

FLOATING METATARSAL OSTEOTOMY FOR TREATMENT OF CHRONIC NON-HEALING WOUNDS

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INTRODUCTION

Chronic plantar wounds can be very difficult to heal, and left untreated can lead to severe infection and possible amputation. The challenge in treating these wounds is mainly the pressure present when the patient is weight bearing. Often these plantar wounds start out as calluses in neuropathic patients. The patient has the callus debrided and for a period of time this will work. In time the callus may turn to a wound due to a number of factors such as increased pressure, decreased circulation, or change in activity level. Whatever the reason the common issue is an increase in pressure that the tissue can not handle.

Common treatments for these ulcers are designed to return the tissue to a pre-ulcer condition. When a problem with circulation is the issue, revascularization with appropriate wound care will often allow the wound to heal with temporary off-loading of the wound. In cases where a temporary increase in pressure or activity cause a blister and this results in a wound, the treatment of short term

off-loading with appropriate wound care, will often result in a healed wound.

The difficult wounds to heal are the type where the environment has changed and the tissue can not withstand the pressure and the wound does not heal in spite of appropriate wound care, circulation, and antibiotic treatment for infection. The environment of the forefoot may change due to atrophy of the fat pad, changes in the position of the metatarsals due to Charcot arthropathy, or even the increased contracture of hammer toes or ankle equinus. These changes will eventually lead to increased hypertrophy of the skin in the form of callus formation and eventually wound formation (Figure 1).

When an area on the forefoot becomes a chronic site for ulcer formation it is time to consider a procedure to decrease the chances of the patient developing a chronic ulcer leading to osteomyelitis. If nothing is done, the alternative is to eventually treat the foot for osteomyelitis and this will most likely lead to a partial amputation of the foot.



Figure 1. Healed ulcer that continues to breakdown regardless of conservative treatment.

HISTORY

Procedures such as shortening osteotomies, plantar condylectomies, dorsiflexory wedge osteotomies, and metatarsal head resections have all been used by the author for the purpose of relieving pressure from the plantar forefoot. These procedures all have uses and will relieve pressure, however each have complications associated with them and levels of complication that in the neuropathic diabetic may make them unattractive.

The floating osteotomy has also been used in the past and was classified as minimal incision surgery. The concept was that the bone was cut and it would find the position that would suit the foot best by the patient ambulating on it. In an active population this will produce extreme complications due to the increased pressure on the remaining intact metatarsals. This can lead to pain, transfer lesions, floating toes, and even stress fractures.

In a population of diabetics who are less ambulatory, the floating lesser metatarsal osteotomy can provide enough pressure relief to allow a wound to permanently



Figure 2. Incision site for lesser metatarsal osteotomy.



Figure 3. Site to perform the metatarsal osteotomy with the periosteum intact.



Figure 4. Completed osteotomy.

heal with minimal risk to the soft tissue due to the minimal dissection and lack of internal fixation.

When the risk of transfer lesion is high due to a very active patient or the need to also reduce ankle equinus is also an issue, an Achilles tendon lengthening can also be performed at the same time. Shortening of the ray due to metatarsal head resection is also eliminated and the elevation in the toe is no more than is seen in a DFWO without the extra dissection or the use of internal fixation. The complications of the floating lesser metatarsal osteotomy are less than those of a partial amputation due to osteomyelitis.

PROCEDURE

The procedure is done through a 2-cm incision on the dorsal aspect of the metatarsal (Figure 2). The subcutaneous tissue is separated, and the bone with the periosteum intact is identified (Figure 3). Neurovascular structures are retracted and the osteotomy is made proximal to the head along the neck of the metatarsal (Figure 4). None of the plantar flare of the metatarsal neck should be left attached to the shaft of the metatarsal or this may lead to future spur formation and future pressure wounds.

After the wound is flushed, the layers are closed. The author allows the patient partial-weight bearing in a padded postoperative shoe for 2 weeks then full-weight bearing in the postoperative shoe until the wound is completely healed. The patient is then transferred to a custom molded accommodative orthotic and the patient follows up for routine foot care visits to quickly identify any future wounds that may begin in other locations of the foot.

CONCLUSION

The floating lesser metatarsal osteotomy is an effective way to treat chronic plantar wounds caused by excessive pressure from the metatarsals. This procedure is best performed in the moderately active diabetic patient that is facing a strong possibility of future infection if the wound is not healed soon. This procedure should only be used after conservative treatments have failed to heal the wound.