Fibular osteotomy and fixation techniques when utilizing a total ankle replacement system implanted with a lateral approach

Garrett M. Wobst, DPM, AACFAS, Nicole M. Protzman, BS, MS, Stephen A. Brigido, DPM, FACFAS
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Garrett M. Wobst

My disclosure is in the final AOFAS mobile app. I have no potential conflicts with this presentation.
INTRODUCTION

- Total ankle replacements (TARs)
  - Continue to advance in technique and design
  - More closely replicate ankle anatomy and kinematics
  - Improved mid- to long-term survivorship (1-6)

- Recently, a resurfacing TAR system, utilizing a lateral transfibular approach for implantation became available
  - Theorized to reduce the risk of postoperative complications that arise from stressing neurovascular structures and disrupting angiosomes (7,8)
To present the initial results following fibular osteotomy and fixation when utilizing a TAR system implanted through a lateral approach.

HYPOTHESIS

- Intraoperative and postoperative complications will be similar across the various combinations of osteotomy techniques and fixation methods.
### Inclusion Criteria

- \( \geq 18 \) years of age
- Diagnosed with end-stage ankle arthritis
- Exhausted conservative treatments
- Elected to undergo surgical treatment with this new generation prosthetic

### Outcomes

- Type of osteotomy
- Method of fixation
- Intraoperative and postoperative complications
### Results

#### Patient Demographics

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>15 (100.0)</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>55.6 ± 15.0</td>
</tr>
<tr>
<td>Body Mass Index (kg/m²)</td>
<td>32.3 ± 6.8</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>12 (80.0)</td>
</tr>
<tr>
<td>Men</td>
<td>3 (20.0)</td>
</tr>
<tr>
<td>Injury Side</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>8 (53.3)</td>
</tr>
<tr>
<td>Right</td>
<td>7 (46.7)</td>
</tr>
</tbody>
</table>

- Data presented as mean ± standard error or count (%).

#### Etiology

- Osteoarthritis: 6 (40.0)
- Post-traumatic arthritis: 9 (60.0)
## Results

### Procedure Summary

Via a lateral approach, a fibular osteotomy was performed, the TAR was implanted, and the fibula was internally fixated.

<table>
<thead>
<tr>
<th></th>
<th>1/3 Tubular Plate</th>
<th>Intramedullary Rod</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transverse</td>
<td>5 (38.5)</td>
<td>8 (61.5)</td>
<td>13 (86.7)</td>
</tr>
<tr>
<td>Chevron</td>
<td>1 (100.0)</td>
<td>1 (6.7)</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Scarf</td>
<td>1 (100.0)</td>
<td>1 (6.7)</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5 (33.3)</strong></td>
<td><strong>10 (66.7)</strong></td>
<td><strong>15 (100.0)</strong></td>
</tr>
</tbody>
</table>

Data presented as count (%).
# Results

## Complications Summary

- Four (26.7%) patients experienced complications

<table>
<thead>
<tr>
<th>#</th>
<th>Age</th>
<th>Past Medical History</th>
<th>Osteotomy</th>
<th>Fixation</th>
<th>Complication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>Obese Hypertension Hypercholesterolemia</td>
<td>Transverse</td>
<td>1/3 Tubular plate</td>
<td>Full thickness wound</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>Talar avascular necrosis Ankle arthrodiastasis with external fixation</td>
<td>Transverse</td>
<td>1/3 Tubular plate</td>
<td>Fracture Full thickness wound</td>
</tr>
<tr>
<td>3</td>
<td>77</td>
<td>Obese Smoker</td>
<td>Scarf</td>
<td>Intramedullary rod</td>
<td>Fracture</td>
</tr>
<tr>
<td>4</td>
<td>52</td>
<td>Smoker</td>
<td>Transverse</td>
<td>1/3 Tubular plate</td>
<td>Full thickness wound</td>
</tr>
</tbody>
</table>
Results

Summary

- Two (13.3%) intraoperative fractures occurred at the osteotomy site
  - One was a transverse osteotomy (7.7% of transverse osteotomies)
  - One was a scarf osteotomy (100.0% of scarf osteotomies)

- Three (20.0%) full thickness wounds occurred
  - All three (100.0%) were treated with the 1/3 tubular plate
  - All wounds were referred to plastic surgery and healed completely
Discussion

- The data suggest a possible association between the development of full thickness wounds and the 1/3 tubular plate.
- At this time, no definitive conclusions can be made regarding the scarf osteotomy and fracture prevalence, given the small sample size (n = 1).

*This information can be used to guide fibular osteotomy and fixation technique selection.*
REFERENCES


