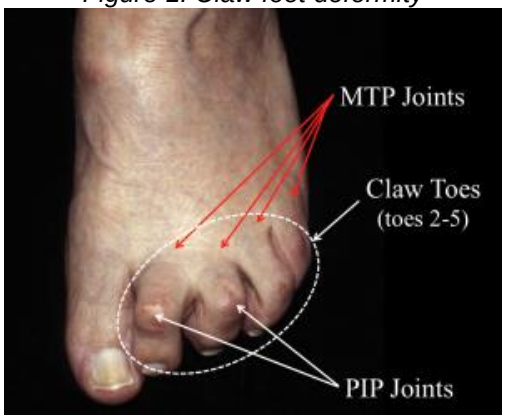
Claw Toes

(Also: Hammer Toes)

Figure 1: Claw foot deformity



Summary

Claw toes can develop in many people as they age, and can make fitting into restrictive shoes uncomfortable. This condition can create symptoms in one or all of three places:

1. On the top of the toes if they rub against the shoes
2. On the tips of the toes if they jam into the soles of the shoes
3. At the base of the toes (metatarsophalangeal (MTP) joints) as they become subluxed (displaced partially out of joint)

In addition, claw toes are often associated with forefoot pain (metatarsalgia), as the MTP joints commonly become displaced in patients with pronounced claw toes. Subluxation is the upward displacement of the toe relative to the metatarsal head or “ball of the foot.” This leaves the metatarsal heads prominent and subject to excessive overload. Patients with this problem often describe “walking on marbles.”

Clinical Presentation

Claw toes result from an inherent muscle imbalance. It is common for patients to develop claw toes as they get older. It is particularly common if there is a family history of the condition. Patients develop claw toes when the long muscles originating from the lower leg overpower the smaller muscles in the foot. This imbalance leads to flexion at the proximal interphalangeal joint, and extension at the metatarsal phalangeal joint, creating the clawing effect. This condition can also occur in post-traumatic situations, when there is an injury to one of the tendons or if there is a compartment syndrome affecting the small muscles of the foot. Commonly, clawing of the toes develop if the calf muscles are tight. If the calf is tight, there is the recruitment of the muscle that pulls the toes upward, the extensor digitorum longus, to assist in pulling the foot up to clear the ground while walking in preparation for the next step.

Claw toe deformities typically involve all four lesser toes (toes 2-5). It is not uncommon for the second toe to have the most pronounced deformity, but a close look at all four toes will often demonstrate that the deformity is present in each toe (See Figure 1). It is uncommon for the big toe to develop clawing, although this does happen in certain conditions, including Charcot Marie Tooth disease. The term ‘hammer toe’ is almost synonymous with claw toes. The main difference between these two conditions is the position of the distal interphalangeal joint (DIP joint). In hammer toes, this joint is extended and in a claw toe it is flexed. However, it can sometimes be difficult to clinically differentiate between the two.

Physical Examination

On physical examination, the physician will want to identify the main areas of tenderness. This will give some indication as to the cause of the pain. If the tenderness is on the top of the toes and is associated with some callus formation, symptoms are likely from direct pressure on the top (dorsal aspect) of the toe. If tenderness occurs on the tip of the toe, this may be from the pressure of the tip of the toe (“hammering”) into the sole of the shoe. In addition, whether or not the toes are flexible or fixed is important. Each joint will be evaluated to assess whether this joint can return to its normal position. The

overall alignment of the toes is important, as well as the sensation, motor function, and blood supply of the toes.

Treatment

Non-Operative Treatment

Most claw toe deformities can be treated non-operatively. The literature describes a number of potential treatments including:

- Applying pads to the area involved. There are numerous commercially available devices, which can be highly effective in reducing the deformity and providing padding or off-loading the areas of prominence.
- Toe spacers and Hammer toe splints (Figure 2). Some commercially available products splint the toes in an improved position. These devices may only provide short-term correction of the toe deformity, but for many patients this can improve their symptoms when the walk and use shoes.
- The use of the wide and deep-toe box. A shoe with more room up front might be better able to accommodate the deformity and make a huge difference in the patient's symptoms.
- A soft pre-fabricated orthotic to create cushioning over the toe region can be helpful, particularly if the symptoms occur at the tip of the toes.
- Trimming painful calluses. If prominent calluses have developed, trimming these back on a regular basis can be very helpful.
- Dynamic intrinsic muscle exercises. This has been proposed as a way to lessen the progression of claw toe deformity. Exercises, such as trying to pick up tissues with the toes, may be beneficial to keep the toes supple.

Figure 2: Hammer toe splint

Operative Treatment

Surgery is occasionally recommended to correct claw toes that cannot be successfully treated non-operatively. There are a variety of procedures that have been described, and often a combination of procedures is performed. Because the deformity occurs as a result of a muscle imbalance, tendon transfer or lengthening may be needed in order to enact a long-term correction and minimize the risk of a recurrence. Common procedures that may be used in combination with others include:

- Straightening the Toe (Proximal Interphalangeal (PIP) joint resection). If there is a fixed deformity at the PIP joint (the first "knuckle" of the toe), this joint can be removed, or repositioned in a straightened position and then fused with some type of fixation, often a wire insert through the toe. This joint may not fully heal with bone, but even a fibrous union (scar tissue) in a straight position will be effective.
- MTP joint (joint at he base of the toe) soft tissue release (capsulorraphy/capsulotomy). Because the MTP joint flexes up, the top part of the joint capsule (soft tissue) becomes very stiff and contracted. It is often necessary to release this, in order for the joint to fall back into the normal position. The MTP joint is held with a temporary wire in the new "straighter" position.
- Extensor tendon lengthening. Often the tendons that pull the toe upwards (long extensor tendons originating from the extensor digitorum longus muscle) will become contracted and tight. These tendons can be lengthened or simply released to allow the toes to fall back into an improved position. If released the little toe extensor may be anchored to the foot so the associated muscle, the extensor digitorum longus, can assist in dorsiflexion of the foot.

- Flexor to extensor tendon transfer [Girdlestone-Taylor procedure]. This procedure involves a release of one of the tendons that pulls the toe downwards (the flexor digitorum longus) at the tip of the toe (distally), and a transfer of this tendon to the top of the toe (dorsal aspect of the proximal phalanx). This procedure aims to convert one of the primary deforming forces leading to clawing of the toes into a force that helps correct the deformity. It produces a fairly predictable correction of the toes, however, the surgery is slightly more involved than some of the other procedures.

Recovery from Surgery

It is important to understand that the recovery from any toe surgery is often more prolonged than a patient expects. During the healing process, an increase in blood flow to the involved toe occurs. This creates swelling and pain. This could persist for many weeks or even months. It is common to still have swelling and stiffness in the toes 4-6 months post-surgery. The patient should be prepared to limit their activity for a period that is often longer than they think, or would like.

Potential Complications

General Complications

The usual list of general post-surgical complications may occur with a claw toe correction. This includes the potential for:

- wound healing problems
- infection
- nonunion (if the PIP joint is fused)
- local nerve injury to the nerves that provide sensation to the tips of the toes
- Deep Vein Thrombosis (DVT) – very uncommon
- Pulmonary Embolism (PE) – very uncommon

Specific Complications

Complications that are specific to claw toe corrections include:

- Malunion: It is common for the toe to heal in a position that may not be perfectly straight. Minor degrees of deformity will be mostly a cosmetic concern, which is why almost all surgeons discourage patients from having toe surgery if the concerns are mostly cosmetic. In severe cases, the toe may be significantly malpositioned, even to the point where further surgery is required.
- Recurrence of the Deformity: Other complications include failure to fully correct the claw toe deformity, or the potential for recurrence of the deformity over time.
- Loss of blood supply to the tip of the toe: The blood supply to the tip of the toe can be tenuous. There are two small arteries (one on either side of the toe) which supply blood to the tip of the toe. It is not uncommon for one of these vessels to be absent. If the blood supply to the tip of the toe is lost the tissue will die and it may be necessary to amputate part, or all of the toe.
- Stiffness: It is not possible to straighten a claw toe and have the involved joints move normally. A good surgical outcome is a stiff, straight toe with the joints properly lined up.