Ankle Fusion with Simultaneous Lengthening Using the Ilizarov Method

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Purpose: While ankle fusion is a good salvage procedure, it becomes more complicated in situations with bone loss and infection. The challenges include difficulty with acute shortening to achieve bony union, unacceptable leg length discrepancy, and problems with the use of internal fixation in the face of infection. The purpose of this study was to review our experience with these complicated cases and determine if simultaneous ankle fusion and tibia lengthening using Ilizarov method could be successful as a salvage procedure.

Methods: Seven patients with distal tibia or talus bone loss as a result of trauma in 6 and neuropathic arthropathy in one were treated between 1999 and 2002. There were 5 males and 2 females with an average age of 43 (range: 35—56). All patients had previous multiple operations which had failed including ankle fusion (1 patient) and tibiocalcaneal fusion (1 patient). Four patients had free flap procedures done. All patients had chronic osteomyelitis. Average total bone loss was 5.8 cm (range, 3.5 — 10). Bifocal compression-distraction osteosynthesis was performed in all cases using a circular frame. Four patients underwent tibiotalar fusion and three patients underwent tibiocalcaneal fusion. Lengthening at a proximal tibia osteotomy was performed in all patients. Bone graft of

the docking site was done in five patients. Full weight bearing was encouraged during the entire treatment. Clinical and radiographic parameters were assessed.

Results: Bony union was achieved in 6 of 7 patients. The mean amount of lengthening was 4.4 cm (range, 2 — 9). The average time in the frame was 8.7 months (range, 5 — 16). Three patients developed a stiff nonunion of the fusion after the initial treatment- two were treated with repeat application of the frame for 3.5 and 5 months, one patient chose to have a below knee amputation rather than frame re-application. Leg length discrepancy after frame removal averaged 1.5 cm (range, 1 — 3). One patient with a leg length discrepancy of 3 cm underwent an additional procedure for lengthening of 2.6 cm one year after frame removal. There was one recurrence of the infection 4 months after removal of the frame secondary to avascular necrosis of the talus that was present pre-operatively. This patient was offered a tibiocalcaneal fusion but chose to have below knee amputation for personal reasons. Lengthening did not affect the range of motion of the knee joint. Full range of motion of the knee at follow up as well as during the treatment was noted. Infection was cleared in 6 of 7 patients.

Conclusion/Significance: The use of the circular frame provides an alternative reconstructive technique for treatment of very difficult problems associated with infection, bone loss and deformity about the ankle. This is an effective method, which can be used to achieve ankle fusion, optimal leg lengths, and eradication of infection. This salvage procedure is an alternative to below knee amputation.