Evaluating midcalcaneal length after Evans calcaneal osteotomy: a comparison of the locking plate and tricortical allograft wedge

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Evaluating midcalcaneal length after Evans calcaneal osteotomy: a comparison of the locking plate and tricortical allograft wedge

Garrett M. Wobst

My disclosure is in the final AOFAS mobile app. I have no potential conflicts with this presentation.
Evans calcaneal osteotomy remains a cornerstone in the correction of the flexible flatfoot (1-5).

Through lengthening of the lateral column, tri-planar correction is consistently achieved (6,7).
INTRODUCTION

• Many methods have been employed to maintain the length of the lateral column (8)
  • Tricortical autograft and allograft wedges
  • Trabecular metal wedges
  • Locking and non-locking plates
  • Simple screw fixation

Figure from Butterworth, 2013 (9)
INTRODUCTION

• Compared with a tricortical graft, the locking plate has been shown to better preserve lateral column length (10)

• Recently, a procedure-specific wedge locking plate was designed to maintain the mid-calcaneal length following Evans osteotomy

Image source: http://footandanklefixation.com/product/
PURPOSE

To compare the maintenance of mid-calcaneal length after Evans calcaneal osteotomy when either a low profile wedge locking plate or a tricortical allograft wedge was employed.

HYPOTHESIS

• The wedge locking plate would better maintain mid-calcaneal length compared with the tricortical allograft wedge.
# Materials & Methods

*Retrospective chart review (September 2009 – June 2013)*

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Presented with a reducible, flexible, symptomatic flatfoot</td>
</tr>
<tr>
<td>• Exhausted conservative treatment</td>
</tr>
<tr>
<td>• Elected to undergo surgical correction of the deformity</td>
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<tr>
<td>• Evans calcaneal osteotomy was performed</td>
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<tr>
<td>• Either a wedge locking plate or a tricortical allograft wedge was employed to maintain postoperative mid-calcaneal length</td>
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<tr>
<td>• Minimum radiographic follow-up of 6 months</td>
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<table>
<thead>
<tr>
<th>Exclusion Criteria</th>
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</thead>
<tbody>
<tr>
<td>• Underwent an adjunctive hindfoot, bony procedure at the time of osteotomy</td>
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</tbody>
</table>
Materials & Methods

Mid-calcaneal Length Measurements

- Immediate postoperative period, and again at 3 months and 6 months

- Distance measured from the most superior aspect of the convex arc on the posterior subtalar facet and the most inferior aspect of the concave arc on the calcaneus at the calcaneocuboid joint (10)

- Change in mid-calcaneal length
  - Immediate postoperative measurements as baseline

Figure from Dayton et al. 2013 (11)
## Results

### Patient Demographics

<table>
<thead>
<tr>
<th>Demographic</th>
<th>All Patients</th>
<th>Tricortical Allograft</th>
<th>Wedge Locking</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (yr)</td>
<td>48.1 ± 17.2</td>
<td>45.7 ± 20.1</td>
<td>49.6 ± 15.8</td>
</tr>
<tr>
<td>Body Mass Index (kg/m²)</td>
<td>31.8 ± 6.6</td>
<td>29.6 ± 7.7</td>
<td>32.9 ± 5.8</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>18 (75.0)</td>
<td>8 (88.9)</td>
<td>10 (66.7)</td>
</tr>
<tr>
<td>Male</td>
<td>6 (25.0)</td>
<td>1 (11.1)</td>
<td>5 (33.3)</td>
</tr>
</tbody>
</table>

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

*Change in Mid-calcaneal Length*

Data presented as mean ± standard error

![Graph showing change in mid-calcaneal length over 3 and 6 months for Tricortical Allograft Wedge and Wedge Locking Plate.]
Discussion

• Our data indicate that the wedge locking plate better maintains mid-calcaneal length compared with the tricortical allograft wedge 6 months following surgical correction.

• Resorption of the allograft wedge at the bone graft interface may cause a decrease in mid-calcaneal length.
REFERENCES