

Podiatry Today

Reassessing Surgical Options For Recalcitrant Hallux Limitus In An Active Population

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Hallux limitus is generally responsive to conservative care consisting of anything from changing foot gear, changing activity and exercises to orthoses, injections, anti-inflammatory medication and physical therapy.¹ When these things fail, surgery is necessary.



It has long been believed that arthrodesis is the optimum procedure of choice to resolve any painful arthritic joint. Coughlin and Shurnas cite "97% good or excellent results" in 110 patients.² They found predictable success to treat grade 1, grade 2 and selected grade 3 cases. When it comes to patients with Grade 4 or Grade 3 hallux rigidus who have less than 50 percent of the metatarsal head cartilage remaining at the time of surgery, Coughlin and Shurnas noted that these patients "should be treated with arthrodesis."²

Although arthrodesis is a good way for the surgeon to get a patient with severe hallux rigidus comfortable, it is obviously not a good way to get mechanical improvement. In order to achieve optimal function, we should try to avoid arthrodesis as much as possible. I also think we have overextended the surgery as many patients with Grade 1 and 2 hallux limitus do not need surgery and are not even experiencing enough pain to warrant surgery. Generally, these are the type of patients who respond to conservative care.

In addition, those with Stage 3 and Stage 4 hallux rigidus are the patients who have surgery and often have very little or no cartilage. Yet surgeons can salvage the joint with arthroplasty instead of arthrodesis in many of these cases.

For years, I have been using a progressive cheilectomy to arthroplasty for Stages 1 through 4 hallux rigidus that are symptomatic. Obviously, most symptomatic hallux rigidus that is not responsive to conservative care would be in the Stage 3 to Stage 4 categories. Nevertheless, there are occasional cases that are not responsive to conservative care in the Stage 1 and 2 categories. While I do cheilectomy primarily for Stages 1 and 2 (which seems standard), I do a more aggressive form of arthroplasty for Stages 3 and 4. While I first started doing this as a Valenti procedure, I have modified this and the procedure doesn't resemble a Valenti at all anymore.^{3,4}

Expanding The Possible Options Beyond Arthrodesis And Implant Arthroplasty

It has been the case for years that foot and ankle surgeons have dealt with hallux limitus as if it was an “all or none” problem. Either it is beyond the scope of a simple cheilectomy or it needs arthrodesis. Based on my own experience, there are very few patients who would not desire another option.

Although arthrodesis makes people comfortable, it does cause problems in mobility and agility. In addition, implant arthroplasty is equally bad in that it causes a transfer of weight, less than adequate range of motion and its own set of problems with implant failure and displacement. I have found that five years after an implant, patients rarely maintain joint motion and functionality.

Many authors have theorized as well that the longevity of implants decreases with high degrees of activity, rendering implant arthroplasty less than the procedure of choice when considering highly active individuals. I also think that one cannot achieve functional independence as easily with an implant — particularly subject to these problems — as it could be with other types of surgical arthroplasty.

It is so misunderstood that in an article, “Diagnosis and Treatment of First Metatarsophalangeal Joint Disorders, Section 2: Hallux Rigidus,” describing clinical practice guidelines for first metatarsophalangeal joint disorders, the panel shows an algorithm of treatment, which refers to “cheilectomy (including modified Valenti).”⁵ There is no way this very destructive procedure of a Valenti is any type of a cheilectomy. In fact, it is a modification of a Keller and Mayo procedure. This is a very destructive procedure for Stage 3 and Stage 4 lesions, but it is listed in this article for Stage 1 and Stage 2 lesions.

I think it has been a long-held myth that a Valenti is nothing more than an aggressive cheilectomy. A Valenti is rather a true joint destructive procedure, which has significant ramifications if surgeons use it for more minor cases of hallux limitus and in cases in which the majority of cartilage is normal.

I think this is a misconception that can lead to significant misinterpretation of surgical reasoning. These are fairly old practice guidelines that are long outdated in many ways. While acknowledging that some patients with hallux limitus need to go on to arthrodesis and that the implant has the good effects of reasonably eliminating joint pain and occasionally increasing range of motion, implant arthroplasty currently does not have many indications due to the numerous factors of complications with implants.⁶

It is stunning to me how many people give implant arthroplasty and arthrodesis as the only methods of treating Stage 4 hallux rigidus. It is disappointing that patients who really need other options do not get a choice.

Rethinking The Progression Of Procedures In The Armamentarium For Recalcitrant Hallux Limitus

When it comes to patients who do not respond to a more aggressive non-implant arthroplasty type of procedure, I actually think the sequence of procedures to consider would be as follows: cheilectomy to a more radical cheilectomy; then a Valenti type of procedure; and, lastly, arthrodesis.

Additionally, I think the surgeon employs much more risk in performing these non-implant arthroplasties as opposed to arthrodesis as there is still motion. Therefore, with these non-implant arthroplasties, there is still the possibility of joint pain (including rheumatic joint pain), such as pain in the tendons, sesamoids and capsule as well as joint pain emanating from degeneration of the joint as well. Obviously, arthrodesis eliminates this possibility. However, it also makes one generally less able to have agility and be more prone to transfer weight when the foot is in certain positions due to the lack of joint motion.

To argue the point, my own experience is quite good with more aggressive types of arthroplasties. We had initial studies in which we used the Valenti procedure and showed a similar increase in range of motion to that of the double stem implant arthroplasty.³ We were able to increase motion and change the arthroplasty procedure we do currently. It is now nothing like a Valenti procedure and nothing like a cheilectomy. To call it either would be stretching the extremes of either procedure.



Toe purchase is obviously a problem in an athletic population as this can diminish stability at the first metatarsophalangeal joint when the patient is jumping or pivoting.

A Descriptive Guide To The Modified Valenti Resection Arthroplasty

One would make a 6.0 cm linear incision over the first metatarsophalangeal joint. Employing sharp dissection, the surgeon should take care not to remove the capsule from the degenerative bone surrounding the first metatarsophalangeal joint.

Proceed with further dissection to expose the degenerated cartilage and hypertrophic bone. Remove the osteophytes from around the joint. It is important to remove debris that is within the joint as well as eccentric hypertrophic bone.

Not only does the surgeon remove ossifications, he or she would also remove central defects that are loose and causing trouble. Subchondral drilling of these defects as one would with an osteochondritis dissecans is occasionally necessary. Using power equipment, remove abnormal bone and severely degenerated cartilage in order to allow motion of the phalanx against the metatarsal without any obstruction on the metatarsal.

One can subsequently remove eccentric and hypertrophied bone from the proximal phalanx with a bone rongeur. Keeping the shape of the proximal phalanx prevents some of the dorsiflexion problems that typical Valenti enthusiasts have encountered.

An important part of the procedure is to mobilize the sesamoids sharply with a #15 blade. After mobilizing the sesamoids, the toe should dorsiflex 90 degrees. Only then do we begin closure. If the toe does not bend without resistance on the table, then we need to loosen things up more or perform a more aggressive resection dorsally.

Pertinent Post-Op Pearls

For the first two weeks, elevation is key and the patient is not putting the foot below the waist except for a minimal amount of time. After the first two weeks, the patient will engage in an aggressive exercise program for the next six months to two years for passive range of motion, active range of motion and proprioceptive exercises of the first metatarsophalangeal joint. It is important that the patient adhere to this program. Otherwise, one can refer the patient to physical therapy for range of motion improvement.

Physicians can expect that edema will last for a minimum of six months after the procedure and weakness is a natural result of this procedure as tendons that have not moved for years are not going to have strength for awhile. Mobilization of the joint will give these tendons more responsibility at the time they are deficient in function.

In addition, the formation of sesamoiditis in sesamoids that have not moved for years is expected and an extraordinarily common result.³ Sesamoiditis still remains an easy problem to treat, particularly with offloading and seems to resolve within approximately six months after surgery. There are those occasions when sesamoiditis is continuing and recurring.

Final Notes

In conclusion, I think we have sometimes unnecessarily limited our scope of surgical procedures to cheilectomy, implants and arthrodesis. The truth is that we should focus more on alternative options of arthroplasty, which are non-implant procedures and have potentially more successful outcomes for the athletic population.

There are very few athletic patients who have had their athletic careers diminished by the presence of hallux limitus. In our practice, after patients have had this type of arthroplasty, they have shown remarkable improvement and returned to their desired athletic activity. This is true in the majority of cases we have seen.

Certainly, there is still an indication for arthrodesis and there are indications for implant arthroplasty as well. I just don't think we should rush from cheilectomy into implant arthroplasty or arthrodesis without considering alternate procedural choices that I have discussed above.

Dr. Grady is the Director of The Foot and Ankle Institute of Illinois. He is the Chief of the Podiatry Section of the Jesse Brown Veterans Affairs Medical Center and the Director of the Podiatric Surgical Residency Program at the Westside Division of the Veterans Administration Chicago Healthcare System. He is board-certified by the American Board of Podiatric Surgery, the American Board of Podiatric Orthopedics and Primary Podiatric Medicine, and the American Academy of Wound Management. Dr. Grady is a Fellow of the American Society of Podiatric Surgeons and is the Scientific Chairman of the Midwest Podiatry Conference.

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For further reading, see "Key Insights On Treating Hallux Limitus" in the March 2007 issue of Podiatry Today, "How To Select The Right Procedure For Hallux Limitus" in the December 2003 issue or "Understanding The Biomechanical Effects Of Hallux Limitus" in the August 2007 issue.

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Dr. Grady,

I have used the Valenti Arthroplasty and Keller Interpositional Arthroplasty with good success for hallux limitus. I agree with you rethinking our approach to Hallux Limitus.

Emanuel Willis, DPM, FACFAS
Scholl's Class of 1986

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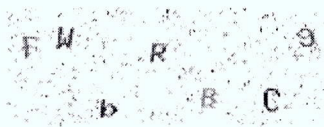
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