Surgical Management of Lateral Ankle Instability

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LATERAL ANKLE SPRAINS
ANATOMY

Anterior Talo-fibular ligament
  – ATFL

• Calcaneofibular ligament
  – CFL

• Posterior Talo-fibular ligament
  – PTFL
• 21% of sport injuries are inversion ankle injuries
• 1 inversion trauma per 10,000 people per day, 50% sports related
• ATFL torn most common finding
• 15-20% experience pain or instability
• Other studies exceed the percentage from 40 to 73%
LATERAL ANKLE SPRAINS

- 45% of basketball injuries
- 31% of soccer injuries
- ATFL by far most common injury
- ATFL + CFL next most common pattern
- PTFL rarely injured in isolation or with CFL
LATERAL ANKLE SPRAINS MECHANISM

- “Rollover” injury
- Inversion of tibiotalar joint
- ATFL injured in plantarflexion (PF)
- Resists internal rotation of talus and adduction in PF
LATERAL ANKLE SPRAINS MECHANISM

- CFL injured in neutral or DF
- 3.5X stronger than ATFL (345N)
- Midsubstance rupture most common
- PTFL injured in severe inversions with DF or DF alone
LATERAL ANKLE SPRAINS GRADEING

• LIGAMENT INJURY - CLINICAL
  • Grade I
    – Ligament stretched w/o any rupture
  • Grade II
    – Partial rupture
  • Grade III
    – Complete rupture
Treatment: Grade I & II

- R.I.C.E. (13.2 vs 30.4) cryotherapy
- Short period of immobilization (allow weight bearing as tolerated)
- Aircast at 10-14 days
- Functional rehabilitation (DF/PF avoiding inversion) leads to stronger ligament remodeling, quicker return to function.
Treatment Grade III

- R.I.C.E.
- SLC in neutral (to reapproximate ATFL)
- Graduate to ROM boot, Aircast etc. at 3 - 4 weeks depending on severity & instability
- Note: Initial Immobilization in plantar flexion may lead to incompetence of the ATFL
Physical Therapy

• Can make an enormous difference in time return to play and return to pre-injury performance

• Guided rehabilitation allows patient to:
  – strengthen peroneals
  – maintain ankle motion
  – recover proprioception
“But doctor… I’m not getting any better”

- Avulsion fractures of the Talus or Calcaneus
- OCD of the Talus
- Subtalar Joint Sprain
- Sensory Nerve Injury
- Tarsal Coalition
- Dislocated / Subluxating Peroneal Tendons
LATERAL ANKLE TRIAD

- ANKLE INSTABILITY
- PERONEAL TENDON TEAR (plantarflexion–inversion, isolated muscle stress test)
- ANKLE SYNOVITIS (palpation anterolateral joint with inversion, fibrous bands, adhesions)
Ankle Instability: Patient History

- Usually a history of at least one severe sprain, followed by multiple recurrent sprains.
- "Gives Way", "Can’t trust it", "Feels Loose"
- Chronic Pain after sprain
- Ankle swells, Feels hot, Aches after practice
- Usually have never had formal ankle rehabilitation
Chronic Ankle Instability: Physical Examination

- Weakness of peroneals
- Tenderness Laterally over ATFL
- Pain + Swelling in Tarsal Sinus and ankle joint over the lateral aspect)
Physical Examination: Talar Tilt

- Talar Tilt - Grasp Hindfoot and place fingers at lateral ankle
  - Feel for talar motion with inversion
  - Difficult to differentiate from subtalar motion
  - Compare to contralateral extremity
Talar Tilt
Physical Examination: Anterior Drawer

- Anterior Drawer
  - Perform in Dorsiflexion, Neutral and Plantar Flexion
  - Slight plantar flexion (10°) isolates ATFL
  - Look for “sulcus sign” at anterolateral ankle joint.
Anterior Drawer Testing
Radiographic Examination

- **Standard Views**: A/P, Mortise, Lateral
  - Looking for Post Traumatic Changes:
    - Os subfibulare (non-union avulsion fracture of CFL ?)
    - Osteochondral Lesions
    - Anterior Tibial Osteophyte
    - Talar Neck Osteophyte
Telos Device
Stress Views

- **Must Compare to Contralateral Extremity**
  - Differentiate from ligamentous laxity
- **Ankle Block**
  - Some suggest to prevent effect of guarding
- **Anterior Displacement**
  - > 5 mm consistent with ATFL injury
- **Talar Tilt**
  - > 15 mm tilt or 5° > contralateral view consistent with CFL Injury
Positive Telos Views
Positive Telos Views
Dynamic views without telos device compare
OTHER STUDIES

• ULTRASONOGRAPHY
  High specificity and sensitivity in finding peroneal tendon tears.

MRI
  Lateral collateral ligaments, OCD lesions, synovitis, loose bodies
Treatment:
First Line is Conservative

- Peroneal Strengthening
- Proprioceptive Exercises & Training
- Ankle Support - Taping, Aircast, Lace-Up
- Lateral Heel Wedge may help
  - drives heel into valgus at heel strike
LATERAL ANKLE SPRAIN TREATMENT

- Focal compression + cryotherapy *tends* toward earlier return to function
- Early mobilization yields, less swelling, better ROM earlier return compared to casting
- Grade I- weight bearing asap, protected return to play w/brace or tape for 3-4 weeks
LATERAL ANKLE SPRAIN TREATMENT

• Early Functional Rehab w/Protected WB- Grade II
  - Immobilization x 1 week, WB as tolerated
  - Resistance bands X 4 weeks
  - 90% decrease in water displacement
  - ROM improved from -19 to -4 degrees of normal

• Casting vs Early Functional Rehab- Grade III
  - Functional treatment showed improved function, less joint laxity at 3 months and 6 months
  - No difference at 1 year
  - *Surgery vs Fxnl RX
    • Surgery with higher complication NO decrease in time to return
Operative Treatment:

Indications

- Chronic Ankle Instability
- Multiple sprains in same ankle
- Continued symptoms after bracing and physical therapy
- Functional and Mechanical instability
Ligament Repair / Reefing = Brostrom + Gould

- Preferred in athletes
- Small incision
- Anatomic Repair
- Difficult to overtighten subtalar joint complex
Ligament Repair Procedures: 
Brostrom with Gould Modification
Incision
Identification of Ligaments

ATFL

CFL
Inspect Peroneals & Repair if Necessary
Create Groove in Distal Fibula
Secure Ligaments into Groove
Secure Periosteum to Inferior Extensor Retinaculum & Repair Peroneal Retinaculum
Muscular Extensor Digitorum Brevis
Muscular Extensor Digitorum Brevis
Tendon Transfer

- Evan’s Procedure: Theoretically offers dynamic stabilization to inversion of ankle and subtalar joint (Easy to overtighten ST Joint)
- High failure rate:
  - 20-90% percent continued instability
  - 45-60% with persistent Anterior Drawer
Variations of Evans

Peroneus Brevis

Evans

Zwipp

Colville
Tenodesis

- Chrisman-Snook: Reconstructs CFL anatomically. ATFL function substituted by anterior limb of tenodesis
- Larsen: Similar to Chrisman-Snook
- Watson-Jones: Reconstructs ATFL anatomically. CFL not addressed.
Tenodesis Procedures

(Watson-Jones)

(Chrisman-Snook)
Sural Neuroma Resection
Cavovarus Deformity

- Varus alignment of the hindfoot puts the reconstructed ligaments under increased strain.

- *Brostrom Acta Chir Scand 1966*
  - Failure of reconstruction in 2 patients with CMT

- *Sammarco Foot & Ankle 2001*
  - 6/21 Patients with neuromuscular Cavovarus presented with ankle instability
Failed Reconstruction in Cavovarus foot
Ankle synovitis - Arthroscopy

- Fibrous bands
- Basset-Nikolopoulos ligament
- Loose bodies
- OCD lesions
- Adhesions-synovitis
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Peroneal tendon synovitis, tears
Conclusions

- Conservative treatment initially
- Immobilization in DF
- Early rehabilitation
- Functional and Mechanical instability
- Post Surgical stiffness
LATERAL ANKLE TRIAD

- ANKLE SYNOSTIS
- CHRONIC ANKLE INSTABILITY
- PERONEAL TENDON TEAR
THANK YOU