

Staged correction of equinovarus in a diabetic patient: A case report

by Amanda Kamery DPM^{1*}, Byron Hutchinson DPM FACFAS²

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A rigid equinovarus deformity in the diabetic patient is a challenge for many surgeons. The utilization of a single stage, acute correction of the deformity can lead to soft tissue compromise and neurovascular complications. Using gradual correction by means of external fixation, with subsequent internal fixation for arthrodesis, provides a viable option for limb salvage in this difficult patient cohort.

Keywords: Reconstructive surgery, diabetes, external fixation, lower extremity

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The diabetic patient with a rigid equinovarus deformity subsequent to soft tissue contracture is a unique and challenging patient [1]. Limb salvage options for this patient population are limited and complex. The utilization of gradual correction with external fixation proves to be an adequate treatment option that has less complications and leads to a stable and functional foot in this at risk group [1]. Single stage acute correction is another viable option, however, this can lead to limb length discrepancy due to significant bone resection or neurovascular compromise [2,3]. Longstanding soft tissue contracture of the medial ankle can lead to a rigid equinovarus deformity, in this setting acute correction is not a viable option due to the risk of neurovascular compromise and the delicate soft tissue envelope [4].

Case Report

A 59 year-old female presented to the clinic with a rigid equinovarus deformity secondary to multiple medial malleolar wound debridement. The patient

developed this deformity over several months of wound care, which resulted in soft tissue contracture to the medial ankle. She presented to our service non-ambulatory and unbraceable due to progression of the deformity (Figure 1). She subsequently developed a wound on the lateral malleolus.

Staged surgical correction was planned due to severe contracture and questionable medial neurovascular and soft tissue compromise. It was felt that a single stage correction would not be ideal in this particular patient. A dynamic circular frame was placed for gradual correction (Figure 2). Five days post initial procedure, the patient was educated on how to perform distraction with a total of 2 degrees of angular correction daily. The patient was non-weight bearing during the correction process.

After 42 days, approximately 84 degrees of correction was obtained (Figure 3). At this point, a clinical decision was made to proceed with a Tibio-talo-calcaneal (TCC) fusion.

1 - Franciscan Foot and Ankle Institute- St Francis Hospital, Federal Way, WA PGY-3

2 - Research Director, Franciscan Foot and Ankle Institute- St Francis Hospital, Federal Way, WA

* - Corresponding author- akamery@kent.edu



Figure 1 Pre-operative AP foot radiograph showing severe equinovarus deformity.



Figure 3 Clinical picture after 42 days of correction.



Figure 2 Intra-operative clinical picture.

It was determined that enough correction had occurred to relax the medial soft tissue envelope. The patient was returned to the operating room for the secondary procedure. This included external fixator removal and TCC arthrodesis with an intramedullary nail. The patient remained non-weight bearing for 6 weeks until bony consolidation was seen on x-ray (Figure 4).

The patient was then transitioned to protected weight bearing for 2 weeks in a controlled ankle motion (CAM) boot. The patient eventually successfully transitioned into a Charcot restraint orthotic walker (CROW) (Figure 5). The patient has remained ambulatory in a CROW for 6 months.



Figure 4 Six-week post secondary procedure.



Figure 5 Clinical picture six weeks post secondary procedure.

Discussion

The diabetic patient with a severe lower extremity deformity and soft tissue compromise presents a challenging case for foot and ankle surgeons. Staged correction of these deformities utilizing gradual correction by external fixation and subsequent internal fixation with arthrodesis proves to be a viable option to help with limb preservation in these patients. Our case presentation demonstrates the efficacy of staged correction in these challenging patients and that limb salvage and return to ambulation in a CROW can be obtained and maintained.

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