Suprapatellar Versus Infrapatellar Intramedullary Nailing of Distal Tibia Fractures: Is There a Difference in Alignment?

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Purpose: This study was performed to evaluate angular malalignment after intramedullary nailing (IMN) of distal tibia fractures (AO/OTA 43 type fractures) using either a suprapatellar (SP) or infrapatellar (IP) approach. Prior studies have shown increased malunion rates following IMN of distal tibia fractures using an IP approach compared to plating. It was hypothesized that malalignment rates of distal tibia fractures treated with IMN would be decreased with use of an SP compared to an IP approach.

Methods: Between January 2010 and January 2015, all patients who underwent IMN for AO/OTA 43 type fracture were retrospectively reviewed and screened for inclusion. Inclusion criteria were skeletal maturity and AO/OTA 43 type fractures. Those with simple intra-articular fracture extension were included but those that required open reduction and internal fixation of the tibial plafond were excluded. Other exclusion criteria included previous injury and/or deformity. Standardized intraoperative and immediate postoperative AP and lateral radiographs were reviewed for alignment in the coronal and sagittal planes. Angular malalignment was defined as ≥5° in either plane. Chi-squared and simple t tests were used for evaluation of categorical and mean data, respectively.

Results: 350 patients were screened for inclusion. 69 patients met inclusion criteria: 47 men and 22 women. 33 underwent IMN of their distal tibia fracture through an IP approach and 36 through a SP approach. Valgus was the most common deformity in the coronal plane, occurring in 11 patients (16% of all nails). The likelihood of valgus deformity was lower in the SP group than the IP group (8.3% vs 23.5%, P = 0.08). Recurvatum was the most common deformity in the sagittal plane, occurring in 7 patients (10% of all nails) and was equally likely using either approach (11.1% in SP nails vs 11.8% of IP nails, P = 0.93). More patients had fibula fixation in the SP group versus the IP group (51.6% vs 17.6%, P = 0.008); however, there was no correlation between fibula fixation and malalignment.

Conclusion: Distal tibia fractures nailed through an SP approach have improved coronal alignment compared to an IP approach. Although not reaching statistical significance, the data in this study demonstrate a clear trend towards this finding. Based on these results, IMN via SP approach may improve overall alignment in distal tibia fractures. A multicenter, prospective randomized trial may provide a definitive answer to this question.

See pages 401 - 442 for financial disclosure information.