CHAPTER 1

Modifications of the Pan Metatarsal Head Resection for Increased Postoperative Stability

David C. Alder, DPM

INTRODUCTION

The pan metatarsal head procedure is a very successful procedure for correcting extreme contracture deformities of the forefoot in rheumatoid patients as well as non-arthritic patients with very unstable hallux valgus and hammer toe deformities. Generally, the procedure works very well when combined with a first metatarsophalangeal joint (MTPJ) fusion and hammer toe arthrodesis. On occasion, certain problems occur as time goes on and the foot reacts to the new alignment of the joints and relative instability of the resected metatarsal heads. If the metatarsal heads are left too long, the plantar aspect of the remaining shaft creates plantar pressure due to the shape of the metatarsal and this can result in chronic pain or ulceration. When the metatarsals are cut too short this can result in excessive contracture of the digits due to lack of bone to support the digit. When the proximal interphalangeal joint (PIPJ) arthrodesis is successful and the metatarsals are left long, this stability then causes the (DIPJ) of the digits to contract since this is where the force across the ray will have motion to occur and eventually create a fixed contracture.

The arthrodesis of the first MTPJ is a common procedure done with the pan metatarsal head resection and it can be fixated in a variety of ways. Due to the deformities often present in this type of patient, more complex forms of fixation can make the procedure longer than it needs to be. A more simple form can be just as successful and be performed in a fraction of the time and without as much restriction of the bone resection to accommodate the fixation.

MODIFICATIONS

Less Metatarsal Head Resection But Also Remove the Plantar Prominence of the Metatarsal Neck

When resecting the metatarsal head, only resect the amount needed to reduce the digital deformity and to eliminate the plantar prominence creating pressure. Often the bone cut can be made at the neck of the metatarsal head leaving plenty of bone and then the plantar prominence is resected using a rongeur (Figure 1) and then smoothing off the bone with a bone rasp (Figure 2).

When the Risk of DIPJ Contracture is High, Do a Flexor Tenotomy

When the digits are severely contracted in the sagittal plane, it will reduce the possibility of later contracture of the flexor tendon at the level of the PIPJ arthrodesis. The tenotomy can be easily performed with a scalpel or tenotomy scissors, and then the Kirschner wire (K-wire) is placed across the fusion site.

First MTPJ Arthrodesis Can Be Performed With Simple K-Wire Fixation

When possible, 2 K-wires can be used to fuse the first MTPJ. The procedure usually takes less the 30 minutes, requires less dissection and will accommodate adequate bone resection without compromise for fixation placement. By using the K-wire fixation, the patient can have limited walking privileges in a rigid postoperative shoe. The wires are then removed after 6 weeks and lessen the chance of pain from the fixation in the case of a non-union or prominent fixation. The wires are placed across the joint in a non-parallel fashion to prevent motion across the fusion site (Figure 3).

The Incisional Approach of Parallel Longitudinal Incisions Provides the Best Exposure and Limits Soft Tissue Complications

The author prefers to use 5 linear incisions evenly placed to give maximum exposure. Keeping the distance between the incisions even, allows for adequate room to prevent narrow skin islands that can lead to soft tissue necrosis (Figure 4).

POSTOPERATIVE CARE

The patient's foot is wrapped with a soft dressing with mild compression. A rigid padded postoperative shoe is used. If the patient is going to need to do much walking, we will encourage the patient to use a wheelchair or knee scooter for the long distances. A the end of the 6-week period the wires are removed and the patient is allowed to wear a stable shoe. In conclusion, with simple modifications of the traditional pan metatarsal head resection and first MTPJ fusion stability can be improved postoperatively leading to better outcomes with decreased complications.

Figure 1. Rongeur used to resect bone on plantar side of metatarsal.

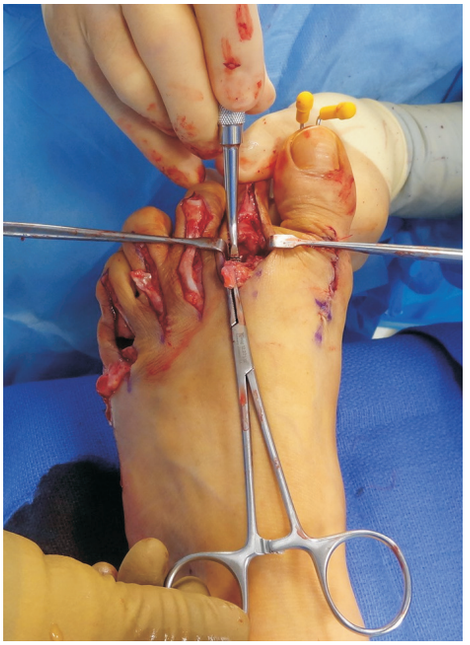

Figure 2. Bone rasp used to smooth off the remaining rough bone on plantar side of the metatarsal.

Figure 3. Kirschner wires are used to secure the fusion site.

Figure 4. Parallel incisions are used for maximum exposure.