Bone and soft-tissue defects of the tibia from trauma are complicated problems to manage. The chronic diaphyseal infections that sometimes result are equally as challenging. The authors present their shared experience over an 8-year period employing ring fixators to close bone and soft-tissue defects using acute shortening and bone transport. Also, basic explanations of monofocal, bifocal, and trifocal bone transport are included.

For several decades, Ilizarov external fixators have been used for treatment of tibial bone defects and nonunions. Over a seven-year period, Mahaluxmivala et al. compared acute shortening and then lengthening versus bone transport for treating tibial nonunions with the Ilizarov method. In their series there was no recurrence of infection and all cases went on to union with an excellent bone result as assessed by the Paley bone result evaluation system. The authors recommended acute shortening over bone transport when possible because of the shorter treatment time and less procedures needed to achieve union. Bone grafting of the docking site is also recommended when employing bone transport.

Mahaluxmivala et al. reported on patients who did not specifically have soft-tissue problems, but none of the patients evaluated by Rozbruch et al. had adequate enough soft tissues to even qualify for flap coverage. A retrospective review published last month in the plastic and reconstructive literature described the change in treatment plans of open tibias in a Level I trauma center. Parrett et al. described a 12-year period in which the overall number of open tibia fractures increased but the number of free-tissue transfers decreased. Advances in wound care technology and a better understanding of local flaps was attributed to the change. Their amputation rate did not increase nor did their soft-tissue infection and osteomyelitis percentages.

Wound vats have changed the management and outcomes of traumatic injuries. It is well known that granulation tissue can form on exposed bone and tendon treated with a wound vac (DeFranzo et al.). This device has contributed to the decreased need for free flaps in the distal tibia, for skin grafts can now be placed onto the abundant bed of granulation tissue.
High-energy open tibia fractures with associated soft-tissue injury are challenging to treat. As technology and research continue to expand the available treatment options, outcomes must continue to be assessed to ensure that the patients benefit. Older treatment modalities with successful results should not be forgotten for the sake of technology.

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References: