

Use of a Motorized Intramedullary Bone Transport Nail for Trauma: Tips, Tricks, Corticotomy Techniques, and Rate and Rhythm

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Abstract

The introduction of internal magnetic nails (IMNs) for bone lengthening and bone transport has given us exciting new tools with which to treat segmental bone loss. Distraction osteogenesis has a long record of success in recreating even large segments of bone, but the availability of IMNs now offers the possibility of performing distraction osteogenesis without the drawbacks of external fixation. However, there are aspects of treatment with IMNs that are critical to understand to achieve success and minimize complications. These include assessment of feasibility in relation to available bone stock and segment configuration, the condition of the soft tissue envelope, and the presence of contamination or infection. They also include execution aspects such as bone end preparation, nail placement, need for and positioning of adjuvant fixation, corticotomy techniques, rate and rhythm of distraction, staged screw exchange, docking site preparation, and nail extraction. We discuss these issues in detail and introduce some novel techniques not previously described including the comminuted wedge osteotomy, testing of the nail with initial compression, and retention plug application for nail extraction to assist in optimizing success in certain clinical situations.