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)

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Revision of Failed Midfoot Arthrodesis in Charcot Arthropathy

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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
similar risk of further complications. In cases of stable, fibrous union with a plantigrade foot, patients may be able to walk without recurrent ulcerations [2].

If hardware failure leads to recurrent deformity and instability with impeding or manifest ulcerations, revision arthrodesis is the treatment of choice. Options for internal fixation include multiple large diameter screws or intramedullary rods, and interlocking plates [1, 6, 7]. Shortening of the midfoot while balancing the medial and lateral foot columns may increase the chance of solid union. In cases of manifest infection, radical, repeated debridements are warranted to avoid amputation. External fixation is a viable alternative, either as temporary or definite stabilization [5]. The goals of revision arthrodesis are ideally the same as in primary stabilization but at least to salvage the foot and prevent amputation in order to enable the patient to an ambulatory lifestyle which significantly reduces mortality.
Fig. 1 a-b: Failed midfoot (Chopart) fusion with small fragment screws in a 46 year old overweight female with Charcot arthropathy. A stable midfoot alignment was achieved with a plantar interlocking plate and multiple large fragment screws buttressing both the Chopart and Lisfranc joints. c: 2 years after fusion the patient is ambulating freely on a plantigrade foot.

References:

Static Ring Fixation in Charcot Foot Arthropathy

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77 year old longstanding diabetic who weights 215 pounds and has not walked on this foot for almost 1 year.