Novel Physical Therapy Protocol Results in Increased Compressive Strain and Improved Outcomes in Insertional Achilles Tendinopathy

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Disclosures

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**Insertional Achilles Tendinopathy (IAT)**

- Affects approximately 5% of the general population
  - Increased prevalence in dancers (10%) and runners (18%)
- Less common than midsubstance Achilles tendinopathy
  - However less responsive to non-surgical treatment
- Prior studies have examined treatment with:
  - Heel lifts, PRP injections, extracorporal shockwave therapy and PT
Methods

• Patients with IAT recruited from 2 F&A clinics
• Underwent baseline assessment for VISA-A and FAAM scores
  • Subset underwent ultrasound elastography measurements (see next slide)
• PT protocol (12 weeks)
  • Mix of isometric/eccentric exercises
• Post-protocol – repeat ultrasound measurements and VISA-A/FAAM assessment
Methods: Ultrasound Elastography

• Static and Dynamic assessment of tissues
  • Captures movements of tendon in the axial and transverse axis
  • Can measure vascular flow (Richards et al 2013)

• Use in disease states
  • IAT patients - decreased compressive and tensile strain (Chimenti et al 2017)
    • Compressive strain – force transverse to the tendon fibers
    • Tensile strain – axial force in line with the tendon fibers
### Results: Patient Demographics

<table>
<thead>
<tr>
<th></th>
<th>Outcomes only (n=12)</th>
<th>U/S and outcomes analysis (n=15)</th>
<th>$P$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>53.9 ± 11.0</td>
<td>58.9 ± 8.6</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Gender (M:F)</strong></td>
<td>4:8</td>
<td>8:7</td>
<td>0.30</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>20.3 ± 7.8</td>
<td>30.0 ± 4.0</td>
<td>0.77</td>
</tr>
</tbody>
</table>

- No significant difference between the patient groups who underwent outcomes only analysis and the subset that underwent ultrasound elastography and outcomes measurements
Outcomes measures

**VISA-A**

- Graph showing a clinically significant improvement in outcomes scores with p=0.0016.

**FAAM**

- Graph showing a clinically significant improvement in outcomes scores with p<0.0001.

- Graph showing a clinically significant improvement in outcomes scores with p=0.0009.

- 20/24 patients demonstrated a clinically significant improvement in outcomes scores.
Regional Differences

Heel lowering

Partial Squat
Effect of Physical Therapy

Heel lowering

Partial Squat

Compressive Strain - superficial

Tensile Strain - deep
Conclusions

IAT patients

• Increased transverse compressive strain in the deep Achilles tendon
• Decreased axial tensile strain in the deep Achilles tendon

Physical therapy protocol

• Increased transverse compressive strain – superficial portion
• Decreased axial tensile strain – deep portion
• 83% demonstrated improved outcomes measures
References:


Martin, RL; Irrgang, JJ; Burdett, RG; Conti, SF; Van Swearingen, JM: Evidence of validity for the Foot and Ankle Ability Measure (FAAM). Foot Ankle Int. 26: 968-983, 2005.