Clinical Outcomes in Intramedullary Nail Fixation of Distal Tibia Fractures With Tibial Plafond Involvement

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Purpose: There is increase in intramedullary nail (IMN) fixation in distal tibia fractures with plafond involvement; however, debate remains on the type of fractures amenable to IMN fixation and the treatment of associated distal fibular fractures. The objective of this study was to determine the rates of infection, nonunion, malunion, and ankle arthrosis in tibial fractures with plafond involvement treated with IMN. We anticipated that tibia fractures with plafond involvement treated with IMN would have acceptable rates of alignment, union, infection, joint arthrosis, and subjective outcomes.

Methods: A retrospective chart review of distal tibia fractures treated with IMN with and without distal fibula fractures was completed. Of these fractures, 57 involved the tibial plafond and were treated with percutaneous or limited open reduction with independent articular lag screw fixation. Fibular fixation consisted of a percutaneous intramedullary screw or plate fixation. Outcome measures included malunion, nonunion, infection, and ankle arthrosis. Subjective outcomes were assessed by Patient-Reported Outcomes Measurement Information Systems (PROMIS) pain interference (PI) and physical function (PF) scores. Outcomes were compared between tibia fractures with an intact distal fibula versus distal fibula fracture, tibia fractures with and without fibular fixation, and percutaneous versus open treatment of fibular fractures.

Results: All tibia fractures (57 of 57) were treated with IMN. The rate of malunion was 9% (5 of 57), nonunion 14% (8 of 57), infection 9% (5 of 57), and ankle arthrosis 3.5% (2 of 57). Distal fibula fracture occurred in 51% (29 of 57), of which 76% (22 of 29) were stabilized with fixation. There was no difference in infection, nonunion, malunion, or ankle arthrosis in tibial plafond fractures treated with IMN with and without distal fibular fractures. Similarly there was no significant difference in these outcomes in tibial fractures with and without fixation of distal fibular fractures. However, when subcategorized, there was a significant increase in tibial malunion in patients with plate fixation of the fibula fracture compared to an intramedullary fibular screw. There was no significant difference in infection, nonunion, or ankle arthrosis between those groups. Mean PROMIS PI and PF scores were 58.4 ± 9.7 and 42.1 ± 8.8. These were not significantly different with regard to fibular fixation.

Conclusion: The clinical and subjective outcomes indicate that IMN with independent fixation of displaced articular components is an acceptable treatment method for distal tibia fractures with plafond involvement. Fibular fixation, although often used in the presence of a distal fibular fracture, does not appear to significantly improve alignment compared to no fibular fixation.