

Elevation and Shortening of the First Metatarsal Following the Modified Lapidus: a Radiographic Comparison of Two Techniques

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Statement of Purpose

Continued developments in the surgical technique for the modified Lapidus arthrodesis are being made with the goal of creating a more desirable and reproducible outcome. Specifically, the authors feel that the joint preparation technique of curettage, which the senior author now routinely utilizes, offers many advantages when compared to the more traditional technique of planal resection. Among these advantages, the authors have noticed more reproducible deformity correction with a decreased incidence of post-operative metatarsus primus elevatus and decreased metatarsal shortening. The aim of the current study is to compare radiographic outcomes of these two surgical techniques with respect to iatrogenic metatarsus primus elevatus.

Methodology

Seventeen (17) consecutive patients receiving a modified Lapidus bunionectomy at the same institution were included in this study. These patients were then divided into two groups: those where anatomic curettage joint preparation was used (8 patients) (Group 1), and those where planal resection joint preparation was used (9 patients) (Group 2). Weight-bearing radiographs from each group were then compared with respect to first metatarsal alignment in the sagittal plane and first metatarsal length post-operatively.

The degree of first metatarsal elevation was measured and compared to its preoperative value according to the Seiberg index. The average value as well as the overall incidence between each group was then compared.

Procedure

In both groups, a dorsomedial incisional approach was utilized. Standard layered and subperiosteal dissection was performed to allow access to the first tarsometatarsal joint. Once the joint was exposed, joint preparation was carried out via curettage (Group 1) and via planal resection using an oscillating saw (Group 2). A similar fixation construct consisting of an interfragmentary compression screw and locking plate was utilized in all but two (2) patients (one in each group).

Both the overall incidence and average degree of post-operative first metatarsal elevation was significantly lower in the curettage joint preparation group (Group 1) when compared to the planal resection study group (Group 2) at final follow-up. The average amount of post-operative elevation was 0.87 degrees in Group 1 versus 5.4 degrees in Group 2. The overall incidence of post-operative elevation was 12.5% (1 of 8) in Group 1 versus 77.8% (7 of 9) in Group 2. The average change in metatarsal length was an increase of 0.5mm in Group 1 versus decrease of 1.84mm in group 2. Incidence of metatarsal shortening was 33.3% in Group 1 compared to 100% in Group 2.



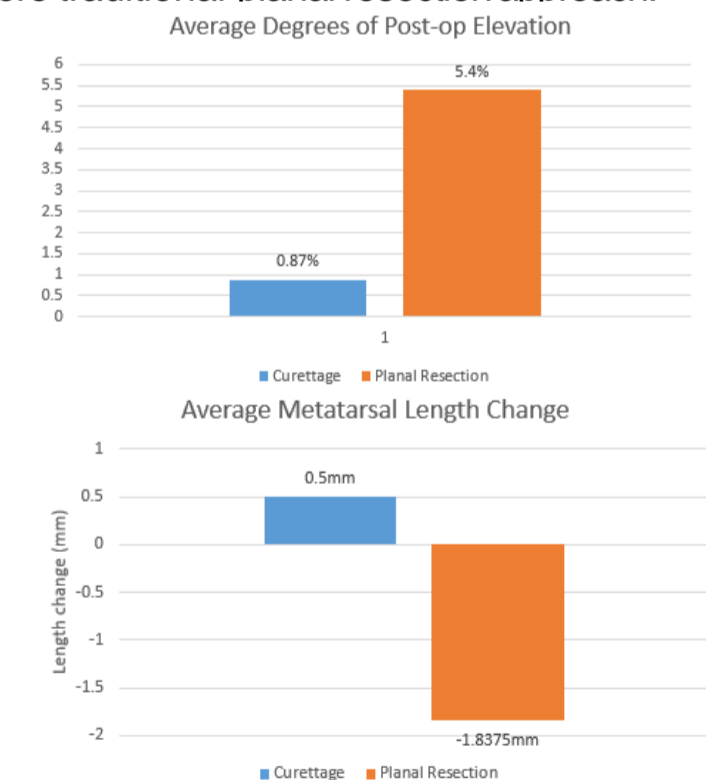
Group 1 (above): weight-bearing lateral radiograph preoperatively and at 12 months post-operatively revealing maintenance of preoperative first ray sagittal plane alignment.



Group 2 (above): weight-bearing lateral radiograph preoperatively and at 12 months post-operatively revealing significant iatrogenic first metatarsal elevation.

Analysis & Discussion

Several radiographic outcome parameters have been studied for the modified Lapidus arthrodesis¹⁻⁸. The authors are unaware of any studies comparing the technique of curettage joint preparation to the traditional planal resection technique with respect to post-operative metatarsal length and first ray alignment, specifically in the sagittal plane. The current study describes an increasingly popular technique for the modified Lapidus arthrodesis with reproducible deformity correction and low incidence of shortening and post-operative metatarsus primus elevatus, a commonly encountered problem with the more traditional planal resection approach.



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