

LOSS OF DEFORMITY CORRECTION IN THE MODIFIED LAPIDUS ARTHRODESIS? A COMPARISON OF TECHNIQUES WITH AND WITHOUT INTERCUNEIFORM FIXATION

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STATEMENT OF PURPOSE

To determine whether patients who underwent hallux valgus surgery involving a modified Lapidus arthrodesis experienced any difference in loss of deformity correction postoperatively based on whether or not intercuneiform fixation was used.

LITERATURE REVIEW

- Hallux valgus is one of the most common pathologies addressed by foot and ankle surgeons [1].
- The Lapidus arthrodesis was described initially by Lapidus in 1934 [2].
- As the procedure has evolved over the years, multiple techniques and fixation constructs have been described.
- Fleming and colleagues in 2015 cited the incidence of intercuneiform instability upwards of 74 percent in their study of 38 Lapidus procedures [4].
- An increasingly popular fixation enhancement involves additional intercuneiform or intermetatarsal screw fixation in effort to address intercuneiform instability and theoretically reduce the incidence of deformity recurrence long-term [5].
- However, there have not been any studies to date looking at whether there is added benefit with intercuneiform fixation with respect to maintenance of correction postoperatively when compared to fixation solely involving the first TMT joint.

METHODOLOGY

- Our institutional database was reviewed for consecutive patients who underwent hallux valgus surgery by way of Lapidus arthrodesis from 2014 to 2018.
- Radiographs were reviewed and patients divided into two groups by the fixation construct used: A) without intercuneiform fixation and B) with intercuneiform fixation
- The following radiographic parameters were measured at pre-op, first weightbearing post-op, and final weightbearing intervals: intermetatarsal (IM) 1-2 angle, hallux valgus angle (HVA), and tibial sesamoid position (TSP). The final weightbearing values were then compared to their first postoperative weightbearing measurements and the two groups compared.
- All radiographs were measured by the same individual.
- Independent t-test was used to test for between group differences. P values less than 0.05 were considered significant.

RESULTS

- This was a retrospective, comparative study
- 207 patients were identified in this study. 130 subjects were excluded based on concomitant osseous midfoot/hindfoot reconstruction, or history of prior ipsilateral hallux valgus surgery
- 77 patients met our inclusion criteria: 50 in the group with intercuneiform fixation (group A), and 27 in the group without intercuneiform fixation (group B)
- All procedures were performed by the same surgeon. All fixation constructs for both groups involved a minimum of a dorsomedial locking plate.
- The mean follow up was 7.7 months for group A, and 6.5 months for group B.
- The only preoperative value that was significantly different between groups was TSP (slightly higher in group A), indicating that preoperative deformities were largely similar in severity
- Both groups saw statistically significant improvements in the three measured parameters (IM 1-2, HVA, TSP) ($p < 0.05$) with minimal loss of correction at final follow up
- There was no significant difference in postoperative loss of correction between the two groups with respect to IM 1-2 angle, hallux valgus angle, and tibial sesamoid position

Table 1. Postoperative loss of correction at final follow up stratified by fixation type

	Without intercuneiform fixation n=27	With intercuneiform fixation n=50	p-value
Loss of Correction			
IM 1-2 angle	-0.2 ± 1.3	0.3 ± 2.2	>0.05
Hallux valgus angle	-1.4 ± 4.6	-1.6 ± 6.1	>0.05
Tibial sesamoid position	-0.1 ± 0.8	-0.6 ± 1.0	>0.05

Values are presented as mean ± sd. Independent t-test used for comparisons. $\alpha < 0.05$

FIGURES

Figure 1)

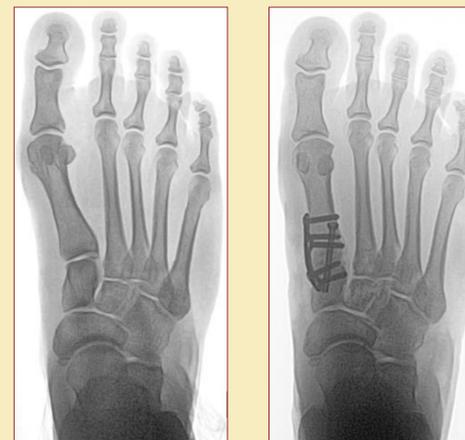


Figure 2)

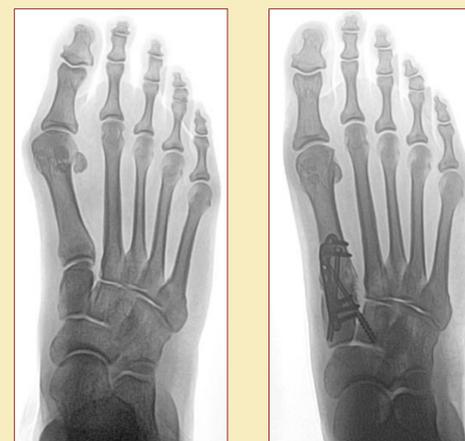


Figure 1) Pre and Post-op radiographs of Lapidus bunionectomy without intercuneiform fixation
Figure 2) Pre and Post-op radiographs of Lapidus bunionectomy with intercuneiform fixation

DISCUSSION

- While previous studies have recognized the importance of considering intercuneiform or intermetatarsal fixation in the modified Lapidus, this is the first study to our knowledge comparing these fixation constructs with respect to loss of correction postoperatively.
- We found no clearly observed difference in loss of correction for those receiving intercuneiform fixation versus those that did not in our study sample of 77 patients who underwent a modified Lapidus arthrodesis.
- The limitations to our study include relatively short follow up.
- Based on these results, intercuneiform fixation is not a clearly superior construct. Given this was generally added when there was suspected intercuneiform instability, however, it is reasonable to believe there may have been greater loss of correction in this group had the intercuneiform screw not been used.

CONCLUSION

The present study would indicate that at short term follow up, both fixation techniques provide appropriate deformity correction with minimal and similar loss of correction postoperatively. Further studies with long-term follow up would be helpful to better answer whether or not supplemental intercuneiform fixation creates a more long-lasting correction.

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