

#1603 - Experimental Study / Posters

Anatomy Of The Lateral Plantar Ligaments Of The Transverse Metatarsal Arch - Is There A Lateral Lisfranc Ligament?

Trauma / Foot & Ankle Trauma / Surgical Treatment

Lara Jayatilaka¹, Eric Swanton², Lauren Fisher³, Andrew Fisher³, Andrew Molloy², Lyndon Mason²

1. Trauma and Orthopaedic Department, Aintree University Hospital, Liverpool, United Kingdom
2. Aintree University Hospital, Liverpool, United Kingdom
3. Liverpool University, Liverpool, United Kingdom

Keywords: Lisfranc, Plantar Ligaments, Midfoot, Anatomy, Transverse Metatarsal Arch

Background

The anatomy of the Lisfranc complex is well understood. In contrast, the lateral tarsometatarsal ligamentous structures are under investigated.

Objectives

Our study aimed to identify the plantar ligamentous structures of the lateral tarsometatarsal joints and their significance in transverse metatarsal arch injuries.

Study Design & Methods

We examined 10 cadaveric lower limbs that had been preserved for dissection at the Human Anatomy and Resource Centre at Liverpool University in a solution of formaldehyde. The lower limbs were carefully dissected to identify the ligamentous structures of the plantar aspect of the transverse metatarsal arch.

Results

In all specimens, the long plantar ligament blended with a transverse metatarsal ligament spanning from the 2nd to the 5th metatarsal. This transverse metatarsal ligament formed the basis of the roof and distal aspect of the peroneus longus canal. The separate long plantar ligament formed the floor of the peroneus longus canal. In addition, separate intermetatarsal ligaments were identifiable connecting each metatarsal. The long plantar ligament provides a connection through the transverse metatarsal ligament, connecting the transverse and longitudinal arches of the foot. This could be thought of as a lateral Lisfranc ligament, to complement the medial Lisfranc ligament, illustrating the importance of the 2nd TMTJ as the keystone to the transverse metatarsal arch.

Conclusions

The plantar ligamentous structures of the lateral tarsometatarsal joints are a combination of individual intermetatarsal ligaments and a transverse metatarsal ligament. This explains the homogenous nature of a divergent tarsometatarsal joint injury and why middle and lateral columns move as one. It also has clinical significance in the observation that in some cases lateral column instability can be overcome when the middle column is stabilised.