Revision Arthrodesis with the Use of Fresh Allograft and Rigid Plate Fixation

Foot & Ankle Category: Ankle

Author(s):
Beat Hintermann, MD
Alexej Barg, MD
Markus Knupp, MD

Introduction
End-stage ankle osteoarthritis is a debilitating condition that results in substantial functional limitation and a poor quality of life. Two treatment modalities have been discussed in the literature: arthrodesis as the traditional treatment and total ankle replacement (TAR) as an alternative method with increasing acceptance among orthopedic surgeons. Non-union in patients with ankle arthrodesis and failure of prosthesis components in patients with TAR belong to major postoperative complication requiring new treatment strategies. Revision arthrodesis in this patient cohort is technically demanding, especially due to decreased bone quality and/or deficient bone stock. The objectives of this study were therefore: 1) to describe our treatment algorithm and surgical technique in patients with failed ankle fusion / TAR, 2) to determine intra- and perioperative complications rate, and 3) to determine the fusion rate.

Methods
17 consecutive patients (8♂, 9♀, mean age 48 years, range 22 – 78) with failed TAR (n = 12) or failed ankle fusion (n = 5) were including into this prospective study. Patients with Charcot neuroarthropathy of midfoot and/or hindfoot were excluded. First, all hardware / prosthesis components were removed. Second, fibrous and necrotic tissue was removed until healthy, viable bone was exposed. In all patients isolated tibiotalar fusion was performed using anterior double plating with additional two oblique screws across the joint reaching the posterior aspect of talus under fluoroscopic control. In two patients additional posterior plate was used to achieve the appropriate primary stability. Postoperatively, all patients were allowed partial weight bearing during the first 8 weeks and full weight bearing thereafter. All patients were clinically and radiologically assessed after 3.5 (2 – 4.8) years. All radiographs were independently evaluated by two persons to assess the osseous healing. When not conclusive, computed tomography has been additionally performed.

Results
There were no intraoperative complications. Wound-healing occurred within two weeks after the surgery without adverse events in all but two cases. In two cases the infection resolved with intravenous antibiotics for 7 days, no operative debridement was necessary. A solid fusion at the site of arthrodesis was detected radiographically after 4, 6, and 8 months in 12, 4, and one patient, respectively. No ankles had to be revised. In three ankles progression of degenerative changes in subtalar joint was observed, however, up to date no subtalar fusion was necessary due to relatively low symptoms.

Conclusion
Our surgical technique with the use of fresh allograft and anterior double plating was shown to be a reliable revision surgery method with low complication rate and high fusion rate. We recommend our treatment algorithm in this patient cohort with challenging bone conditions.