High Rate of Recurrent Hallux Valgus Following Proximal Medial Opening Wedge Osteotomy for Correction of Moderate to Severe Deformity

Sravisht Iyer, MD
Constantine Demetracopoulos, MD
Jeanne Yu, BS
Sriniwasan Mani, BS
Jeremy Chan, BS
Scott Ellis, MD

1Hospital for Special Surgery, 535 E 70th Street, New York, NY, 10021
High Rate of Recurrent Hallux Valgus Following Proximal Medial Opening Wedge Osteotomy for Correction of Moderate to Severe Deformity

Presenter: Sravisht Iyer, MD

My disclosure is in the Final AOFAS Mobile App.

I have no potential conflicts with this presentation.
Introduction

• The proximal medial opening wedge osteotomy (PMOW) has become more popular to treat moderate to severe hallux valgus with the recent development of low-profile modular plates.

• We have noticed a higher recurrence rate with this technique than previously reported in the literature despite good correction in the OR.

• We sought to analyze the radiographic and clinical outcomes in our initial cohort of patients.
Methods

• Retrospective analysis of a prospectively gathered data collected as part of an institutional registry.

• **Inclusion:** 17 consecutive patients treated with PMOW between 1/2010 – 12/2010
  – Identified by review of OR schedule
  – Querying registry for CPT code 28306†

• **Exclusion:** None

†Osteotomy, with or without lengthening, shortening or angular correction, metatarsal; first metatarsal
Methods

• Outcomes:
  – Radiographic outcomes: Standard XR of the foot obtained at follow-up visit. The following angles were measured:
    • Hallux Valgus Angle (HVA), 1-2 Intermetatarsal Angle (IMA), Distal metatarsal articular angle (DMAA)
  – Functional outcomes: Pre-operative Foot and Ankle Outcome Score (FAOS) and most-recent FAOS was used to determine functional outcomes
  – Complications were also recorded

• Recurrent HV was defined as one or more of the following†:
  – Increase in HVA of greater than 5 degrees
  – HVA greater 15 degrees at follow
  – Increase in IMA under 2 degrees.

• Patients with recurrent HV were compared to patients without recurrence using an unpaired two-tailed Student’s t-test

† Shurnas, PS; Watson, TS; Crislip, TW: Foot Ankle Int. 30:865-872, 2009.
Results

- 14 females, 3 males
- Age: 47.7 years (14.9, 71.7)
- Follow up: 2.35 years (11 months, 3.5 years)

- Pre-operative radiographic measurements:

<table>
<thead>
<tr>
<th></th>
<th>HVA</th>
<th>DMAA</th>
<th>IMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-op</td>
<td>26.4 (14.5, 37.1)</td>
<td>24.2 (13.5, 40.1)</td>
<td>13.7 (7.1, 20.3)</td>
</tr>
<tr>
<td>2 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 years</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Recurrent HV: 12/17 patients (70.6%)
Results – Radiology

### HVA by group

- **Pre-op**
- **2wk**
- **6wk**
- **3 mos**
- **6mos**
- **Most recent**

**Time from Surgery**

- **All patients**
- **Recurrent HV**
- **No Recurrence**

* p < 0.05 when compared to non-recurrent HV group

### DMAA by group

- **Pre-op**
- **2wk**
- **6wk**
- **3 mos**
- **6mos**
- **Most recent**

**Time from Surgery**

- **All patients**
- **Recurrent HV**
- **No Recurrence**

### IMA by group

- **Pre-op**
- **2wk**
- **6wk**
- **3 mos**
- **6mos**
- **Most recent**

**Time from Surgery**

- **All patients**
- **Recurrent HV**
- **No Recurrence**

* p < 0.05 when compared to non-recurrent HV group
Results – Radiology

Key Findings:

Pre-operative HVA and DMAA were larger in the group with recurrent HV (p < .05)

Mean Preoperative HVA and DMAA by Group

<table>
<thead>
<tr>
<th></th>
<th>Recurrent HV</th>
<th>No Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVA</td>
<td>29.1 (20.7, 37.1)</td>
<td>20.0 (14.5, 25.5)</td>
</tr>
<tr>
<td>DMAA</td>
<td>27.2 (14.6, 40.1)</td>
<td>17.2 (13.5, 23.5)</td>
</tr>
</tbody>
</table>

HVA and DMAA between the recurrent and non-recurrent groups diverged at 3 months (p < .05)
Results – Functional Outcomes

- **Improvement in Quality of Life** subscale of FAOS (pre-op 38.8 vs post-op 73.8, p = .05).

- **No other differences** between pre-operative and final FAOS scores (p > 0.05 for all subscales).

- **No differences** between recurrent and non-recurrent groups.
# Results - Complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd toe hammering</td>
<td>1 (5.9%)</td>
</tr>
<tr>
<td>MTP arthritis (MRI)</td>
<td>3 (17.6%)</td>
</tr>
<tr>
<td>MTP Pain, non-specific</td>
<td>3 (17.6%)</td>
</tr>
<tr>
<td>Stiffness</td>
<td>1 (5.9%)</td>
</tr>
<tr>
<td>Prominent Hardware</td>
<td>2 (11.8%)</td>
</tr>
</tbody>
</table>

## Comparison to Existing Literature

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>MTP pain</th>
<th>Symptomatic Hardware</th>
<th>Recurrence</th>
<th>Hallux Varus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shurnas et al; Foot Ankle Int., 2009</td>
<td>84</td>
<td>2.4%</td>
<td>11.9%</td>
<td>3.6%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Saragas; Foot Ankle Int., 2009</td>
<td>64</td>
<td>NR</td>
<td>3.1%</td>
<td>3.1%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Kumar et al; Acta Orthop. Belg., 2012</td>
<td>20</td>
<td>NR</td>
<td>10%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Wukich et al; J. Foot Ankle Surg., 2009</td>
<td>18</td>
<td>NR</td>
<td>NR</td>
<td>11.1%</td>
<td>NR</td>
</tr>
<tr>
<td><strong>Current Series</strong></td>
<td>17</td>
<td>35.3%*</td>
<td>11.8%</td>
<td>70.6%</td>
<td>0%</td>
</tr>
</tbody>
</table>

* Includes all causes of MTP pain
Conclusions

• We report a significant rate of recurrent HV (70.6%) in patients treated with the PMOW osteotomy

• Patients with recurrent HV had a worse pre-operative deformity

• Our results suggest PMOW must be used with some caution in patients with moderate to severe HV

• One potential cause for recurrence might be hypermobility of the 1st tarsometatarsal (TMT) joint
  – The senior author now performs a 1st TMT fusion when treating moderate to severe HV.

• Limitations:
  – Retrospective study with relatively small sample size compared to existing series in the literature
  – Consecutive series of the first 17 PMOW performed by the author and results might improve with more experience
References


• Saragas, NP: Proximal opening-wedge osteotomy of the first metatarsal for hallux valgus using a low profile plate. Foot Ankle Int. 30:976-980, 2009.

• Shurnas, PS; Watson, TS; Crislip, TW: Proximal first metatarsal opening wedge osteotomy with a low profile plate. Foot Ankle Int. 30:865-872, 2009.