Bunion Surgery: Should You Perform A Lateral Release?

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Yes. *Neal Blitz, DPM says the lateral release is a common component of bunion surgery as it aids in bunion correction and assists with reduction of the intermetatarsal angle when surgeons combine this procedure with structural realignment of the first metatarsal.*

Bunion surgery is a common part of nearly all foot surgery practices and many surgeons have a strong opinion on whether a lateral release is necessary. We have all performed numerous bunion surgeries and have been exposed to various techniques for bunion correction. However, the lateral release seems to be common to a vast majority of all of these procedures.

Is the lateral release an essential component of bunion surgery correction or do we do it because we have been trained to perform it?

McBride popularized the lateral release in the earlier part of the century as an isolated soft tissue procedure to correct hallux valgus. Since the procedure did not correct the structural deformity, surgeons performed the procedure with fibular sesamoidectomy and/or adductor transfer in an attempt to maximize the soft tissue correction. However, it became apparent that overzealous work within the interspace may promote a muscular imbalance, resulting in hallux varus.

It is obvious that a bunion, for the most part, is a problem in which the first metatarsal deviates from its native position, resulting in a subluxation/deviation of the first metatarsophalangeal joint (MPJ). Therefore, surgical correction is geared toward restoring an anatomic relationship of the first metatarsal with the entire foot as well as restoring the alignment of the big toe joint. Depending on the severity of the bunion, the surgeon may restore this relationship through varying metatarsal osteotomies and/or fusion of the first metatarsocuneiform joint.

The lateral release is an ancillary procedure that facilitates this relocation of the first metatarsal. Remember that the osseous reconstruction is what drives the success of the correction.

The literature and textbooks are clearly filled with articles that utilize variations of a lateral soft tissue release as part of a bunion surgery operation, whether it is a metatarsal osteotomy and/or a Lapidus bunionectomy. We should remember that the surgeon may even perform the lateral release as an isolated procedure although this does not seem to be common practice today unless the deformity is indeed minimal.

The purpose of the lateral release is simple and, in my opinion, serves two very important purposes. The release eliminates the pull of the adductor muscle on the hallux and releases the soft tissue contracture of the lateral first MPJ capsule. The first addresses a potential cause of the bunion and the second addresses an effect of the bunion.

Removing the adductor tendon from its insertion on the phalanx (and sesamoid) eliminates a deforming force that pulls the big toe laterally. Whether one believes that the adductor musculature is a deforming force or not in the etiology of bunions is irrelevant. In the muscular imbalance tug of war between the adductor and abductor of the big toe joint, the adductor clearly has won. Restoring the balance of power by releasing/removing the adductor tendon altogether has some theoretic merit. However, in clinical practice, the adductor attachments can reform so this release may not be so permanent.

Releasing the lateral sesamoid ligament and lateral capsule contracture is important with larger bunions and longstanding bunions. For these patients, logic would suggest that the lateral side of the joint complex is tightened and/or contracted whereas the medial side is loosened and/or attenuated. Though this has not been proven scientifically with a bunion per se, we understand that, in general, dislocated or subluxed joints develop soft tissue contractures.

Addressing The Fibular Sesamoid

As such, it is reasonable to think that a bunion would also be prone to such contractures and releasing these contractures also has some theoretical merit. In the case of large bunions, the fibular sesamoid may be somewhat rotated into the first interspace and release of the lateral ligaments allows this sesamoid to "drop down" or mobilize for lack of better terminology.

There are studies that clearly document that the fibular sesamoid does not "move" (medially).1,2 Judge and Yu specifically studied this relationship in 75 feet undergoing hallux valgus surgery and stated "the correction in sesamoid position gained with hallux abducto valgus correction is a direct result of lateral translocation of the metatarsal head, with no contribution from change in the position of the sesamoid apparatus relative to the foot."1

It is my belief that interspace release facilitates the ability of the first metatarsal to be relocated over the sesamoid when one combines this with procedures that physically (and structurally) relocate the metatarsal to anatomic position.

When performing large intermetatarsal angle corrective bunionectomies, the lateral release is helpful in attaining maximal intermetatarsal angle reduction as the surgeon may directly position the first metatarsal head over the sesamoids. The surgeon may be able to manually displace the fibular sesamoid inferiorly to relocate the metatarsal head directly over the sesamoids. This maneuver seems to be especially important when the fibular sesamoid has some rotation into the interspace.

I have found that success with a Lapidus is predicated on getting the intermetatarsal angle as close to zero as possible. I have achieved better corrections when I manually displace the fibular sesamoid inferiorly.3 Rotation of the fibular sesamoid into the interspace may act like a bony block to intermetatarsal angle reduction so visualizing this reduction is helpful. The surgeon can be sure the intermetatarsal angle is reduced when the first and second metatarsal heads are abutting, and one can palpate this with an index finger in the operating room.

If one does not reduce the intermetatarsal angle, it may result in false intraoperative hypermobility.3-5 Therefore, it is important to perform the intraoperative hypermobility test.4

A Closer Look At Preliminary Results From A Retrospective Review

In unpublished data, Lawrence DiDomenico, DPM and I performed a retrospective review of 80 cases to assess early weightbearing of Lapidus arthrodesis utilizing similar surgical techniques. Our results demonstrated a union rate of 100 percent with a mean 45 days to union and a mean 14.8 days to protected weightbearing.6

There were some differences in several radiographic outcomes between surgeons and this may be due to the nuances in the techniques between the surgeons. The major differences in the techniques were Lapidus with lateral release and curettage resection of the metatarsocuneiform joint in comparison to Lapidus without lateral release and sagittal saw joint resection of the metatarsocuneiform joint. Of the 80 Lapidus procedures, 60 patients specifically underwent Lapidus for hallux valgus.

The mean pre-op intermetatarsal (IM) angle for both surgeons in the hallux valgus group was 13.9 degrees and the mean post-op IM angle was 6.4 degrees. It is interesting to note that early weightbearing after Lapidus did not seem to have a negative effect on intermetatarsal angle results. In the 16 patients who underwent Lapidus with the McBride technique, the mean pre-op IM angle was 15.8 degrees with a post-op IM of 4.7 degrees. In the 44 patients who underwent the Lapidus without the McBride technique, the mean pre-op IM angle was 13.3 degrees and the mean post-op IM was 6.8 degrees.6

The mean pre-op hallux abductus angle for both surgeons in the hallux valgus group was 22.4 degrees and the mean post-op hallux abductus angle was 9.5 degrees. In the 16 patients who underwent the Lapidus with the McBride technique, the mean pre-op hallux abductus angle was 29.4 degrees with a post-op hallux abductus angle of 7.1 degrees. In the 44 patients who had the Lapidus without the McBride technique, the mean pre-op hallux abductus angle was 19.8 degrees with a post-op hallux abductus angle of 10.3 degrees.6

Interestingly, the mean changes in intermetatarsal angle and hallux abductus angle were greater when surgeons performed the lateral release. This loosely suggests that a concomitant McBride allows for greater correction in the hallux abductus angle and the intermetatarsal angle, at least in the case of Lapidus arthrodesis. In the hallux valgus group that had McBride and Lapidus, the bunions were slightly larger (on average), and the correction was slightly greater (on average), which would be a cause for the greater changes in intermetatarsal correction and hallux valgus correction.

In my opinion and analysis of our data, I think the slight improvement in radiographic parameters is due to visualizing the sesamoid reduction with the lateral release.

I should be clear that the Lapidus without the McBride technique also reduced the intermetatarsal angle and hallux abductus angle appropriately. These numbers clearly demonstrate that both surgical techniques can achieve adequate correction on radiographic parameters. Remember that our study was on the early weightbearing of the Lapidus and only extracted this information as we felt it would be interesting to evaluate. A single surgeon study comparing the effects of lateral release with and without osteotomy/Lapidus would be well received.

Other Factors To Consider With The Lateral Release

An anatomic cadaveric study performed by Roth and colleagues further supports radiographic improvements in a sample of eight patients with hallux valgus who underwent lateral release. Sequential lateral release demonstrated that “the hallux valgus angle was predominantly and significantly improved by capsule splitting and tenotomy of the tendon of the adductor hallucis muscle.”6

It is well known that lateral release may be associated with hallux varus. This is especially true when one combines this with a fibular sesamoidectomy. Hallux varus rates with Lapidus reportedly occur in 1.5 to 15.7 percent of patients.

In an internal review (more unpublished data) of 154 Lapidus bunionectomies, we identified six varus feet with an overall rate of 3.9 percent. The most common reason for hallux varus with a Lapidus was due to over-resection of the medial eminence and occurred in half of the patients.

Interestingly, surgeons performed a lateral release and an adductor transfer in 83 percent of patients (five of six), though it is difficult to clearly link the adductor transfer to the sole cause of the varus. Rather, the adductor transfer may be a contributor when other more obvious structural causes of hallux varus are present such as negative intermetatarsal angle and/or over-resection of the medial eminence. Therefore, surgeons should take caution not to perform aggressive releases, especially if the release is not needed to gain “correction,” such as

with a Lapidus.

It is clear that the lateral release is a powerful procedure and prior to "better" techniques that allow surgeons to structurally realign the metatarsal, they had to depend on the soft tissue correction. In particular, surgeons may perform extensive lateral releases when correcting larger deformities with osteotomies that do not fully address the structural malalignment. (For example, one may treat a large intermetatarsal angle bunion with a head osteotomy instead of a proximal procedure such as a base wedge or Lapidus.)

Unfortunately, this procedure selection may be dictated by patient convenience, post-op weightbearing status and surgeon experience. Newer techniques that allow surgeons to perform large angle correction and institute early weightbearing/mobilization may result in less reliance on overzealous lateral capsule releases, and better utilization of the lateral release as an adjunct to structural realignment.

In Summary

The lateral release is an ancillary procedure in bunion surgery that surgeons should use in conjunction with a structural realignment of the first metatarsal. Surgeons should not depend on the lateral release as a driving force to gain a majority of their correction with bunionectomies. The main benefits of lateral release seem to facilitate bunion correction by releasing lateral joint contracture and assisting in the intermetatarsal angle reduction when one performs osseous structural realignment. Surgeons should choose the proper procedure that best realigns the metatarsal.

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Editor's note: For related articles, see "Current Concepts With The Lapidus Bunionectomy" in the December 2008 issue or visit the archives at www.podiatrytoday.com

No. *Citing the literature and clinical experience, Lawrence DiDomenico, DPM questions the necessity of the lateral release in facilitating long-term hallux valgus correction.*

Hallux valgus correction is one of the most frequent operations that foot and ankle surgeons perform. The medical literature has described over 130 different types of procedures concerning the surgical correction of the deformity.

This deformity has proven to be elusive when it comes to definitive correction. In addition, there is a lack of widespread thought regarding an ultimate correction.1 To this date, the foot and ankle societies have not established the most effective surgical procedure/ technique for the correction of hallux valgus. The widespread recommendations for success remain osseous realignment and soft tissue balancing.

Both intrinsic and extrinsic factors have been implicated in the development of hallux valgus. The combination ultimately leads to a progressive deformity with an increase in the first intermetatarsal angle and lateral deviation of the hallux. As the deformity progresses, a soft tissue imbalance perpetuates the hallux valgus development, creating a retrograde effect at the level of the metatarsophalangeal joint (MPJ).

As the metatarsal drifts medially, the sesamoid complex becomes subluxed from the plantar crista grooves. The lateralization of the sesamoid complex renders a mechanical gain, creating a deforming force in hallux valgus progression.

It is imperative to understand that this subluxation development is the direct result of the medial migration of the first metatarsal rather than movement by the sesamoids. An increase in the hallux valgus angle and splaying of the metatarsals may indicate the presence of hypermobility.2 One can often view successful correction of the hallux valgus deformity via radiographic parameters such as the intermetatarsal angle, hallux valgus angle and realignment of the sesamoid apparatus.3

The location of the sesamoid complex in association to the first metatarsal plays an essential part in determining whether one has achieved appropriate realignment. In regard to evaluating the sesamoid position, foot and ankle surgeons have typically used an anterior-posterior (AP) radiograph. More current investigations have now determined that one should employ the plantar axial projections (tangential view) over standard AP radiographs when evaluating the sesamoid position.4-6

The position and function of the sesamoid apparatus in its connection to hallux valgus development has long been debated. Foot and ankle surgeons often perform an adductor tenotomy/ transfer along with a lateral sesamoid releases to ensure relocation of the sesamoid apparatus “back under” the first metatarsal during the surgical correction of the deformity. Research has foot and ankle surgeons beginning to question the importance of the lateral releases and their connection to sesamoid position as it relates to hallux valgus sugery.3,7,8

What The Literature Reveals About The Lateral Release And Hallux Valgus Correction

The question arises as to whether lateral release of the adductor tendon and sesamoid apparatus plays any role in the surgical correction of hallux valgus. Although the majority of foot and ankle surgeons today perform the lateral release as an adjunctive procedure to their operation, the release itself probably plays a lesser role than its corresponding osseous part.

Judge and co-workers established this as they found no change in the tibial sesamoid-second metatarsal distance when they compared preoperative views and postoperative results.3 The authors concluded that the

correction in sesamoid position gained with hallux valgus surgery is a direct result of lateral transposition of the metatarsal head with no change in the position of the sesamoid apparatus relative to the foot. This theory has support from Mann and Coughlin, Jahss and Alvarez et al.9-11

Esemenli and colleagues found comparable results when they evaluated patients with hallux valgus and grade 2 or 3 sesamoid positions on AP radiographs.7 In this study, surgeons performed distal metaphyseal osteotomies with no lateral releases. The researchers concluded that sesamoid release is unnecessary for metatarsosesamoidal reduction if one achieves adequate lateral shift of the first metatarsal head over the sesamoid.7

Furthermore, studies have cited increased rates of avascular necrosis with the addition of an adductor tenotomy.12-14 Jones and colleagues showed the complex and delicate vascular network that the joint capsule provides to the metatarsal head. They also demonstrated the lateral capsular attachments are the only remaining blood supply to the head of the bone following a distal osteotomy and the lateral aspect accounts for two-thirds of the supply.15

Authors have cited increased rates of avascular necrosis with the addition of an adductor tenotomy in hallux valgus repair.12-14 Due to this concern, some authors advocate avoiding soft tissue releases.13,14,16-20 Jahss stated that sesamoid release is not necessary for reduction of an intermetatarsal angle.14

Inside Insights From An Unpublished Retrospective Review

Neal Blitz, DPM, FACFAS, and I debated this topic earlier this year at the American College of Foot and Ankle Surgeons (ACFAS) annual scientific conference in Washington, DC. In an unpublished study, we assessed early weightbearing in patients after they underwent the Lapidus technique. The Lapidus technique is a very versatile procedure and has many indications. The primary purpose of our study was to evaluate the early weightbearing and union rate of our Lapidus procedures for multiple uses.21

Since then, Blitz has extracted data from this study to comment on the lateral release topic for hallux valgus procedures. In the “no lateral release group,” there was a patient with neuromuscular disease who had an extremely high intermetatarsal and hallux valgus angle (60 degrees). In retrospect, I should not have performed a Lapidus procedure on that patient. The poor procedure selection for this patient with neuromuscular disease had an effect on the results. As I previously stated in our debate, if we had removed this patient, the numerical data would change.

As it stands, the overall final results of both techniques (with lateral release and without lateral release) revealed adequate reduction in both the intermetatarsal angles and the hallux valgus angles. This may lead one to think, “Why perform a lateral release? Is there really a need?”

I have not been pleased with outcomes related to the procedures in which the reductions were not optimal. If the surgeon reduces the intermetarsal angle significantly (between 0 and 8 degrees), there should be a considerable reduction of the hallux valgus angle and a lateral release is not necessary. Being able to obtain the appropriate reduction and not having to perform the lateral release is very beneficial for the outcomes of hallux valgus repair.

Has The Lateral Release Become An Easier, Force Of Habit Procedure?

The goals of hallux valgus correction are to promote the establishment of a congruous first MPJ, reduce the intermetatarsal angle and realign the sesamoids. The correction should seek to restore weightbearing function

of the first ray and its two sesamoids while maintaining first MPJ range of motion and repositioning the hallux in a rectus alignment. The overall goals are to balance the soft tissues and align the bony factors that would otherwise lead to the development of deformity.

When one is discussing hallux valgus correction, there has not been a consensus among foot and ankle surgeons if a lateral release is essential or not. Historically, surgeons have emphasized the lateral release to remove the deforming force of hallux valgus and release the fibular sesamoid to allow lateral transition of the metatarsal head. Traditionally, surgeons have taught the lateral release as an adjunctive procedure to most bunionectomies.

I believe this has become more of a "habitual" type of procedure. In my experience over the years, I typically see surgeons list their procedures for hallux valgus as an osteotomy and McBride bunionectomy. I also believe the soft tissue release has helped surgeons in the short term perform a less technically challenging surgical procedure. However, the chosen procedure often may not be properly indicated as the lateral release allows for more of a temporary correction.

In the long-term, these procedures frequently lead to recurrence because a less complex procedure and lateral release are not always effective.

Raising Other Key Issues

For example, when I perform a Lapidus bunionectomy, I do not resect the medial eminence. I have found that when I perform the appropriate reduction, the medial eminence is no longer prominent and therefore does not need resection. At the time of surgery, this can be difficult to accept clinically as the longstanding soft tissue changes in the medial bursa of the first MPJ will remain.

It is at this point in time that I review my reduction of the intermetatarsal angle and hallux valgus angle (both clinically and radiographically) to ensure there is significant reduction and alignment. If the reduction is sufficient, this excess soft tissue is no longer stressed and will eventually reabsorb. To me, this is no different than the soft tissues around a patient's abdomen following a gastric bypass. Over a period of time, the body adjusts, adapts to the new anatomical position and contracts/absorbs.

I also do not perform a lateral release after a quality intermetatarsal angle reduction. In these cases, the hallux valgus angle naturally reduces. To me, this is very similar to other subluxed/dislocated joints that surgeons may reduce.

Once one makes the reduction and achieves a "normal alignment," the "tightness" of the adductor tendon has essentially been lengthened. When the surgeon accomplishes this, I have found that a lateral release is not necessary. After the surgeon reduces the intermetatarsal angle, the first metatarsal moves back over the sesamoids. This creates a congruent first MPJ and essentially lengthens the adductor tendon. This will help alleviate any potential for a stiff postoperative first MPJ, hallux varus, avascular necrosis or nerve entrapment.

Thinking Beyond The Metatarsophalangeal Joint

When it comes to discussion about not performing a lateral release with hallux valgus correction, I think beyond the metatarsophalangeal joint. I consider the metatarsal cuneiform pathology, the mobility of the first ray, the weightbearing load and the tendon imbalance originating far proximal to the hallux itself. Surgeons who refrain from performing a lateral release can obtain a properly realigned hallux valgus and achieve significant reduction of intermetatarsal angle, realignment of the sesamoids' apparatus and restoration of a congruent MPJ.

Conversely, when one considers performing a lateral release at the MPJ – oftentimes over-staking the medial metatarsal head – an uncontrollable amount of lateral soft tissue lengthening/ dissection can lead to a risk of hallux varus. Surgical intervention into the first MPJ can often lead to stiffness with the development of scar tissue. By not performing a lateral release, one may successfully avert possible nerve injury.

In Conclusion

As surgeons, we are obliged to reevaluate procedures and methods when it comes to hallux valgus. I have found that avoiding the lateral release and ensuring good reduction in my intermetatarsal and hallux valgus angles can lead to a more successful outcome.

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Editor's note: For a related article, see "Early Weightbearing After Lapidus: Is It Possible?" in the August 2004 issue or visit the archives at www.podiatrytoday.com