We utilize a femoral locking plate on the lateral hind foot and ankle, which provides a rigid, stable construct for a tibiotalocalcaneal (TTC) arthrodesis. The plate has a hybrid component that allows lag and locking screw fixation. In four of our patients tibial fractures occurred just proximal to the plate. This case series discusses our treatment for proximal tibial fractures above the femoral locking plate following TTC arthrodesis.

Methodology and Hypothesis

We have experienced four patients who underwent a TTC fusion utilizing a femoral locking plate that developed a fracture above the proximal portion of the femoral locking plate after a traumatic event. These instances occurred between 12/2012-04/2017. We believe that these fractures occurred due to the combination of poor bone quality in the diabetic patient population and the stiffness of the femoral locking plate. We believe the rigidity of the plate transmitted the traumatic forces into the proximal aspect of the plate which caused the bone to fracture at that location.

Procedure

All patients were placed in the supine position under general anesthesia. Attention was directed to the lateral aspect of the ankle where an incision was made and the necessary hardware was removed. Attention was directed to the fracture site. Bone reduction forces were used to reduce the fracture. With the soft tissue envelop intact, the fractures were reduced. The fracture was then fixed with a 300 mm intramedullary nail. The appropriate size diameter of the nail was based on the “chatter” and patient size. Transfixation screws were applied to the proximal and distal aspects of the nail.

Results

All four of the patients had successful unions. Average time to achieve bony union was approximately 2 months. No complications from the surgery occurred. The followup period for these patients is 12-60 months.

Discussion

Diabetes is a complex disease that causes harmful effects to the body, including the foot and ankle. Diabetic charcot arthropathy is a risk factor in these subset of patients that can lead to limb loss.

Intramedullary nailing is the gold standard for tibial fractures. This option provides stability without extensive dissection. Due to the orientation of the fractures sustained by these patients, transition to an IM nail allowed salvage of fusion as well as fixation of the fracture. The nail was utilized in a retrograde fashion in order to treat the fracture as well as provided stability to the arthrodesed ankle and subtalar joint.

References

2. Franke, J. et al. “Infrapatellar vs. suprapatellar approach to obtain an optimal insertion angle for intramedullary nailing of tibial fractures.”