Treatment of 5th Metatarsal Shaft Fracture using MIPO Technique

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My disclosure is in the Final AOFAS Mobile App. I have no potential conflicts with this presentation.
Introduction

- **Conservative treatment** for 5th metatarsal shaft fracture
  - Splint of cast immobilization
  - Fractures without displacement

- **Operative treatment** for 5th metatarsal shaft fracture
  - Indication for open reduction
    - Displacement > 3mm
    - Rotational displacement
    - Angular displacement > 30°

The standard treatment of 5th metatarsal shaft fracture is still not determined yet.
Purpose

In this study, we report the result of 5th metatarsal shaft fracture using MIPO technique, which can shorten recovery period by reducing soft tissue damage with minimal incision.

Materials and Methods

- March 2013 ~ December 2015
- Displaced 5th metatarsal shaft fractures
  - 11 cases
    - simple oblique fracture
  - 14 cases
    - comminuted fracture
Surgical Procedure

1. Less than 1cm skin incision on dorso-lateral aspect of 5th metatarsal shaft
   Temporary fixation with K-wire under fluoroscopy guided image.

2. Choose proper size of 2.0 LCP Compact Hand Locking Condylar
   Plate (Depuy-Synthes, Switzerland).

   There are no tendon or muscle attached on lateral border of 5th
   metatarsal, ideal space for plating.
3. Plate fixation and Intra-operative C-arm image
Postoperative Care

- Short leg splint was applied for 4 weeks
- Partial weight bearing was allowed until 4th week
- Full weight bearing was allowed until 6th week

- Clinical and Radiological follow-up was made at post-op week 2, 6, 12, 24

- Clinical results were obtained using VAS and AOFAS score
## Results

### Demographic characteristics (n=25)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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<tbody>
<tr>
<td>Mean Age at the time of surgery (yr)</td>
<td>47.4 (29-69)</td>
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<tr>
<td>Sex (M:F)</td>
<td>8 : 17</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>23.3 (19-28)</td>
</tr>
<tr>
<td>Mean fracture gap (mm)</td>
<td>4.4 (3.1–7.6)</td>
</tr>
</tbody>
</table>

### Clinical outcomes

<table>
<thead>
<tr>
<th>Patient Data</th>
<th>Pre-op</th>
<th>Last follow-up</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAS</td>
<td>5.6 ± 0.8 (4~7)</td>
<td>1.2 ± 1.3 (0~4)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>AOFAS score</td>
<td>42.0 ± 12.8 (24~54)</td>
<td>86.4 ± 7.7 (74~95)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
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Mean union period obtained from follow-up radiograph was 6.0 week post-op.
Case 2 F/64
Discussion

• 5\textsuperscript{th} metatarsal bone: widest ROM
  - plate: easy access to the bone, more stable

• Recommend plating rather than pinning or screws

• MIPO
  - well union, not painful callus, early weight bearing

5\textsuperscript{th} MT shaft fracture is good indication of MIPO
Conclusion

Plate fixation can be the preferred option for 5th metatarsal shaft fracture, because 5th metatarsal shaft is surgically easily accessible and more stable fixation can be applied. Since it results complete bone union without any complications and enables early weight bearing, **MIPO technique for displaced 5th metatarsal shaft fracture can be considered as useful surgery technique.**

References