

Can we diagnose the ligament tear of ankle using X-RAY?

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Abstract

Ligaments of the ankle are one of the most frequently injured as we are bipeds and thus a lot of pressure is put on the bones that form the ankle and the ligaments that are under constant pressure to ascertain the tasks. One sixth of the static load of the leg is carried by the fibula at the tibiofibular joint. These require a high degree of stability which is determined by the passive and dynamic factors. The passive stability depends on the contour of the articular surfaces, the integrity of the collateral ligaments, the integrity of the distal tibiofibular ligaments, the reticular system around the ankle and the crossing and attached tendon tunnels. The study puts in an effort to find whether the ligaments injury can be diagnosed on a simple X-Ray?

Key Word:

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INTRODUCTION

Ligaments of the ankle are one of the most frequently injured as we are bipeds and thus a lot of pressure is put on the bones that form the ankle and the ligaments that are under constant pressure to ascertain the tasks. One sixth of the static load of the leg is carried by the fibula at the tibiofibular joint¹. These require a high degree of stability which is determined by the passive and dynamic factors². The passive stability depends on the contour of the articular surfaces, the integrity of the collateral ligaments, the integrity of the distal tibiofibular ligaments, the reticular system around the ankle and the crossing and attached tendon tunnels^{5,6,7}. The lateral

ligament is injured more often when compared to medial. A sprained ankle results due to tear of anterior talofibular and calcaneofibular ligaments when the foot is twisted in lateral direction. In forcible eversion of the foot the deltoid ligament may be torn. At times the deltoid ligament pulls the medial malleolus thereby causing avulsion fracture of the malleolus. Potts fracture occurs when the foot is caught in the rabbit hole in the ground and the foot is forcibly everted. In this condition at first there is an oblique fracture of shaft and lateral malleolus of fibula. The strong eversion pull on the deltoid ligament causes transverse fracture of medial malleolus. If the tibia is carried anteriorly, the posterior margin of the distal end of the tibia is also broken by the talus producing a trimalleolar fracture^{8,9}. Magnetic resonance (MR) imaging has opened new horizons in the diagnosis and treatment of many musculoskeletal diseases of the ankle and foot. It demonstrates abnormalities in the bones and soft tissues before they become evident at other imaging modalities. But in a nation like ours the MRI is not there in a village set up and cost factor plays a major role. It is important to use simple X-Rays to diagnose the same.

AIMS AND OBJECTIVES

To study the normal X-Rays and try to measure normal parameters so as to be useful in diagnosing the ligament tears when there are no fractures evident on X-Rays in the west coast population.

MATERIALS AND METHODS

This study was done in the Department of Anatomy, Srinivasa Medical College, Mangalore. This study was done from March 2014 to February 2016. One hundred X-Rays were collected from the Department of Radiology and the study was done. The following were measured.



RESULTS

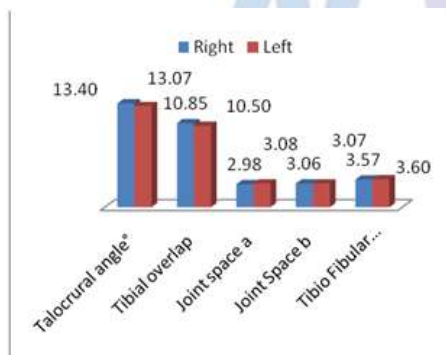


Table 1: Left Vs Right

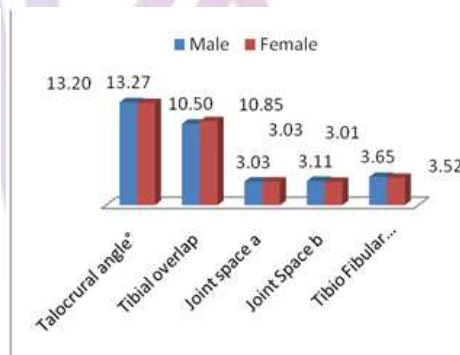


Table 2: Male Vs Female

DISCUSSION

It is important to use whatever is available and try to come to a diagnosis and that's where the study of the basic sciences comes in handy. Use of the basic knowledge to come to definitive diagnosis is what is meant to be a good doctor instead of heavily relying on the advances in the field of sciences. Patil MS *et al.*¹⁰ in 2012 in their study on anthropometric measurements of ankle mortise for evaluating mortise fracture reductions with an aim to develop contoured implants measured the talocrural angle, tibiofibular clear space, tibiofibular overlap and compared joint clear space at two places.

Anteroposterior radiographs, of both ankles in 20 adult individuals formed the material. They agreed that the talocrural angle of two ankles of a given individual does not vary by more than 2 degrees. Tibiofibular clear space on Anteroposterior radiographs measured a mean value of 2.4 mm with a standard deviation of 1.3 mm. Tibiofibular overlap on Anteroposterior radiographs was measured as 11.2 mm with a standard deviation of 4.4 mm. Joint spaces at two levels were almost equal. Chen Yan-Xi *et al.*¹¹ in 2011 on a study of three-dimensional morphological characteristics measurement of ankle joint based on computed tomography image post-processing,

commented that the mean talocrural angle (10.01 ± 0.38)° was measured to be 10.1 degrees with a standard deviation of 0.38 degrees. Tibiofibular clear space mean measurements were 2.78 mm, with a standard deviation of 0.19 mm. There was no significant correlation to gender, height and weight ($P > 0.05$) in 100 cases, (50 males and 50 females). This study helps to firmly put in a foundation towards forming measurement standards so as to be helpful in diagnosing the ligament injuries.

CONCLUSION

A firm foundation is put in forming measurement standards so as to be helpful in diagnosing the ligament injuries.

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