Overview

- Lateral ankle sprains are the most common sports injury (Godges & Klingman, 2014)

- Conservative treatment:
  - Aggressive rehabilitation, bracing, taping, and/or orthotics (UW Sports Medicine, 2014)

- 20% of lateral ankle sprains can lead to chronic pain and instability (UW Sports Medicine, 2014)

- Surgical treatment:
  - Indications: third degree ankle sprains, chronic instability (w/ extreme laxity), interference with ADLs, and/or limitations in activity level (Starkey, 2013)
Anatomy of the Ankle

- Anterior Talofibular Ligament (ATFL)
- Calcaneofibular Ligament (CFL)
- Posterior Talofibular Ligament (PTFL)

- Chronic ankle instability:
  - Mechanical insufficiencies
  - Functional insufficiencies
  - Combination of both

(Brigham and Women’s Hospital, 2010; Hertel, 2002; Kraemer, 2014)
Surgical Procedures

Nonaugmented (Anatomic) Lateral Ankle Repair

- Brostrom, modified Brostrom techniques
  - Primary repair of the ruptured ligaments
    - Preferred method - does not cross the subtalar joint,
    - Can result with a 85% success rate and return to sport rate
  - Accelerated rehab with no immobilization (faster return to play)
    (de Vries et al., 2011; Karlsson, 1999; Miyamoto, 2014)
Augmented (Tenodesis) Lateral Ankle Reconstruction

- Evans, Watson-Jones, Elmslie-Trillat, Chrisman-Snook
  - A portion of the peroneus brevis tendon is used to reconstruct the lateral ligaments
  - Used with more severe cases (greater extent of ligament damage)
  - “Satisfactory stabilization in > 90% of patients after 10 years” *(Stapp et al., 1996)*
  - Poor long term results (persistent pain, degenerative changes, restricted subtalar motion)

*(Baumhauer & O’Brien, 2002; OrthopedicsOne, 2014; Starkey, 2013; William Beaumont Army Medical Center, 2005)*
Surgical Procedures

Nonaugmented Repair

Augmented Reconstruction

(Starkey, 2013)
Timeline

- Initial Rehabilitation (0-6 weeks)
  - Phase I: Weeks 1-2
    - Pain management
  - Phase II: Weeks 3-6
    - Reconst.: Minimize quad atrophy and deconditioning
      - (Repair: early mob. \( \rightarrow \) ankle ROM, no PF or inv.)

- Beginning Strengthening (6-12 wks)
  - Phase III: Weeks 6-10
    - Ankle rehab (WB in boot)
  - Phase IV: Weeks 11-12
    - Full ROM (WB in shoe)

- Advanced Strengthening (12-16 weeks)
  - Phase V: Weeks 12-16
    - Strength, proprioception
  - Phase VI: Weeks 16+
    - Endurance, specificity

- Return to Sport

(Minnesota Orthopedic Sports Medicine Institute, 2014; Workers’ Compensation Board, 2005)
Phase I: Weeks 1-2

- **Goals:**
  - Rest and recovery from surgery
  - Control swelling and pain
  - Increase ADL

- **Interventions:**
  - Rest and elevation to control swelling
  - Physician prescribed medications for pain
  - Hip and knee AROM
  - Patient education

  - Sutures removed at 10-16 days, back in cast for another 4 weeks

(Minnesota Orthopedic Sports Medicine Institute, 2014)
*Avoid all strenuous physical activity – keep foot elevated!
Initial Rehabilitation

Phase II: Weeks 3-6

- Goals:
  - Edema control / reduction
  - Protect healing tissue
  - Maintain upper body, core, hip, knee strength and ROM

- Interventions:
  - Elevation to control swelling
  - Core exercises
  - Hip / knee: AROM, strengthening, stretching
  - Patient education
    - Cast removed at 6 weeks

(Minnesota Orthopedic Sports Medicine Institute, 2014)
Initial Rehab Exercises

- **Core exercises**
  - Abdominal recruitment
  - Crunches, scissors, bicycle

- **Hip: AROM**
  - Strength: clamshells, sidelift (plank), glut max (donkey kicks), SLR

- **Knee: AROM**
  - Strength: SLR, theraband press (flexion/extension)

- **Stretching**
  - Gluteus maximus and medius, piriformis, rectus femoris, hamstrings

- **Upper body**
  - All upper body exercises as tolerated
  - UBE

- **Ankle exercises (healthy ankle)**
  - Strength/ROM to increase blood flow to opposite ankle

(Minnesota Orthopedic Sports Medicine Institute, 2014)
Initial Rehab Exercises

Hip Clam Shells
(durablehealth.net, 2014)

Single Leg Raise
(emi2hips.com, 2014)

Upper Body Lift
(sprouthealthlifestyle.com, 2014)

*Repairs: avoid plantarflexion and inversion exercises (Starkey, 2013)
Phase III: Weeks 6-10
- Goals:
  - Control edema and pain
  - Return ankle strength to 80% of uninjured side
  - MMT 4/5 (week 8-9)
  - Weight Bearing
  - Improve proprioception and stability of ankle
  - Min. gait deviations on surface
  - Decrease post-op scar tissue
    - Joint mobilizations (posterior: DF)

- Example Exercises:
  - Isometric Dorsi-/Plantarflexion
  - AROM ABC’s
  - Standing bilateral heel raises
  - T-Ball Squats
  - Pool therapy
  - Proprioceptive Single Leg Stance
  - Stretching (gastroc and soleus)

- Cardiovascular Exercise:
  - UBE (upper body ergometer)
  - Stationary Bike

(Minnesota Orthopedic Sports Medicine Institute, 2014; Sandor, 2007; Tripler Army Medical Center, 2005)
Exercises

T-Ball Squat
(learning.summitrehab.ca, 2014)

Ankle ABC’s
(scoutingmagazine.org, 2014)

Cardiovascular Exercise
(sw.org, 2014)

*Avoid: -vigorous plantarflexion and inversion exercises
-anterior joint mobilizations

(Stapp et al., 1996)
Phase IV: Weeks 11-12

- Goals:
  - Full PROM/AROM ($\geq$ 95%)
  - MMT 5/5
  - Prevent re-injury with return to sport
  - Discharge to home or gym program
  - Decrease post-operative scar tissue
    - Joint mobilizations (posterior: DF and anterior: PF)

- Example Exercises:
  - Theraband Resisted ABC’s
  - Proprioceptive Single Leg Stance on uneven surface
  - Resisted 4-way hip
  - Single Leg Rebound Ball Toss
  - $\frac{1}{4}$ Body Weight Squats
  - Stretching (gastroc and soleus)

- Cardiovascular Exercise:
  - Walking on Treadmill
  - Walking on Stairs

(Chelsea and Westminster Hospital, 2012; Minnesota Orthopedic Sports Medicine Institute, 2014)
Exercises

Bodyweight Squats (nofaplife.com, 2014)
Cardiovascular Exercise (gymwolf.com, 2014)
Proprioceptive Single Leg Stance (anklesprainrecovery.org, 2014)

*Avoid plyometrics and full speed, change of direction workouts
Advanced Strengthening

Phase V: Weeks 12-16

- **Goals:**
  - Prevent re-injury
  - Gait Training
  - Proprioception
  - Full strength
  - Power

- **Example Exercises:**
  - Proprioceptive Single Leg Balance on uneven surface
  - Single Leg Dot Drills
  - Agility Ladder Drills
  - Single Leg Hops
  - 90 ° Body Weight Squats
  - Body Weight Single Leg Squats
  - 4 - way Slide Board
  - Stretching (gastroc and soleus)

- **Cardiovascular Exercise:**
  - Running on Treadmill
  - Swimming
  - Cycling

(Minnesota Orthopedic Sports Medicine Institute, 2014; Royal National Orthopedic Hospital, 2009)
Exercises

Single Leg Hops
(womenshealthmag.com, 2014)

Single Leg Squats
(physiohub.com, 2014)

Agility Ladder
(steelcitycrossfit.com, 2014)

*Avoid re-injury; listen to body; continuing using ice after workouts
Advanced Strengthening

Phase VI: Weeks 16+

- Goals:
  - Return to Play
  - Endurance
  - Sport specificity
  - Prevent re-injury

- Example Exercises:
  - Weighted 90° Squats
  - Single Leg Stance - Body Blade
  - Side Lunges
  - Box Jumps
  - T-test agility
  - Sport specific drills
  - Stretching (gastroc and soleus)

- Cardiovascular Exercise:
  - Sprint Intervals
  - Swimming
  - Running on Treadmill

(Minnesota Orthopedic Sports Medicine Institute, 2014)
Exercises

Box Jumps
(bicycling.com, 2014)

T-Test
(sportsscience.co, 2014)

Side Lunge
(saveourbones.com, 2014)

*Avoid re-injury; continue stretching and strengthening lower leg and ankle
Conclusion

Rehab Program Goals

- Stretching / ROM exercises
  - Weeks 6-16+
- Strengthening
  - Weeks 6-16+
- Cardiovascular endurance
  - Week 3 → Week 12+

- Proprioception
  - Week 12+
- Speed
  - Week 12+
- Power
  - Week 12+
- Agility
  - Week 12+

(Minnesota Orthopedic Sports Medicine Institute, 2014; Tymms & Bedi, 2011)
References

References


Questions?