Allen et al., J Clin Case Rep 2014, 4:8
DOI: 10.4172/2165-7920.1000407

Journal of Clinical Case Reports

Case Report Open Access

Foot and Ankle Reconstruction for Adult Acquired Flatfoot after Ligamentous Ankle Injury

Amanda L Allen[1], Alexandria M Carlisle[2], Lindsey A Beaman[2], Cristobal S Berry-Caban[2]*, James Santangelo[1] and Asim Raja[1]

[1]*Department of Orthopedics and Rehabilitation, Womack Army Medical Center, Fort Bragg, NC, USA*
[2]*Department of Clinical Investigation, Womack Army Medical Center, Fort Bragg, NC, USA*

Abstract

Introduction: Ankle syndesmosis injuries typically occur when the foot is forced upward and outward. Syndesmosis of the ankle is the joint that connects the tibia and fibula and allows these two bones to work together to provide stability to the lower leg.

Case: 24 year old active duty female service member presented to Womack Army Medical Center for left ankle pain approximately 12 weeks after incurring an injury while playing basketball. She reported increased pain with activity and no improvement when using a brace.

Imaging studies performed on the weight bearing left leg, ankle, and foot revealed a healed proximal fibular fracture, syndesmosis widening with lateral shift and medial space widening, and decreased longitudinal arch height. A magnetic resonance imaging revealed a deltoid ligament tear and widening of the syndesmosis, but showed no tibialis posterior tendinopathy. The patient was taken to the operating room for open reduction internal fixation of the syndesmosis with a medial displacement calcaneal osteotomy, deltoid ligament repair, gastrocnemius recession, and medial cuneiform opening wedge osteotomy.

Discussion: The coexistence of syndesmosis and deltoid ligament injuries modifies ankle joint motion and significantly destabilizes the ankle joint. Radiographs of the affected limb to rule out any fracture are important; however, stress radiographs may be needed to accurately determine stability of the ankle joint as clinical examination cannot assess or diagnose deltoid ligament injury.

Keywords: Syndesmosis; Deltoid ligament; Flatfoot; Reconstruction

Introduction

An ankle syndesmosis injury, also known as a high ankle sprain, typically occurs when the foot is forced upward and outward [1]. This injury involves the syndesmosis of the ankle, the joint that connects the tibia and fibula and allows these two bones to work together to provide stability to the lower leg [2]. This stability is important due to the substantial force from walking and running that is exerted on the ankle [3]. The deltoid ligament is located on the inner part of the ankle and helps sustain the syndesmosis indirectly by stabilizing the medial ankle mortise [1]. When an ankle syndesmosis and deltoid ligament injury occur simultaneously, it can affect the patient's overall foot type and level of activity if diagnosis and repair is delayed. Unfortunately, this type of injury is challenging to detect and treat.

An examination of the ankle is required to diagnose an ankle syndesmosis injury. The ankle can be analyzed for tenderness or pain by the squeeze test or external rotation test. If the physical examination is indicative of an injury, radiographic evaluations should be performed to assess for fractures and any abnormalities between the distal tibia and fibula. Syndesmosis injuries may require surgery involving screw fixation to reduce separation between the tibia and fibula.

Case Report

24 year old active duty female service member presented to Womack Army Medical Center for left ankle pain approximately 12 weeks after incurring an injury while playing basketball. She reported increased pain with activity and no improvement when using a brace.

A physical examination revealed antalgic gait on the left side with increased hindfoot valgus (Figure 1). Single limb heel rise revealed slight inversion of the hindfoot. Additionally, decreased ankle dorsiflexion and tenderness to palpation of the left ankle syndesmosis and deltoid ligaments was reported. Imaging studies performed on the weightbearing left leg, ankle, and foot revealed a healed proximal fibular fracture, syndesmosis widening with lateral shift and medial space widening, and decreased longitudinal arch height (Figure 2). A magnetic resonance imaging (MRI) revealed a deltoid ligament tear and widening of the syndesmosis, but showed no tibialis posterior tendinopathy. The patient was taken to the operating room for

Figure 1: Preoperative Radiographs, Left Hind foot Valgus.

***Corresponding author:** Cristobal S Berry Caban, Department of Clinical Investigation, Womack Army Medical Center, Fort Bragg, NC, USA, Tel: +1 910-907-9262; E-mail: cristobal.s.berry-caban.civ@mail.mil

Received June 26, 2014; **Accepted** August 25, 2014; **Published** August 27, 2014

Citation: Allen AL, Carlisle AM, Beaman LA, Berry-Caban CS, Santangelo J, et al. (2014) Foot and Ankle Reconstruction for Adult Acquired Flatfoot after Ligamentous Ankle Injury. J Clin Case Rep 4: 407. doi:10.4172/2165-7920.1000407

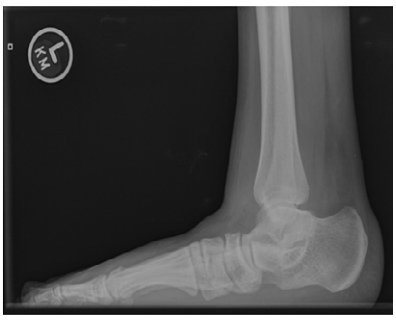

Figure 2: Preoperative Radiographs, Decreased Longitudinal Arch Height.

Figure 3: Postoperative Radiographs, Internal Fixation of the Syndesmosis.

open reduction internal fixation of the syndesmosis with a medial displacement calcaneal osteotomy, deltoid ligament repair (Figure 3), gastrocnemius recession, and medial cuneiform opening wedge osteotomy.

Thirteen months postoperatively, the patient has resumed all activities with some minor pain after running longer than 3 miles. Furthermore, she is able to complete all of her military physical requirements without pain or restriction.

Discussion

The coexistence of syndesmosis and deltoid ligament injuries modifies ankle joint motion and significantly destabilizes the ankle joint. According to a cadevaric study by Boden et al., "when the deltoid complex was disrupted, widening of the syndesmosis was greater and was directly related to the amount of disruption of the interosseous membrane [3]." Additionally, Smith et al says the "deltoid ligament has an important role in preventing valgus deformity of the ankle [4]."

Radiographs of the affected limb to rule out any fracture are important; however, stress radiographs may be needed to accurately determine stability of the ankle joint as clinical examination cannot assess or diagnose deltoid ligament injury [1].

An examination of the ankle is required to diagnose an ankle syndesmosis injury. The ankle can be analyzed for tenderness or pain by the squeeze test or the external rotation test. The squeeze test involves squeezing the leg under the knee to observe if pain is felt in the high ankle area, indicating a high ankle sprain. To perform the external rotation test the knee is bent, the ankle is 90 degrees with the foot in relation to the leg and the foot is turned outward. Injury is indicated if pain is present at the syndesmosis of the ankle [3].

If the physical examination is indicative of an injury, radiographic evaluations should be performed to assess for fractures and any abnormalities between the distal tibia and fibula. Syndesmosis injuries may require surgery involving screw fixation to reduce separation between the tibia and fibula.

Surgery is often warranted when a fracture or widening between the tibia and fibula is detected. The aim of treatment is to allow the tibia and fibula to heal in the correct position relative to each other. Although there are various suggestions for the most appropriate treatment, the goal is to correct the tibia and fibula's position and hold them together with screws or devices containing sutures [3].

Although syndesmosis injuries are well known, this case shows that these injuries are commonly missed, especially in the primary care setting. The only therapeutic approach to this is surgical intervention, preferably at the time of injury. However, due to the delay of surgery in such cases as this, there are significant deformities that can also occur. Delay of surgical intervention also may require more procedures necessary to get the foot/ankle into alignment.

References

1. Zalavras C, Thordarson D (2007) Ankle syndesmotic injury. J Am Acad Orthop Surg 15: 330-339.
2. http://www.orthogate.org/patient-education/ankle/ankle-syndesmosis-injuries.html
3. Boden SD, Labropoulos PA, McCowin P, Lestini WF, Hurwitz SR (1989) Mechanical considerations for the syndesmosis screw. A cadaver study. J Bone Joint Surg Am 71: 1548-1555.
4. http://www.ncbi.nlm.nih.gov/pubmed/2512295