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

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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
<table>
<thead>
<tr>
<th></th>
<th>Malleolar Sled</th>
<th>Cancellous Lag Screws</th>
<th>Tension Band</th>
<th>Healthy Patients$^9$</th>
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<tbody>
<tr>
<td>% Union</td>
<td>100</td>
<td>Fully Threaded Screws - 100%</td>
<td>100%$^8$</td>
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<td>Partially Threaded Screws - 95.65%$^6$</td>
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<tr>
<td>% Hardware Removal</td>
<td>5.3 (1/19)</td>
<td>Fully Threaded Screws - 0%</td>
<td>12.9 (4/31)$^8$</td>
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<td>Partially Threaded Screws - 4.35$^6$</td>
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<tr>
<td>% Deep Wound Infection</td>
<td>0</td>
<td>1.44$^7$</td>
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<td><strong>SMFA</strong></td>
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<td><strong>AAOS Foot and Ankle Survey</strong></td>
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References


