The Incidence and Significance of Posterior Talofibular Ligament Injury on Magnetic Resonance Imaging

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My disclosure is in the Final AOFAS Program Book.
I have no potential conflicts with this presentation.
INTRODUCTION

The ankle is one of the most frequently injured joints of the body due to the weight it supports and the forces that are applied through it. During excessive supination and adduction of the plantarflexed foot the lateral collateral ligaments are placed under a high tensile load which may result in failure\(^1\). It is estimated that it affects 1 in 10,000 persons per day with a higher incidence in athletes\(^2\).

Commonly, the lateral ligamentous complex of the ankle is affected. It consists of the anterior talofibular ligament (ATFL), calcaneofibular ligament (CFL) and the posterior talofibular ligament (PTFL). It is known that the ATFL is injured first and most frequently, followed by the CFL\(^3\). Injury to the PTFL is rare and rarely alluded to in the literature. This study aims to establish the incidence of injury to the PTFL and incidental findings associated with it.
The ligaments are seen as thin linear low signal intensity structures joining adjacent bones and are delineated by high signal intensity fat. The PTFL is present on oblique axial slice just inferior to the tibial plafond. The next slide demonstrates the striated pattern of the PTFL due to interspersed fat.

The next slide also depicts the high intensity fluid signal after rupture. On MRI, the PTFL can be identified as being fan shaped. It runs horizontally from the lateral malleolar fossa to the posterior talar process.
MRI ANATOMY

Normal PTFL

Ruptured PTFL
SAMPLE POPULATION

The sample included 338 patients. 175 males and 163 females with an average age of 38.7 and 45.0 years respectively. The age range was 11-84 years in males and 9-82 years in females. Mean age for the whole study was 41.8 years and range 9-84. Overall there were 154 left ankles and 184 right ankles. Mean symptom duration was 6.6 months.

METHODS

A retrospective review of MR scans and patient notes dating from September 2007 to July 2010 was performed. Included were patients with acute or chronic ankle pain, swelling and instability. Excluded were patients that had undergone previous surgery to the ankle. Routine MRI was performed on all patients with oblique axial, coronal and sagittal views taken. Any MRIs that were not clear or missed one of these views were excluded from the study. All MR scans were reviewed using a set proforma.
RESULTS

Incidence of Ligament Injury
The following figures highlight the incidence of injury to the ATFL (83.1%), CFL (34.9%) and the PTFL (8.6%) respectively. This data shows that the ATFL was most frequently ruptured followed by the CFL and then the PTFL. Another important finding was that the PTFL never ruptured in isolation.

Combinations of Ligament Injury
ATFL, CFL & PTFL = 7.7%, ATFL & PTFL = 0.9%, ATFL & CFL = 27.2%, ATFL alone = 47.6%
This illustrates that the majority of PTFL injury is sustained when both the ATFL and CFL are injured. Additionally, the PTFL was never injured without involvement of the ATFL. This highlights that both the ATFL and CFL must rupture before injury can be sustained to the PTFL.
Incidental Findings

Osteochondral defects (OCD) were the most frequently observed incidental finding in the study. Incidence within the study was 20.7% in all patients. Ligament associated incidence of OCD shows an interesting relationship with patients with PTFL injury at more risk.

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<th></th>
<th>All</th>
<th>ATFL</th>
<th>CFL</th>
<th>PTFL</th>
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</thead>
<tbody>
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<td>Series 1</td>
<td>20.7%</td>
<td>24.9%</td>
<td>34.7%</td>
<td>48.3%</td>
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CONCLUSIONS

The study has highlighted that injury to the PTFL is rare. It is also rare in relation to the other ankle ligaments of the lateral ligamentous complex. Injury to the PTFL rarely occurs in isolation and only fails once the ATFL and CFL have been injured. There is also a high incidence of OCD associated with PTFL injury. In summary, patients with PTFL injury have sustained a significant ankle injury with a more extensive injury pattern.

STUDY LIMITATIONS

The study was retrospective in nature which lead to a number of problems. Difficulties were encountered when identifying prospective patients on review of the scan requests. Ultimately we cannot be fully sure that all patients who have undergone MR have been included in the study. MR scans are open to different interpretation by different radiologists, so there may be intraobserver bias. The sample may not be truly representative due to exclusion criteria set.
REFERENCES


FURTHER INFORMATION

This study was completed as part of a Special Study Module for TF’s MBChB.

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