Minimally Invasive Fibular Fixation with One-Third Tubular Plate for Supination-External Rotation Ankle Fractures

Chao-Ching Chiang, M.D.\(^1\), Ching-Kuei Huang, M.D.\(^1\), Yun-Hsuan Tzeng, M.D.\(^2\), Chien-Lin Liu, M.D.\(^1\)

\(^1\)Division of Orthopaedic Trauma, Departments of Orthopaedics & Traumatology, Taipei Veterans General Hospital, Taiwan, R.O.C.

\(^2\)Division of Medical Imaging for Health Management, Cheng Hsin General Hospital, Taiwan, R.O.C.
NO CONFLICT TO DISCLOSE

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Chao-Ching Chiang, M.D.

My disclosure is in the Final AOFAS Mobile App.

I have no potential conflicts with this presentation.
Background

- Open reduction and internal fixation (ORIF)
  - Standard fixation techniques
  - Wound complications
    - As high as 18% in high risk patients
- Minimally invasive surgery (MIS)
  - Possibly decrease wound complications
Purpose of this study
• Describe our algorithm of MIS techniques
• Surgical outcomes

- SER fractures
- Closed manipulation
- Anatomical reduction?
  - Yes
    - MIPPO
  - No
    - 1/3 tubular plate ± interfragmental screw
    - MIS Transfracture
Methods

- June 2008 to June 2013
- Single surgeon of a medical center
- 35 Lauge-Hansen supination-external rotation (SER) ankle fractures
  - 13 percutaneous plating (37%)
  - 22 transfracture approach (63%)
  - No procedures abandoned
- Mean age 41.6±15.9 years (18 to 74)
- Mean follow-up 37.1±22.2 months (12 to 74)
1. MIPPO: Percutaneous fibular plating

40/F, AO/OTA 44-B1, SER 2

Outline fracture

Manipulation
Temporary fixation
Distal incision 1cm

Retrograde plate

MIPPO wound
2. MIS: Transfracture approach

20/M, AO/OTA 44-B3, SER 4

2-3cm incision

Direct reduction
Pre-contoured plate, adjust plate position

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Chiang CC
Outcome evaluation

AP weight-bearing radiograph
• Compared with uninjured side
• Talocrural angle (TCA)
• Fibular length (FL)

Function
• AOFAS ankle-hindfoot scale
• Range of motion (ROM)
Results

- Union time: $9.0 \pm 1.8$ weeks (6 to 14)
- AOFAS ankle-hindfoot scale $92.1 \pm 6.2$ (80 to 100)
- No nonunion, no malreduction
- 1 complication of infection
  - 2.9%, cured after removal

<table>
<thead>
<tr>
<th>Measure</th>
<th>Injured</th>
<th>Uninjured</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talocrural angle (degrees)</td>
<td>$76.4 \pm 3.3$</td>
<td>$76.9 \pm 2.7$</td>
<td>0.323</td>
</tr>
<tr>
<td></td>
<td>(68 to 84)</td>
<td>(71 to 81)</td>
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<tr>
<td>Fibular length (mm)</td>
<td>$27.9 \pm 2.7$</td>
<td>$27.2 \pm 2.4$</td>
<td>0.068</td>
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<tr>
<td></td>
<td>(21.8 to 33.7)</td>
<td>(22.2 to 31.2)</td>
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<tr>
<td>ROM (degrees)</td>
<td>$62.6 \pm 12.9$</td>
<td>$73.3 \pm 11.6$</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(42 to 90)</td>
<td>(50 to 92)</td>
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Discussion

• MIS fibular plating is a safe and reliable procedure for SER injuries
• Fibular anatomy could be anatomically restored.
• Low wound complication rates.
• Need some learning curve

References