**Posterior Tibial Tendon Dysfunction: Confirmation When No MRI-Detectable Intra-Substance Tendon Pathology is Present**

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**Category:** Hindfoot

**Keywords:** PTT, MRI

**Introduction/Purpose:** Stage 1 posterior tibial tendon dysfunction (PTTD) may be present without intra-substance tendon pathology. We hypothesize that in individuals with the clinical diagnosis of Stage 1 PTTD, with no MRI-detectable intra-substance tendon pathology, that sheath fluid amount is a confirmatory finding of PTTD. This purpose of this study was to quantify the amount of PTT sheath fluid in 1) individuals with the clinical diagnosis of Stage 1 PTTD and no MRI-detectable intra-substance tendon pathology and compare to controls with medial ankle pain (causes other) also without MRI-detectable intra-substance PTT pathology, and 2) test if there was a sheath fluid measurement predictive of the clinical diagnosis of PTTD.

**Methods:** 326 individuals with medial ankle pain, no intra-substance PTT pathology, were studied, 48 with the clinical diagnosis of Stage 1 PTT dysfunction and 278 with medial ankle pain, causes other. Geometric methods defined MRI-based sheath fluid volume, maximum cross-sectional fluid area, and maximum fluid width. Fluid measurements were compared between groups and a predictive measurement calculated to identify individuals with PTTD. Measurement reliability was tested.

**Results:** Individuals with PTT dysfunction had larger PTT sheath fluid volume, area, and width than controls (p's < 0.001). An 9mm threshold maximum fluid width was associated with PTTD (sensitivity 84%, specificity 85%). Measurements were reliable (p's <0.03).

**Conclusion:** The amount of PTT sheath fluid, in individuals with medial ankle pain and no intra-substance PTT pathology, was associated with Stage 1 PTTD and a maximum PTT sheath fluid width of > 9mm predicted PTTD. This is clinically significance as MRI-detected sheath fluid can now be used as a confirmatory finding in individuals with the clinical diagnosis of Stage 1 PTTD who do not have MRI-detectable intra-substance pathology.

Table 1: Sheath fluid measurements (mean ± SD)

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<th>Non-PTT dysfunction</th>
<th>PTT dysfunction</th>
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<tr>
<td>Fluid volume (ml)</td>
<td>4 ± 6 (range 0-27)</td>
<td>16 ± 7 (range 0-31)</td>
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<td>Maximal CSA fluid ellipse (mm²)</td>
<td>133 ± 182 (range 0-832)</td>
<td>390 ± 241 (range 0-1117)</td>
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<td>Mean maximal fluid width (mm)</td>
<td>1.5 ± 2 (range 0-11)</td>
<td>6 ± 2 (range 0-12)</td>
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