Surgical Treatment of Charcot Midfoot Neuroarthropathy
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The treatment of midfoot arthropathy in diabetic and other neuropathic patients is in evolution. Contact casting in the acute phase and management with an accommodative orthosis is still the mainstay of treatment. In the past, surgery for this condition was limited to resection of bony prominences to prevent or resolve ulceration and lengthening of the contracted Achilles tendon. Medical comorbidities may preclude surgery and make post-operative complications more likely.

Some patients will continue to have significant problems despite appropriate non-operative care. Progression of deformity and intractable ulceration often lead to deep infection, osteomyelitis and at times amputation. There are some cases where resection of bony prominence may destabilize the foot and lead to progressive deformity. Attempts have been made to classify these deformities, but to date, no study has shown a predictive value for prognosis based on these classifications.1;2

Surgical reconstruction of Charcot deformity by bony resection and midfoot arthrodesis is controversial, although increasingly reported. Challenges include slow fusion rates due to neuropathy, impaired vascular status, impaired immune function, patient obesity and non-compliance with weight bearing restrictions. In addition, the bone involved in Charcot fracture dislocations is not normal and often suffers form significant osteoporosis and fragmentation. These challenges have lead surgeons to develop techniques to increase the mechanical stability of fusion constructs.

Several studies have shown a high rate of deformity recurrence and non-union when standard crossed lag screw techniques are used for midfoot fusion in patients with neuroarthropathy. Newer, more stable techniques include the use of large plates, locking plates and intramedullary screw application. These techniques use stronger implants than have traditionally used in foot and ankle fusions and bridge the area of Charcot bone involvement, achieving fixation in more normal bone proximally and distally. Use of an external fixator to off-weight the extremity is also gaining popularity. Definitive studies have not been published to support these techniques, although small series have been reported at national meetings with promising results.

We have reported successful correction of neuropathic Charcot midfoot deformity in 21/22 patients with minimum 2 year follow-up using a technique whereby the fusion is fixes with long screws that pass into the intramedullary canal of the metatarsals.3 This technique minimizes the exposure needed for hardware application and bridges the area of Charcot dissolution. Indications were primarily patients who presented with a grossly unstable dislocation, a “bayonet” foot and recalcitrant ulceration. Most complications were seen in Sammarco Type V dislocations (navicular and perinavicular dislocation/fragmentation).

In selected patients, Charcot neuroarthropathic deformity can be definitively treated by correction and arthrodesis. Techniques are evolving and we consider this treatment primarily for patients who are at risk of future amputation.

Reference List:
