Purpose
To evaluate the non-union in patients who are immediately weight-bearing in a controlled ankle motion (CAM) boot following a modified Lapidus procedure.

Methodology/Hypothesis
We propose there is no significant difference in non-union rate between patients who immediately weight bear in a CAM and the literature reports of patients who undergo the traditional 6-8 weeks of non-weight-bearing following a modified Lapidus procedure.

Procedures

Level of Evidence: IV
Study Design: Random, Retrospective Chart Review
• 376 patients-35 meeting inclusion criteria

Procedure:
Via a standard, dorsomedial approach, a modified Lapidus arthrodesis was performed with a 3 screw construct (solid cortical screws).

Inclusion Criteria:
1. Lapidus arthrodesis with 3 screw construct (solid cortical screws)
2. Isolated Lapidus procedure with no other reported bone work
3. Immediate weight-bearing in CAM boot post-operatively
4. Complete chart with radiographs

Outcomes:
Radiographic analysis for non-union between the initial post-operative visit and the final visit.

Literature Review
Surgical techniques for correction of hallux valgus deformity are numerous. Distal, mid-shaft, proximal & Lapidus procedures are typically employed depending on the surgeon.

Arthrodesis of the first metatarsocuneiform joint has become a commonly performed procedure for patients with ligamentous laxity, hypomobility, severe HAV, arthritis, and recurrent HAV deformity. The procedure was first described by Albrecht et al. (1) in 1911 and later popularized by Lapidus (2) in 1934.

A 6-8 week non-weight-bearing period post modified Lapidus arthrodesis has traditionally been universally accepted. Numerous fixation options have emerged since the inception of this osteotomy originally utilized with screws including staples, plates, K-wire, external fixation and staples (3-5). Some authors have reported nonunion rates 5-10% after modified Lapidus with 6-8 weeks of non-weight-bearing (3-5). There are only a few reports in the literature that discuss immediate weight-bearing after the modified Lapidus procedure (6-8). In this retrospective review, we examined the nonunion rate among patients undergoing the modified Lapidus arthrodesis who received 3 screw fixation. We hypothesized that the two groups will have similar rates of nonunion and that the nonunion rates for both groups will be comparable to the traditional postoperative protocol nonunion rate.

Results

Table 1: Patient Demographics

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Non-unions</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>Male</td>
<td>10</td>
</tr>
<tr>
<td>30-39</td>
<td>Female</td>
<td>20</td>
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<tr>
<td>40-49</td>
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<td>10</td>
</tr>
<tr>
<td>50-59</td>
<td>Male</td>
<td>5</td>
</tr>
<tr>
<td>60+</td>
<td>Male</td>
<td>5</td>
</tr>
</tbody>
</table>

Fig. 1: AP Lapidus radiograph with 3 screw construct

Fig. 2 Lateral Lapidus radiograph with 3 screw construct

Discussion
In the retrospective review, we attempted to determine if our immediate weight-bearing protocol had a deleterious effect on non-union rates. Failure rates remained comparable, and we feel that our early weight bearing should be retained.

In a recent study, Blitz et al reported on 80 feet in 76 patients who underwent the traditional 6-week non-weight-bearing modified Lapidus arthrodesis with 2 screws and an additional wire as a third point of fixation. The nonunion rate was 7.5% in the modified Lapidus group compared to 8.75% in the traditional group.

In another study, Basile et al reported on 21 patients who underwent Lapidus arthrodesis with locking fixation. Patients had routine external bone stimulation during the 6-week weight-bearing period. One patient developed delayed union, for a nonunion rate of 5.0%. This patient was allowed to weight bear after 6 weeks. There were no revisions necessary.

Basile et al presented a study involving immediate weight-bearing following a modified Lapidus procedure. A total of 34 patients were included in this prospective cohort study. Patients were followed for 9 months. Group one had 24 patients who underwent modified Lapidus arthrodesis with a 3 screw construct and additional blade plate fixation. Group two had 10 patients who underwent a blade plate Lapidus with additional Kirschner wires. Both groups were allowed to weight-bearing without the use of a CAM boot for 6 weeks. An objective toe-to-floor distance of less than 1 cm indicated union. The rate of delayed union or nonunion was 3%. Few authors have discussed immediate weight-bearing after a modified Lapidus procedure with a 3 screw construct. However, it is important to note that this rate is within the literature range.

The results of this study found a 6.6% nonunion rate. Based on radiographic results we conclude that a modified Lapidus procedure using a 3 screw construct and allowing weight-bearing early in the post-operative period is a safe and effective surgical technique.

References
1. Albrecht JA, Basile D, Hickey J, Oskay AC. Immediate weight bearing following a modified Lapidus arthrodesis with 2 screws and an additional wire as a third point of fixation. Foot Ankle Int. 2010;31(5):392-7.