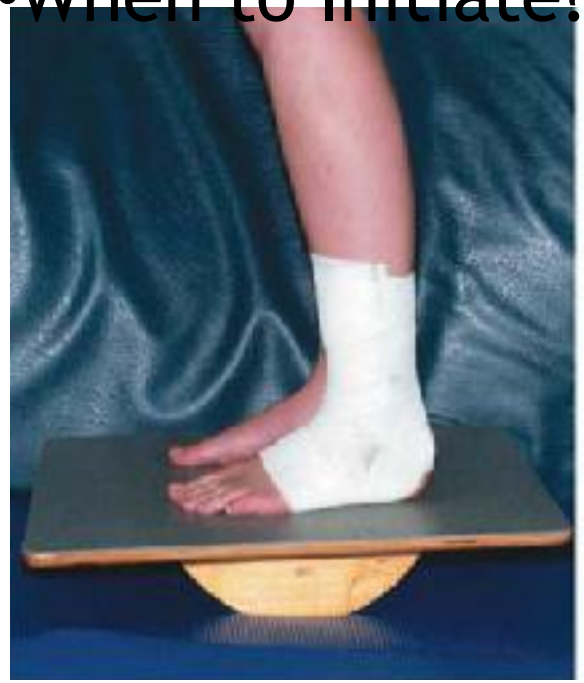
# Functional Treatment

- Bracing provides Mechanical Stability and Proprioceptive Feedback
- Taping is adjunctive and not detrimental but it's Mechanical effects rapidly diminish



# Functional Treatment

- Rehabilitation Phase
  - Exercises, Strength, Balance, Proprioception
  - When to Initiate?



# Functional Treatment

- Extensive Literature exists (Inconclusive)
- Some studies report higher pain, dysfunction and instability with Aggressive Early rehabilitation
- Others report Earlier return to Normal Activity with Acute Therapeutic exercises

Surgical Versus Functional Treatment for Acute Ruptures of the Lateral Ligament Complex of the Ankle in Young Men

A Randomized Controlled Trial

# Conclusion

- Both Patients treated with a Brief period of Rest and Immobilization and Those with Early Exercise show No significant difference in the Long Term

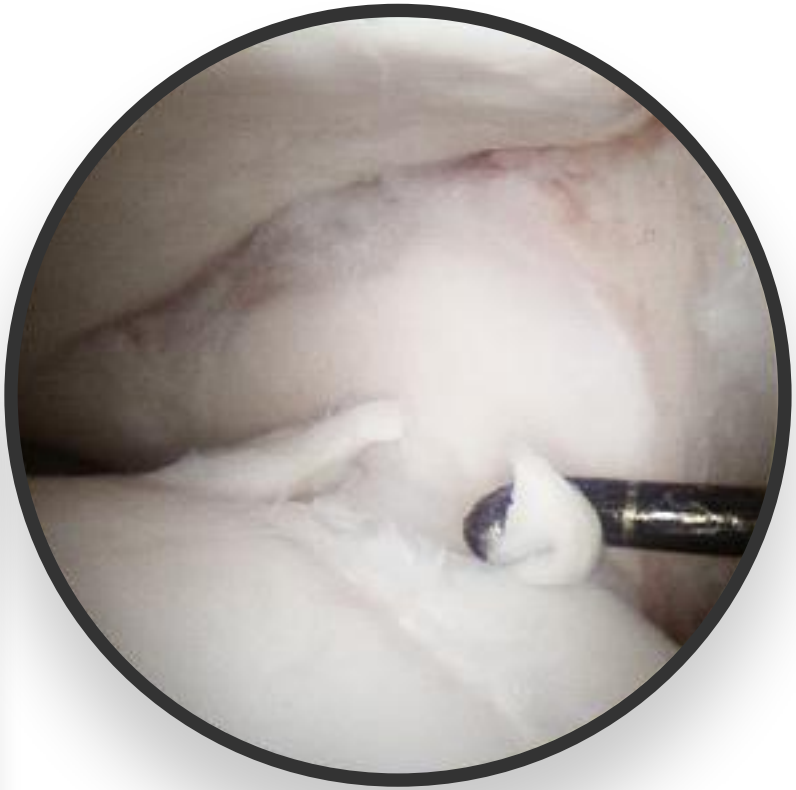
- If In Doubt:
  - A Brief period (Less than 3 weeks) of Activity Modification (REST) and Immobilization (BRACE or CAST) is NOT detrimental and should be considered as part of a Functional Treatment Protocol

# Surgical Treatment

- Chronic Pain, Weakness, Instability
- Failed Non-Operative management
  - Under-treated?
- Acute Surgical repair of an Unstable (GR III) Lateral ligament sprain Not recommended
- Type of Surgery – Anatomic Repair

# Surgical Treatment

- Role of Arthroscopy
- Ultimate Goals:
  - Restore Mechanical Stability
  - Reduce Pain
  - Address Associated Pathology



# Chronic Ankle Instability

- Therapeutic Exercise can still play a role
  - Impaired Neuromuscular Control
- Patients have Demonstrable Mechanical Instability
- Persistent Pain
- Associated Pathology (80+%)
  - Synovial Irritation (Joint Laxity/Cavitation)
  - Cartilage Damage (OCD)
  - Soft and Hard Tissue Impingement
  - Tendon Pathology (synovitis or tearing)
- Surgery often Recommended in this Subset

# Medial Ankle Sprain

- Deltoid Ligament
  - Deep (stronger) and Superficial
- Different Mechanism of Injury
  - Valgus/ABduction or External Rotation
- More Energy = More Injury
  - Rarely an Isolated injury (4%)
- Always Assume Additional Injury:
  - Syndesmosis, Lateral Ligaments, Fibular Fx
- Shift, Shuck, Cotton tests, Provocative Tests

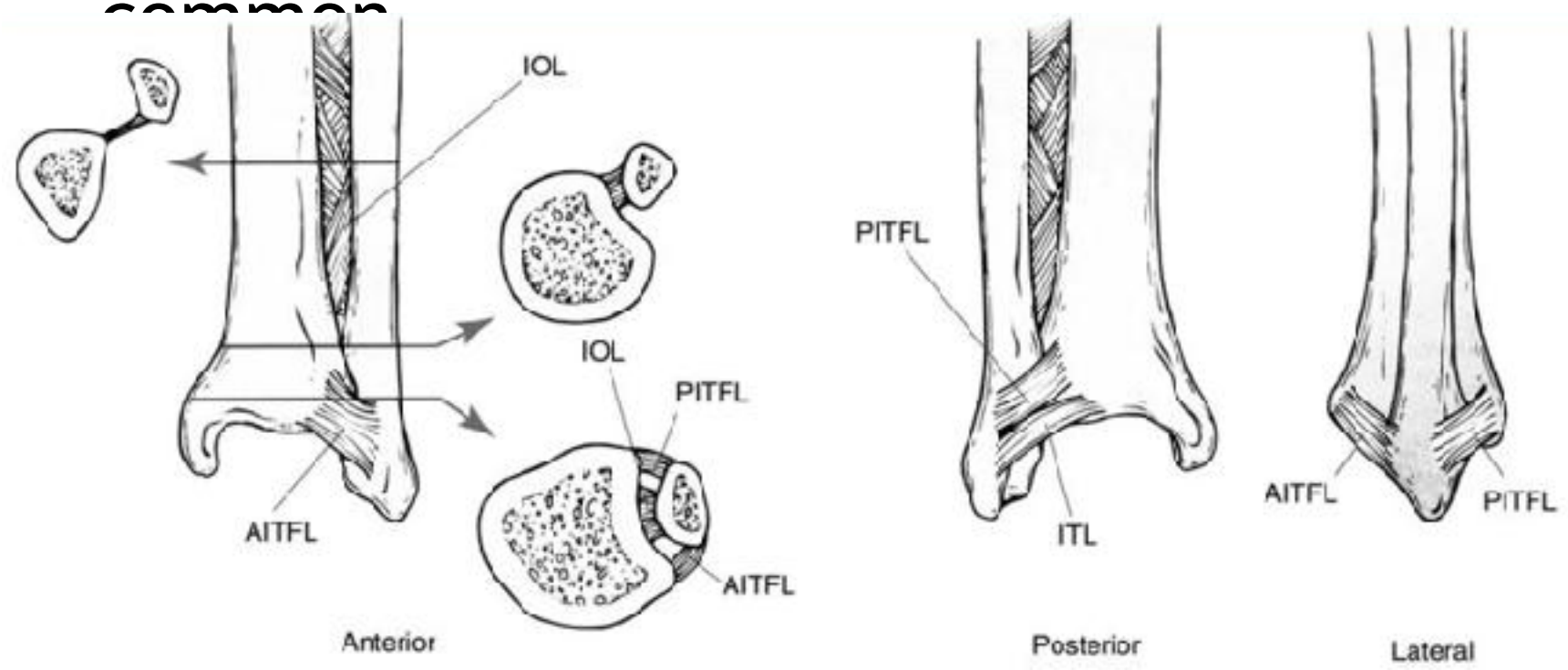
- Treatment depends on Associated Injury
- Longer Immobilization, Longer Healing Time

# Syndesmosis Sprain

- "High Ankle Sprain"
- Commonly Missed or Undertreated
- Greater Impairment –Chronic Pain/ Disability
- About 18% (5-30%) of All Ankle Sprains

# Syndesmosis Sprain

- Anatomy
  - Tib-Fib Interosseous Membrane (IOM)
  - Three Distinct Bands- AITFL most common



# Syndesmosis Sprain

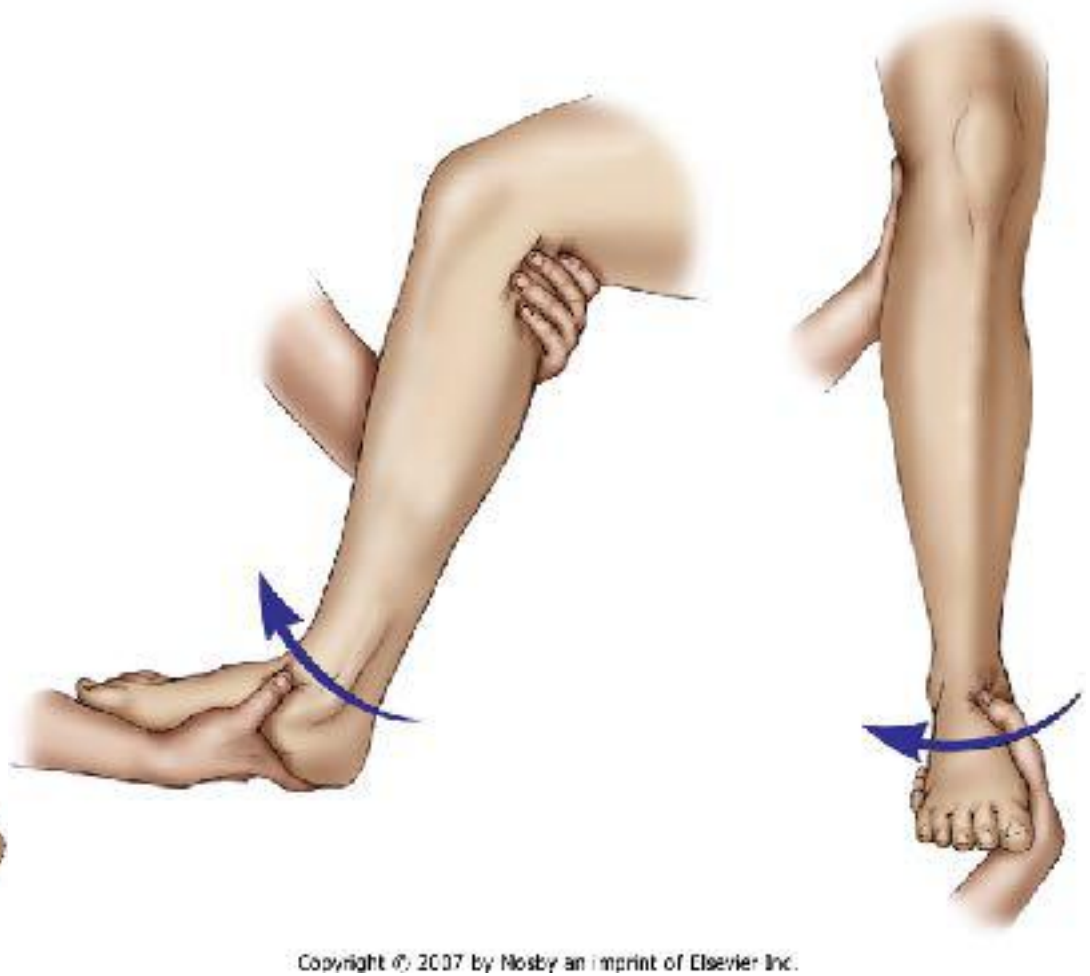
- External Rotation Mechanism
- Football Tackle, Skiing, Soccer
- HyperDorsiflexion of Ankle in Mortise
- Severe= Diasthasis=
  - Deltoid=
  - Fracture=
  - Maisonneuve

# Syndesmosis Sprain

- Hallmark: “Delay in healing” or “Persistent Pain”
- Watch For:
  - Antero-Lateral “Leg” pain
  - Medial (Deltoid) pain
  - High Fibular pain (near Knee)
- Exam:
  - Tenderness Up Leg (? Specific Early on)
  - Squeeze Test
  - External Rotation Test – Most Reliable!

# Squeeze External



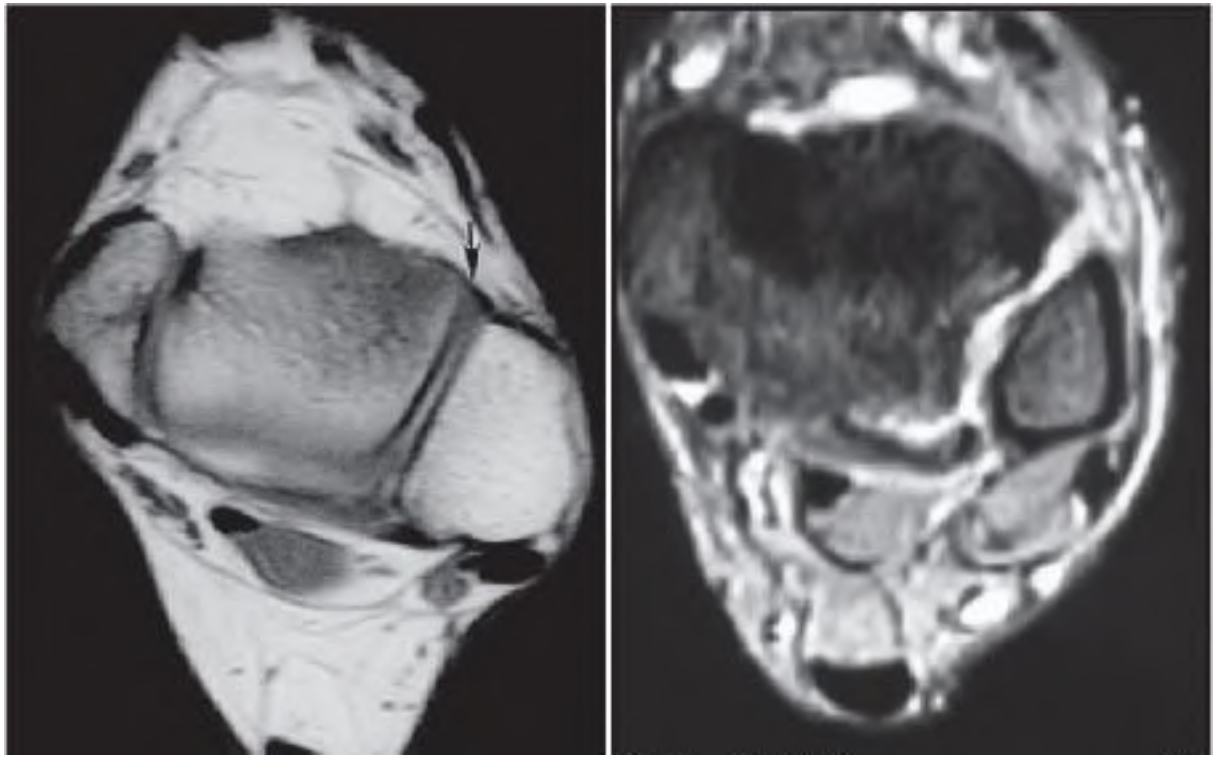



# Syndesmosis Sprain

- Radiologic Evaluation
- Even Standing X-rays may be Unremarkable
- Tib-Fib Relationship (Overlap, Widening, etc)
- Comparison Films (Standing)
- Stress Films
  - ? Inconclusive
- MRI + Mechanism + Exam

# Syndesmosis

- MRI
  - Preferred study
  - May be Read as Normal



# Syndesmosis Treatment

- Acute with No Diasthasis or Fracture
  - Boot or Cast with Crutches (initially)
  - “Double the Treatment/Time of Typical Sprain
- Sub-Acute (~4 wks)
  - Refer to Orthopaedist
- Acute/Latent with Diasthasis/Fracture
  - Surgical Stabilization or Reconstruction
- Long Term:
  - Excellent Results when Recognized Early
  - Poor Results (Pain and/or Ankle Arthritis)

# Surgery

# Conclusions

- Lateral ankle sprains very common
- Functional and Mechanical Instability
- Role of Physical Therapy
- Functional rehabilitation mainstay
- Consider initial immobilization
- Activity modification
- Bracing when return to activity/sports
- Recognize different types of sprains
- Recognize numerous associated findings
- Chronic instability
- Role of surgery

# Thank You