Intermediated-term Results of Salvage Procedure using Tibiocalcaneal Fusion and Strut-fibular Graft for Ankle Arthropathy with Severe Bone Defect

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Introduction/Purpose: Severe bone defect around the ankle joint is a challenging problem in salvage operation. It has been considered as one of major factors leading to the failed fusion, because it can be difficult to make the rigid internal fixation and the compact bone filling. This retrospective study was performed to evaluate the clinical outcomes of the tibiocalcaneal fusion combined with strut-fibular graft as a salvage procedure for end-stage ankle arthropathy with severe bone defect.

Methods: Twenty-eight patients were followed for more than 3 years after tibiocalcaneal fusion using the locking compression intramedullary(IM) nail and strut-fibular graft. The mean age was 57.6 years, and the mean follow-up period was 4.2 years. The clinical evaluation consisted of the American Orthopaedic Foot and Ankle Society(AOFAS) scores, Foot and Ankle Ability Measure(FAAM) score. The subjective satisfaction score, postoperative complications, and the reoperation rate were evaluated. As the radiographic evaluation, the period to fusion, the degree of shortening compared with contralateral limb, and the degenerative change on adjacent joints were analysed.

Results: AOFAS score significantly improved from preoperative average 28.8 points to 80.4 points at final follow-up (p<0.001). FAAM score had significantly improved from preoperative average 33.5 points (daily activity), 15.4 points (sports activity) to 79.8 points, 68.4 points at final follow-up (p<0.001). The period to fusion were average 18.2 weeks (tibia-fibular graft) and 19.5 weeks (calcaneus-fibular graft), respectively. 26 patients (92.8%) except for 2 patients achieved complete fusion. The degree of limb shortening was maintained from preoperative average 12.8 mm to 14.5 mm at final follow-up (p=0.236). There were 3 cases of postoperative wound infection, 3 cases of superficial peroneal nerve injury, 4 cases of metal irritation, 3 cases of degenerative changes on adjacent joint, and 2 cases of reoperation following the failed fusion.

Conclusion: Tibiocalcaneal fusion using the locking compression IM nail and strut-fibular graft appear to be an effective salvage procedure for end-stage ankle arthropathy with severe bone defect. Although longer operation time and more postoperative complications have happened as compared to the cancellous bone graft alone, this surgical technique can contribute to the pain relief and improvement of gait ability through a satisfactory fusion rate and minimization of limb shortening.