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Simple Solutions for Difficult Problems: A Beginner's Guide to Ring Fixation 1
Michael S. Pinzur

Ring external fixation is a surgical method for leg lengthening and deformity correction. It allows limited surgical exposure and dissection and can be tolerated for prolonged periods as compared to threaded uniplaner or multiplaner constructs. Because of the complexity in application and adjustment of the frame constructs, most orthopedic surgeons avoid using these devices. Surgeons are advised to apply these techniques initially to less complicated clinical situations, expanding application with comfort and proficiency. This discussion introduces ring fixation and provides guidelines for simple applications. Experience with these simple applications allows surgeons to expand their spectrum of proficiency and provides alternatives for solving complex clinical problems.

The Basics of Ring External Fixator Application and Care 15
Douglas N. Beaman and Richard Gellman

The advantages of ring external fixation for correction of complex deformities of the foot and ankle include the ability to correct severe deformity, perform gradual correction, modify treatment during correction, and minimize neurovascular damage. External fixation can provide opportunities to operate on scarred and contracted tissues, preserve joints and joint function, maintain or gain foot length, and allow weight bearing during treatment.

Salvage of Pilon Fracture Nonunion and Infection with Circular Tensioned Wire Fixation 29
James J. Hutson, Jr

Nonunion, malunion, and infection are complications encountered when treating fractures of the distal tibia extending into the joint surface. There is rank order of severity of those complications extending from a varus collapse of the medial column of the distal tibia with a reduced joint surface to an infected nonunion with destruction of the joint surface, segmental bone loss, and damaged soft tissue envelope. Malunion and malposition of nonunion of the distal tibia have a combination of angular deformity, translation, rotational malalignment, and shortening. These deformities require correction in the reconstruction and there are multiple technique pathways to achieving a successful reconstruction.

Perioperative Planning for Two- and Three-Plane Deformities 69
J. Charles Taylor

Primary multiplanar external fixation is efficacious for a variety of fractures and may avoid a salvage situation. Complex deformity in conjunction with fractures, nonunions, and malunions can be measured and corrected with the Taylor Spatial Frame using the chronic and especially the total residual correction methods. Distal referencing—characterizing a deformed proximal fragment with respect to a normal distal fragment—is very useful in most lower-limb salvage cases. Corrections may be performed in stages using way points, and additional total residual corrections may be performed as needed. The same frame and analysis used for gradual correction may be used in conjunction with intramedullary nailing or plating in some cases.

Hindfoot Salvage with External Fixation 123
Ahmed M. Thabet and Paul C. Kupcha

Hindfoot salvage procedures by definition present circumstances requiring extraordinary measures to prevent or limit damage or destruction. Although this technique is used at some centers as the only means of correcting and fixating foot and ankle deformities, it is an expensive procedure. Other available methods may be more expeditious depending on the circumstances. However, the benefits of external fixation in certain circumstances are invaluable. Circular frame external fixators are important tool for the foot and ankle surgeon.

External Fixators as an Adjunct to Wound Healing 145
Mark W. Clemens, Pranay Parikh, Melanie M. Hall,
and Christopher E. Attinger

Complex foot and ankle wounds present multiple challenges for the reconstructive surgeon. Soft tissue deficits must be closed to protect underlying structures from infection and to provide a stable

environment for healing. Surgical options commonly used include healing by secondary intention, local flap closure, skin grafts, pedicled flaps, and free tissue transfer. Despite a surgeon's best operative efforts, these strategies may fail because of postoperative shear forces created by premature joint motion or pressure (either weight bearing or decubitus). In the properly selected patient population, external fixators serve as an indispensable adjunct to wound healing by providing temporary offloading or immobilization of joints.

Charcot Salvage of the Foot and Ankle Using External Fixation 157
Janet D. Conway

This article details the advantages of external fixation for salvage of the Charcot foot and ankle. Preoperative evaluation, postoperative care, and surgical technique for external fixation are described. The literature on the effectiveness of this technique in the Charcot foot and ankle is reviewed.

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