

Ankle – Lateral Ligament Reconstruction and Rehabilitation

Surgical Indications and Considerations

Anatomical Considerations: The main lateral soft tissue stabilizers of the ankle are the ligaments of the lateral ligamentous complex: the anterior talofibular ligament, the calcaneofibular ligament, and the posterior talofibular ligament. As the foot goes into plantar flexion the bony talar contribution to overall talocrural stability dissociates thereby causing the ligamentous structures to assume a greater role in providing stability and become more susceptible to injury.

Pathogenesis: The anterior talofibular ligament is a small thickening of the tibiotalar capsule. When the foot is in plantar flexion, the ligament's course becomes parallel to the axis of the leg allowing for greater force to be placed upon it. Most sprains occur when the foot is in plantar flexion and inversion thereby injuring the anterior talofibular ligament.

Epidemiology: Ankle sprains are the most common sport-related injury accounting for 10-15% of all sport injuries. Approximately 85% of all ankle sprains involve the lateral structures of the ankle: a tear of the anterior talofibular ligament and sometimes the calcaneofibular ligament and anterior inferior tibiofibular ligament. Previous sprain is a predictive factor for lateral ankle sprains although studies have found a decreased risk of re-injury when a brace is worn. Gender, joint laxity, and anatomical foot type does not appear to be a risk factor as was previously thought but the literature remains divided with regard to whether or not height, weight, limb dominance, ankle-joint laxity, anatomical alignment, muscle strength, muscle-reaction time, and postural sway are risk factors for ankle sprains.

Diagnosis:

Lateral ankle ligament sprains or general talocrural instability is assessed through a history of the mechanism of injury, a physical examination with special tests, and radiographic evaluation.

- Previous lateral ankle ligament sprain
- Foot is usually plantar flexed and inverted during injury
- Many patients state hearing a “snap”
- Immediate pain and swelling usually are localized over the anterior talofibular ligament
- Positive anterior drawer test (anterior talofibular ligament) or talar tilt test (calcaneofibular ligament)
- Radiographic analysis to detect fractures

Nonoperative versus Operative Management: Nonoperative management of a lateral ankle sprain includes physical therapy, bracing, activity modification, and steroid injections. Operative management is an option when the above have failed to return the patient to a pain-free active lifestyle. A failure occurs when the patient has recurrent giving way of the ankle with activities of daily living or the patient's particular activities or sports, abnormal inversion, and

positive anterior drawer stress x-rays. Lateral ligament repair surgery is indicated in patients all ages. However, those older than 40 seldom have surgery secondary to decreased activity levels.

Surgical Procedure: Surgery begins with arthroscopy to identify further intraarticular ankle pathology. If intraarticular pathology is identified, it is then addressed and the arthroscopic surgery is completed. Arthroscopic techniques are performed, but an open stabilization gives a reproducible result. There are numerous procedures that use the peroneus brevis tendon to reconstruct the anterior talofibular ligament during open stabilization. More recently other surgical procedures for direct anatomic repair have gained popularity such as direct suturing of the ligament, imbrication, reinsertion to the bone, and in some cases augmentation with surrounding tissues. After the repair is completed the ankle is put through total range of motion to make sure that it has been maintained throughout surgery.

Preoperative Rehabilitation:

- Injury protection with ankle splint or cast
- Instruction in the use of assistive device to maintain weight-bearing status
- Instructions/review of postoperative rehabilitation plan

POSTOPERATIVE REHABILITATION

NOTE: The following protocol is taken from Ferkel, Donatelli, and Hall. Refer to their publication for a full explanation of the protocol and for information regarding criteria for advancement to next stage, anticipated impairments and functional limitations, and treatment rationale.

Phase I for Lateral Ligament Repair: Postoperative Weeks 4-6

Goals: Decrease pain

Control edema

Increase range of motion and muscle contraction tolerance

Intervention:

- Isometric exercises
- Passive and active range of motion: plantar and dorsi flexion
- Progressive resistance exercises of the hip
- Soft tissue mobilization and modalities as needed
- Joint mobilization as indicated
- Instruct and monitor gait training progressing to full weight bearing ambulation using appropriate device
- Patient education

Phase II for Lateral Ligament Repair: Postoperative Weeks 6-8

Goals: Control edema and pain

Increase strength and tolerance to single-limb stance and advanced activities

Improve proprioception and stability of ankle

Minimize gait deviations on level surfaces

Intervention:

- Isometric exercises
- Active range of motion of ankle for all ranges against gravity
- Standing bilateral heel raises and squats and lunges
- Treadmill and stationary bike and pool therapy
- Elastic tubing and balance board exercises
- Proprioceptive neuromuscular facilitation

Phase III for Lateral Ligament Repair: Postoperative Weeks 8-10

Goals: Full active and passive range of motion

Return ankle strength to 80% of uninvolved side

Self-management of edema and pain

Intervention:

- Increase elastic tubing resistance
- Isotonics and Isokinetics

Phase IV for Lateral Ligament Repair: Postoperative Weeks 11-18

Goals: Prevent reinjury with return to sport

Return to sport

Discharge to home or gym program

Intervention:

- Ankle brace
- Advanced exercises: plyometrics, trampoline, box drills, slide board, lateral shuffle, figure eight exercises
- Increase demand of pivoting and cutting exercises

Selected References:

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