MANAGEMENT OF ANKLE SYNDESMOTIC INJURIES

Essay

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List of Abbreviations

AITFL	Anterior inferior tibiofibular ligament
PITFL	Posterior inferior tibiofibular ligament
LCL	Lateral Collateral Ligament
AP	Anteroposterior
RSA	Radiostereometric analysis
CT	Computerized tomography
MRI	Magnetic resonance image
ORIF	Open reduction and internal fixation

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Introduction

Ankle injuries are the most common injuries incurred during sports and recreational activities. They are particularly common in sports such as basketball, soccer, volleyball, or other activities performed on uneven surfaces ,Stability of the distal tibiofibular syndesmosis is necessary for proper functioning of the ankle and lower extremity [١].

Syndesmosis is made up of anterior inferior tibiofibular ligament, interosseous ligament, and posterior inferior tibiofibular ligaments, inferior transverse tibiofibular ligament, and; these stabilize the mortise by opposing the fibula in the fibular notch [٢].

Ankle syndesmotic injury does not necessarily lead to ankle instability, however, the coexistence of deltoid ligament injury critically destabilize the ankle joint, the syndesmotic injuries may involve the distal tibiofibular syndesmosis and can be associated with a variable degree of trauma to the soft tissue and/or osseous structures that play an important role in ankle joint stability [٣].

The diagnosis of syndesmotic injury may not be a straightforward, in the absence of fracture; physical

examination findings suggestive of injury include ankle tenderness over the anterior aspect of the syndesmosis and a positive squeeze or external rotation test, radiographic findings usually include increased tibiofibular clear space, decreased tibiofibular overlap, increased medial clear space, and other advanced diagnostic modalities include CT and MRI. However, syndesmotic injury may not be apparent radiographically; thus, routine stress testing is necessary for detecting syndesmotic instability [٤].

Although the pathomechanics and extent of syndesmotic injuries have been systematically described by **Lauge Hansen** and **Weber**[٥], These injuries are frequently overseen or misdiagnosed as anterolateral rotational instability of the ankle and often become apparent through protracted courses [٥].

The goal of management is to restore and maintain the normal tibiofibular relationship to allow for healing of the ligamentous structures of the syndesmosis. Non surgical management is indicated when the syndesmotic sprain is not associated with diastasis or instability, or when restoration of the proper tibio fibular relationship and accurate restoration of the fibular length is achieved with open reduction and stable fixation of the fibular fracture. Non surgical treatment begins with rest, ice, compression and elevation.

Subsequently, a non weight bearing cast is used for ٢ to ٣ weeks followed by progressive weight bearing as tolerated [٦].

Fixation of the syndesmosis is indicated when evidence of a diastasis is present. This may be detected preoperatively, in the absence of fracture, or intraoperatively after fixation of medial malleolus and fibular fractures. Syndesmotic injury can be controlled by screw fixation. However, the choice between metal and bioabsorbable screws, screw size, number of cortices fixed, and indications for screw removal remain controversial. Conditions such as uncomplicated diabetes or advanced age are no longer absolute contraindications to usual management recommendations [٦].

Failure to diagnose and stabilize syndesmotic disruption adversely affect outcome. Functional, mechanical instability, or chronic pain, stiffness, and/or edema are the main complication of missed diagnosis and management of this type of injury [٧].

Aim of the work

The aim of this essay is to discuss the importance of injury, the proper diagnosis and management of syndesmotic disruption of the ankle with or without associated bony or other ligament injury, and the complication associated with missed diagnosis and management.

Anatomy

Talocrural and Subtalar Joints:

The talocrural or ankle joint is auniaxial modified hinge joint formed by the talus, the medial malleolus of the tibia, and the lateral malleolus of the fibula. Specifically, the concave distal articular facet of the tibia articulates with the convex superior articular surface of the talus (trochlea). The medial malleolus articulates with the medial aspect of the trochlea, whereas the lateral malleolus articulates with the lateral aspect of the trochlea. The stability of the ankle mortise is enhanced because the dome shaped body of the talus fits snugly into the slightly concave tibial undersurface [٨].

The relation of the tibia, fibula, and talus is maintained by an articular capsule and ٣ groups of ligaments (medial, lateral, and syndesmosis). The articular capsule surrounds the joint and is attached to the borders of the articular surfaces of the malleoli proximally and to the distal articular surface of the talus distally. The anterior aspect of the capsule is broad, thin, and membranous, whereas the posterior component of the capsule is very thin and consists mostly of transverse fibers. The lateral aspect of the capsule is slightly thickened [٩].

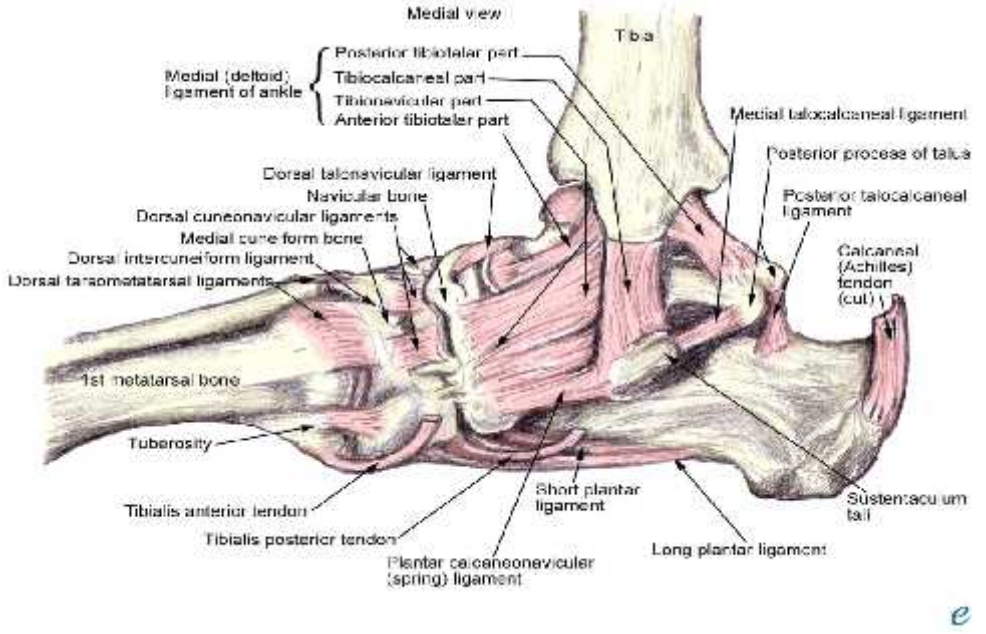

Figure ١:

Deltoid ligaments of the ankle [١٠].

The deltoid (medial) ligament:

It is a strong, flat, and triangularly shaped ligament on the medial aspect of the ankle. This ligament consists of ٤ bands: the anterior tibiotalar, the posterior tibiotalar, the tibio calcaneal, and the tibio navicular **(Fig ١)**. The deltoid ligament is considered the strongest of the ankle ligaments and especially during plantar flexion, functions to prevent excessive eversion at the subtalar joint. The deltoid particularly its anterior portion also resists talar external rotation [١٠].

Lateral collateral ligaments of the ankle:

Lateral collateral ligaments are formed of the anterior talofibular ligament, the posterior talofibular ligament, and the calcaneofibular ligament **(Fig ٢).** The anterior talofibular ligament limits anterior displacement and medial shifting of the talus (or posterior displacement and lateral rotation of the tibia and fibula), respectively, primarily in plantar flexion. This ligament also helps to prevent lateral talar tilt. The posterior talofibular ligament braces the talus posteriorly and helps to limit talar external rotation(or internal rotation of the tibia and fibula).The calcaneofibular ligament functions to prevent lateral talar tilt, principally when the ankle is in a neutral amount of plantar flexion and dorsiflexion [١١].

The bony and ligamentous arrangement:

The bony and ligamentous arrangement of the talocrural joint provides it with considerably more stability than other diarthrodial joints, such as the knee or shoulder. Depending on the position and the loads placed on the joint, the bones and ligaments alternate as primary and secondary stabilizers. Weight bearing and axial loading have been reported to increase talocrural bony stability. When dorsiflexed, the ankle is thought to be in the most stable position, sometimes termed close packed, since this is the