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Abstract

Category: Limb Lengthening; Trauma, Acute; Nonunions

Title: Simultaneous Treatment of Bone and Soft-tissue Defects with the Ilizarov Method

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What was the question?

Can the Ilizarov Method be used to treat bone and soft-tissue defects in the tibia simultaneously without the use of flap coverage?

How did you answer the question?

Twenty-five patients from multiple university centers with tibia bone and soft-tissue defects as a result of trauma were reviewed. Ilizarov frames were used to simultaneously shorten the bone and soft-tissue defect. These patients were not considered candidates for flap coverage and this treatment was a limb salvage undertaking in all cases.

What are the results?

The average patient age was 33.7 years (range, 16-58). All fractures were open-Gustillo-Anderson Grade 3. The average size of bone and soft-tissue defect after debridement was 9.7 cm (range, 2-25) and 5.8 cm (range, 2-14) respectively. Infections of the bone were present in 10 patients; infections of the soft-tissue were present in 16 patients. Two patients had flap coverage which then had partial necrosis resulting in the soft-tissue defect. The average time of compression in the frame was 17 weeks (range, 5-39) and time to soft-tissue

closure in the frame was 14.8 weeks (range, 3-41). Bone grafting of the bony docking site was performed in 12 patients. Bony union occurred in 24 patients. Three patients required intramedullary nailing after frame removal to achieve bony union. One patient with a nonunion is satisfied and does not wish additional treatment. The average time in the frame was 41.5 weeks (range, 10-82). Infections were cleared and there were no recurrences in all patients. Lengthening at another site was performed in 11 patients. These sites were the proximal tibia, middle tibia, fibula, and the distal femur. The average amount of bone lengthening was 5.5 cm (range, 2-11). Final leg length discrepancy (LLD) averaged 1.4 cm (range, 0-5). Residual deformity was present in 7 patients. This averaged 5.6⁰ valgus (range, 3⁰ -9⁰) and 5.6⁰ recurvatum (range 5⁰ -8⁰). Five patients required skin grafts to assist with soft-tissue closure. All patients developed superficial pin tract infections with no significant sequelae.

What are your conclusions?

The Ilizarov method can be used successfully salvage legs with infected tibial bone and soft-tissue defects when flap coverage is not an option. Gradual shortening of the defect is accomplished with a frame resulting in bony union and soft-tissue closure. Lengthening can be performed at another site. Advances in frame design and technique should help prevent residual deformity.