

# THE NEXT EVOLUTION OF ANATOMIC DISSECTION FOR ENHANCED HEALING IN LAPIDUS FUSION

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## INTRODUCTION

For many years Ruch and others have recognized and taught the benefits and principals of anatomic dissection in hallux valgus surgery. More recently Schubert and others have presented the benefits and advancements in minimally invasive fracture management using percutaneous/subcutaneous plating. These benefits primarily focus on maintaining the periosteal envelope, therefore minimizing the damage to the blood supply and enhancing osseous healing.

Historically the Lapidus fusion has had a rather high rate of nonunion. Review of the literature show this to typically be around 10%. Over the last several years many believe that we have seen a decrease in this number with utilization of locked plating.

In addition to decreasing the nonunion rate, we have also been able to accelerate the recovery with earlier weight bearing and earlier return to shoes as a result of the enhanced stability. The problem, until recently, was that the traditional exposure essentially skelatonized the first metatarsal, thus significantly compromising the blood flow to the bone for healing.

Here I would like to present a new modification of the traditional exposure that minimizes the periosteal stripping. Further modifications are certainly possible and have been executed by Brosky and others using several small incisions for further advancement of this periosteal sparing approach

## TECHNIQUE

Exposure to the first ray is typically undertaken through a dorsomedial incision at the level of the first metatarsophalangeal joint (MTPJ). Then for more proximal exposure the author typically sweeps this incision more medial midline to allow for more direct access to the joint for cartilage debridement and fixation placement.

Standard periosteal-capsular dissection at the level of the first MTPJ is undertaken sparing the synovial fold and only reflecting the medial capsular flap an adequate

amount for resection of the medial eminence. Once all work around the head has been completed attention is directed proximal to the metatarsal cuneiform joint. Figure 1 shows how the author had historically approached the metatarsal cuneiform joint. Note that the metatarsal has been stripped of approximately 50% or more of its periosteal covering and as a result, blood supply with this technique.

By comparison the newer “anatomic dissection” technique spares the periosteum of almost the entire metatarsal. Simple release of the extensor and direct incision in line with the joint allows access to the joint with almost no periosteal stripping, thereby preserving the vast majority of the blood supply to the metatarsal and cuneiform (Figure 2).

After release and incision of the metatarsal cuneiform joint, exposure for joint resection is enhanced with the application of the AO mini-distractor (Synthes, West Chester, PA). Due to the periosteal sparing approach, 2 small stab incisions are made into the dorsal periosteum for placement of the pins (Figure 3).

Following preparation of the fusion site, the distractor is removed and the distal pin site entrance hole is then utilized for placement of temporary fixation (Figure 4). After placement of the axial compression screw, the periosteum is closed and placement of the plate is undertaken. It is the author’s preference to place the plate on the plantar medial aspect of the fusion site thus enhancing the mechanical stability of the fixation construct. (Figures 5 and 6).

## SUMMARY

The author has presented what seems to be the next logical step in anatomic dissection with minimal stripping of the periosteum for enhanced healing of the Lapidus fusion. Further limitation can be undertaken on the dissection with several smaller incisions once one becomes comfortable with the approach and limited direct visualization. This can be facilitated with use of intra-operative C-arm imaging.



Figure 1. Intraoperative medial view showing proximal extension of the dorsomedial capsular incision to the proximal cuneiform and complete degloving of the medial and dorsal metatarsal to allow for distraction, joint resection and placement of fixation.



Figure 2. The release of the medial extensor sheath, allowing lateral retraction of the tendon. The joint capsule and dorsal metatarsal cuneiform ligaments are then transected allowing full mobilization and subsequent distraction of the joint.



Figure 3. The joint is distracted and articular cartilage resected with all periosteum intact except for ~2-3 mm proximal and distal to the fusion site.



Figure 4. The guide pin and subsequent placement of a cannulated screw have been undertaken through the distal distractor pin entrance site. The periosteum has also been reapproximated over the fusion site.



Figure 5. Final fixation construct with plantar medial placement of locking plate.



Figure 6. Lateral radiograph view showing placement of the plate slightly below the longitudinal axis of the medial column, well consolidated several months postoperative.