Does a fibula-sparing approach improve outcomes in tibiotalocalcaneal arthrodesis?

Adam P Schiff, MD
Manuel J Pellegrini, MD
Samuel B Adams, MD
Mark E Easley, MD
James K DeOrio, MD
James A Nunley, MD
I (AND/OR MY CO-AUTHORS) HAVE SOMETHING TO DISCLOSE.

DOES A FIBULA-SPARING APPROACH IMPROVE OUTCOMES IN TIBIOTALOCALCANEAL ARTHRODESIS?

MY DISCLOSURE IS IN THE FINAL AOFAS MOBILE APP.

- Adam Schiff: 3B: Stryker Orthopaedics
- Manuel Pellegrini: 6: Promedon, Synthes
- Samuel Adams: 2: Harvest; 3B: Biomet, Medshape, Medtronic, Regeneration Technologies, Stryker; 4: Medshape
- James DeOrio: 1: BioPro, Merete, SBI; 2: Acumed, Datatrace, Integra, Wright; 3B: Acumed, Datatrace, Exactech, Integra, Sanofi-Aventis, SBI, Tornier, Wright
Introduction

• Tibio-Talo-Calcaneal (TTC) Arthrodesis salvage operation for:
  – Severe ankle and subtalar arthritis
  – Charcot deformities
  – Failed TAR
  – AVN talus
  – Stage IV PTTD

• Fixation:
  – Retrograde intramedullary nail
  – Plate and screw construct
  – Thin wire external fixator
Introduction

- Many described surgical approaches
  - Open vs arthroscopic
  - Anterior, lateral, posterior, medial approaches
  - Fibula can be resected or spared

- Some authors advocate retaining the fibula
  - With variety of approaches

- Others have demonstrated success with fibula resection:

- Objective:
  - Determine if fibular retention improves outcomes and decreases complication rates in patients undergoing TTC arthrodesis
Methods

• Retrospective review of all TTC arthrodesis at single academic center
• 4 Orthopaedic surgeons with foot/ankle practices
• 2000-2012
• All patients with 2 year follow up

• Union defined as:
  – Bridging bone on 3 of 4 cortices on orthogonal x-rays
  OR
  – CT scan with 50% bridging trabeculae
Results

• 95 patients
  – 49 female and 46 male

• Fibular Status
  – Fibula resected: 55% (52 pts)
  – Fibula spared: 45% (43 pts)

• Fixation:
  – IM nail: 59% (56 pts)
  – Plate: 41% (39 pts)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthritis</td>
<td>25</td>
</tr>
<tr>
<td>Prior non-union</td>
<td>23</td>
</tr>
<tr>
<td>Charcot neuroarthropathy</td>
<td>17</td>
</tr>
<tr>
<td>Failed TAR</td>
<td>13</td>
</tr>
<tr>
<td>AVN talus</td>
<td>13</td>
</tr>
<tr>
<td>Stage IV PTTD</td>
<td>4</td>
</tr>
</tbody>
</table>
Results

Union Rate

- Overall: 71.6%
- Spared: 76.9%
- Resected: 67.4%

P-value: 0.409
Results

Complications Rate

- Spared: 44.2%
- Resected: 44.2%

Fibular status

P-value: 0.26

Complications in Tibiotalocalcaneal Arthrodesis

- Non-union: 28.40%
- Tibial stress fracture: 9.50%
- Wound breakdown: 4.20%
- Metatarsal stress fractures: 2.1%
- BKA: 2.1%
- Flap coverage: 2.1%
- Nerve irritation: 1.1%
Conclusions

• Advocates of fibula sparing claim:
  – Lateral support to the fixation/fusion construct
  – Decreases risk for hindfoot valgus
  – Additional surface area for arthrodesis
  – Necessary for possible conversion to total ankle replacement
Conclusions

• Despite theoretical advantages:
  – No difference in union rates
  – No difference in complication rates

• Union rates lower than other previous studies
  – All diagnoses included
    • Charcot, failed TAR, Talar AVN
    • All tertiary care center
Conclusions

- TTC arthrodesis is a salvage operation
  - Overall union rates around 71%
- Both fibula resection and fibula retention can be successful in achieving TTC arthrodesis
- Surgeons should use the technique in which they are most comfortable to achieve arthrodesis and minimize complications
References


