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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THE NATIONAL
APMA ANNUAL SCIENTIFIC MEETING
SALT LAKE CITY | JULY 11-14, 2019

Connecticut Orthopaedic Specialists

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Disclosure

- Please see program for full disclosure of all the authors

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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[1]
- Akin[2] (1925) - relatively popular procedure
- Suboptimal in isolation for many HV deformities[3-6] and fallen out of favor as of late[7-8]
- Superior results when performed in conjunction with first ray procedure[9-15]
- 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[6,9,16]
- Few studies comparing outcomes of HV correction with and without the Akin

Introduction – Literature

Lechler et al.[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.[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

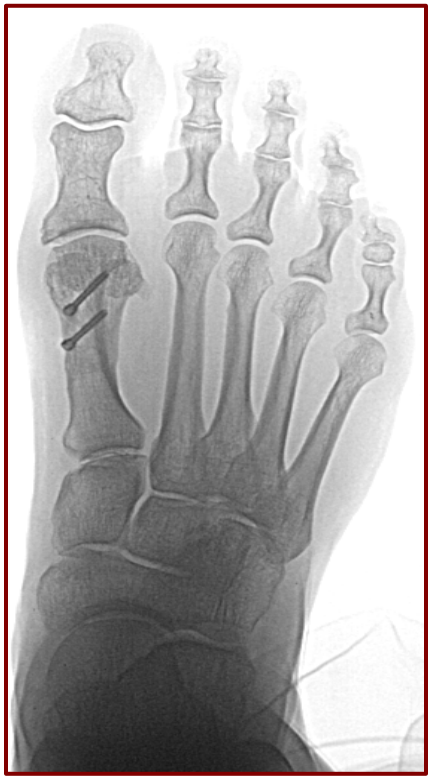
- IRB review with exempt determination granted
- Study population identified and divided into **two groups**:
  - Scarf osteotomy
  - Scarf/Akin osteotomies
- Demographic, pre- and post-op radiographic and FAOS data gathered
- FAOS scale - validated patient-centered outcome measure in hallux valgus surgery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

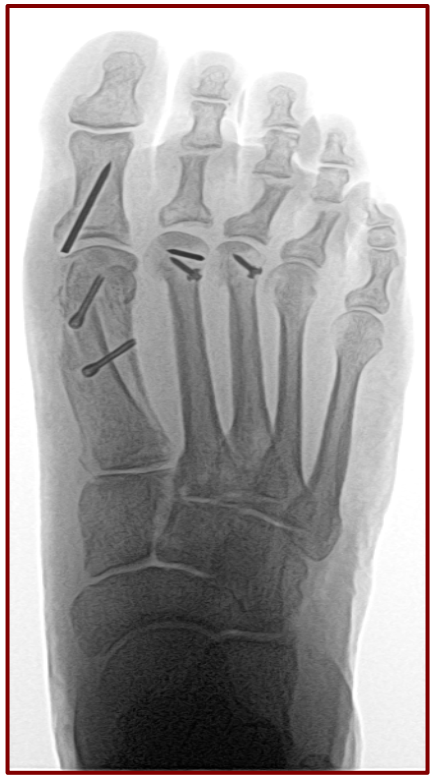
Analyses

- 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





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Results – Demographics

- No significant group differences found for age, BMI, gender, or presence of bilateral foot surgery

	Scarf Osteotomy N=26	Scarf plus Akin N=66	p-value
Age (yrs)	48.3 ± 12.6	53.4 ± 13.3	0.095
BMI (kg/m^2)	24.3 ± 3.1	25.2 ± 3.7	0.278
Female gender (y/n)	25 (96%)	62 (94%)	0.673
Bilateral surgery (y/n)	17 (65%)	48 (73%)	0.486

Results – Baseline FAOS Scores

- No significant group differences in any of the 5 subscales

FAOS Subscale Scores	Scarf Osteotomy N=26	Scarf plus Akin N=66	p-value
Pain	70.6 ± 16.6	70.2 ± 19.5	0.924
Symptoms	81.7 ± 14.9	81.3 ± 15.5	0.911
ADL	82.1 ± 17.3	80.2 ± 20.1	0.687
Sports/Rec	66.5 ± 25.9	69.8 ± 23.3	0.554
QoL	49.0 ± 22.1	50.3 ± 16.8	0.754

Results – Baseline Radiographic Variables

- No significant group differences with exception of HAI angle

Radiographic Angles	Scarf Osteotomy N=26	Scarf plus Akin N=66	p-value
HA angle (°)	24.0 ± 10.3	28.1 ± 8.1	0.051
1st/2nd IM angle (°)	11.7 ± 4.1	13.0 ± 3.5	0.122
HAI angle (°)	**8.0 ± 3.5**	**10.5 ± 3.5**	**0.003***
TSP	4.5 ± 1.7	4.8 ± 1.4	0.319
MA angle (°)	25.7 ± 5.1	25.4 ± 6.0	0.764
MPD (mm)	-3.7 ± 2.6	-2.9 ± 3.1	0.239

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Results – Final FAOS Scores

- 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)

FAOS Subscale Scores	Scarf Osteotomy N=26	Scarf plus Akin N=66	p-value
Pain	89.6 ± 12.5	86.1 ± 14.6	0.247
Symptoms	89.1 ± 13.2	86.8 ± 12.4	0.450
ADL	93.9 ± 13.6	93.5 ± 9.6	0.903
Sports/Rec	92.0 ± 10.5	87.0 ± 17.5	0.179
QoL	81.3 ± 22.8	76.4 ± 23.0	0.362

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Results – Final Radiographic Variables

- No significant difference at final follow up between groups

Radiographic Angles	Scarf Osteotomy N=26	Scarf plus Akin N=66	p-value
HA angle (°)	6.8 ± 7.3	9.5 ± 8.8	0.185
1st/2nd IM angle (°)	4.8 ± 2.3	5.9 ± 3.0	0.104
HAI angle (°)	8.5 ± 2.8	8.8 ± 3.2	0.654
TSP	2.6 ± 1.3	2.6 ± 1.8	0.973
MPD (mm)	-5.9 ± 2.7	-4.9 ± 3.5	0.176

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 **HAA > 20°**
  - 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[19]

- 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**

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Published 5/1/2019|Terry Stanton

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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

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