The Medial Malleolar Sled: A New Device for the Fixation of Medial Malleolar Fractures

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Disclosure

My disclosure is in the final AOFAS program book

- The authors declare no financial support or other conflicts of interest
Medial Malleolar Fractures: Background

• Foot and ankle injuries comprise >20% of musculoskeletal injuries\(^1\)
• Many require open reduction internal fixation (ORIF)\(^2-5\)
• Tension band construct or cancellous lag screws are commonly used in ORIF
• Purpose: To evaluate a new method of fixation for medial malleolar fractures
• Hypothesis: Union rates, clinical and functional outcomes comparable to other methods of fixation
Materials and Methods

• Retrospective Review
  • GMC patients undergoing ORIF of medial malleolus fractures using TriMed Sled
  • Single surgeon
  • November 2006 - June 2011

• Patient Evaluation Questionnaires
  • AAOS Foot and Ankle Questionnaire
  • Short Musculoskeletal Form Assessment (SMFA)

• Inclusion Criteria
  • Age >18
  • Closed fracture

• Patients were seen in clinic at 2, 6, and 12 weeks following operative fixation
Operative Technique

- Medial incision
- Identify and protect saphenous nerve and vein
- Two 1.1mm k-wires to maintain reduction
- Place Sled guide on malleolus and insert two 0.9mm k-wires
Operative Technique

- Legs of the Medial Sled are slid over the guide pins
- Impact approximately one-quarter of the depth of the sled legs and remove 0.9mm k-wires
- Remove pins and completely impact Sled
- Seat the groove of the Sled Washer Guide against the proximal loop of the Sled
- Two holes are drilled with the 2.3mm drill through the guide at an approximate 15° angle
Operative Technique

- A 3.8mm cancellous bone screw is inserted into the distal hole but is not completely tightened.
- A second 3.8mm cancellous screw is inserted into the proximal hole and seated to compress the fracture and the distal bone screw is fully tightened to complete fixation.
- Irrigation with sterile saline and closed in layered fashion.
- Sterile dressings and a posterior splint with a U-strap are applied at the end of the procedure.
Results

• Average clinical follow-up: 48±3 weeks (range, 20-71 weeks).

• Fourteen patients (73.7%) completed the AAOS Foot and Ankle Questionnaire and SMFA survey

• Clinical results obtained during office visits:
  • 100% union
  • 0 malunions
  • 0 deep infections
  • 1 (5.3%) superficial skin infection
  • 1 (5.3%) reoperation for removal of painful hardware
## Results

<table>
<thead>
<tr>
<th></th>
<th>Malleolar Sled</th>
<th>Cancellous Lag Screws</th>
<th>Tension Band</th>
<th>Healthy Patients&lt;sup&gt;9&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td>% Union</td>
<td>100</td>
<td>Fully Threaded Screws - 100%</td>
<td>100%&lt;sup&gt;8&lt;/sup&gt;</td>
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<td></td>
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<td>Partially Threaded Screws - 95.65%&lt;sup&gt;6&lt;/sup&gt;</td>
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<td>% Hardware Removal</td>
<td>5.3 (1/19)</td>
<td>Fully Threaded Screws - 0%</td>
<td>12.9 (4/31)&lt;sup&gt;8&lt;/sup&gt;</td>
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<tr>
<td></td>
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<td>Partially Threaded Screws - 4.35&lt;sup&gt;6&lt;/sup&gt;</td>
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<tr>
<td>% Deep Wound Infection</td>
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<td>1.44&lt;sup&gt;7&lt;/sup&gt;</td>
<td>1.44&lt;sup&gt;7&lt;/sup&gt;</td>
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### SMFA

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<th>Activity</th>
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<td>daily activities</td>
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<td>function index</td>
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<td>12.7</td>
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<td>Bothersome index</td>
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<td>13.8</td>
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### AAOS Foot and Ankle Survey

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<tr>
<td>Shoe Comfort Score</td>
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<td>73.9</td>
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<tr>
<td>Foot and Ankle Core Score</td>
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References