

Proximal Tibia Shaft Fractures: Intramedullary Nail Treatment with Manual versus Tension Wire-Assisted Reduction

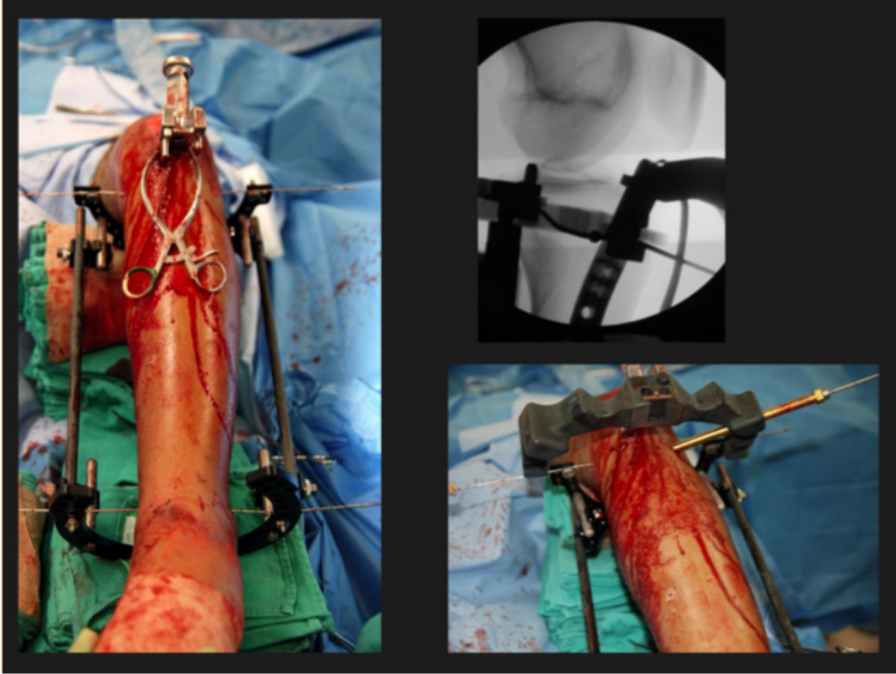
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Purpose: We sought to compare the postoperative reduction achieved with proximal tibia shaft fractures treated with intramedullary nails using manual reduction to those treated with tension wire-assisted reduction.

Methods: All skeletally mature patients with proximal tibia shaft fractures treated with an intramedullary nail beginning with the first use of tension wire-assisted reduction in December 2007 through September 2015 were reviewed. 77 patients with proximal tibia fractures underwent intramedullary nailing at a single Level I trauma center. 42 of the 77 underwent tension wire-assisted intramedullary nailing, while the remaining 35 underwent conventional intramedullary nailing with manual reduction. The main outcome measurement was malreduction, defined as $>5^\circ$ of angulation in any plane.

Results: The manual reduction and tension wire-assisted groups showed similar age and gender demographics. Open fractures comprised 33% of the tension wire-assisted group and 57% of the conventional group. Additional surgical techniques, such as blocking screws and percutaneous plates, were frequently utilized within both groups ($P = 0.1944$). Nailing in the semiextended position via a suprapatellar approach was more frequently utilized by surgeons who applied the tension wire-assisted technique ($P = 0.0005$). Valgus malreduction occurred three times as often in the manual reduction group ($P = 0.0382$), while the incidence of apex anterior deformity was roughly equivalent ($P = 0.4994$) between the two groups. The series of proximal tibia fractures treated with tension wire-assisted nailing had a significantly lower rate of postoperative malalignment than the group treated with manual reduction intramedullary nailing ($P = 0.0124$).

Conclusion: Tension wire-assisted intramedullary nailing showed a distinct advantage in the treatment of proximal tibia fractures. Specifically, the rate of postoperative malalignment in the coronal plane was significantly lower among fractures treated with a tension wire reduction technique prior to nailing. No significant difference in malalignment was observed in the sagittal plane. The most prevalent form of malalignment in the manual reduction group was valgus, while the tension wire-assisted group contained an equal incidence of valgus and apex anterior malalignment. Additional surgical reduction techniques, including blocking screws, were frequently utilized in both groups. Semiextended technique was more commonly utilized in the tension wire-assisted group. In addition, it is notable that tension wire-assisted reduction allows for greatly decreased radiation exposure by eliminating the need to hold the fracture reduced during fluoroscopy, and the need for surgical assistants is almost eliminated. We therefore conclude that treatment of proximal tibia shaft fractures with tension wire-assisted reduction provides an effective means to improve the ease of surgery and postoperative results for these difficult fractures.



The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.