

DECISION MAKING IN HALLUX VALGUS SURGERY

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ABSTRACT

The present paper proposes a treatment plan for surgical correction of hallux valgus. Standing radiographs of the forefoot are required to determine the precise nature of the deformity. If degenerative arthrosis is present at the first metatarso-phalangeal joint, reconstructive procedures are not promising and resection arthroplasty or arthrodesis are indicated. Without degenerative changes, the presence and the amount of incongruity at the first metatarso-phalangeal joint must be assessed on the anteroposterior radiograph. If present, incongruity is corrected with a lateral soft tissue release and reefing of the medial capsule. Metatarsus primus varus often accompanies first metatarso-phalangeal joint incongruity. If the intermetatarsal angle (IM) exceeds 10-15 degrees, a proximal metatarsal osteotomy is indicated. If the metatarso-phalangeal joint is congruent, a distal first metatarsal osteotomy with lateral displacement of the metatarsal head is indicated. Lateral deviation of the joint surface of the first metatarsal head relative to the first metatarsal shaft axis is assessed with the distal metatarsal articular angle (DMAA, normal < 10 degrees) and corrected by resection of a medially based wedge. In hallux valgus interphalangeus with an increased articular angle of the proximal phalanx (PPAA), a proximal phalangeal osteotomy is indicated. The results of hallux valgus treatment achieved with this differentiated approach demonstrate that the deformity must be corrected where and how it occurs, and that not all forms of hallux valgus can be treated with the same surgical procedure.

ÖZET

HALLUKS VALGUS CERRAHİSİNDE

KARAR VERME

Bu makale halluks valgus'un cerrahi düzeltmesi için tedavi planını vermektedir. Deformitenin ayrıntılı bilgisi için ön ayağın yere basarak radyografileri gerekmektedir. Birinci metatarso-falangeal eklemde artroz varsa rekonstrüktif girişimler yerine

rezeksiyon artroplastisi veya atrodez önerilmektedir. Dejeneratif değişiklik yoksa birinci metatarso-falangeal eklemin uyumu ön-arka radyografide değerlendirilmelidir. Ekleme uyumsuzluk varsa bu lateral yumuşak dokuları gevşetilmesi ve medial kapsülün gerginleştirilmesiyle düzeltilebilir. Metatarsus primus varus çokunlukla birinci metatarsofalangeal eklem uyumsuzluğuna eşlik eder. Intermetatarsal açı (IM) 10-15 derecenin üstündeyse proksimal metatarsal osteotomi zorunludur. Metatarso-falangeal eklem uyumluysa metatars başını laterale alacak bir distal metatarsal osteotomi önerilmektedir. Birinci metatars başının metatarsal salt aksına oranı distal metatarsal eklem açısı (DMAA, normalde 10 derecenin altındadır) ile ölçülür ve eklem yüzünün lateral deviasyonu medial tabanlı proksimal ostetomiyle düzeltılır. Proksimal falanksın (PPAA) artmış eklem açısıyla birlikte olan halluks valgus interfalangeusta proksimal falangeal osteotomi endikedir. Tanımlanan farklı girişimlerin ortak özelliği deformitenin olduğu yerde ve şekilde düzeltilmesi gerektidir. Diğer bir deyişle tek bir cerrahi yöntemle halluks valgus'un tüm formlarının düzeltilebilmesi olası değildir.

INTRODUCTION

More than one hundred surgical procedures to correct hallux valgus have been proposed, ranging from osteotomies at the first metatarsal bone or at the proximal phalanx to soft tissue procedures at the first metatarso-phalangeal joint. The use of operative procedures to correct the alignment of the great toe, however, has at times been rather uncritical, and the same technique was applied for different forms of hallux valgus. For adequate treatment of hallux valgus, however, it is crucial to understand that not all deformities are equal. Unquestionably, one of the great number of surgical techniques currently in use will be suited to correct whatever deformity may be present. Not the introduction of new procedures is needed at this time, but the decision making process must be clarified, i.e., which technique should be used for what deformity.

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The present paper describes the hallux valgus deformity and proposes a treatment plan for surgical correction. Naturally, no comprehensive plan, no matter how sophisticated, can substitute personal consideration of each individual patient by the experienced surgeon. The most important issue to decide is the indication to operate, and this decision will be based primarily on the patient's complaints and his expectations of treatment. The ultimate goal of surgical intervention must be to restore normal foot function, and function can only recover if normal anatomy of the foot is rebuilt. Therefore, a number of questions must carefully be considered: How does the hallux valgus deformity deviate from normal anatomy? Which of the numerous surgical procedures is best suited to correct the particular deformity? Is it reasonable to expect full recovery of function or do degenerative changes mandate less ambitious goals of treatment?

The proposed treatment plan reflects the author's personal experience. Other procedures not listed here may be equally applicable. They must, however, reliably correct the hallux valgus deformity where and how it occurs.

The Decision to Operate

The details of the procedure, the postoperative treatment and the possible complications must be discussed in depth with the patient, as must be the option of leaving the hallux valgus untreated. The patient must be informed about what can reasonably be expected from surgical intervention, with regard to pain relief, correction of the deformity, the level of physical activity and shoewear.

Conservative treatment, i.e., various braces and other appliances, have been recommended. They may be useful during the immediate postoperative period, but they can never by themselves correct or significantly improve the hallux valgus deformity. At times, orthotic appliances may temporarily relieve symptoms, such as a painful bunion. This may also be achieved with a change of shoewear.

Cosmetics are relevant to every patient with hallux valgus. However, restoration of a normal looking foot in an otherwise asymptomatic is usually not an indication to surgically correct the deformity. One or more of the following symptoms should be present:

- A painful bunion is caused by the medial eminence of the first metatarsal head. At times, a bursa is found. Atrophy and inflammation may lead to skin breakdown and ultimately to chronic ulceration. Generally, conservative

measures fail and patients experience relief from padding etc. at best temporarily.

- The laterally deviated great toe encroaches on the lesser toes. Pressure symptoms and hammer or claw toe deformities commonly develop. Patients may use various sorts of padding, but pain relief again is only temporary.
- Loss of the great toe's ability to support weight commonly leads to transfer metatarsalgia, often under the second and third ray. If this is the presenting symptom, a trial of insoles with soft forefoot padding and metatarsal arch support should be completed before surgery is indicated.
- Incongruence or degenerative changes at the first metatarso-phalangeal joint often cause pain with motion and on weightbearing. Improvement with local antiphlogistic medication or by orthotic means is short term effective at best.

The patient must be informed that some swelling and discomfort will be present for several weeks postoperatively. The timing of surgery should be decided by the patient to meet his own schedule. No crucial worsening of the deformity must be anticipated over six to twelve months.

Contraindications to Surgery

Peripheral Vascular Disease

Adequate vascular supply is of foremost importance for postoperative healing. Peripheral vascular disease may affect the great toe before it presents at any other extremity. Through clinical evaluation of the vascular supply must include palpation of the posterior tibial and the dorsalis pedis pulses and a judgement of skin perfusion. If any evidence of macro- or microangiopathy is detected, a complete angiologic work up including doppler studies and possibly angiograms must be carried out preoperatively.

Inadequate Patient Expectations

High heeled shoes with a narrow toe box must be considered the prime contributor to hallux valgus, and malalignment of the great toe will inevitably recur if this is not corrected. With their consent to surgery, patients must also accept to wear adequate shoes postoperatively.

The Hallux Valgus Deformity

Even though hallux valgus, i.e., lateral deviation of the great toe, is the most prominent deformity, a number of other factors have to be considered. Standing anteroposterior and lateral radiographs

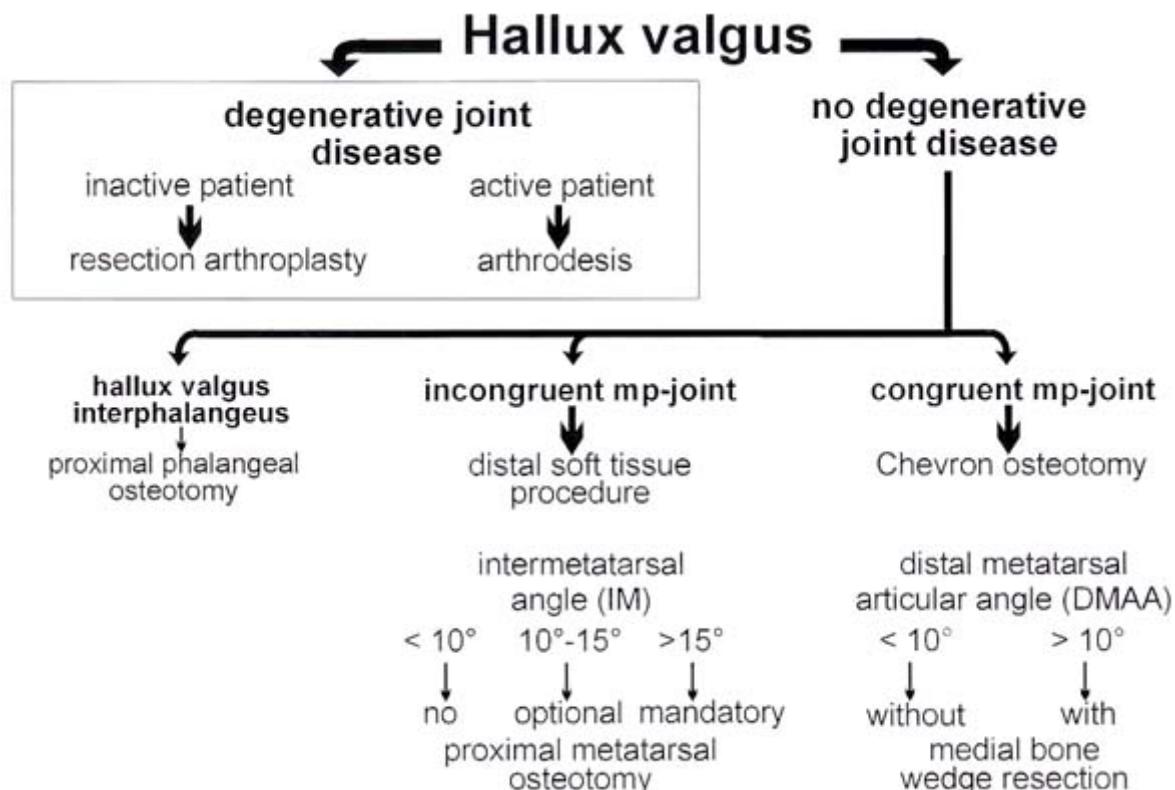


Figure 1: Decision making scheme for surgical treatment of hallux valgus.

of the forefoot are required in all cases. A number of measurements must be determined to define the nature and the precise location of the deformity. Soft tissue abnormalities associated with hallux valgus are adequately represented by radiographic assessment. A treatment plan (Fig. 1) may guide the surgeon through the decision making process, but it will not relieve him from contributing his personal experience and expertise.

Degenerative Changes

Arthrosis of the first metatarso-phalangeal joint strongly affects the decision making process. Clinically, patients may complain of pain during weightbearing, particularly at push off. The range of motion of the joint is often decreased and crepitus may be palpable. Radiographically, joint space narrowing, osteophyte formation and sclerosis of the subchondral bone are noted.

Congruence of the first metatarso-phalangeal joint (Fig. 2)

In hallux valgus, lateral subluxation of the proximal phalanx on the metatarsal head is commonly seen on the weight-bearing anteroposterior radiograph.

This will render the first metatarso-phalangeal joint unstable. The presence and the amount of incongruity can be judged by marking the margins of the articular surface on both sides with dots (Fig. 2). If hallux valgus is present, but the first metatarso-phalangeal joint is congruent, only a mild hallux valgus deformity is present or the distal metatarsal articular angle (DMAA) is increased.

Metatarsus Primus Varus

Metatarsus primus varus denotes increased divergence between the first and the second metatarsal, as assessed with the intermetatarsal angle (IM) on the weight-bearing anteroposterior radiograph (Fig. 3). An intermetatarsal angle (IM) of up to 8-10 degrees is considered normal¹⁻³.

The intermetatarsal angle (IM) closely correlates to the position of the sesamoid bones relative to the first metatarsal head^{4,5}. With medial deviation of the first metatarsal, the sesamoids remain stationary relative to the second metatarsal head. Reduction of the first metatarsal head on the sesamoids postoperatively therefore allows to make a judgement on the correction of metatarsus primus varus.



Figure 2: Incongruence of the first metatarsophalangeal joint on the weightbearing anteroposterior radiograph. The margins of the articular surface at the metatarsal head and at the proximal phalanx are marked with dots, making subluxation of the proximal phalanx obvious.



Figure 3: The intermetatarsal angle (IM) on the weightbearing anteroposterior radiograph (normal < 10 degrees).

Distal Metatarsal Articular angle (DMAA) (Fig. 4)

The position of the joint surface at the first metatarsal head relative to a line perpendicular to the shaft of the first metatarsal is determined on the weight-bearing anteroposterior radiograph. Physiologically, the joint surface is tilted less than 10 degrees laterally. In some cases of hallux valgus, this lateral tilt is increased to 30 degrees or more.

Proximal Phalangeal Articular Angle (PPAA)

Physiologically, the metatarso-phalangeal joint surface of the proximal phalanx lies within 10 degrees of a right angle to the shaft axis. If the angle is increased, hallux valgus interphalangeus is present.

Motion at the First Metatarso-cuneiform Joint

Correction of the axis of the first metatarsal will fail if motion of the metatarso-cuneiform joint is not sufficiently constrained. The range of motion of this joint is assessed clinically by displacing the first metatarsal relative to the second metatarsal

in a dorsal-plantar direction. A flat joint surface on the anteroposterior radiograph usually indicates more restricted motion, whereas a round surface, which is often tilted medially, may indicate hypermobility. In our experience, however, hypermobility significantly contributes to hallux valgus only in a small number of patients.

Decision Making

Decision making in hallux valgus surgery occurs at various levels, as demonstrated in Fig. 1. The hallux valgus angle itself, i.e., the amount of lateral deviation of the great toe, is not the major determinant of the corrective procedure. It is rather the location and the severity of the underlying deformities that mainly prescribe the technique of surgery.

First, a decision must be made concerning the presence of degenerative changes at the first metatarso-phalangeal joint. If both a significant hallux valgus deformity and degenerative arthrosis



Figure 4: The distal metatarsal articular angle (DMAA) on the weightbearing anteroposterior radiograph (normal < 10 degrees).

of the metatarso-phalangeal joint are present, reconstructive procedures will usually fail. Resection arthroplasty or arthrodesis are the procedures of choice. Arthrodesis of the first metatarso-phalangeal joint has the major advantage of restoring the function of the great toe, at least partially. Therefore, this procedure is preferable in younger patients with higher expectations and a high level of activity. Resection arthroplasty is confined to patients with limited goals, such as elderly and less active persons.

If no degenerative changes are present, it must be decided if the surfaces of the first metatarso-phalangeal joint are congruent or not. If there is lateral subluxation of the proximal phalanx on the metatarsal head, this is due to soft tissue contractures on the lateral side of the first metatarso-phalangeal joint. A lateral soft tissue release with reefing of the medial capsule is then indicated. This will bring the great toe in line with the first metatarsal. The medial eminence at the metatarsal head is removed simultaneously. The soft tissue procedure is contraindicated in hallux

valgus with a congruent first metatarso-phalangeal joint, as an incongruent situation will then be created.

Commonly, lateral subluxation of the first metatarso-phalangeal joint is accompanied by metatarsus primus varus with an increased intermetatarsal angle (IM), and this must be corrected. If the intermetatarsal angle (IM) is between 10 and 15 degrees, and if no significant resistance is met on intraoperative reduction of the metatarsus primus varus, correction may be achieved by approximating the first and second metatarsal heads with sutures through the respective metatarso-phalangeal joint capsules. If the angle is more than 15 degrees, a proximal metatarsal osteotomy is obligatory. In the rare patient with hypermobility of the first metatarso-cuneiform joint, this joint must be fused.

If the articular surfaces of the first metatarso-phalangeal joint are congruent, a mild hallux valgus deformity is usually present or the distal metatarsal articular angle (DMAA) is increased. This is corrected by an osteotomy with lateral displacement of the metatarsal head and resection of a medially based wedge, if necessary.

Less commonly, the deformity is located at the base of the proximal phalanx, with an increased articular angle of the proximal phalanx (PPAA). This is referred to as hallux valgus interphalangeus. A corrective osteotomy at the proximal phalanx with resection of a medially based wedge is then indicated. This is rarely performed as a single operation and usually in conjunction with a distal soft tissue procedure.

Reconstructive Procedures

Distal Soft Tissue Procedure (Figs. 5-6)

Soft tissue procedures to correct the alignment of the first metatarso-phalangeal joint were first described by Silver⁶, who combined removal of the medial eminence with lateral capsular and adductor tendon release and medial capsular reefing. This was subsequently modified by McBride⁷, who included resection of the fibular sesamoid, and by DuVries⁸. Mann⁹ again modified the procedure to include transection of the transverse metatarsal ligament and lateral metatarso-phalangeal joint capsulotomy.

The distal soft tissue procedure includes the steps listed below. It must be emphasized that this procedure alone is only successful if no metatarsus primus varus in excess of 10 degrees is present.

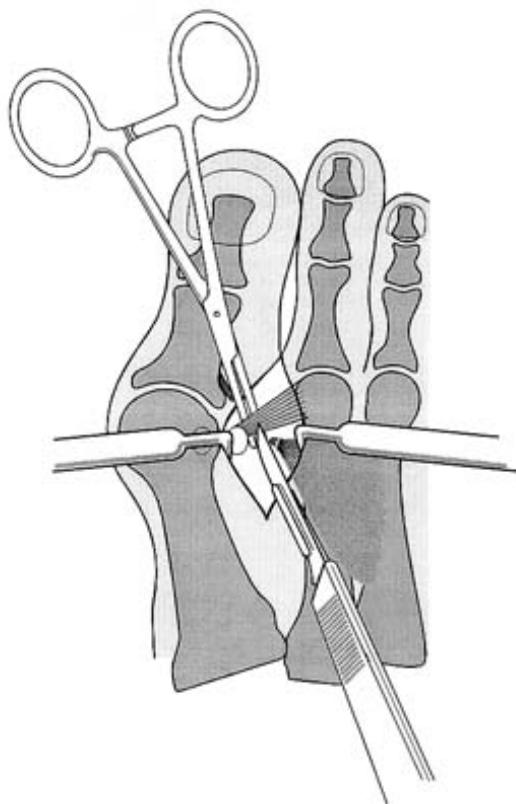


Figure 5: Lateral soft tissue release through a dorsal incision at the first interspace. The adductor tendon has been transected. The transverse metatarsal ligament is exposed over a clamp and the joint capsule lateral to the first metatarsophalangeal joint is still intact.

Otherwise, an osteotomy at the base of the first metatarsal must be added. Bandaging of the forefoot is important to hold the great toe in the reduced position postoperatively, as no internal fixation is used.

1. Lateral soft tissue release (Fig. 5)

The lateral release is carried out through a longitudinal incision at the dorsal aspect of the first intermetatarsal space. The adductor hallucis tendon is detached from its insertion into the fibular sesamoid and the proximal phalanx. This is best performed with a knife blade, cutting distally from the first metatarsal. The sesamoids are released by transecting the transverse metatarsal ligament, which is found plantar to the adductor hallucis tendon. Care must be taken not to injure the neurovascular structures that lie directly

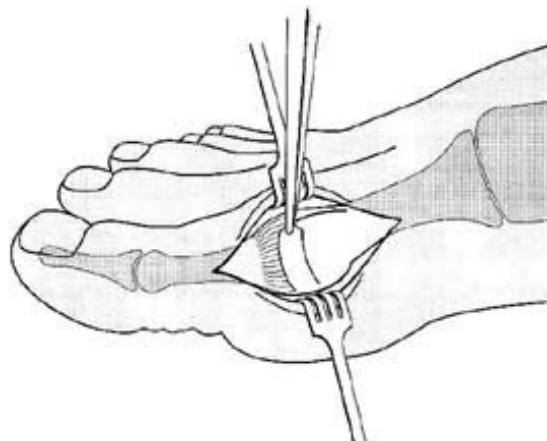


Figure 6: The first metatarso-phalangeal joint has been opened through a vertical capsular incision. A vertical soft tissue strip is removed to align the great toe following closure. The medial eminence will be exposed and resected.

underneath. In addition, the contracted lateral first metatarso-phalangeal joint capsule must be released. In older patients, this can usually be achieved by forcefully bringing the great toe into a position of 20 to 30 degrees of varus. The joint capsule usually tears during this maneuver. In younger patients, the capsule must be perforated with a number of transverse stab incisions before the great toe can be abducted. The capsule remains open and is not resutured.

2. Reefing of the medial first metatarso-phalangeal joint capsule and resection of the medial eminence (Fig. 6)

The first metatarso-phalangeal joint capsule is exposed through a longitudinal, medial incision. A vertical capsular incision is made parallel and slightly proximal to the joint line, from the tibial sesamoid to approximately five millimeters medial to the long extensor tendon. A four to eight millimeter wide strip of tissue is resected. Its width depends on the severity of the deformity. The capsular incision is extended proximally and the medial eminence is resected in line with the medial aspect of the first metatarsal diaphysis.

Proximal First Metatarsal Osteotomy (Fig. 7)

An increased intermetatarsal angle (IM), i.e. varus alignment of the first metatarsal, is corrected with an osteotomy at the base of the first metatarsal^[2,10-13].

This procedure is performed in combination with a distal soft tissue procedure. A dorsal incision is used. The location of the osteotomy should be approximately one centimeter distal to the metatarsocuneiform joint. A biplanar chevron shaped saw cut with a distal opening is preferable (Fig. 7, 8), as it

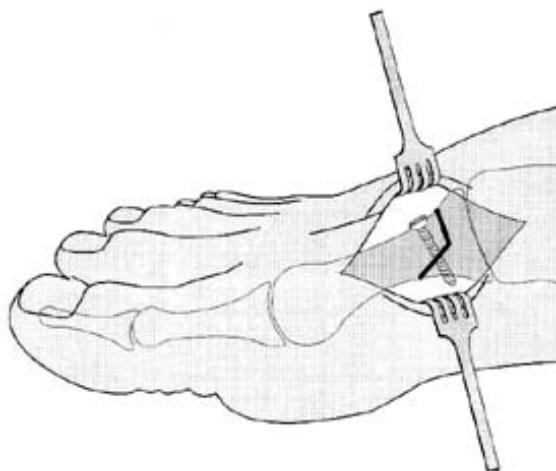


Figure 7: Technique of proximal first metatarsal osteotomy. The dorsal leg of the osteotomy is opened medially to correct metatarsus primus varus.



Figure 8: Postoperative radiograph following distal soft tissue procedure and proximal metatarsal osteotomy.

allows stable fixation with a screw and precludes dorsal-plantar malalignment¹⁴. Bone resected from the pseudoexostosis is placed into the opened dorsal osteotomy. Alternatively, a closing wedge osteotomy may be used, but this will result in some shortening of the first ray.

In mild and subtle varus alignment of the first metatarsal it may suffice to place sutures between the capsules of the first and the second metatarsophalangeal joint. This, however, is only successful if the intermetatarsal angle (IM) is less than fifteen degrees and if no significant spring resistance of the first metatarsal is met intraoperatively.

Distal First Metatarsal Osteotomy

(Fig. 9, 10)

The osteotomy is made in the distal metaphyseal segment of the first metatarsal, preserving the integrity of the articular surface and improving bone healing. A subcapital osteotomy was first proposed by Ludloff¹⁵. Traditionally, the Hohmann osteotomy^{16,17} and the Kramer osteotomy¹⁸ have been used mostly in Europe. The Chevron osteotomy has been most popular in the United States. It was initially described by Austin and Leventen¹⁹ and by Corless²⁰. A V-shaped bone cut is made, centered at the first metatarsal head, through a straight medial skin incision. The capital fragment is shifted laterally. Internal fixation, which was not included in the procedure initially, should always be used, as frequent dislocation of the capital fragment without internal fixation was reported². Generally, a Kirschner wire is brought in from the dorsum of the foot for this purpose. The Chevron osteotomy has been reserved for mild to moderate hallux valgus deformity (hallux valgus angle less than thirty degrees, intermetatarsal angle (IM) less than twelve degrees). However, two modifications have recently been introduced: 1. a medially based bone wedge has been resected to correct the alignment of the distal metatarsal articular surface². 2. Asymmetric placement of the V-shaped bone cuts has been used²¹, facilitating internal fixation. These modified Chevron osteotomies may be used in more advanced deformity.

A number of other procedures to correct malalignment of the distal metatarsal articular surface have been introduced²²⁻²⁹.

Proximal Phalangeal Osteotomy

Lateral deviation of the proximal phalanx relative to the joint surface of the first metatarsophalangeal

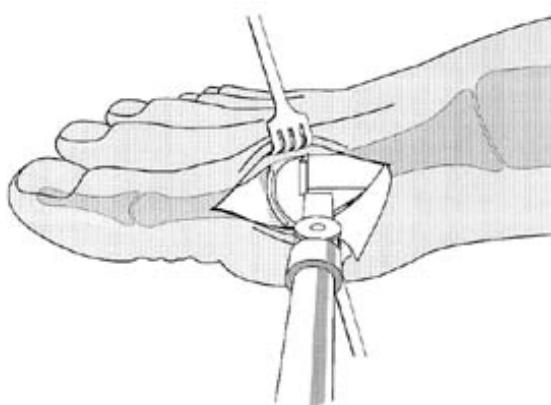


Figure 9: Modified Chevron osteotomy with correction of metatarsal head alignment, asymmetrical placement of bone cuts and bone wedge removal.



Figure 10: Postoperative radiograph following Chevron osteotomy.

joint, i.e. hallux valgus interphalangeus, is not uncommon, but rarely repaired as a single procedure. It is corrected with a proximal phalangeal osteotomy³⁰, most often combined with the distal soft tissue procedure. Proximal phalangeal osteotomy is performed through a straight medial incision. A medially based bone wedge is excised, corresponding to the severity of the deformity.

Non-Reconstructive Procedures

Resection arthroplasty of the first metatarso-phalangeal joint

This procedure was first introduced by Davies-Colley³¹, by Keller³² and by Brandes³³. It sacrifices the integrity of the first metatarso-phalangeal joint and leaves the great toe without the ability to resist plantar pressure. Its use must therefore be restricted to patients with limited expectations concerning postoperative function of the great toe. Using a medial incision, approximately one third of the proximal phalanx is resected. A distally based flap of capsule and thickened bursa from the medial eminence is inserted into the bone gap. Temporary fixation with a longitudinal Kirschner wire, brought in through the great toe, is recommended.

Arthrodesis of the first metatarso-phalangeal joint

If degenerative changes are present at the first metatarso-phalangeal joint, or if the severity of the deformity precludes reconstruction, arthrodesis is the procedure of choice. This was first described by Broca³⁴. Its major advantage is preservation of push-off function of the great toe. The joint is exposed through a dorsal incision and minimal subarticular bone is removed. The position should be in ten to twenty degrees of dorsiflexion relative to the plantar foot surface, i.e., twenty-five to thirty-five degrees of dorsiflexion relative to the first metatarsal, and in fifteen degrees of valgus. Stable internal fixation is recommended, as pseudarthroses may occur. A dorsal AO-one third tubular plate and an interfragmentary screw are best used for this purpose.

RESULTS

In a recent follow-up study of 103 distal soft tissue procedures (66 with proximal metatarsal osteotomy) after 31 months (12-54 months) by the author³⁵, a mean preoperative hallux valgus angle of 37.3 degrees improved to 15 degrees postoperatively in patients with proximal metatarsal osteotomy, from 36.4 to 17.5 degrees in patients without proximal metatarsal osteotomy. The intermetatarsal angle was improved from 16.8 degrees to 7.5 degrees with osteotomy, from 13.8 degrees to 8.1 degrees without osteotomy. All patients without osteotomy and 84.4 percent of patients with osteotomy were satisfied with the procedure. Reasons for dissatisfaction were cosmetics, swelling and pain. Motion was essentially normal in all patients without osteotomy and in 97.8 percent of patients with osteotomy.

Complications included two deep and three superficial wound infections, and two recurrences.

Mann and Pfeffinger³⁶ reported on 72 feet in 47 patients, who underwent a distal soft tissue procedure with excision of the fibular sesamoid. Follow-up was four years. 92 percent were satisfied. The main causes for dissatisfaction were residual pain at the first metatarso-phalangeal joint and persistence of the deformity. 47 percent were unable to wear shoes of their choice. The hallux valgus angle decreased from 32.4 degrees preoperatively to 15.9 degrees postoperatively. The intermetatarsal angle (IM) decreased from 14.3 degrees preoperatively to 8.8 degrees postoperatively. Correction was most satisfactory in patients with a preoperative intermetatarsal angle (IM) of less than 15 degrees.

The results of proximal osteotomy of the first metatarsal in combination with a distal soft tissue procedure were reviewed by Mann et al.³⁷. 93 percent of the patients were satisfied. Dissatisfaction was due to persistent pain and malalignment of the great toe. In 76 percent, the hallux valgus was reduced to 16 degrees or less.

For the Chevron osteotomy, the hallux valgus angle was corrected from 21.7 to 13.6 after 22 months, in the author's series³⁸. Approximately 80 percent good and excellent results were previously reported³⁹⁻⁴⁰. Pain and recurrence of the deformity were the major reasons for patient dissatisfaction. Hallux valgus correction was 13 degrees. 91 percent of 119 patients followed by Lian and Leventen⁴¹ were painfree, 93 percent had a cosmetically acceptable result. The hallux valgus angle decreased from 27.6 degrees preoperatively to 12.5 degrees postoperatively.

Resection arthroplasty was followed in 606 patients after 5 to 14 years. Thirty-four percent were very satisfied with the procedure, 55 percent satisfied. Pain rating was significantly better than cosmesis. Dorsal extension force was usually clearly decreased, 67 percent could not perform a one-sided toe rise. Only three patients had complete remodeling of the resection space into a near-normal joint.

DISCUSSION

If lateral deviation of the great toe was the only deformity to be considered in hallux valgus, correction could be attained with one single procedure, and no major decision making would be required. However, it has become increasingly clear that the deformity may vary considerably

between patients, who are of different ages and have differing expectations with regard to the result of their surgery. Therefore, a more differentiated approach must be taken.

In addition to realignment the great toe, forefoot reconstruction in hallux valgus must strive to accomplish the following: correct the intermetatarsal angle (IM), reestablish congruence of the first metatarso-phalangeal joint, eliminate the medial eminence, maintain a full functional range of motion of the first metatarso-phalangeal joint and restore the weight-bearing capacity of the great toe. The deformity must be analyzed in detail preoperatively and the choice of the operative technique must be based on the type and the location of the deformity. The choice of the corrective procedure will, of course, depend somewhat on the experience of the surgeon, and the recommendations given here are based on the experience of the author. However, normal anatomy of the forefoot must be restored in order for function of the foot to recover.

The preoperative work up for adequate decision making in hallux valgus surgery is easy to perform and inexpensive. Besides a thorough history and physical examination, only weightbearing radiographs of the forefoot in two planes are required. From these radiographs, all measurements on which the decision must be based can be made.

Surgical procedures that sacrifice the first metatarso-phalangeal joint may not be used indiscriminately. Probably no other joint of the human body has been resected as commonly as the first metatarso-phalangeal joint, and resection of an intact articular surface for mere varus/valgus malalignment has only been used there. Patients may initially be satisfied with the result of the resection arthroplasty, but biomechanical forefoot function is markedly impaired. The principle of anatomic restoration must not be abandoned, as anatomy can be restored in the vast majority of patients.

Endoprosthetic replacement of the first metatarso-phalangeal joint is not listed as a treatment option for hallux valgus. Replacement of the joint surfaces by itself does not correct the deformity, and it is only indicated if advanced degenerative disease is present. Unlike the hip and the knee joint, total joint replacement has had poor success at the great toe².

The postoperative management is of great importance following hallux valgus surgery. In particular the distal soft tissue procedures require that the great toe be held in the corrected position

by bandaging over six to eight weeks. As the objective of reconstructive procedures is full restoration of foot function, this must not be impeded by unnecessary restrictions postoperatively. In fact, full weightbearing with a postoperative shoe can generally be permitted. This will markedly decrease tissue atrophy and joint stiffness.

The expectations of the patient with regard to the outcome of the surgery are an important part of decision making. Distorted expectations must be corrected, or the patient must be recommended not to have the surgery done. This is in particular true with regard to shoewear. As inappropriate shoes are a major cause of hallux valgus, no expectations must be raised that the patient will be able to wear such shoes postoperatively.

Decision making in hallux valgus surgery must question which procedure is least invasive to the patient. This is with respect to the length of the incision, the operative time, postoperative mobilization and weight bearing and the time until complete rehabilitation. Regional anesthesia is standard for forefoot procedures. Depending on the health care environment, many procedures can today be performed on an outpatient basis or with a hospital stay of only a few days.

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