

## REFINEMENTS IN FIRST INTERSPACE DISSECTION

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## INTRODUCTION

The lateral release, as it has traditionally been performed at the Northlake/Dekalb Surgical Residency Program, includes tenotomy of the adductor hallucis insertion from the base of the proximal phalanx with a sectioning of the fibular-sesamoidal ligament. This is routinely followed by the complete stripping of the adductor tendon off of the fibular sesamoid. In some instances further release of lateral contracture is indicated and continues with tenotomy of the lateral head of the flexor hallucis brevis tendon, excision of the fibular sesamoid, progressing and finishing with transfer of the adductor tendon to the medial capsule of the first metatarsophalangeal joint (MPJ).<sup>1</sup> In 2006, Roman and Ruch brought critical attention to the routine performance of an extensive lateral release, an evaluation brought on by a spike in the incidence of postoperative hallux varus deformity (with 11 hallux varus occurrences over a 3-year period.)<sup>2</sup> Since 2006, we have modified the lateral release as it is routinely performed at our institution. The technique refinements and our recent results with these refinements are illustrated and discussed.

## OPERATIVE TECHNIQUE

**Incision**

The technique for first interspace dissection begins with the incisional placement and proceeds with complete visualization of the adductor tendon. The most critical portion of this being the distal-most point of the incision. We recommend placing this distal point slightly medial to the extensor tendon on the proximal phalanx, just proximal to the DIPJ. This will allow full access and enhanced visualization of the insertion of the adductor tendon on the base of the proximal phalanx (Figure 1).

**Identification of the Adductor Tendon**

An atraumatic, blunt dissection technique utilizing a sponge is used to deepen dissection into the first interspace. When performing this maneuver, it is important to peel the subcutaneous tissues off of the underlying deep fascia. One

should feel the curve of the neck of the proximal phalanx during this sponge technique. Additional blunt dissection is carried out by wrapping the index finger around the neck of the proximal phalanx and working the finger in a distal-to-proximal fashion.

At this point a self-retaining retractor is inserted. One will begin to visualize the adductor tendon, but its full visualization will be impeded by a small number of overlying fascial bands. These are sectioned carefully using a spread-and-cut technique with a curved Metzenbaum scissor. Now the adductor tendon is fully visualized within the interspace, and pause should be taken to appreciate how well the tendon is exposed with a minimum of trauma and dissection to the interspace (Figure 2).

**Isolating the Adductor Tendon**

The next step in the lateral release is the adductor tenotomy. A stab incision is created just dorsal to the tendon at the level of the MPJ. An angle of approximately 45° in the frontal plane is used to avoid damaging the fibular sesamoid. This



Figure 1. Insertion of the adductor tendon on the base of the proximal phalanx.

stab incision is dilated with a curved mosquito hemostat and clamped. The hemostat is then rotated in such a way that the tip of the hemostat is seen just beneath the adductor tendon. This way the superior and inferior borders of the tendon are clearly defined prior to performance of the tenotomy. Before we progress, it should be noted that inferior to the adductor tendon there is a thin fascial layer that protects the neurovascular structures within the interspace—it often has a purplish hue which makes identification easier. This layer should remain intact to protect those structures for the remainder of procedure.

### Adductor Tenotomy

The adductor tenotomy is performed by keeping light tension on the hemostat and executing a circular or J-stroke maneuver around the insertion of the tendon. It is important that the angle of the blade strips the adductor tendon off of the base of the proximal phalanx, leaving no further attachments on the base of the proximal phalanx (Figure 3). Of equal importance is that the lateral capsular tissues are left intact—we do not advocate the performance of a lateral capsulotomy.

### Fibular-Sesamoidal Ligament Release

If the tenotomy has been executed properly, then the fibular sesamoid is readily seen within the interspace. This small opening allows easy visualization of the fibular-sesamoidal ligament and likewise easy section of that ligament. The ligament is sectioned by first placing the tip of the knife-blade (blade facing up) in the opening created by the tenotomy; the blade is passed from distal to proximal around the metatarsal head until the entire ligament has been freed. Now a mobilized fibular sesamoid is seen in the interspace. Finally, the first MPJ is realigned and assessed for further lateral contracture.

## DISCUSSION

In the routine performance of the lateral release we are no longer stripping the adductor tendon from the entire sesamoid and rarely progress to flexor hallucis brevis release, etc. This correlates intra-operatively to adequate release of contracture and a significant increase in stability and resistance of medial luxation of the hallux.

We followed 20 hallux valgus cases performed by the senior author (JAR) over a 1-year period. The average preoperative IM angle was 16. Austin osteotomies fixed with a lock-pin technique were performed in 17 cases. One closing base wedge osteotomy and two Lapidus bunionectomies were performed. Of the distal bunionectomies,



Figure 2. Exposure of the adductor tendon within the interspace.

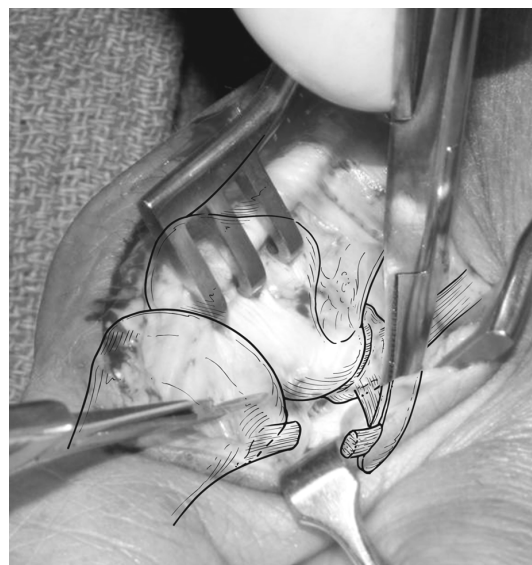


Figure 3. The angle of the blade strips the adductor tendon off of the base of the proximal phalanx.

14 had adductor tenotomy and fibular-sesamoidal ligament release. One had a release of the lateral head of the flexor hallucis brevis, one had a full McBride and one had an adductor tendon transfer. In the 3 proximal bunionectomies only adductor tenotomy and fibular—sesamoidal ligament release were executed. To date there have been no varus deformities, recurrences, or osteonecrosis of the patients included here.

The importance here is noting that larger IM angle, or more severe deformity does not necessarily correlate with

a greater amount of lateral contracture, and does not necessarily require a greater lateral release. This report is not meant by any means to have the sound of finality. The significance is in reinforcing the techniques of anatomic dissection to aid in visualization of targeted tissues, minimizing surgical trauma, and easing the surgical process; also in restating the power of an effective lateral release; and the notion that even the most routine surgical procedures need constant re-evaluation in order to improve patient outcomes.

## REFERENCES

1. Ruch JA, Peebles CF, Sun CA. Anatomic dissection of the first metatarsophalangeal joint for hallux valgus surgery. In: Banks AS, Downey MS, Martin DE, Miller SJ, eds. *Comprehensive textbook of foot and ankle surgery*, 3rd ed. Philadelphia: Williams & Wilkins; 2001. p. 493-504.
2. Roman SR, Ruch JA. *Hallux varus. Reconstructive Surgery of the Foot and Leg, Update '06*. Tucker (GA): Podiatry Institute Publishing; 2006.