Angular Correction with Chevron-Akin Double Osteotomy in Mild, Moderate, and Severe Hallux Valgus
Disclosure

- No conflicts to disclose
- Senior author disclosures can be found at AOFAS website
Introduction

- Common problem in foot and ankle
- Multitude of procedures exist with varying degrees of technical difficulty
- Current procedures can be categorized simply into distal, mid-shaft, and proximal osteotomies
- Primary goal - center metatarsal head over sesamoid sling
- No consensus on ideal procedure
Purpose

- Chevron osteotomy is commonly used in mild hallux valgus.
- The chevron-Akin double osteotomy is a more powerful tool, with presumed usefulness in moderate and severe deformity.
- The objective of this study was to use radiographic analysis to determine the average and maximum corrections achievable with the chevron-Akin double osteotomy.
Methods

- Retrospective analysis
- Included totals of 30 patients and 33 feet
- Pre- and postoperative hallux valgus angles (HVA) and intermetatarsal angles (IMA) were measured
  - differences pre-op to post-op were calculated
  - 3 individual observers were used for measurements
    - three-way intraclass correlation, as well as pairwise agreement, was performed and found to have good correlation
Patients were grouped based on the severity of preoperative hallux valgus into mild, moderate, and severe pathology.

The pre- to post changes of HVA and IMA were compared between severity groups by using ANOVA, and means and standard deviation were reported at each level of severity.

The rate of correction to normal was noted in each severity group.
Results

- Of the 33 feet, 3 were categorized as mild, 19 as moderate, and 11 as severe.
- Mild group: average improvement was 13 in HVA and 6 in IMA; maximum correction achieved was 14 in HVA and 9 in IMA
  - 3 of 3 (100%) were corrected to the normal range.
- Moderate group: average improvement was 16.5 in HVA and 5.2 in IMA; maximum correction achieved was 29 in HVA and 9 in IMA
  - 18 of 19 (95%) were corrected to the normal range.
- Severe group: average improvement was 28.5 in HVA and 8.8 in IMA; maximum correction achieved was 43 in HVA and 20 in IMA
  - 9 of 11 (82%) were corrected to the normal range.
<table>
<thead>
<tr>
<th>Hallux Valgus Angle</th>
<th>Pre Op</th>
<th>Post Op</th>
<th>ΔHV</th>
<th># of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>15.33</td>
<td>2.33 ± 1.53</td>
<td>13 ± 1</td>
<td>3</td>
</tr>
<tr>
<td>Moderate</td>
<td>27.48</td>
<td>9.95 ± 5.12</td>
<td>16.47 ± 6.05</td>
<td>21</td>
</tr>
<tr>
<td>Severe</td>
<td>41.22</td>
<td>12.09 ± 6.24</td>
<td>28.45 ± 8.26</td>
<td>9</td>
</tr>
</tbody>
</table>

p-value† 0.03136 0.00008

p-value* 0.02513 0.00044

† ANOVA test  
* Kruskal-Wallis test
Discussion

- **Demonstrated range of achievable correction**
  - Verified techniques
  - Intra-observer reliability

- **Utility in surgical planning**
  - Confidence in the technical capabilities of the procedure
Discussion

- No consensus regarding ideal surgical procedure
- Currently accepted literature states proximal or midshaft osteotomies are required for the correction of severe hallux valgus
  - Proximal/mid shaft more technically demanding
  - Hardware required
    - Increased cost
  - Increased soft tissue disruption
- Utility of chevron-Akin
  - Effectiveness in mild/moderate/severe
  - Extremely flexible
- Does not require permanent hardware
  - Decreased cost
The chevron-Akin procedure is an effective tool for the correction of all degrees of hallux valgus deformity and can achieve various degrees of angular correction depending on the clinical scenario.
REFERENCES