Subtalar and Naviculocuneiform Fusion for the Treatment of Hindfoot Valgus with Collapse of the Medial Arch

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Lukas Zwicky

My disclosure is in the Final AOFAS Mobile App.
I have no potential conflict with this presentation.
The Issue

- Collapse of the medial arch
- Sagging at the naviculo-cuneiform joint
- Instability of the peritalar joints
The Idea

- Peritalar instability
  - load of the posterior tibial tendon (PTT)
  - *treatment as in PTT dysfunction*?

- Stabilization of the hind- and midfoot joints
  - subtalar fusion
  - navicu-lo-cuneiform fusion

- Prevent further destabilization of the adjacent joints
The Aim

- Prospective analysis of a preliminary series of selected patients:
  - clinical outcome
  - radiological correction (at 2 months) and stability of the achieved correction (at 1 year) follow-up
  - complications

(a) talonavicular coverage angle, (b) talus-first metatarsal angle ap, (c) talus-first metatarsal angle lateral, (d) talo-calcaneal angle, (e) calcaneal offset
Patients

- Between June 2009 and May 2012
- 28 surgeries in 26 patients
  - mean age 66 [44-80] years
  - 21 females, 5 males

- Inclusion criteria
  - symptomatic acquired adult flatfoot with peritalar instability with or without PTT dysfunction
  - apex of the deformity at the naviculo-cuneiform joint

- Exclusion criteria
  - TMT I instability
  - stage IV PTT dysfunction
  - Charcot arthropathy
**Technique**

1. Subtalar fusion

2. Medial sliding osteotomy if necessary (13 cases, 46%)

3. Naviculo-cuneiform fusion
Intraoperative Findings and Surgeries

- Condition of PT tendon
  - 5 complete ruptures (18%)
  - 19 degenerative changes (68%)
  - 4 intact (14%)

- 5 soft tissue reconstructions (18%)
  - 1 x FDL transfer
  - 1 x PTT reconstruction
  - 3 x capsulo-plasties and deltoid ligament reconstruction

- 13 medial sliding osteotomies (46%)
Results
Results

- **Angular Correction**

<table>
<thead>
<tr>
<th>Angle</th>
<th>Preoperative</th>
<th>2 months postoperative</th>
<th>1 year postoperative</th>
<th>P value (pre/2mo)</th>
<th>P value (2mo/1y)</th>
<th>P value (pre/1y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN Coverage</td>
<td>37.4±12.4 (13.6-63.5)</td>
<td>23.4±11.8 (1.0-52.0)</td>
<td>24.8±11.9 (0.0-51.8)</td>
<td>&lt;0.001</td>
<td>0.02</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TMT I ap</td>
<td>16.7±11.4 (-7.1-35.2)</td>
<td>5.9±12.6 (-32.0-28.7)</td>
<td>8.2±12.1 (-22.6-27.2)</td>
<td>&lt;0.001</td>
<td>0.41</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TMT I lateral</td>
<td>-23.3±9.4 (-41.8-0.0)</td>
<td>-11.0±8.1 (-31.9-4.3)</td>
<td>-12.6±9.1 (-37.2-3.8)</td>
<td>&lt;0.001</td>
<td>0.04</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Talocalcaneal</td>
<td>39.1±8.8 (14.8-61.1)</td>
<td>32.4±5.5 (21.4-39.9)</td>
<td>32.9±5.0 (23.4-43.4)</td>
<td>&lt;0.001</td>
<td>0.49</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Calcaneal Offset</td>
<td>16.2±8.4 (0-39.6)</td>
<td>1.1±8.4 (-9.9-23.0)</td>
<td>2.2±7.9 (-10.5-20.7)</td>
<td>&lt;0.001</td>
<td>0.04</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

- **Complications**
  - 2 asymptomatic nonunions
    - 1 subtalar, 1 naviculo-cuneiform
  - 2 nerve entrapments
  - 2 soft tissue infections
  - 1 avascular necrosis of the talus
Conclusion

- Powerful correction in all three planes
- Stable correction over time (loss of correction <2°)
- Acceptable complication rate (nonunion)
- We continue to use this technique for extended breakdown of the medial arch
- We avoid extended fusions (that may cause secondary damages)

Be aware!
References


