Treatment of Acute Lateral Ankle Ligament Rupture in the Athlete
Conservative Versus Surgical Treatment

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Abstract

Acute lateral ankle ligament sprains are common in young athletes (15 to 35 years of age). Diagnostic and treatment protocols vary. Therapies range from cast immobilisation or acute surgical repair to functional rehabilitation.

The lateral ligament complex includes 3 capsular ligaments: the anterior tibiofibular (ATFL), calcaneofibular (CFL) and posterior talofibular (PTFL) ligaments. Injuries typically occur during plantar flexion and inversion; the ATFL is most commonly torn. The CFL and the PTFL can also be injured and, after severe inversion, subtalar joint ligaments are also affected.

Commonly, an athlete with a lateral ankle ligament sprain reports having ‘rolled over’ the outside of their ankle. The entire ankle and foot must be examined to ensure there are no other injuries. Clinical stability tests for ligamentous disruption include the anterior drawer test of ATFL function and inversion tilt test of both ATFL and CFL function. Radiographs may rule out treatable fractures in severe injuries or when pain or tenderness are not associated with lateral ligaments. Stress radiographs do not affect treatment.

Ankle sprains are classified from grades I to III (mild, moderate or severe). Grade I and II injuries recover quickly with nonoperative management. A nonoperative ‘functional treatment’ programme includes immediate use of RICE (rest, ice, compression, elevation), a short period of immobilisation and protection with a tape or bandage, and early range of motion, weight-bearing and neuromuscular training exercises. Proprioceptive training on a tilt board after 3 to 4 weeks helps improve balance and neuromuscular control of the ankle.
Treatment for grade III injuries is more controversial. A comprehensive literature evaluation and meta-analysis showed that early functional treatment provided the fastest recovery of ankle mobility and earliest return to work and physical activity without affecting late mechanical stability. Functional treatment was complication-free, whereas surgery had serious, though infrequent, complications. Functional treatment produced no more sequelae than casting with or without surgical repair. Secondary surgical repair, even years after an injury, has results comparable to those of primary repair, so even competitive athletes can receive initial conservative treatment.

Sequelae of lateral ligament injuries are common. After conservative or surgical treatment, 10 to 30% of patients have chronic symptoms, including persistent synovitis or tendinitis, ankle stiffness, swelling, pain, muscle weakness and ‘giving-way’. Well-designed physical therapy programmes usually reduce instability. For individuals with chronic instability refractory to conservative measures, surgery may be needed. Subtalar instability should be carefully evaluated when considering surgery.

1. Epidemiology of Lateral Ankle Ligament Rupture

It is estimated that, each day, 1 inversion injury of the ankle occurs for every 10 000 people.[1-3] This means that approximately 5000 and 27 000 such injuries occur each day in the UK and US, respectively. Ankle sprains constitute 7 to 10% of all admissions to hospital emergency departments.[4] In the US, Jackson and colleagues[5] found this to be the most common injury in military cadets at West Point, with one-third of all cadets sustaining an ankle sprain during their 4 years there.

Ankle sprain is also the most common injury in sports.[6-10] In a 1-year study in Oslo, Norway, Maehlum and Dahljord[11] found that 16% of sports injuries were acute ankle sprains. In Sweden, Axelsson and colleagues[12] found that 14% of the sports injuries treated at the emergency department of a central hospital were acute ankle sprains.

The large majority of ankle sprains occur in individuals under 35 years of age, most commonly in those in the age range from 15 to 19 years.[13] In spite of the high frequency of and remaining disability associated with ankle sprains, there is great variation in diagnostic approaches, criteria used to define significant ligament disruption needing surgery, treatment modalities and rehabilitation techniques.

2. Biomechanics of the Ankle Joint

In the neutral position, the ankle joint is stabilised by the shape of the talus and its tight fit between the tibia and the fibula. Osseous stability is enhanced by weight-bearing compressive loads. Stormont et al.[14] showed that under loading, the articular surface of the joint provided 30% of the rotational stability and 100% of the inversion stability. Under non-weight-bearing conditions, the observations were more dependent on the testing mode and ankle position, with more restraint being provided by the ligamentous structures. With increasing plantar flexion, the osseous constraints are lessened and the soft tissues are more susceptible to strain and injury.

The lateral ligamentous complex of the ankle is composed of 3 ligaments: (i) the anterior talofibular ligament (ATFL); (ii) the calcaneofibular ligament (CFL); and (iii) the posterior talofibular ligament (PTFL) [fig. 1].

The ATFL originates from the anterior border and tip of the lateral malleolus and runs anteriorly to insert at the neck of the talus. The ATFL is really nothing more than a thickening of the tibiotalar capsule: it is 6 to 10mm wide, 20mm long and 2mm thick.[15] It runs almost parallel to the axis of the neutral foot, but when the foot is in plantar flexion, it assumes a course parallel to the axis of the leg.[6,16] Because most sprains occur when the foot is in