THE PLANTAR PLATE OF THE FIRST
METATARSOPHALANGEAL JOINT:
AN ANATOMICAL STUDY

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Disclosure

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Introduction

• The plantar plate of the first metatarsophalangeal (MP) joint is a critical structure of the great toe and has been identified as a major stabilizer within the capsuloligamentous complex.

• Its relationship within the capsuloligamentous complex has been incompletely described in the literature.
Purpose

• Injury to the 1st MP plantar plate is increasing in incidence.
• These injuries can result in both short and long term disability.
• Anatomic guidelines for surgical repair or reconstruction are sparse in the current literature.
• Our goal was to elucidate the anatomic relationships surrounding the 1st MP plantar plate
Methods

- 10 cadaveric specimens dissected
- Average age 69.2 years
- Dissection carried out by a single surgeon (SH)
- Digital calipers used to measure plantar plate location relative to surrounding anatomy
1st MP Plantar Plate

Caliper measurement
Results

- **Length of Distal Footprint in Sagittal Plane**
- **Distance from MP joint to plantar plate insertion on proximal phalanx**
- **Distance from MP joint to plantar plate insertion on metatarsal**
- **Distance from proximal pole of tibial sesamoid**
- **Distance from distal pole of tibial sesamoid**

Measures (mm): 6.33, 17.29, 18.55, 4.69, 0.33
Results

• The length of the footprint on the proximal phalanx in the sagittal plane averaged 6.3mm (3.9-7.7)
• Distance from distal edge of MP joint to proximal edge of distal insertion averaged 0.33mm (0-1.3mm)
• Distance from proximal edge of MP joint to distal edge of proximal insertion averaged 17.3mm (15.4-22.2)
• Distance from proximal edge of Plantar Plate to proximal edge of tibial sesamoid averaged 18.55mm (16.6-21.5)
• Distance from proximal edge of Plantar Plate to distal pole of tibial sesamoid averaged 4.7mm (1.0-6.8)
Discussion

• The plantar plate of the 1\(^{st}\) MP joint is a crucial structure of the capsuloligamentous complex that frequently requires surgical intervention when injured.

• This study aims to provide objective anatomical data to assist in operative intervention when required.

• Weaknesses of our study include unknown medical history of our specimens as well as possible expectation bias related to having only one surgeon performing the dissection.
References


