

When the Foot Hits the Ground from Toe to Heel

Series 4: All About Bunion Surgery



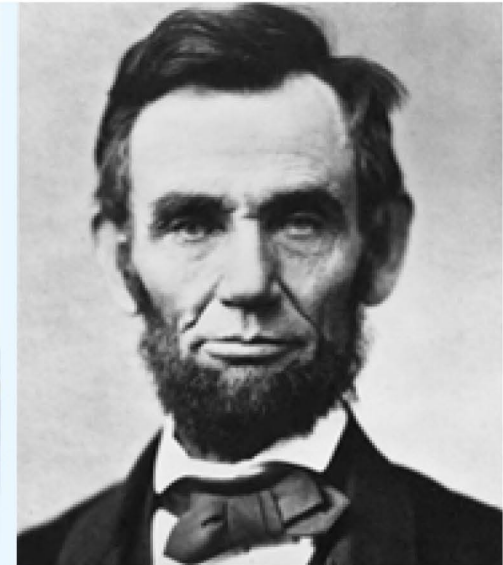
All about Bunion Surgery

What do this model, Abe Lincoln, and this young mom have in common? Painful bunions! It's too late for Abe, but bunion surgery could be in the future for this model and young mom . . .

If you have bunions or bunion pain, you too, may have bunion surgery in your future. To help you walk through the maze of information about bunion surgery, this eBook summarizes the risks and expected outcomes of bunion surgery. It reviews the more common procedures with convenient links to in-depth videos and shares post-surgical care tips for lasting surgical fixation.

Contents

How did you get this bunion?	3
Have you tried non-invasive bunion treatments?	4
Do you know the severity of your bunion deformity?	5
At what point do I have to undergo bunion surgery?	6
What are the risks and complications from bunion surgery?	7
What can you expect from your bunion surgery?	8
Who should perform your surgery?	10
What are the types of bunion surgery?	11
What is hallux limitus?	18
Now that your surgery is over, what is rehab like?	20



How did you get this bunion?

A quick review of bunions (Hallux valgus) and how they anatomically develop will help you better understand the process of surgically correcting a bunion. A bunion is the prominent protrusion at the base joint of the big toe (metatarsophalangeal joint.)

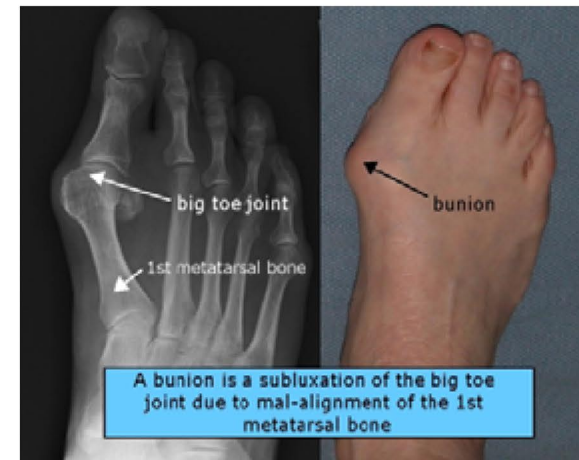
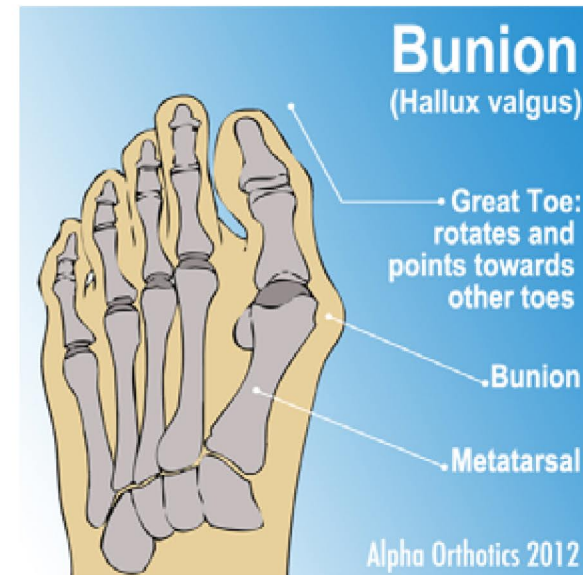
It develops as the first metatarsal (the large bone leading to the big toe) moves away from the second metatarsal which is often caused by over-pronation. The forefoot widens and forces the base joint to move outward.

Tendons run circumferentially around the metatarsal and toe, and under normal biomechanics, move and stabilize the big toe. However, with the misalignment of the first metatarsal, these tendons no longer lie in the correct axis, and in fact, act as a deforming force. The big toe is pulled across towards the second toe by the tendons of the big toe, and the tendons between the first and second metatarsals contract over time further contributing to the formation of a bunion.

Videos:

[Anatomy of the Foot](#)

[Understanding Bunions](#)



Have you tried non-invasive bunion treatments?

Prior to undergoing the knife, most any reputable podiatric or orthopedic surgeon will recommend conservative bunion treatments. These non-invasive ways to ease bunion pain and prevent progression of the deformity are:

- Soaking the affected foot in warm water and using Epsom salt
- Using an anti-inflammatory oral medication
- Using a cushioned or gel pad against the inflamed joint when wearing shoes
- Tossing out the pointy-toed high heeled shoes in exchange for wearing wide toe boxed, lower heeled shoes
- Getting an injection of steroidal medication into the area surrounding the big toe joint
- Wearing a bunion splint to straighten the big toe and take pressure away from the misaligned toe joint and metatarsal
- Maintaining proper arch support to provide support to the mid-foot arch
- Wearing orthotics insoles that pull pressure away from the forefoot with a metatarsal pad

To see how a regular routine of walking and resting in a hinged bunion splint such as Bunion Aid helps stop the progression of mild to moderate bunions while also avoiding surgery, refer to the Pre-operative Application of Hallufix Splint Study

Or if you are waiting for bunion surgery, wear a bunion splint or adjustable arch support to relieve pain from more severe bunions. For further information about various splints and braces, download the third series of When the Toe Hits the Ground from Toe to Heel: Bunion Self-Treatment Products

Bunion Aid Splint

Splint and midfoot strap lift transverse arch to bring midfoot bones into optimal position.

Breathable material.

Splint and toe strap correct big toe malpositioning.

The gel side cushion cools and protects the irritated bunion.

Foot mobility is maintained from flexible hinge.



Do you know the severity of your bunion deformity?

Prior to consulting a doctor about bunion surgery, you can use a simple clinical screening tool, the Manchester Scale, to identify the severity of your bunion. The Manchester scale includes standardized photographs of feet with four grades of Hallux valgus:

- No deformity = 0
- Mild deformity = 1
- Moderate deformity = 2
- Advanced deformity = 3

The enlarged, life-sized foot images (right and left feet) are easy to download and print directly from www.bunionadvisor.com

Self-assessment of hallux valgus using the Manchester scale

Alpha Orthotics
SPECIALIST ORTHOTIC SOLUTIONS



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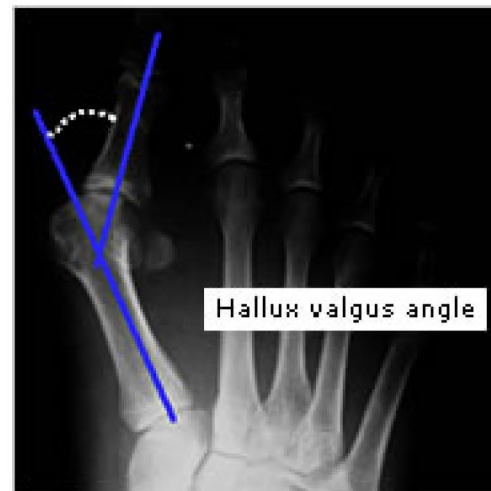
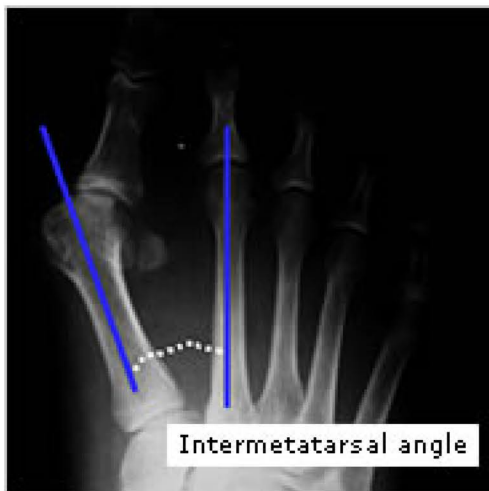
Identify the severity of your bunions with this clinical screening tool, the Manchester Scale.

At what point do you have to undergo bunion surgery?

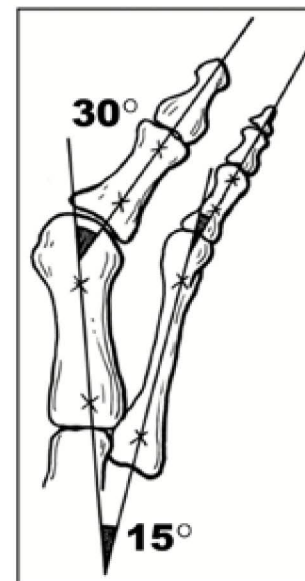
If the severity of your bunion is 2 or 3 on the Manchester Scale, and you have exhausted conservative treatments, most likely you are considering bunion surgery. Some surgeons, such as Dr. Michael Zapf, DPM, will only consider performing bunion surgery if the two following criteria are met:

1. The angle between the first two metatarsals approaches 15° , the angle between the toe and 1st metatarsal approaches 30°
2. If the X-ray indicates there is damage to the joint caused by the abnormal position of the joint. Usually this damage is the loss of cartilage space between the bones and cysts in the metatarsal head which appears as if the two bones are touching on an X-ray.²

Even if you are experiencing bunion pain, surgery is not recommended unless you meet these two criteria. In the meantime, to relieve the bunion pain, Bunion Aid can be worn to relieve bunion pain by providing corrective arch support and releasing tension away from the inflamed joint.



Other indicators that you should seek medical advice about bunion surgery is when your second toe begins to lift and the big toe starts moving over under it (called crossover toe deformity), or when you start experiencing pain in the ball of the foot behind the second toe, called metatarsalgia.³



What can you expect from your bunion surgery?

Your expectations may influence your level of satisfaction with the surgery. A review of bunion surgeries shows that up to 33% of people who have surgery for bunions are disappointed in the result despite pain being reduced and the toe being straighter.⁴ Your expected result will primarily depend on the degree of your deformity that has occurred prior to surgery, your medical condition and age, and your adherence to the recovery regimen prescribed. The more compliant you are after surgery in exercising your feet, walking in supportive shoes, and wearing a hinged bunion splint, the better and more long-lasting your surgical fixation.

Maintain surgical fixation by walking with the support of a hinged bunion splint like the Bunion Aid Treatment Splint.



Dr. Robert C. Chelin DPM, FAAFAS

likes to use analogies when speaking to patients about post surgical care and compliance. “In this case, orthopedics is similar to orthodontics, the branch of dentistry concerned with correcting tooth irregularities. Once the orthodontic braces are removed from the patient’s teeth, it’s only natural that the teeth want to return to their native position. Wearing a retainer is part of the ongoing treatment because the retainer helps maintain control over the movement of the teeth.

The use of orthotics and a Post Operative Bunion Splint after bunion surgery is no different from wearing a retainer. Orthotic surgery alters the foot mechanics. If a patient does not continue to wear an orthotic or splint, there is no longer control over the deformity, and most likely, the foot deformity will return to its original state.”



About Surgical Scarring

A maxim in surgery is that surgical wounds heal from side to side not end to end.

Wounds on particularly light or dark skinned people can be very prominent.

Some people are prone to thick scars, called hypertrophic, and some can even form a raised area called a keloid.

To minimize scarring the surgeon should close the wound and use a running subcuticular suture with fine suture material called Prolene. The suture method of one single stitch is used and the suture snakes back and forth just below the skin. The so-called railroad tracks of traditional suturing are avoided.⁵



Dealing with a foot deformity such as Hallux valgus can be difficult. Connecting with others who are going through the same thing can make a world of difference. Healthboards.com is a place where you can make those connections to find out about everything from costs of surgery to realistic recovery times.



Video:
[Bunion Surgery Expectations](#)



Who should perform your bunion surgery?

Podiatric surgeons and Orthopedic surgeons who are Board Certified should perform the surgery. They have met strict criteria of training and have extensive surgical experience. Podiatric medicine is certified by the American Board of Podiatric Surgery (ABPS). Those who are certified by this Board can join the American College of Foot and Ankle Surgeons (ACFAS) There is another approved board in podiatry, the American Board of Podiatric Orthopedics and Podiatric Medicine (ABPOPPM) which certifies the non-surgical experience, medical and biomechanics, of the profession and allows a unique view of how foot surgeries can affect the lower extremity.

Orthopedic medicine is certified by the America Board of Orthopedics (ABO) and can be members of the American College of Foot and Ankle Surgeons. All ACFAS members are dedicated to surgical excellence in the treatment of foot and ankle disorders.

In general, best practice is to choose a surgeon who performs at least 20 bunion surgeries per year and is experienced in both head and base procedures (refer to types of bunion surgery). The best way for you to confirm number of annual surgeries is to call the Medical Staff Office at the hospital where the surgery is performed and make sure the doctor is classified as “ACTIVE” as opposed to “courtesy” or “provisional.”

Complications from bunion surgery

The following percentage rates of complications are generally accepted ones for the surgeries described. As you can see from the rates quoted, they are all unlikely to occur:

- Slow wound healing /infection: 1-2% *
- Tender scar, numb inner border of toe: 10-15%
- Stiffness of big toe joint
- Pain under 2/3 toe
- Deep vein thrombosis *
- Hallux varus: 1%
- Delayed union of the osteotomy *
- Avascular necrosis *

*Denotes that this is probably more common if you smoke.6



Estimated cost of bunion surgery:

- Single bunion surgery: \$1500 - \$2500 per foot
- Facility fee: \$1000 - \$3000
- Anesthesiologist: \$300 - \$600

The above estimates do not include cost of downtime and other hidden costs. When you take these into account, bunion surgery can easily exceed \$5000 per foot.

The average cost of bunion surgery exceeds \$5,000 per foot

1. Operation approx \$2000 per foot, after insurance
2. Lost income: \$2608 (4 wks off work at \$652 wk)
3. Post-operative boot: \$16 - \$115
4. Post-surgery medications
5. Anti-inflammatory: \$21 - \$65
6. Painkillers: \$61 - \$115
7. Cold compressors: \$7 - \$72 per cold pack
8. Epsom salt or foot soaks: \$4 - \$22
9. Support wraps and pads
10. Splints: \$8 - \$70
11. Plastic wraps and tape: \$3.50
12. Crutches: \$20 - \$50
13. Physical therapy: cost depends on insurance plan
14. Inability to drive: 4 - 6 wks
15. Inability to stand/walk normally: 3 wks - 3 mos
16. New shoes

Source: www.alphaorthotics.com

Refer to [When the Foot Hits the Ground: From Toe to Heel: Bunions](#)



*Some insurance companies will pay for a portion of the bunion surgery, but always get a “pre-authorization” to verify coverage and the amount of coverage. Provided by Cigna, the attached questionnaire is useful in preparing for surgery:
[Surgery Information Form \(PDF\)](#)
www.cigna.com*

What are the types of bunion surgery?

In general, there are two categories of bunionectomy procedures: head and base. Each category includes many variations of the procedures. Some surgeries will include a combination of procedures. No one bunion condition is similar. Surgeons will consider the following factors when selecting which procedure(s):

- Severity of your bunion deformity
- Your age and health condition
- Your lifestyle and work requirements
- Your expectations

General Overview of Bunion Surgery

Dr. Robert Chelin's Overview of Bunion Surgery

Although there are many types of procedures, their primary goals are the same: to remove the bump and realign the joint. No matter what procedures are selected, the same steps usually apply to bunion surgery:

1. The 1st step is to remove the bony prominence along the inner border of the big toe joint (exostosis,) the bump from the side of the 1st metatarsal head. For small bunions, the surgery may stop at this point.
2. The second step of realigning the joint requires cutting the bone in the first metatarsal (osteotomy.) Realign the bones by applying a surgical fracture in the neck of the metatarsal bone and moving the head of the bone closer to the rest of the foot. The bone is usually held in place (fixation) with a wire, pin or screw.
3. The soft tissues that held the big toe in a bad position are cut so the toe can be realigned. This step of "tendon balancing" or "lateral release" should be part of most bunion procedures.



Before (left) and After (right) a Head Osteotomy Procedure



Before (left) and After (right) a Base Wedge Procedure

Two categories of bunionectomy procedures: head and base

The most common category, head procedure, is performed at the head of the first metatarsal, in the area of the big toe joint. Head procedures are usually performed on moderate bunions or for patients who cannot be non-weight bearing for any length of time, i.e. a service worker who stands on her feet all day.

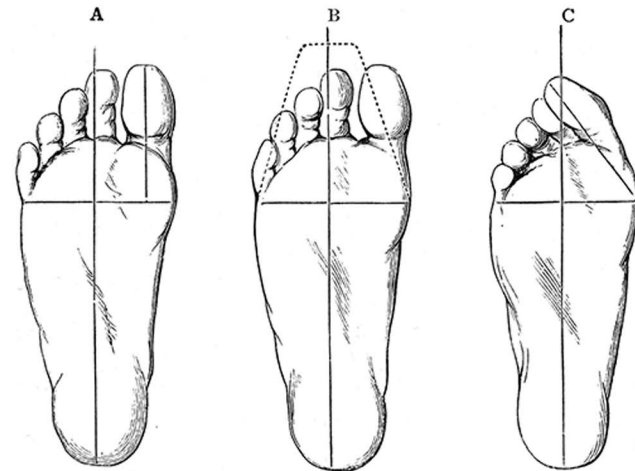
The second category is base procedure which is performed further back around the base of the 1st metatarsal bone behind the great toe. ⁷

Both feet at once, or one foot after another?

Most surgeons will recommend performing surgery on one foot at a time. Patients recover more quickly and experience less complications. Surgeons recommend, at minimum, four to five weeks between surgeries. According to a liability insurance company, the complications rate for a bunion surgery when done one foot at a time is a modest 1 -3%; whereas, the complication rate for two bunions operated on at the same time increases ten-fold. ⁸



“My insurance company told me that if I had all my bunions fixed during one surgery, the complication rate would be 300 times higher than if I had one bunion done at a time. However, if I have one bunion corrected at a time and waited five weeks between each surgery, it will take me almost three years to correct all of them! What should I do?”



Common bunionectomy procedures:

The outcome of the following procedures effectively narrows the foot because “the combination of removing the bone spur and cutting and sliding the head of the first metatarsal bone eliminates the spur and reduces the angular deformity of that bone and the big toe. Reducing the angle and narrowing the foot improves alignment and eliminates the pressure point in the area where the bunion formed in the first place.”⁹

Austin (Chevron) bunionectomy - The bone cut is V-shaped with the “V” sitting on its side and the tip of the “V” pointing toward the joint. The head of the metatarsal and joint is then shifted laterally toward the 2nd toe.

The chevron osteotomy, an accepted method for the correction of mild and moderate hallux valgus, is generally advocated for patients younger than the age of fifty years.¹⁰

Videos

[Chevron Osteotomy Video](#)

[Austin Bunionectomy](#)

[Austin-Akin Bunionectomy](#)

[Austin-Akin Bunionectomy Demo Part 1](#)

[Austin-Akin Bunionectomy Demo Part 2](#)

[Austin-Akin Bunionectomy Demo Part 3](#)



Chevron study compares 2 yr and 5 yr follow-up. Pre-op: hallux valgus angle at 28° and intermetatarsal at 15°; 2 yr. hallux valgus angle at 7° and intermetatarsal at 4°; 5yr. at 10° and 5°.



Reverdin-Green osteotomy

The bone cut is made in a similar location but in a trapezoidal in shape. Both of these procedures use a stainless steel pin across the bone cut to hold the bone in place and are performed on mild to moderate deformities.

Kalish-Austin bunionectomy

The bone-cut is also V-shaped but is for greater degrees of deformities. Titanium screws are used to fixate the bone position.¹¹

Scarf osteotomy

Narrows the wide space between the 1st and 2nd metatarsal by dividing the 1st metatarsal in a Z-shape fashion, moving it, and stabilizing it with pins. The tissues on the second toe side of the deformity may have been shortened and contracted, so the surgery requires a releasing operation known as lateral release.¹²



Before and After a Scarf Osteotomy

Video:
[Scarf Osteotomy](#)



Crescentic osteotomy

It requires cutting a "wedge" out of the bone, making a semi-circular cut and rotating the bone and Lapidus bunionectomy requires fusion of joint behind the great toe to joint. These base procedures are usually performed on moderate to severe bunions.¹³



Before and After a Lapidus bunionectomy

Silver bunionectomy

A simple, successful way to treat bunion formation in patients who do not display any associated angular deformity of the foot. This procedure removes the bony prominence that exists along the medial or inner portion of the joint of the big toe.



McBride bunionectomy

It is an extension of the simpler Silver procedure by transferring a small tendon from the base of the big toe to the first metatarsal bone in the foot. It is an acceptable procedure for mild to moderate foot deformities. Because of its limitations, its popularity and frequency of use has been replaced by the more popular Austin procedure.

Keller bunionectomy

Removes the cartilage surface and a portion of the base of the bone in the big toe, called the proximal phalanx, which comes into contact with the first large bone in the foot, called the first metatarsal. In cases of severe arthritis, or for patients whose condition or other factors such as age or mobility status prohibit more complex foot surgery, the Keller procedure is a simple way to relieve severe arthritis pain.¹⁴

Video:

[Keller Bunionectomy](#)

Mini TightRope®

It is a rather new procedure that doesn't cut the bone and hastens recovery. "A tiny hole is drilled through the side of the bone leading to the big toe. Another hole is drilled through the bone leading to the second toe. Next, a special type of wire, called FiberWire®, is fed through each of the holes. The wire is very strong, yet flexible. Tiny buttons on each end of the wire keep it from slipping out of the bones. As the surgeon tightens the wire, the outer bone is slowly pulled toward the second bone, moving the toe into correct alignment. Then the wire is secured to maintain the new position of the bone while it heals."¹⁵

Videos:

[New Mini Tightrope Bunion Surgery](#)

[Mini Tightrope Bunionectomy Part 1 by Dr. George Holmes](#)

[Mini Tightrope Bunionectomy Part 2 by Dr. George Holmes](#)

[Mini Tightrope Bunionectomy Part 3 by Dr. George Holmes](#)



Caution: Laser bunion surgery

If you see an ad promising bunion correction and quick recovery from laser bunion surgery, be cautious. Why?

Modern laser technology vaporizes high water content soft tissues. Laser cannot vaporize bone which is necessary to correcting a big toe deformity. The only advantage in using laser bunion surgery process vs. traditional bunionectomy is that your surgeon will use a laser to make an initial incision that is supposed to bleed less compared to a cut made with a cold steel scalpel. Furthermore, the healing time is the same no matter which procedure is used. ¹⁶

What is Hallux Limitus?

A big toe (called a hallux) should have 70° - 90° of “up” motion (called dorsiflexion) and 20° - 25° of down motion (plantarflexion.) Foot biomechanics requires that the metatarsal move down in order for the big to move up. In essence the toe ends up on top of the first metatarsal when you raise your big toe. A joint that has less “up motion” is said to have hallux limitus.

The bone in the big toe is jammed against the metatarsal head, which causes inflammation and pain. Often there is a build-up of bone spurs around the head of the metatarsal. If an x-ray is taken with the heel off the ground and the ball of the foot on the ground, the base of the toe bone can be seen to impact the first metatarsal instead of sliding over it.

- Mild hallux limitus can be addressed with a slight modification to a traditional bunion surgery. The metatarsal head can be shifted down and over instead of just over toward the second metatarsal.
- Moderate hallux limitus needs modifications to regular bunion surgeries. The **Youngswick modification** takes an extra wedge out of the top of the “V” or chevron bone cut in the first metatarsal head. This will allow the first metatarsal head to move down and back thereby allowing the big toe to move up and over the head and allow easier walking and running.
- More severe hallux limitus is accompanied by near complete degeneration of the joint with pain with any motion. This might require either of three procedures: a **Keller bunionectomy**, a Keller bunionectomy with an implant or a joint fusion.



According to James G. Clough, DPM, in his article published in Lower Extremity Review, functional hallux limitus is a separate distinct diagnosis from structural hallux limitus.¹⁷



Radiograph of functional hallux limitus. Note the lack of joint destruction in this joint with functional limitation of motion.

Functional hallux limitus (FnHL) is characterized by a lack of motion of the first metatarsophalangeal (MTP) joint during gait only.



Radiographs of structural hallux limitus. Note the significant spurting of the joint preventing mobilization and the pervasive destructive changes in the joint.

Structural hallux limitus (SHL) is characterized by structural adaptations of the first MTP joint that prevent normal motion from occurring



Now that your surgery is over, what's next?

If necessary, use pain medicine: Most patients experience pain after the surgery which can be controlled with medication.

Limit activities but avoid stiffness with foot exercises: During the first three to seven days, patients should limit activities and elevate their foot above their heart. The frequent use of ice and elevation of the foot throughout the following weeks will hasten the rehab period. Once the wounds begin to heal, surgeons will recommend exercises and/or physical therapy to improve the foot strength and range of motion. Getting the foot back into motion is critical to avoiding stiffness.

Gradually bear weight only in postoperative shoe: Gradual weight-bearing using a special postoperative shoe begins in week two and continues until the pins or screws are removed three to four weeks after surgery. The more recent use of small stainless steel or titanium screws allow for earlier mobility. These screws are usually left in permanently while pins are generally removed three to four weeks after surgery.

Always wear a supportive shoe until bone thoroughly heals: Healing time varies depending on the type of surgery. If the surgery is limited to the area of the big toe joint, the healing time can be less than six weeks; whereas, if the surgery is performed further back on the bone with more severe bunion deformity, initial bone healing can take six to eight weeks and the patient is required to wear a cast and use crutches for

three to eight weeks. No matter how long the healing time, it is important to always wear supportive shoes until the bone thoroughly heals, or else, there is a risk of re-fracturing the bone.

Avoid recurrence of bunion deformity with ongoing use of hinged bunion splint: Bunionectomies do not correct over-pronation (fallen or collapse arches). Surgeons will or should prescribe either off-the-shelf or custom orthotics to help support the metatarsals and mid-foot arch and prevent the recurrence of the bunion. Furthermore, ongoing use of a Post Operative Hinged Bunion Splint to hold the surgical fixation of the big toe while walking will also help avoid the recurrence of the bunion deformity.



Acknowledgements:

This eBook drew upon many resources available on the web. In addition to the footnoted references, appreciation for the use of photos, X-rays, and videos is noted to the following sources:

- The Foot and Ankle Clinic, Birmingham, London, www.thefootandankleclinic.com
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- Clinic for Foot and Ankle Surgery, St. Mary's Hospital, Copyright © 2009 Xanodyne Pharmaceutical
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[When the Foot Hits the Ground from Toe to Heel](#)

Series 1: Bunion Prevention

Series 2: Common Foot Ailments

Series 3: Bunion Self-treatment Products



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What are the risks and complications from bunion surgery?

Risks and Complications	Actions to limit Risks & Complications
Infection	Wet bandage increases risk of infection. Risk of infection is highest in the first three days after surgery. Bandage should stay dry for one to two weeks after surgery.
Joint stiffness	Stiffness is common. Postoperative therapy to improve movement is helpful in eliminating the stiffness.
Side effects from anesthetic	There are three types of anesthesia: local which is an injection into the area of surgery; twilight which is a combination of a local injection and intravenous to make the patient drowsy; general which is an anesthetic gas. Consult your physician about the appropriate anesthetic for your surgery.
Persistent pain and swelling	Pain and swelling is common. However, you should be able to wear shoes seven to eight weeks after the surgery. If not, physical therapy will help reduce the pain and swelling and increase the range of motion.
Numbness, tingling, or burning in the toe	This feeling is due to damage to the nerve which usually disappears soon after surgery. If a larger nerve is damaged, it can take six to twelve months before sensation returns. As the nerve heals, you may frequently experience a sharp electric shooting up the leg towards the knee during first few weeks after surgery.
Scarring	Scarring is part of surgery and all wounds heal by scarring. It can take up to a year for scars to disappear. The application of Mederma® helps fade the scar.
Reduced range of motion in the big toe	Normal big toe motion is 70° up and 20° down, but this range of motion can be greatly reduced after surgery. Early exercise of the big joint soon after surgery is imperative.
Development of a callus in the 2nd or 3rd metatarsal head region and pain on the bottom of the foot	Sometimes weight shifting from the big toe to the 2nd toe after surgery will cause this problem. Cortisone injections and the use of custom orthotics can treat this condition.
Delays in healing, non healing in the bone, or healing of the bone in the wrong direction	Dislocation of the bone where it is cut is usually caused by the patient walking on the foot too soon or not wearing a post-operative cast or shoe. If x-rays show the bone not healing correctly in four to seven weeks, the use of crutches and a bone simulator will most likely be recommended.
Over or under correction of the bunion	Moving the metatarsal head during the surgery is based upon a doctor's judgment at the time of surgery. Hallux varus is when there is over correction and the 1st metatarsal remains in its anatomical position while the toe moves away from the foot towards the middle of the body. Unfortunately, once this happens it is difficult to repair.
A shorter big toe, if bone is removed	An implant can be put into the joint. There are several kinds of implants: double stemmed with a hinge in the middle, and modular or two-piece implants.
Degenerative joint disease (arthritis) or disruption of the blood supply to the bone (avascular necrosis)	Discuss these complications with the surgeon.
Reoccurrence of the bunion	It is important to note that bunion surgery does not correct the cause of the bunion. Since bunions are caused by abnormal movement of a set of joints, muscles and tendons below the ankle, ongoing use of a <u>flexible bunion splint</u> and custom-made shoe orthotic insert will help prevent the recurrence of the bunion.