Sinus Tarsi Volume Changes with Hindfoot Positioning on Weight-Bearing CT Scan

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Measuring Visualized Joint Surface in Hallux MTP Arthroscopy

• NO CONFLICT TO DISCLOSE
• Our disclosures are in the Final AOFAS Mobile App
• There are no potential conflicts with this presentation
Sinus Tarsi Syndrome

- Chronic lateral subtalar pain, or “Sinus Tarsi Syndrome”, is commonly reported to be caused secondary to prior trauma
- Predisposing factors
  - Flatfoot deformity and valgus HFA
- Conservative treatment
  - Medial heel posting attempts to widen the sinus tarsi space and alleviate synovitic pain.
- Question: Does changing heel position alter sinus tarsi volume?
Methods

• IRB approved retrospective study using six healthy volunteers
• Weight-bearing Computed Tomography (CT) scans
  – 25° varus and 25° valgus platforms
  – Bilateral imaging was obtained, resulting in 4 scans per volunteer for a total of 24 scans
• Statistical Analysis – One way ANOVA – GraphPad Prism
Sinus Tarsi Volume

- Saggital imaging
- Measure cross sectional area of sinus tarsi space
- Multiplied by the depth between each measurement (0.36 mm).
- Measurements were continued until the most lateral aspect of the middle facet of the subtalar joint was encountered.
- The sum of these values estimates the sinus tarsi volume.

*Volume = Σ (Area*.36mm)
Other Measurements

Critical Angle Distance:
• Saggital imaging
• Measure distance from most lateral point of the lateral process of the talus to the corner of the critical angle of gissane

Subfibular Distance:
• Coronal imaging
• Measure distance from the most distal point of the fibula to the nearest point of the lateral calcaneal wall
Results

Valgus | Varus | p-value
---|---|---
4.2 | 10.6 | < 0.0001
Results

<table>
<thead>
<tr>
<th>Position</th>
<th>Valgus</th>
<th>Varus</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.6</td>
<td>9.5</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>

**Critical Angle**

- Valgus: 2.6
- Varus: 9.5

* p < 0.001
Results

Subfibular Distance

<table>
<thead>
<tr>
<th>Position</th>
<th>Valgus</th>
<th>Varus</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.8</td>
<td>11.3</td>
<td>NS</td>
</tr>
</tbody>
</table>
Inter- and Intra-observer Reliability

- Interobserver Reliability: 0.77 – 0.97
- Intraobserver Reliability: 0.82 – 0.99

<table>
<thead>
<tr>
<th>R-value</th>
<th>Sinus Tarsi Volume</th>
<th>Critical Distance</th>
<th>Subfibular Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter-</td>
<td>0.811</td>
<td>0.969</td>
<td>0.767</td>
</tr>
<tr>
<td>Intra-</td>
<td>0.817</td>
<td>0.976</td>
<td>0.990</td>
</tr>
</tbody>
</table>
Conclusion

- Sinus Tarsi Volume INCREASES in varus
- Distance from the lateral process of the talus to the Critical angle INCREASES in varus
- Subfibular distance did not significantly change – bringing into question the concept of subfibular impingement (with limitations)