Extended Distal Chevron Osteotomy
: Stable & Accurate Correction of the Angulation and Rotational Profile

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Disclosure

No conflict to disclosure
Extended distal chevron osteotomy

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Out disclosures are in the Final AOFAS Mobile App.
We have no potential conflicts with this presentation.
Extended Distal Chevron Osteotomy

- Conventional distal chevron osteotomy
  - Complications
    - Infection, damage to nerves, blood vessels, and bleeding
    - Bone failing to heal or disruption of the blood supply
    - Misalignment, instability

Dorsal angulation  Breakage  Troughing  Screw breakage
Extended Distal Chevron Osteotomy

• How to reduce these complications?
  1. Proximal fragment dorsal angulation
  2. Nonunion of cut bone
  3. Risk of troughing
  4. Insufficient correction

→ Extended distal chevron osteotomy
Extended Distal Chevron Osteotomy

*Material & Methods*

- From July 2013 to June 2014 (Follow-up 2 years)
- Mild-to-moderate hallux valgus deformity
- 91 feet (77 patients) by the same surgeon
  - Group A: 37 feet (32 patients) with *Conventional DCO*
  - Group B: 54 feet (45 patients) with *Extended DCO*
- Evaluation & Assessment
  - Hallux valgus angle (HVA)
  - 1st-2nd Intermetatarsal angle (IMA)
  - Distal Metatarsal Articular Angle (DMAA)
  - VAS pain score
  - Postoperative complications
Extended Distal Chevron Osteotomy

*Material & Methods*

1. Cut 25~30mm toward horizontal plane of the plantar surface to the upper 1/3 of the neck

2. Cut from 5~10mm distal to the head of metatarsal bone with an angle of 60~75°

3. The distal fragment was displaced laterally to reduce the IMA.

4. Rotational correction was achieved by derotating distal fragment.

5. Fixation by using K-wire or Trim-It pin.
* Results

Table 1. Comparison between 2 groups in HVA, IMA & DMAA

<table>
<thead>
<tr>
<th></th>
<th>Extended DCO (Pre-Post-Last F/U)</th>
<th>Conventional DCO (Pre-Post-Last F/U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean HVA</td>
<td>32.3 → 5.8 → 8.4</td>
<td>32.4 → 10.93 → 11.4</td>
</tr>
<tr>
<td>Mean IMA</td>
<td>14.8 → 4.9 → 7.3</td>
<td>15.1 → 7.8 → 9.2</td>
</tr>
<tr>
<td>Mean DMAA</td>
<td>26.1 → 7.1 → 8.73</td>
<td>27.2 → 8.4 → 15.7</td>
</tr>
</tbody>
</table>

Compare with VAS score between 2 group
- statistically No significant difference
Extended Distal Chevron Osteotomy

* Results

Table 2. Complications between 2 groups

<table>
<thead>
<tr>
<th></th>
<th>Extended DCO</th>
<th>Conventional DCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-union</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AVN</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sensory problems</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Skin problem</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1st Metatarsal shortening</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Recurrence</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
Extended Distal Chevron Osteotomy

* Discussion

<table>
<thead>
<tr>
<th>DISTAL MT OSTEOTOMIES</th>
<th>PROXIMAL MT OSTEOTOMIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mitchell {step cut osteotomy}</td>
<td>1. Proximal Crescentic</td>
</tr>
<tr>
<td>2. Wilson</td>
<td>2. Proximal Chevron</td>
</tr>
<tr>
<td>3. Chevron</td>
<td>3. Opening Wedge</td>
</tr>
<tr>
<td>4. Modified chevron</td>
<td>4. Ludloff</td>
</tr>
<tr>
<td></td>
<td>5. Mau</td>
</tr>
<tr>
<td></td>
<td>6. Closing Wedge</td>
</tr>
<tr>
<td></td>
<td>7. Scarf</td>
</tr>
</tbody>
</table>
Extended Distal Chevron Osteotomy

*Discussion*

- **Mau osteotomy**
  Transverse plane osteotomy
  Plantar-proximal to dorsal-distal
  Dorsal shelf to resist the potentially disruptive forces of weight bearing

- **Scarf osteotomy**
  Z-step cut in the first MTB
  Mild to severe deformities
  Inherent stability and rigid compression
  \(\rightarrow\) immediate weightbearing

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Nonunion: Dorsal cortical (8%)
Elevation (2%)
Recurrence (3%)
Undercorrection (5%)
Infection (0%)

BUT

Neuralgia
Irritation by inserted screws
Unstable fixation
Recurrence
Infection
Troughing: Coetzee reported in 35%
Stress fracture
Extended Distal Chevron Osteotomy

* Discussion

Extended chevron osteotomy
- Technically simple and highly reproducible.
- Prevent dorsal angulation
- Fixation by using K-wires or Trim-it(bio-absorbable) pin
  - Prevent troughing and Irritation of screws
- Large contact surface of the cut bone
  - Effective for stability & decrease non-union rate

* Conclusion
- Stable and accurate correction of the deformity (HVA, IMA, DMAA)
- Unconverted fixation as compared with conventional DCO.
Extended Distal Chevron Osteotomy

**References**


