Exploring Outcomes of Rigid Tibial Intramedullary Nailing in Pediatric Patients

Jessica Lynn Koshinski, Daniel Hayes, Mark Seeley

INTRODUCTION:
Tibial shaft fractures are the most common lower extremity fractures in pediatric patients. Treating these fractures requires caution to avoid growth plate interruption and disruption of the native anatomy of the tibial slope. Rigid intramedullary nailing fixation may be beneficial for patients approaching or at a skeletal mature age, while avoiding common complications of flexible intramedullary nailing, such as infection, hardware pain, and frequent hardware removal. In this study, we investigated the clinical and anatomic outcomes of patients aged 10-16 years old that underwent rigid intramedullary nail fixation of a tibial shaft fracture.
METHODS: A retrospective chart review of patients who underwent rigid tibial intramedullary nailing at Geisinger Health System was done from March 2009 to December 2021. Data such as injury severity, associated injuries, radiographic follow up, postoperative complications, postoperative weightbearing status, hardware removal, tibial slope, and radiographic evidence of growth arrest were collected.
RESULTS: Eighty-one cases were identified, with an average age of 14.9 +/- 1.12 years old. Patients had a mean follow up of 394.4 days, and a mean radiographic follow up of 429.2 days. Closed fractures comprised 80.2% of fractures treated with rigid intramedullary nailing, and 49.3% sustained an associated fibula fracture. More than half of patients began weightbearing as tolerated immediately postoperatively (55.6%). Of the 81 cases, 9.9% proceeded with hardware removal, the majority being removal of proximal or distal locking screws. One infection was reported, consisting of an infection of an overlying skin graft.
DISCUSSION AND CONCLUSION: Our findings suggest that rigid intramedullary nailing may offer a safe alternative to flexible intramedullary nailing in patients 10-16 years old, including earlier postoperative weight-bearing time and low infection rates, while mitigating some of the risks associated with flexible intramedullary nailing, such as malunion and hardware removal.