Peritalar Dislocation After Tibio-Talar Arthrodesis: Fact or Fiction?

Fabrice Colin, MD; Lukas Zwicky, MSc; Alexej Barg, MD; Beat Hintermann, MD
‘Peritalar Dislocation after Tibio-Talar Arthrodesis: Fact or Fiction?’

by Fabrice Colin

My disclosure is in the Final AOFAS Program Book.

I have no potential conflicts with this presentation.
Introduction

- Isolated tibiotalar (TT) arthrodesis for the unstable valgus ankle where the medial ligament complex has become incompetent, as seen typically in the stage IV adult acquired flatfoot deformity (AAFD), is still advocated by many surgeons. **Figure 1**

- The idea behind this procedure is to stabilize the talus within the ankle mortise, and to compensate the loss of motion in the sagittal plane at peritalar joints.

- Increased mechanical load of peritalar joints can further destabilize the hindfoot.

**Figure 1:** Weightbearing radiograph in a patient with AAFD stage 4-B
Introduction

- We have seen 4 patients with a peritalar dislocation beneath the successfully healed tibiotalar fusion for an AAFD stage IV. Figure 2

- The purpose of this study was to critically analyze these cases and to assess the underlying causes.

Figure 2: Frontal view of patient with Peritalar dislocation after healed TT arthrodesis
Material and Methods

- 4 patients were seen for a highly unstable valgus foot after a previous healed TT fusion.
- Preoperatively, all patients presented a valgus unstable ankle associated to a stage IV AAFD, with a valgus tilt of talus of 12° (range 9-14). Table 1
- Clinical examination; radiographs (mortise, lateral, AP, Saltzman view) of the foot and ankle were performed to assess the 3D talar position already fused.

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex, Age</th>
<th>Etiology</th>
<th>Talar-Tilt</th>
<th>Arthrodesis</th>
<th>Follow-up (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M, 70</td>
<td>Post-trauma</td>
<td>12°</td>
<td>TT</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>M, 55</td>
<td>PTTD</td>
<td>14°</td>
<td>TT and CC</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>M, 72</td>
<td>PTTD</td>
<td>13°</td>
<td>TT</td>
<td>1,2</td>
</tr>
<tr>
<td>4</td>
<td>M, 79</td>
<td>Post-trauma</td>
<td>9°</td>
<td>TT</td>
<td>15</td>
</tr>
</tbody>
</table>

**Table 1: Summary of individual patient characteristics.**
M, Male; Post-trauma, Post-traumatic; PTTD, Posterior Tibial Tendon Dysfunction; TT, Tibio-talar joint; CC, Calcaneo-cuboid joint
Results

- All patients presented valgus and pronation fixed deformity highly unstable foot that was not manageable without orthopaedic shoes. **Figures 3 and 5**
- Talus was fused in valgus position in all of them. **Figure 4**

<table>
<thead>
<tr>
<th>Case</th>
<th>Talus valgus Fusion</th>
<th>CO (mm)</th>
<th>TCI</th>
<th>TMT1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4°</td>
<td>54</td>
<td>38°</td>
<td>-30°</td>
</tr>
<tr>
<td>2</td>
<td>6°</td>
<td>16</td>
<td>36°</td>
<td>10°</td>
</tr>
<tr>
<td>3</td>
<td>5°</td>
<td>40</td>
<td>52°</td>
<td>14°</td>
</tr>
<tr>
<td>4</td>
<td>4°</td>
<td>38</td>
<td>44°</td>
<td>-13°</td>
</tr>
<tr>
<td>Normal</td>
<td>8 ± 7</td>
<td>30° ± 4</td>
<td>3° ± 8</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2:** Radiographic assessment of the 3D talar position in the case series and in normal cohort. TCI, Talocalcaneal inclination angle; CO, Calcaneum offset; TMT1, Talometatarsal 1 angle (endorotation of talus related to the first metatarsal was mentioned as a positive value)
Results

Case 1: 70-year old man, 18 years after TT arthrodesis.

Case 2: 55-year old man, 3 years after TT and CC arthrodesis.

Case 3: 72-year old man, 1.2 years after TT arthrodesis with complete dislocation of the talus towards medially.

Case 4: 79-year old man, 15 years after TT arthrodesis with complete dislocation of the talus towards plantar and medially.
Discussion

- The presented study has shown that in AAFD stage IV, despite TT fusion with rigid stabilization of the talus in the ankle mortise, peritalar instability can persist and allow the talus to slide and rotate on calcaneus, which can result in progressive destabilization of the hindfoot complex with final peritalar dislocation\textsuperscript{6}.

- A main problem could be that, in AAFD stage IV, overall destabilization and incompetence of medial ankle and interosseous ligaments may not be able to withstand the increased mechanical load after TT fusion\textsuperscript{6-8}.

- A common finding in the 4 cases of present study was a severe deformity and a valgus position of talus after TT fusion. It could be that the subsequent slightly position into valgus articular surfaces have increased at subtalar joint the translational forces of talus towards medially\textsuperscript{6,7}. 
Conclusion

- Despite TT fusion and rigid fixation, peritalar instability can persist.

- In the case of not sufficiently balanced ankle joint complex, in particular when the talus is fixed in valgus position, progressive peritalar dislocation can occur.

- Isolated TT fusion should be done with caution for treatment of valgus tilted ankle in an AAFD stage IV.

- If considered, fusion in neutral or even slightly varus position of talus should be attempted.
References

1. Bluman, EM; Myerson, MS: Stage IV posterior tibial tendon rupture. Foot Ankle Clin. 12: 341-362, viii. 10.1016/j.fcl.2007.03.004.


7. Valderrabano, V; Hintermann, B; Nigg, BM; Stefanyshyn, D; Stergiou, P: Kinematic changes after fusion and total replacement of the ankle: part 2: Movement transfer. Foot Ankle Int. 24: 888-896.