

A Study of Morphometry and Morphology of Calcaneofibular Ligament in Gujrat Region

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Abstract

The lateral ligaments origin at the fibula and draw also to talus anterior and posterior talofibular or calcaneus Calcaneofibular ligament. Specific interest because their rupture is the most common posttraumatic identification is situated extraarticularly in its entire course and is separated muscles peroneus longus and brevis tendons by their synovial sheaths.

It is a long rounded cord, which runs downward and backward from the notch on the lower border of tip of the lateral malleolus to tubercle on the lateral surface of the calcaneum.

Material & Method: The present study was conducted on Total Fifty formalin fixed adult ankles specimen human cadavers right 25 and left 25 were dissected from department of anatomy, Baroda Medical College, Kiran Medical College of Gujrat Region and Dr. N. D. Desai Medical College and Research.

Results: Calcaneofibular ligament is subject to a great variety of shapes and courses. Calcaneal center of insertion of the Calcaneofibular ligament was situated 20.69 ± 3.52 mm anterior and 5.79 ± 1.72 mm plantar to superior edge of the calcaneal. Its lateral malleolus attachment of were Calcaneofibular ligament directly at the tip of lateral malleolus, dorsal to the fibular attachment of the Anterior Talofibular ligament. Variation of band of Calcaneofibular ligament is noted.

Conclusion: knowledge anatomy ankle ligament provides foundation ankle sprain.

Keywords: Calcaneofibular ligament, ankle sprain, Ankle Reconstruction.

Introduction

- Ankle joint is uni-axial synovial joint. Since the axis of movement is basically transverse with a slight downward inclination on lateral side.
- It is modified hinge joint.

Bone forming the joint

- Above: Inferior articular surface of the lower end of tibia with its medial malleolus & lateral malleolus of fibula. Articular surfaces of both bones form a tibio–fibular mortise, the posterior margin of which is deepened by inferior transverse tibio-fibular ligament. The tip of lateral malleolus lies about 2 cm below that of medial malleolus.
- The epiphyseal plate of the lateral malleolus corresponds with the joint space and that of the medial malleolus is situated about 1.25 cm above the joint.

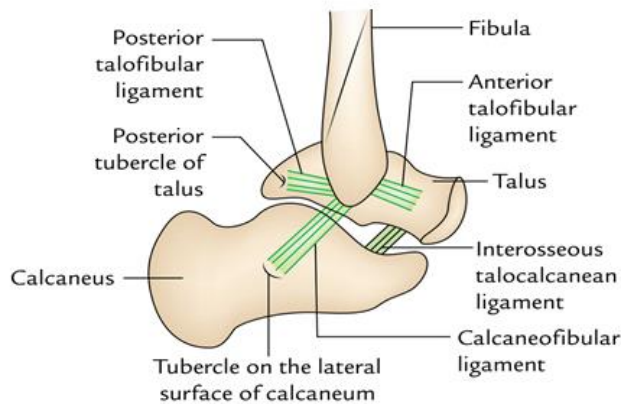
Below

- The trochlear upper surface of the body of talus with comma shaped facet for the tibial malleolus and triangular facet for fibular malleolus.
- These three articular areas form continuous surface known as trochlea tail.
- The upper surface of talus is convex from before backward and gently concave from side to side. It's broader in the anterior part.
- The comma shaped facet is restricted to the upper part of medial surface.
- The triangular facet for the fibula occupies the entire lateral surface of talus is gently concave from above downward and faces upwards and laterally.
- The posterior part of lateral margin of talus between the trochlear and fibular facet forms a triangular flattening which comes in contact with the inferior transverse tibio –fibular ligament.
- Anatomy and the orthopaedic literature contain various descriptions of lateral ankle ligament anatomy. When attempting to reconstruct these ligaments, authors allude to the importance of restoring normal anatomy.

- There are however, few accounts of the exact relationships between the lateral ankle ligaments and adjacent ankle and Subtalar joints. For example, the bony landmarks on the calcaneus for attachment of the calcaneal fibular ligament are vague, therefore, many physicians do not know the precise anatomic points where this should be attached during operative procedures.
- In Ankle ligament reconstruction, the closer attention to anatomic detail and proper positioning of ligaments has led to improvements in results.
- This study was undertaken to
 1. better define lateral ankle ligament anatomy, with specific references to relationships with the ankle and Subtalar joints
 2. Compare normal anatomy with two commonly performed ligament reconstructions and
 3. Propose a more anatomically precise reconstruction for the anterior talofibular and Calcaneofibular ligaments.
- The lateral ligaments origin at the fibula and draw also to talus anterior and posterior talofibular or calcaneus Calcaneofibular ligament. Specific interest because their rupture is the most common posttraumatic identification is situated extraarticularly in its entire course and is separated muscles peroneus longus and brevis tendons by their synovial sheaths.

It is a long rounded cord, which runs downward and backward from the notch on the lower border of tip of the lateral malleolus to the tubercle on the lateral surface of the calcaneum.

Figure 1:



Aims and Objectives

Aims

To describe the anatomical Morphometry of Calcaneofibular Ligament which is done during cadaveric dissection.

Objectives

I. Dimensions of Calcaneofibular Ligament

II. Shape of Calcaneofibular Ligament

Material and Methods

- Source of Material: Department of Anatomy, Baroda Medical College, Kiran Medical College, Dr. N.D. Desai. Faculty of Medical Science and Research
- Ethical approvals: required.
- Sample framework
- i) Method – Cross - sectional observational Study
- ii) Sample size:25 bilateral (total 50) depends upon availability of cadavers in Department of Anatomy, Baroda Medical College, Kiran Medical College, Dr. N.D. Desai. Faculty of Medical science and Research
- Sampling technique: Stratified sampling technique
- Time scale of study: approximately 3 years.
- Inclusion criteria: Un dissected, Intact ankle joint. Preferably lean and thin body.

- Exclusion criteria: ankle joint devoid of any external deformity, any surgical procedure carried out.

Material

- Scalpel
- Two pair of forceps: one pair is blunt ends other is sharp pointed.
- Scissors
- Saw Labels
- Digital vernier calliper
- Pointer pins
- Thread
- Labels

Figure 2:



Methods

This was a cross –sectional observational study carried out after obtaining approval from the ethics committee at Anatomy Department, Medical College Baroda, Gujrat. Total Fifty properly embalmed & formalin fixed adult cadaveric ankles specimen human cadavers right Twenty-five and left Twenty-five selected for the study. The cadavers belonged to mature, ages and gender of the cadavers were know. Showing pathology of cadavers were excluded from study.

Dissection was done according to the standard method. On the lateral side of the ankle, identify the tendons of the peroneus longus and peroneus brevis muscles. Open the superior and inferior peroneal retinacula. Retact the

tendons of the peroneus longus and peroneus brevis anteriorly. Clean and define the lateral ligament of the ankle. Identify this parts.

Calcaneofibular ligament

length, width, Thickness of ligament measured by digital vernier caliper in millimetre. The Data was tabulated, analysed in microsoft Excel & relevant photographs of the examined specimen were taken using a digital camera.

Samples were collected from department of anatomy, Medical College Baroda, Maharaja Sayjirao University, Baroda, Kiran Medical College, Veer Narmad South Gujrat University, Surat, Dr. N.D. Desai .Faculty of Medical science and Research, Dharmsinh Desai University, Nadiad of Gujrat regions.

Observations

Calcaneofibular Ligament

Figure 3:



Figure 4:



Figure 5:



Figure 6:



Results

Calcaneofibular ligament is subject to a great variety of shapes and courses. The Calcaneal center of insertion of the Calcaneofibular ligament was situated 20.69 ± 3.52 mm anterior and 5.79 ± 1.72 mm plantar to the superior edge of the calcaneal. Its lateral malleolus attachment of were Calcaneofibular ligament directly at the tip of the lateral malleolus, dorsal to the fibular attachment of the Anterior Talofibular ligament. Variation of band of Calcaneofibular ligament is noted.

Table 1:

SR NO	Ligament	Left Side			Right Side		
		Length	Width	Thickness	Length	Width	Thickness
	Calcaneofibular Ligament	20.69 ± 3.52	5.79 ± 1.72	3.54 ± 1.60	20.67 ± 3.53	5.76 ± 1.73	3.50 ± 1.52

Discussion

The lateral ligament apparatus is represented by the PTFL, the CFL and the ATFL. Its origin is at the anterior margin of the lateral malleolus, running anteromedial to the talar insertion on its body anterior to

the joint surface of the lateral malleolus. In neutral ankle position it should run horizontally, inclining upward or downward dorsiflexion resp. plantar flexion Golano et al. 2010; Taser et al. 2006; van den Bekerom et al. 2008. Also originating from the anterior margin of the lateral malleolus is the CFL, lying profound to the origin of the ATFL. Its attachment is found in the posterior region of the lateral surface van den Bekerom et al. 2008.

Golano et al. 2010; Taser et al. 2006 Originating from the malleolar fossa and, like the ATFL, running almost horizontal, the PTFL inserts at the posterolateral talus van den Bekerom et al. 2008; Golano et al. 2010; Taser et al. 2006. Neuschwander et al. 2013 investigated the footprint of the lateral ankle ligament complex through three-dimensional computed tomography imaging.

In comparison with the results presented in this study, their insertion areas with 1.5 ± 0.26 and 0.90 ± 0.07 cm² talar insertion of bifid ATFL, 2.68 ± 0.20 cm² CFL and confluent fibular insertions of both ligaments with an area of 3.48 ± 0.39 cm² seem quite large.

Conclusion

- Appropriate knowledge of anatomy the ankle ligament provides a foundation for understanding the basic mechanism of injury, Diagnosis and treatment of ankle sprain.
- Acute ankle sprain is a common injury that, if not treated correctly, may result in long-term disability in the treatment of chronic ankle instability and anatomical repair.
- Reconstruction showed better results compared to other therapeutic options. Therefore, precise anatomic information on the dimensions of the ankle ligaments and their insertion is important and can help to optimize these procedures.

- The data represented here may be important when considering surgical repair or reconstruction of traumatized or attenuated collateral ligaments. This may assist in defining isometric positions and avoiding restriction of motion.

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