Is There Any Added Value of the Akin Osteotomy in Hallux Valgus Corrective Surgery?  
An Analysis of Patient-Centered Outcomes in 92 Subjects

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Disclosure

- Please see program for full disclosure of all the authors
Objectives

- Added Value of an Akin?
- Is it necessary?
- Are the benefits purely cosmetic?
- Function benefits of Akin to Hallux Valgus surgery
Introduction

- Hallux valgus among most common pathologies for foot and ankle surgeons
- Akin (1925) - relatively popular procedure
- Suboptimal in isolation for many HV deformities and fallen out of favor as of late
- Superior results when performed in conjunction with first ray procedure
- Proponents of the adjunctive Akin osteotomy:
  - More rectus appearing hallux
  - Maintain deformity correction and mitigate recurrence
  - Alters mechanics by medializing the long flexor and extensors of the hallux
- Few studies comparing outcomes of HV correction with and without the Akin
Introduction – Literature

Lechler et al.\textsuperscript{17} in 2012

- Prospectively compared chevron and chevron-Akin
- Follow up 1.04 to 1.37 years
- Radiographic and clinical outcome measures based on AOFAS scores
- Slightly favorable results for the chevron-Akin group

Shibuya et al.\textsuperscript{18} in 2016

- Radiographic comparison between first ray procedures with and without Akin
- Improved immediate radiographic deformity correction with Akin
- However, no significant difference at > 6 months postop
Purpose

- No studies examining whether an adjunctive Akin osteotomy improves hallux valgus outcomes from the patient’s perspective

- Present study aims to investigate whether patients undergoing adjunctive Akin osteotomy for hallux valgus surgery experienced improved pain, function, and quality of life compared to those that did NOT undergo an Akin osteotomy
Patients & Methods

- Retrospective cohort study of consecutive patients undergoing HV correction (Jan 2013 – Dec 2015)

- Inclusion Criteria:
  - Scarf or Scarf/Akin osteotomy
  - Baseline FAOS scores in institutional database
  - Final follow up with FAOS data ≥ 1 year postop
Patients & Methods

- IRB review with exempt determination granted
- Study population identified and divided into two groups:
  - Scarf osteotomy
  - Scarf/Akin osteotomies
- Demographic, pre- and post-op radiographic and FAOS data gathered
- FAOS scale - validated patient-centered outcome measure in hallux valgus surgery
  - Pain, symptoms, function – sports & rec, function – ADLs, and quality of life\(^\text{19}\)
Statistical analysis

- Independent T-test to test for between-group differences
- Paired T-test to test for within-group differences
- p-value < 0.05 considered statistically significant
Results

- 92 patients (92 feet) met inclusion criteria
  - Scarf osteotomy group (n=26)
  - Scarf/Akin osteotomy group (n=66)

- Mean follow up: 57.4 ± 11.7 weeks

- All procedures performed by one of four surgeons
  - 87 of 92 procedures (95%) performed by two surgeons (LWJ, LSW)

- 24 (36%) in Scarf/Akin group had concomitant lesser metatarsal osteotomies

- No additional procedures performed in Scarf osteotomy group
No significant group differences found for age, BMI, gender, or presence of bilateral foot surgery

<table>
<thead>
<tr>
<th></th>
<th>Scarf Osteotomy N=26</th>
<th>Scarf plus Akin N=66</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>48.3 ± 12.6</td>
<td>53.4 ± 13.3</td>
<td>0.095</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>24.3 ± 3.1</td>
<td>25.2 ± 3.7</td>
<td>0.278</td>
</tr>
<tr>
<td>Female gender (y/n)</td>
<td>25 (96%)</td>
<td>62 (94%)</td>
<td>0.673</td>
</tr>
<tr>
<td>Bilateral surgery (y/n)</td>
<td>17 (65%)</td>
<td>48 (73%)</td>
<td>0.486</td>
</tr>
</tbody>
</table>
Results - Baseline FAOS Scores

- No significant group differences in any of the 5 subscales

<table>
<thead>
<tr>
<th>FAOS Subscale Scores</th>
<th>Scarf Osteotomy N=26</th>
<th>Scarf plus Akin N=66</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>70.6 ± 16.6</td>
<td>70.2 ± 19.5</td>
<td>0.924</td>
</tr>
<tr>
<td>Symptoms</td>
<td>81.7 ± 14.9</td>
<td>81.3 ± 15.5</td>
<td>0.911</td>
</tr>
<tr>
<td>ADL</td>
<td>82.1 ± 17.3</td>
<td>80.2 ± 20.1</td>
<td>0.687</td>
</tr>
<tr>
<td>Sports/Rec</td>
<td>66.5 ± 25.9</td>
<td>69.8 ± 23.3</td>
<td>0.554</td>
</tr>
<tr>
<td>QoL</td>
<td>49.0 ± 22.1</td>
<td>50.3 ± 16.8</td>
<td>0.754</td>
</tr>
</tbody>
</table>
Results - Baseline Radiographic Variables

No significant group differences with exception of HAI angle

<table>
<thead>
<tr>
<th>Radiographic Angles</th>
<th>Scarf Osteotomy (N=26)</th>
<th>Scarf plus Akin (N=66)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA angle (°)</td>
<td>24.0 ± 10.3</td>
<td>28.1 ± 8.1</td>
<td>0.051</td>
</tr>
<tr>
<td>1st/2nd IM angle (°)</td>
<td>11.7 ± 4.1</td>
<td>13.0 ± 3.5</td>
<td>0.122</td>
</tr>
<tr>
<td>HAI angle (°)</td>
<td>8.0 ± 3.5</td>
<td>10.5 ± 3.5</td>
<td>0.003*</td>
</tr>
<tr>
<td>TSP</td>
<td>4.5 ± 1.7</td>
<td>4.8 ± 1.4</td>
<td>0.319</td>
</tr>
<tr>
<td>MA angle (°)</td>
<td>25.7 ± 5.1</td>
<td>25.4 ± 6.0</td>
<td>0.764</td>
</tr>
<tr>
<td>MPD (mm)</td>
<td>-3.7 ± 2.6</td>
<td>-2.9 ± 3.1</td>
<td>0.239</td>
</tr>
</tbody>
</table>
Both groups with significant improvement in FAOS scores

No significant group differences in any of the 5 subscales (even when those receiving concomitant procedures were excluded)

<table>
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<tr>
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<th>Scarf Osteotomy N=26</th>
<th>Scarf plus Akin N=66</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>89.6 ± 12.5</td>
<td>86.1 ± 14.6</td>
<td>0.247</td>
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<tr>
<td>Symptoms</td>
<td>89.1 ± 13.2</td>
<td>86.8 ± 12.4</td>
<td>0.450</td>
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<tr>
<td>ADL</td>
<td>93.9 ± 13.6</td>
<td>93.5 ± 9.6</td>
<td>0.903</td>
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<tr>
<td>Sports/Rec</td>
<td>92.0 ± 10.5</td>
<td>87.0 ± 17.5</td>
<td>0.179</td>
</tr>
<tr>
<td>QoL</td>
<td>81.3 ± 22.8</td>
<td>76.4 ± 23.0</td>
<td>0.362</td>
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</tbody>
</table>
Results - Final Radiographic Variables

- No significant difference at final follow up between groups

<table>
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<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA angle (°)</td>
<td>6.8 ± 7.3</td>
<td>9.5 ± 8.8</td>
<td>0.185</td>
</tr>
<tr>
<td>1st/2nd IM angle (°)</td>
<td>4.8 ± 2.3</td>
<td>5.9 ± 3.0</td>
<td>0.104</td>
</tr>
<tr>
<td>HAI angle (°)</td>
<td>8.5 ± 2.8</td>
<td>8.8 ± 3.2</td>
<td>0.654</td>
</tr>
<tr>
<td>TSP</td>
<td>2.6 ± 1.3</td>
<td>2.6 ± 1.8</td>
<td>0.973</td>
</tr>
<tr>
<td>MPD (mm)</td>
<td>-5.9 ± 2.7</td>
<td>-4.9 ± 3.5</td>
<td>0.176</td>
</tr>
</tbody>
</table>
Results

- Total of 5 complications
  - Hallux varus in the Scarf osteotomy group (n=2, 7.69%)
  - Hallux varus in the Scarf/Akin group (n=3, 4.55%)
  - No significant difference between groups

- Radiographic recurrence, defined as $\text{HAA} > 20^\circ$
  - 2/26 subjects in the Scarf only group
  - 0/66 subjects in the Scarf/Akin group
  - No significant difference between groups
Discussion

- This study represents the first attempt to examine the effects of an Akin osteotomy on patient-centered outcomes after hallux valgus surgery.

- No clearly observed benefit with the Akin osteotomy.

- We did not find any meaningful difference in radiographic correction or maintenance of correction at final follow up.
Discussion – Limitations

- Possible selection bias and not perfectly comparable groups
  Slightly higher preop HAI in Scarf/Akin group

- Akin allowed for added correction for these slightly greater deformities, possibly explaining why no obvious differences in FAOS scores (however, radiographic differences between groups were quite small)

- Expect to see greater FAOS scales if Akin was truly beneficial from the patient’s perspective, particularly foot-related QoL scale

- Possible response bias – those completing FAOS surveys more likely at the extremes

- Longer follow up ideal to see proposed upsides with the Akin (e.g. less recurrence)
Discussion

- While we routinely perform adjunctive Akin osteotomies along with a primary first ray procedure, the indication is generally to create a more cosmetically appealing great toe rather than to improve function or help mitigate recurrence.

- Our preliminary findings would appear to support the notion that there may be little added benefit beyond aesthetics when adding the Akin osteotomy.
Little Benefit for Akin Osteotomy in Hallux Valgus Surgery Beyond the Cosmetic

A study presented at the AAOS Annual Meeting looking to gauge the added value of Akin osteotomy in hallux valgus corrective surgery has found no benefit to the procedure, such as improved function, beyond a more appealing aesthetic result.

Although the Akin phalangeal osteotomy is commonly utilized to enhance the clinical appearance of the great toe in hallux valgus surgery, it is unclear whether this additional procedure also improves postoperative patient-reported outcomes.

Jeeten Singha, DPM, past foot and ankle surgery fellow at the Weil Foot and Ankle Institute, who presented the study, said, “During my fellowship, we did hundreds of bunion surgeries, and we would make the clinical decision to add an Akin osteotomy, mostly intraoperatively. We were curious to see if the addition of an Akin osteotomy has any benefits in patient outcome and aesthetics.”

The researchers retrospectively reviewed the records of 92 patients (92 feet; mean age, 45 ± 13 years) who underwent bunion surgery via scarf or scarf/Akin osteotomy at the Weil Foot and Ankle Institute between January 2013 and December 2015. All patients had Foot
References

Thank You!