Forefoot Deformities

58

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Overview
Forefoot deformities comprise a wide spectrum of pathologic conditions with a high prevalence in the worldwide population. This chapter aims to focus on the most prevalent diseases.

58.1 Hallux Valgus

58.1.1 Introduction

The term hallux valgus was originally introduced by Carl Hueter to define a subluxation of the first MTP joint characterized by lateral deviation of the great toe and medial deviation of the first metatarsal. Currently, it is understood that hallux valgus deformity can occur because of lateral deviation of the articular surface of the metatarsal head without any subluxation of the first MTP joint.

Hallux valgus deformity can also be associated with abnormal foot mechanics, such as a pes planus, shortened Achilles tendon, generalized neuromuscular diseases, or secondary to a hindfoot deformity. In addition, it can occur with various inflammatory arthritic conditions, such as rheumatoid arthritis.

58.1.1.1 Pathoanatomy and Pathophysiology

A congruent MTP joint is inherently more stable than an incongruent or subluxated joint. A congruent joint tends to remain stable, whereas once a joint has begun to subluxate, the deformity tends to progress with the passing of time.

Incongruent or subluxated hallux valgus deformities are usually progressive. Movement of the proximal phalanx laterally over the metatarsal head causes a medially directed pressure on the head pushing it medially and causing an increased intermetatarsal (IM) angle. This causes an attenuated medial capsule and a contracted lateral joint capsule. Simultaneously, the sesamoid sling, which is anchored laterally by the insertion of the adductor hallucis muscle and the transverse metatarsal ligament, remains in place as the metatarsal head moves medially, creating added pressure on the medial joint capsule. The medial joint capsule is weakest just superior to the abductor hallucis muscle where it ultimately gives way, allowing the abductor hallucis muscle to gradually slide beneath the medially deviating metatarsal head. This will thereby result in causing the intrinsic muscles to become a deforming force and become

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unable to support the MTP joint. Also due to the fact that this abductor hallucis muscle is attached to the phalanx, it will spin the proximal phalanx into pronation. It has been shown that as the hallux valgus deformity progresses, so does this degree of pronation. This pronation will cause calluses to develop on the medial side of the IP joint. Eventually, as the MTP joint becomes less stable, the hallux carries less weight, body weight is transferred laterally in the forefoot, and callus may also develop beneath the second, third, or both metatarsal heads. Increased pressure may lead to capsulitis, instability, or deviation of the second MTP joint as well.

With more severe degrees of this hallux valgus deformity, the extensor hallucis longus tendon is also displaced laterally, and this also leads to it not only extending the toe but also adducting it, further worsening the deformity. The flexor hallucis longus tendon, which retains its relationship to the sesamoids, moves laterally and also becomes a dynamic deforming force (Fig. 58.1). In rare circumstances, if the progressive deformity of the MTP joint continues unabated, dislocation of the MTP joint may occur over time, with the fibular and tibial sesamoids becoming dislocated into the first IM space.

Hallux valgus deformities are also associated with a splayed appearance of the foot. Initially, this might occur because the first metatarsal head is no longer contained within the sesamoid sling and is displaced in a medially deviated position. The middle metatarsals do not splay because of the stable articulation at their tarsometatarsal joints. Sometimes, the fifth metatarsal lacks stability and drifts laterally, thereby completing the appearance of a splayed foot.

With further drifting of the hallux laterally, the other lesser toes come under increasing pressure, especially the second toe. If the second MTP joint remains stable, the great toe may drift beneath it or occasionally on top of it. In other instances, subluxation or complete dislocation of the second MTP joint occurs. Additionally, occasionally, all the lesser toes are pushed into lateral deviation or a "wind-swept" appearance.

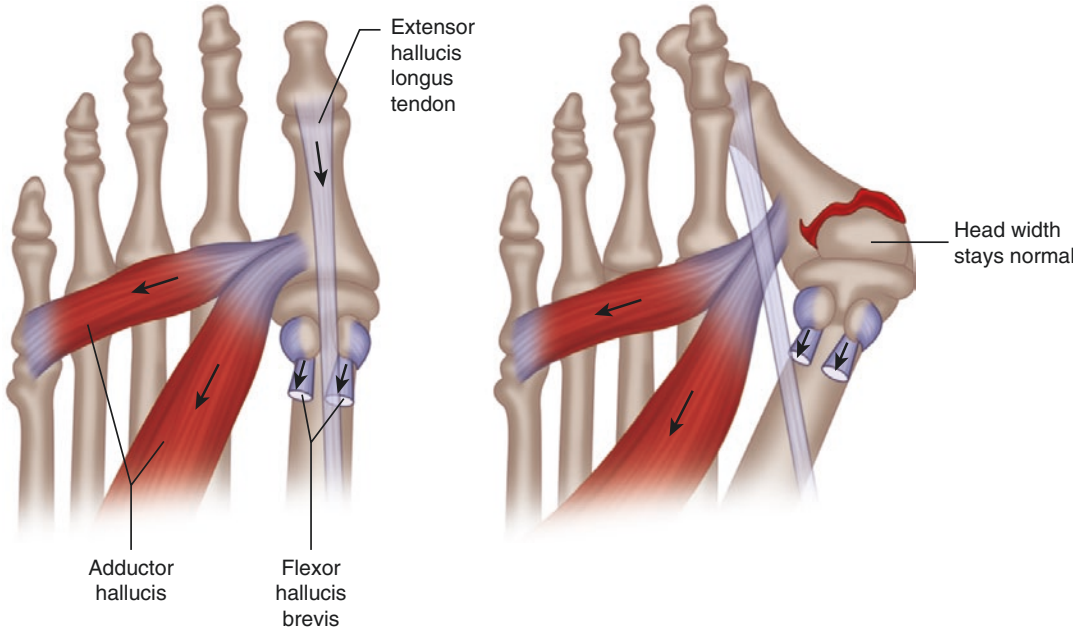

Fig. 58.1 Pathophysiology of hallux valgus deformity. With lateral deviation of the proximal phalanx, medially directed pressure is applied on the metatarsal head, which deviates medially. This results in attenuation of the medial joint capsule and contracture of the lateral joint capsule. Additionally, the extensor hallucis longus and flexor hallucis brevis tendons become deforming forces by their displacement medially to the metatarsal head

58.1.2 Demographics

Myerson has suggested that bunions occur in 2–4% of the population. Almost 46% of bunions have been reported to occur before the age of 20 years. The mean age at which patients had surgery for the deformity was 60 years of age.

Regarding gender distribution, several studies have found a female preponderance of up to 90%.

Although it has been reported that almost 84% of patients had bilateral hallux deformities, yet only 18% had both sides corrected.

58.1.3 Etiology

The hallux valgus deformity can be caused by extrinsic or intrinsic factors. The most common extrinsic factor is reportedly *shoe wear*. Some authors have reported *trauma* with rupture of medial joint capsule as a causative factor for the development of the deformity.

The most commonly cited intrinsic factor is a *hereditary factor*. On the other hand, the association of hallux valgus with *pes planus* is controversial. Another factor is *pronation of the foot*. This causes more stress on the first MTP joint, which assumes a more oblique orientation with the ground resulting in more pressure being exerted on the medial joint capsule and thereby causing a progression of a hallux deformity. Another intrinsic factor is *hypermobility of the first metatarsocuneiform joint*. Some authors have also described *ligamentous laxity* as a causative factor in the development of hallux valgus deformity. Some authors have suggested that an *Achilles contracture* might occur with hallux valgus. Others noted no such correlation. There are other miscellaneous causes of hallux valgus. *Second toe amputation* has been shown to be a cause of the deformity. *Syndactylization* of first and second toes has also been shown to be a cause.

58.1.4 Radiographic Parameters and Specific Anatomic Implications

The classical radiographic studies have been described as weight-bearing standard AP, lateral, and oblique radiographic views. The AP view has been classically described as taken at 1 m tube-to-film distance centered on the tarsometatarsal joints and angled 15° towards the ankle joint. On this weight-bearing AP view, some important angular measurements should be assessed (Fig. 58.2).

The *intermetatarsal angle* is the line formed between the longitudinal axis of the first and second metatarsal bones. It is normally usually less than 9°. Mild deformity has been described as between 9° and 11°, while moderate is defined between 11° and 16° and any degree of deviation above 16° is considered severe.

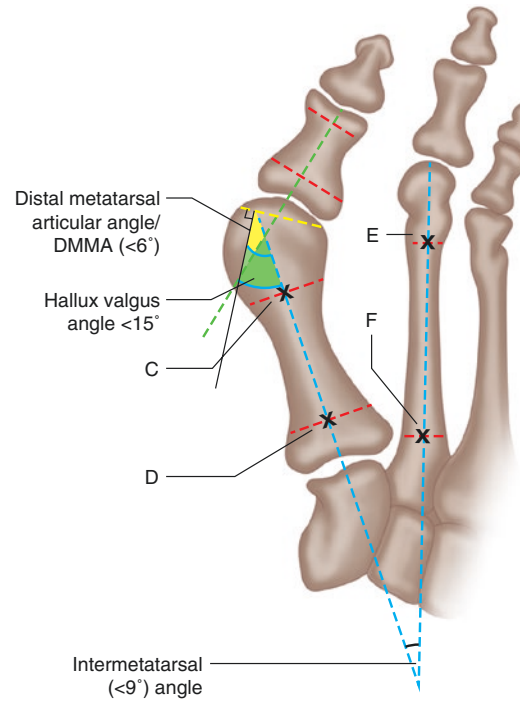

Fig. 58.2 Schematic representation of angular measurements on weight-bearing radiograph in a case of hallux valgus deformity. Points C and D are mid-diaphyseal points along the axis of the first metatarsal. Points E and F are the mid-diaphyseal points along the axis of the second metatarsal. *Intermetatarsal angle* (red colored angle) is formed between the axis of the first and second metatarsal bones (lines CD and EF). *Distal metatarsal articular angle* (yellow-colored angle) is formed between the axis of the first metatarsal (line CD) and a line that is drawn perpendicular to the line joining the most medial and most lateral points of the first distal metatarsal articular surface (yellow dotted line). *Hallux valgus angle* (green-colored angle) is the angle formed between the axis of the first metatarsal (line CD) and the axis of the proximal phalanx (green dotted line)

The *distal metatarsal articular angle* is the angle of lateral slope of the articular surface on the first metatarsal axis. It is formed between a line perpendicular to another line connecting the most medial and most lateral points on the articular surface and between the first metatarsal axis. Normally, it has been defined as being less than 6°.

Hallux valgus angle is the angle of deviation of the proximal phalanx on the first metatarsal and is formed between the lines representing the longitudinal axis of both the first metatarsal and the first proximal phalanx. Normally, it has been defined at 15°. Mild deformities are less than 20° moderate between 20° and 40°, and severe are defined as larger than 40°.

Similarly, the *hallux valgus interphalangeal angle* is formed between the longitudinal axis of the distal and proximal phalanx.

An important point of assessment is the *congruency of the first metatarsal joint surfaces*, between the respective articular surfaces of the first metatarsal head and the proximal phalanx base. It should be distinguished from mere subluxation where corresponding points on the articular surface of the base of the proximal phalanx migrate laterally in relation to first metatarsal head articular surface (Fig. 58.3). It has been stated that no lateral shift of the proximal phalanx will occur with a congruent deformity.

Another point of interest is the *medial eminence*. Authors have described the medial eminence as being new bone formation and a bunion. Others believe that it is not a new bone but rather a part of the metatarsal that becomes exposed with lateral deviation of the proximal phalanx. Although medial eminence resection has become a standard part of hallux valgus corrective surgery, it should be stated that basing this resection on the sagittal sulcus may result in excessive bone resection and may be a cause for hallux varus deformity.

Metatarsus primus varus has also a close association with hallux valgus. While some authors report that it in itself is a cause for the development of the deformity, others believe that it might actually be a cause of the deformity. It is still a matter of debate.

The *first metatarsocuneiform joint* (MTC joint) is also thought to play an important role in hallux valgus deformities. The shape of this joint has been described as flat, curved, or oblique. Some authors have observed that with increasing "medial obliquity" of this joint, a hallux valgus deformity would be more likely to occur. Other authors have questioned the fact that this orientation is actually an apparent orientation on the radiographs. Coughlin and Anderson have observed in cadaveric dissections that the first MTC joint at the cuneiform articulation has a superior dorsal convex surface and a flatter concave plantar and inferior surface. This might in itself allow for the variable appearance of the joint on radiographic projections. Also, as previously stated, stability of this first MTC joint is of importance in hallux valgus deformities. Some authors have found a decrease in the intermetatarsal angle following distal soft-tissue releases only or following concomitant metatarsal osteotomies. This might lead one to believe that sufficient mobility is present at the first MTC joint to allow for surgical correction of an increased intermetatarsal angle.

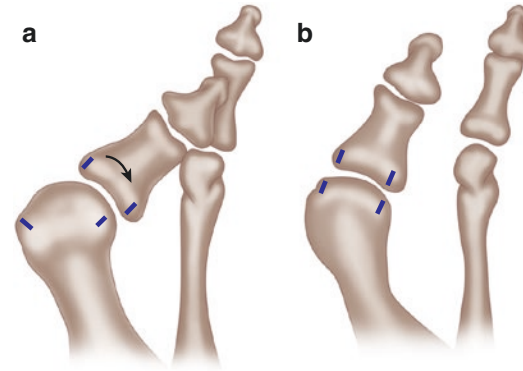

Fig. 58.3 Difference between (**a**) subluxated (incongruent) and (**b**) congruent articular surfaces of first metatarsal joint articular surfaces

The blood supply of the metatarsal head is of particular anatomical importance. It usually arises from a nutrient artery that traverses from lateral to the midshaft of the first metatarsal in a distal direction where it divides into distal and proximal branches. Shereff et al. have shown that the primary blood supply arises from the first dorsal metatarsal artery, first plantar metatarsal artery, and superficial branch of the medial plantar artery. Most of this blood supply penetrates the joint capsule through the dorsal and lateral aspects. The clinical implication of this is that

while performing a capsulorrhaphy or a metatarsal osteotomy, the blood supply is dependent on the remaining vessels and thus a wide soft-tissue dissection might result in avascular necrosis of the metatarsal head.

58.1.5 Classification

The purpose of any classification system should be to ultimately dictate management options. However, with that in mind, one should acknowledge that classification systems for hallux valgus deformities are not rigidly established and should be used as a general guide (Table 58.1).

58.1.6 Patient Evaluation

Similar conditions in the family should also be investigated. The onset of symptoms whether adolescent or later and also the patient's level of activity, occupation, sporting participation, type of shoe wear preference, and consistency with symptoms should be investigated. Additionally, one should thoroughly investigate the reason for surgery and the degree of intensity of symptoms. Some points of consideration would be to inquire about transfer metatarsalgia, callosities or corns, and lesser toe deformities.

As with most foot and ankle disorders, physical examination of the patient should include the gait observation, and foot examination while standing and while sitting. One should document the degree of the hallux deformity, hallux pronation, lesser toe deformity, as well as state of the medial longitudinal arch and the hind foot position.

While examining the first MTP joint range of motion, one should note any crepitus or painful motion. Passive ROM of the first MTP has been reported to be almost 87°.

Examination of the mobility of the first MTC joint should also be performed. This is usually performed with the patient sitting knee flexed, with ankle in neutral and forefoot stabilized with one of the examiner's hand while the thumb and index finger of the other hand hold the first metatarsal and move it from a dorsomedial to plantar-lateral direction. It is the opinion of some authors that even if instability is present, merely realigning the hallux restores stability to the first MTC joint.

58.1.7 Management

58.1.7.1 Conservative Management

Shoe wear with wide toe box and soft soles may give significant relief from patients' symptoms. The use of custom or prefabricated orthotics has not been found to be of value to these patients. Actually, some authors have concluded that these orthotics do not prevent progression of the deformity and even in some cases might increase the hallux valgus angle. Conservative care might perhaps be considered more in patients with hyperlaxity, or those with neuromuscular disorders due to the high recurrence rates.

58.1.7.2 Surgical Management

The patient must be informed that perhaps some residual stiffness or minor reduction in their daily activities might occur.

Broadly when one is faced with a hallux valgus deformity, the congruency and condition of the first MTP joint will play a pivotal role in the procedure selection. If from the offset the joint is degenerative, then a fusion or MTP joint replacement should be considered. On the other hand, if this

Table 58.1 Hallux valgus classification

Hallux degree	HV angle	IM angle	MTP joint	Hallux position	Sesamoid position
Mild	>20°	>11°	Congruent	Might be mild pronation	Normal or 50% subluxation of lateral sesamoid
Moderate	20°–40°	11°–16°	Usually subluxated joint	Pronated	75–100% subluxation of lateral sesamoid
Severe	>40°	>16°–18°	Significant subluxated joint	Moderate or severe pronation	100% subluxation of lateral sesamoid

joint is with normal cartilage, one should examine congruency: if it is congruent or subluxed (proximal phalanx is subluxed on the MT head or not). A working algorithm has been proposed for such deformities. Although several authors might propose different methods of management, this algorithm sets general broad lines of management and one can use it as a general rule of thumb.

Generally, the concept behind this algorithm is that when the proximal phalanx is congruent, then the procedures utilized should be mainly extracapsular to maintain normal relationship between the phalanx and metatarsal head. Conversely, when the phalanx is subluxed on the metatarsal head, a soft-tissue release would be required to restore normal joint congruency. Additionally, the procedure selected might be based on the degree of the deformity present whether mild, moderate, or severe (Fig. 58.4).

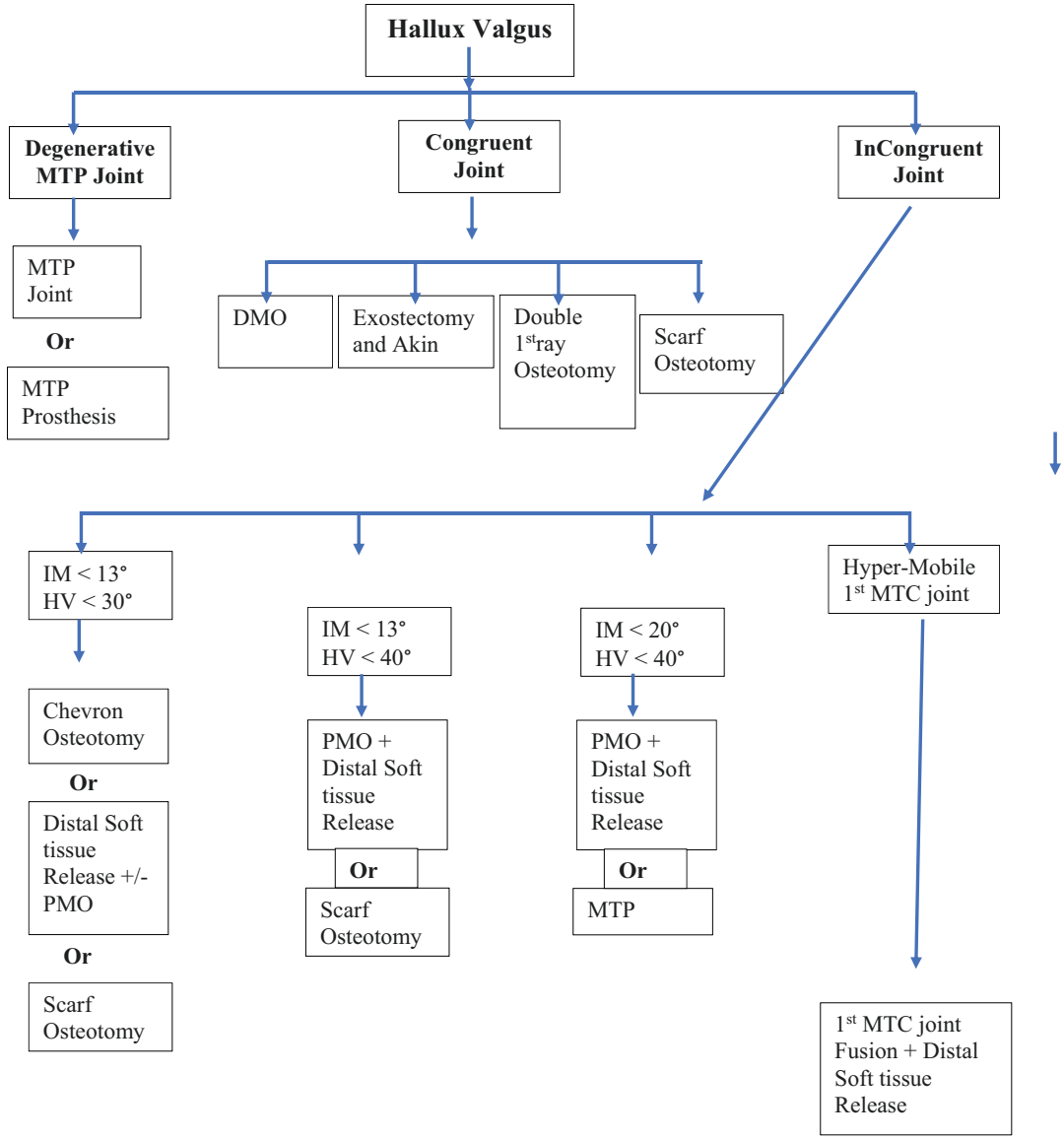

Fig. 58.4 Proposed algorithm for management of hallux valgus deformities. *MTP* metatarsophalangeal, *DMO* distal metatarsal osteotomy, *PMO* proximal metatarsal osteotomy, *IM* intermetatarsal angle, *HV* hallux valgus angle, *MTC* metatarso-cuneiform

When performing a lateral soft-tissue release, the basic concept is the release of the constrained lateral structures, namely the lateral joint capsule, the transverse metatarsal ligament, and the adductor hallucis, thereby reallowing the proximal phalanx to be realigned on the metatarsal head. A medial incision might be performed separately for the removal of the medial eminence and a medial capsulorrhaphy or plication. An Akin procedure is a minimal medial closing wedge resection osteotomy of the proximal phalanx. A chevron osteotomy was so-named by the chevron or V-shaped osteotomy that is performed in the distal metatarsal head. Various modifications and methods of its fixation have since been introduced. This is one of the distal metatarsal osteotomies; others are the Bosch or the Mitchell distal osteotomies. Among the most common metatarsal osteotomies is the scarf osteotomy. It was originally described as a longitudinal Z-type of osteotomy of almost the whole length of the first metatarsal bone.

58.2 Hallux Rigidus

It has been reported that in 2.5% of patients over 50 years, a degenerative arthritis of the first metatarsophalangeal joint (MTPJ) shall be present. This is termed "hallux rigidus" and is the most common arthritic condition that might affect the foot. This condition is associated with pain and loss of motion of the big toe. Usually, conservative management is the first line of treatment, and later surgical management might be warranted with options being removal of excess osteophytes, osteotomies, or fusion of the first MTPJ.

58.2.1 Evaluation

Normal first MTPJ range of motion is usually 75° dorsiflexion and 35° plantar flexion. Pain and joint stiffness that will both worsen with activity are the main complaints of patients with hallux rigidus.

On examination, one might find dorsal osteophytes and tenderness localized to the dorsal joint. Some authors have described a "grind test," which is pain on compression of the first MTPJ.

Radiographs are classic standing anteroposterior oblique and lateral projections. Joint space narrowing, flattening, and widening of the metatarsal head with subchondral sclerosis will be evident. Dorsal osteophytes of the proximal phalanx and metatarsal head might also be evident. Other diagnostic modalities are usually not required. Coughlin and Shurnas described a classification system based on both radiographic and clinical findings.

58.2.2 Management

58.2.2.1 Nonsurgical Management

Management of the condition should start with nonoperative treatment. Nonsteroidal anti-inflammatory drugs, activity modification, orthotics designed to limit motion across the MTPJ, and shoe modifications with high and wide toe boxes are the usual options available. Some authors have suggested steroid injections or hyaluronic acid injections into the first MTPJ.

58.2.2.2 Operative Management

Surgical management options are removal of excess osteophytes, osteotomies, or fusion of the first MTPJ.

Cheilectomy

This was originally described by DuVries in 1959; it involves resection of the dorsal one-third of the articular cartilage of the metatarsal head along with the associated osteophytes on the dorsal surface of both the head and the phalanx.

Moberg Osteotomy

Described as a closing wedge dorsiflexion osteotomy of the proximal phalanx by Boney and Macnab in 1952, it was designed to shift the arc of motion of the first MTPJ to more dorsiflexion.

Keller Resection Arthroplasty

This involves the resection of the proximal base of the phalanx to increase dorsiflexion but at the

expense of stability of the MTPJ. This procedure has been associated with several complications as cock-up deformities of the big toe, weakness at toe-off, and transfer metatarsalgia.

Interpositional Arthroplasty

This is essentially a Keller resection but with the addition of a biological spacer into the joint. Various modifications have been described for the biological spacers, preservation of the flexor hallucis brevis insertion, use of gracilis tendon as interposition, and various other modifications.

MTP Arthroplasty

Historically, the arthroplasty has progressed from silastic implants to all metal implants and then synthetic cartilage implants. The results for each of these types have not been very promising with high failure and loosening rates reported.

First MTPJ Arthrodesis

This is still considered the "gold standard" of treatment for cases with MTPJ arthritis.

58.3 Bunionette Deformity

This is a lateral bony prominence at the fifth metatarsal head that is sometimes painful, especially with constricting shoe wear. The condition was originally described in tailors and hence the name "tailor's bunionette," and this was attributed to the fact that they would be seated working cross-legged causing pressure and friction on the lateral aspect of the foot.

58.3.1 Clinical Evaluation

More commonly, patients will describe pain on the lateral aspect of the foot with pressure from shoe wear. With examination, one should assess hindfoot alignment and pes planus deformities. Hallux valgus and increased width of the foot may be noticed. While the patient is seated, one should examine for lateral eminence swelling, redness ulceration, or keratosis. In particular, location of any callosity is of importance; for example, if the callosity is plantar, one should plan for a correction that involves not only translation but also elevation of the metatarsal head.

Normal radiographic projections and standing anteroposterior, lateral, and oblique views are usually obtained. Most measurements are made on the anteroposterior views similar to hallux valgus deformities. These measurements are metatarsal head width, intermetatarsal angle, and fifth metatarsophalangeal angle.

58.3.2 Management

58.3.2.1 Nonsurgical Management

Very good results have been reported with the use of conservative management for treatment of bunionette deformities although strong high-grade evidence is still lacking. Wide shoes, custom-made orthotics, and pads can alleviate pain.

58.3.2.2 Surgical Management

Surgical options are reserved for failure of conservative treatment. They range from lateral eminence resection to different osteotomies. Adequate randomized controlled studies are still lacking.

58.3.2.3 Lateral Eminence Resection

This might be reserved for patients who exhibit an isolated prominent lateral condyle as this only reduces the mass effect.

58.3.2.4 Distal Fifth Metatarsal Head Osteotomy

Transverse, oblique, and chevron-type osteotomies have been described.

58.3.2.5 Diaphyseal Fifth Metatarsal Osteotomy

This technique is probably reserved for patients with increased four to five intermetatarsal angle or with significant lateral metatarsal shaft bowing.

58.3.2.6 Proximal Fifth Metatarsal Osteotomy

This osteotomy was designed to correct increased four to five intermetatarsal angles but is associated with higher rates of nonunion due to impaired blood supply in the region.

58.3.2.7 Metatarsal Head Resection

This may be considered as a salvage procedure for painful bunionettes, failed osteotomies, rheumatoid forefoot, infections, and neuropathies with ulcers.

58.4 Lesser Toe Deformities

Of all foot problems, those involving the lesser toes are more common with almost 20% incidence. Also, they seem to occur more in females and more in older individuals.

Coughlin and Mann defined the principal deformity to be occurring at the metatarsophalangeal joint (MTPJ). So, a *hammertoe deformity* will have no deformity at the MTPJ but flexion of the middle and possibly the distal phalanges. *Claw toe deformities* will show hyperextension at the MTPJ and flexion of the proximal interphalangeal joint (PIPJ) and the distal interphalangeal joint. However, in most cases, the distinction is not that evident and both deformities can coexist together.

58.4.1 Etiology

Some authors agree that an imbalance between the intrinsic (flexors) and the long extensors plays a role. Others have implicated tight shoe wear causing a crowding of the toes and high heels that might also result in hyperextension at the MTPJ. Another common association is with hallux valgus deformity. Other etiological causes are inflammatory conditions (as rheumatoid or psoriasis) or diabetes or other neurological conditions. In particular, claw toes are associated with the latter condition.

58.4.2 Clinical Examination

As with most foot and ankle conditions, the patient should be examined standing, seated, and during gait or walking. While standing, examination should include assessment of cavus deformities, hallux valgus, or hindfoot malalignments. With the patient seated, one should also examine both the plantar surface of the foot and the dorsal aspects of the toes for callosities or ulcers and try to assess whether the toe deformities are fixed or mobile at both the MTPJ and the interphalangeal joints.

Standard weight-bearing radiographs of the feet with anteroposterior, lateral, and oblique views should be requested.

58.4.3 Management

58.4.3.1 Nonsurgical Management

Obviously, a change of shoe wear is warranted. Usually, the patient is advised wide toe box shoes to accommodate the digits. Tapping and strapping of the toes might be effective in flexible deformities. Additionally, silicon pads or felt pads might be useful for the painful callosities. Nonsteroidal anti-inflammatory medications might be used for pain alleviation.

58.4.3.2 Surgical Management

Generally, if the MTPJ becomes subluxed or dislocated, the management would be usually surgical. Multiple procedures have been described for lesser toe deformity management. These can be broadly classified into soft tissue, bony procedures, or joint destruction procedures.

Soft-Tissue Procedures

Dhukaram and colleagues evaluated a sequential soft-tissue release in the management of lesser toe deformities. The sequence suggested was extensor digitorum longus (or Z-lengthening), extensor digitorum brevis release, dorsal capsule release, collateral ligament release, and reduction of the plantar plate. The authors added a Weil osteotomy plus a flexor to extensor transfer if MTPJ extension remained after those sequential releases.

58.4.3.3 Bony Procedures

If deformity of the MTPJ is severe with dislocation of the proximal phalanx, soft-tissue release may be insufficient and a bony "decompression" might be necessary. Such options as shortening osteotomy of metatarsal head, partial hemiphalangectomy, or metatarsal head arthroplasty might be used.

Metatarsal Shortening Osteotomy

The concept is to relief plantar pressure and reduce the hyperextended or dislocated MTPJ.

Partial Proximal Hemiphalangectomy

This involves excision of the proximal phalanx base.

PIP Joint Arthrodesis

PIP joint arthrodesis may provide a stable pain-free construct.

Take-Home Message

- The term hallux valgus defines a subluxation of the first MTP joint characterized by lateral deviation of the great toe and medial deviation of the first metatarsal.
- Myerson has suggested that bunions occur in 2–4% of the population. The mean age at which patients had surgery for the deformity was 60 years of age.
- The most common extrinsic factor is reportedly shoe wear.
- Hallux rigidus has been reported in 2.5% of patients over 50 years and a degenerative arthritis of the first metatarsophalangeal joint (MTPJ) shall be present.
- Bunionette deformity is a lateral bony prominence at the fifth metatarsal head that is sometimes painful, especially with constricting shoe wear.
- Very good results have been reported with the use of conservative management for treatment of bunionette deformities, although strong high-grade evidence is still lacking.

Summary

The term hallux valgus was originally introduced by Carl Hueter to define a subluxation of the first MTP joint characterized by lateral deviation of the great toe and medial deviation of the first metatarsal. Currently, it is understood that hallux valgus deformity can occur because of lateral deviation of the articular surface of the metatarsal head without any subluxation of the first MTP joint. Incongruent or subluxated hallux valgus deformities are usually progressive.

Myerson has suggested that bunions occur in 2–4% of the population. Almost 46% of bunions have been reported to occur before the age of 20 years. The mean age at which patients had surgery for the deformity was 60 years. The hallux valgus deformity can be caused by extrinsic or intrinsic factors. The most common extrinsic factor is reportedly shoe wear. Patient's level of activity, occupation, sporting participation, type of shoe wear preference, and consistency with symptoms should be investigated. Shoe wear with wide toe box and soft soles may give significant relief from patients' symptoms. The patient must be informed that perhaps some residual stiffness or minor reduction in their daily activities might occur.

Hallux rigidus has been reported in 2.5% of patients over 50 years, and a degenerative arthritis of the first metatarsophalangeal joint (MTPJ) shall be present. Normal first MTPJ range of motion is usually 75° dorsiflexion and 35° plantar flexion. Pain and joint stiffness that will both worsen with activity are the main complaints of patients with hallux rigidus. Management of the condition should start with nonoperative treatment. Surgical management options are removal of excess osteophytes, osteotomies, or fusion of the first MTPJ.

Bunionette deformity is a lateral bony prominence at the fifth metatarsal head that is sometimes painful, especially with constricting shoe wear. More commonly, patients will describe pain on the lateral aspect of the foot with pressure from shoe wear. Very good results have been reported with the use of conservative management for the treatment of bunionette deformities, although strong high-grade evidence is still lacking. Surgical options are reserved for failure of conservative treatment. They range from lateral eminence resection to different osteotomies.

Of all foot problems, those involving the lesser toes are more common with almost 20% incidence. So, a hammertoe deformity will have no

deformity at the MTPJ but flexion of the middle and possibly the distal phalanges. Claw toe deformities will show hyperextension at the MTPJ and flexion of the proximal interphalangeal joint (PIPJ) and the distal interphalangeal joint.

Questions

Multiple correct answers are possible. Answers available in the book back matter.

1. Hallux valgus is frequently associated with:
   (a) Transverse flat foot
   (b) Hollow foot
   (c) Flat foot
   (d) Club foot
2. Hallux valgus occurs in:
   (a) 2–4% of the population
   (b) 5–10% of the population
   (c) 10–20% of the population
   (d) 20–30% of the population
3. The most common extrinsic factor causing hallux valgus is:
   (a) Shoe wear
   (b) BMI
   (c) Age
   (d) Gender
4. The intermetatarsal angle is the line formed between the longitudinal axis:
   (a) Of the first and second metatarsal bones
   (b) Of the second and third metatarsal bones
   (c) Of the third and fourth metatarsal bones
   (d) Of the fourth and fifth metatarsal bones
5. Normal first MTPJ range of motion is usually:
   (a) 75° dorsiflexion and 35° plantar flexion
   (b) 35° dorsiflexion and 75° plantar flexion
   (c) 15° dorsiflexion and 25° plantar flexion
   (d) 5° dorsiflexion and 55° plantar flexion

Further Reading

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