Arthritis of the Tarsometatarsal Joint and Midfoot

Mark S. Myerson, MD

Arthrodesis of the tarsometatarsal (TMT) joint is performed for arthritis of varying extent with or without deformity, in the setting of idiopathic osteoarthritis, post-traumatic and inflammatory arthritis, and for correction of neuropathic deformity. The arthrodesis should be limited to symptomatic joints. Common to each of these procedures is the need to correct and restore the alignment with the arthrodesis, since the functional results of arthrodesis are far better if the forefoot as well as any hindfoot deformity is corrected. The deformity that is commonly associated with arthritis of the TMT joint is abduction of the forefoot relative to the hindfoot associated with sagittal and coronal plane instability of the 1st metatarsal. If possible, I try to use only one incision for an arthrodesis if it includes two adjacent joints. For the middle column arthrodesis (2nd and 3rd TMT joints) I use a single dorsal incision which is slightly more lateral than the 2nd metatarsal, since the 3rd metatarsal-cuneiform joint extends farther over toward the midline of the foot than is readily apparent. If the 3rd metatarsal-cuneiform joint is to be included in the arthrodesis, then the dorsal incision must be centered correctly over the midfoot, and not the 2nd metatarsal. If the 1st and 2nd TMT joints are to be fused, then either one or two incisions can be used. If there is minimal deformity present, then I try to use one dorsal incision in the 1st-2nd interspace. If however deformity and instability of the medial column are present, then I will use a separate medial incision to plantarflex the medial column. The joint is prepared by removing the remaining articular cartilage with a flexible chisel. Perhaps the most important aspect of the joint preparation is aggressive perforation of the joint surface using a 1.5 or 2mm drill bit, made at 1-2mm intervals across the entire joint surface. Following joint preparation, correction is therefore done first with the medial column, adducting the first metatarsal and locking this in position. For the first metatarsal to be positioned correctly, the hallux is grasped, and the base of the first metatarsal is pushed inward into the medial cuneiform, while the distal portion of the first metatarsal is pushed into adduction. At the same time, the hallux is dorsiflexed, and this dorsiflexion forces the first metatarsal into plantar flexion. A guide pin or K-wire is used to lock the first metatarsal in the corrected position. This can then be used as a template on which to build the rest of the foot. Once the first metatarsal is correctly positioned, the second metatarsal can be reduced into its base and the mortise with a bone reduction clamp, which is applied to the medial cuneiform and the base of the second metatarsal. Although I prefer to use screws wherever possible, sometimes they simply do not work adequately because of either the plane of the metatarsal or the paucity of bone to work with. The medial column is easier to stabilize by inserting a screw from the medial cuneiform aimed distally into the first metatarsal. Although this insertion can be made from the 2nd metatarsal directed proximally, it may split the base of the metatarsal. If the instability of the medial column is severe and the fusion is extended across to the navicular cuneiform joint, then I will consider the use of a dorsal or medially applied plate. At
times, I apply the plate on the tension side of the bone directly under the first metatarsal cuneiform joint, particularly in patients for whom instability and the potential for nonunion are increased (e.g., in those with neuropathy. There are current fixation options such as custom anatomically designed midfoot plates which provide stability as well as locking and compression capacity (Maxlock, Orthohelix, Akron OH, and DePuy, Warsaw IN). A novel alternative for fixation is using an intramedullary system (Tars-X, Extremity Medical, Parsippany, NJ)

Jung HG, Myerson MS, Schon LC. Spectrum of operative treatments and clinical outcomes for atraumatic osteoarthritis of the tarsometatarsal joints. Foot Ankle Int. 2007 Apr;28(4):482

Revision of Failed Midfoot Arthrodesis in Charcot Arthropathy

Stefan Rammelt, MD, PhD, Hans Zwipp, MD, PhD
strammelt@hotmail.com
Dresden, Germany

Charcot osteoarthropathy at the foot and ankle is a progressive, often devastating disease with profound consequences for the patient’s mobility and quality of life. The majority of Charcot feet manifest in the midfoot area, which is the focus of this symposium. The goal of reconstructive surgery is an ulcer-free plantigrade, stable foot that allows the patient to walk in a commercially available boot [4].

Surgical stabilization aims at correction of the deformity – mostly midfoot breakdown with prominent medial or plantar bone fragments – and thus prevention of ulcerations and soft tissue infections with its deleterious consequences as well as functional rehabilitation of patients with highly unstable feet [2]. Still, there is a considerable complication rate ranging from 10 to more than 30% after surgical interventions in Charcot feet, including non-union, recurrent deformity and ulceration, and, most seriously, deep soft tissue and bone infection [3].

The reasons for failure of midfoot arthrodesis are manyfold. There are patient-related factors like poor bone stock, low healing potential of soft tissues and bone, obesity, non-compliance with the postoperative protocol, and loss of sensation at the foot. On the other hand, inappropriate fixation and timing of surgery may contribute to recurrent deformities. Not every non-union warrants revision arthrodesis which carries a