

Three-Dimensional Surface Mapping of the Neuromuscular Attachments at the Pubic Symphysis: Implications for the Treatment of Symphyseal Tendinopathy

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Disclosures

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Introduction

- Endoscopic management for orthopedic pathology around the pubic symphysis is currently being adopted by orthopedists¹.
- An understanding of the structures around the pubic symphysis and their relationship to each other is important in order to effectively manage orthopedic pathologies affecting this region².

Purpose

The purpose of this study was to determine the anatomy of the neuromuscular structures about the pubic symphysis.

Methods

- Fresh frozen cadaveric pelvises thawed for 24 hours were dissected down to the pubic symphysis and surrounding structures.
- The landmarks of interest included musculotendinous insertion of the rectus abdominis, adductor longus, adductor brevis, and the insertion of the inguinal ligament.
- The 3 dimensional outline of footprints of the structures using a three dimensional (3D) coordinate measuring system (MicroScribe, Amherst Va)

Methods

- Footprint cross-sectional area and distances between structures were calculated using data acquisition software (Rhinoceros 3D v5.0, Seattle Wa).
- The coefficient of variation (CV) was used to assess variability in footprint area and distances between anatomic structures.

Results

- Specimens were males with an average of 62 ± 2 years.
- The average footprints of the rectus femoris, inguinal ligament, adductor longus and adductor brevis were $8.21 \pm 3.1 \text{ cm}^2$, $1.64 \pm 0.5 \text{ cm}^2$, $3.14 \pm 0.35 \text{ cm}^2$ and $3.08 \pm 0.11 \text{ cm}^2$, respectively.
- The adductor brevis and longus insertions were closest together with an average distance of $14.9 \pm 2.5 \text{ mm}$. The adductor longus and rectus distance was $27.9 \pm 3.6 \text{ mm}$.

Results

- The average pectineus and gracilis footprints were 7.01 ± 0.54 cm² and 4.76 ± 0.85 cm², respectively. The area of the entire cartilage plate had an average cross-sectional area of 24.8 ± 5.6 cm².
- The pectineus and gracilis had thin yet fan-like attachments whereas the adductor longus and brevis had thicker origins.
- The highest variability in anatomic position was seen for the distance between the adductor longus and brevis insertions (0.81) and the distance between the adductor longus and inguinal ligament (0.54).

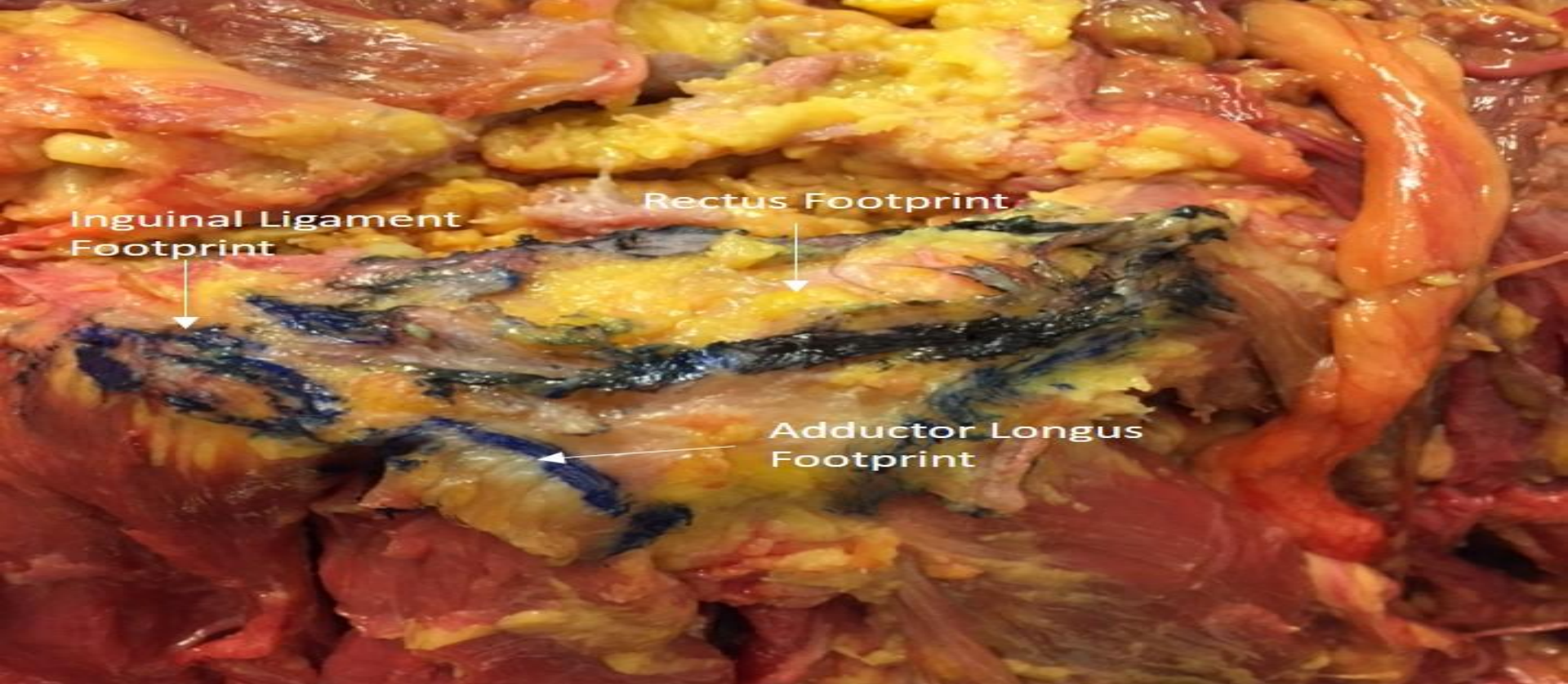


Figure 1. Mapping of the musculoskeletal structures attached to the pubic symphysis

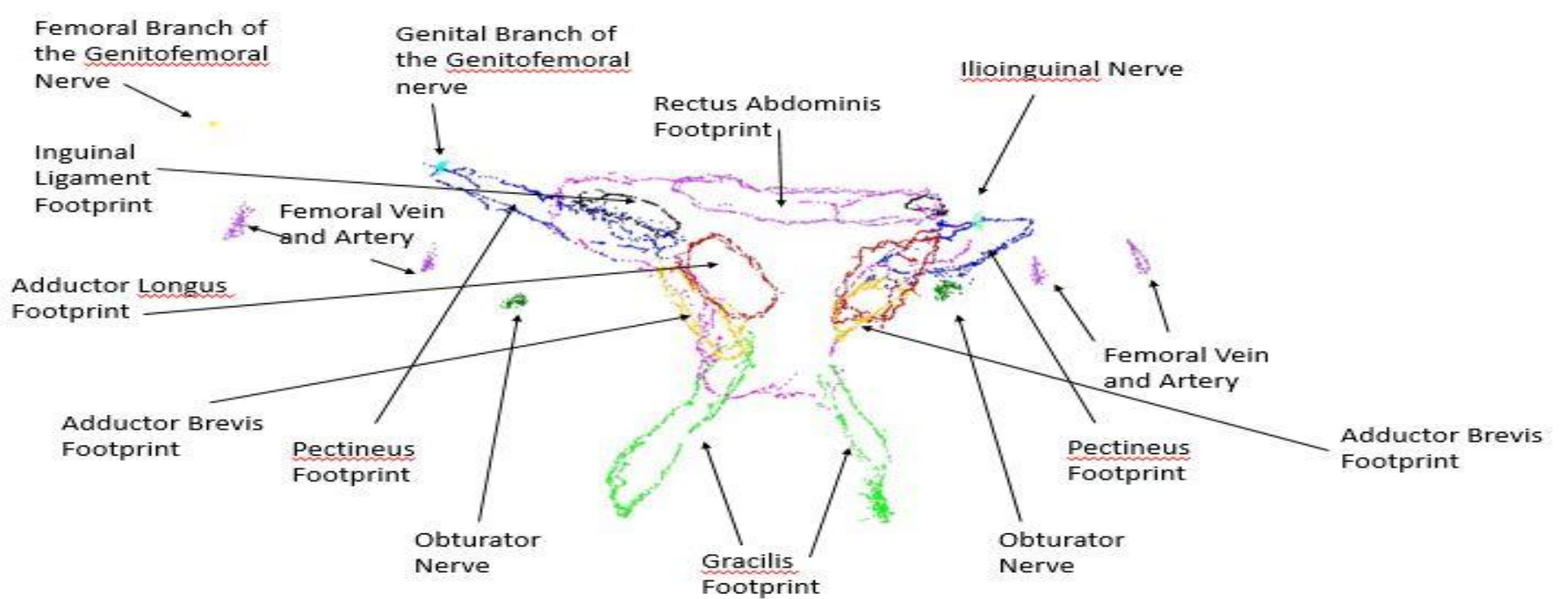


Figure 2. Three dimensional coordinate measuring system (MicroScribe, Amherst Va) outlining the footprints of structures around the pubic symphysis.

Conclusions

- Understanding the structures around the pubic symphysis is helpful in improving orthopedic management of pathologies of this region.
- This study is one of the first to describe the native anatomic relationship of the structures around the pubic symphysis.

References

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