

Does Provisional Plating of Closed Tibia Fractures Have Higher Complication Rates?

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Background/Purpose: Provisional plating is a useful adjunct to intramedullary nailing of tibia fractures. This technique allows an accurate reduction to be maintained during reaming and placement of a nail. Most of the literature reports on this technique in the setting of open fractures. The literature is scant with regard to outcomes of patients that undergo provisional plating for closed tibia fractures. The concern is that patients treated in this manner will have higher infection and nonunion rates. The purpose of this study was to compare the patient outcomes following provisional plating with standard reduction techniques for closed tibia fractures.

Methods: Patients with closed tibia fractures (OTA 42) treated with intramedullary nailing from January 2008 through December 2014 were identified in our prospectively collected orthopaedic trauma registry. Patients were excluded if they passed away during their initial hospital course, had incomplete radiographs, were skeletally immature, had a vascular injury, or had less than 6 months follow-up or were not healed at final follow-up. Medical records were reviewed for demographic data including age, gender, and mechanism of injury. Operative reports and fluoroscopic images were reviewed to document reduction strategy. Standard reduction techniques included closed reduction, percutaneous clamp application, and the use of a femoral distractor or external fixator. At final follow-up, additional surgical procedures and any complications were recorded including infection, implant removal, and nonunion. Radiographs at final follow-up were assessed for malunion $>5^\circ$.

Results: During this period, there were 265 closed tibia fractures that underwent intramedullary nailing with 35 patients receiving provisional plating (PP) and 230 patients receiving standard reduction techniques. Nine patients (1 PP and 8 standard) died during hospitalization, 1 PP had a vascular injury, and 95 patients (6 PP and 89 standard) had insufficient follow-up. This left 27 patients in our PP cohort and 133 patients in our standard cohort. Mean follow-up was similar between the PP cohort (mean 13 months; range, 6-38 months) and standard cohort (mean 14 months; range, 6-79 months) ($P = 0.43$). We were unable to detect a difference in postoperative infection between the PP cohort (0/27, 0%) versus the standard cohort (5/133, 3.8%) ($P = 0.59$). Similarly, we were unable to detect a difference in nonunions between the PP cohort (2/27, 7.4%) versus the standard cohort (4/133, 3%) ($P = 0.27$). Malunion rates were similar between the PP (1/27, 3.7%) and standard groups (6/133, 4.5%) ($P = 1.0$). Finally, implant removal was similar between the PP (3/27, 11%) and standard groups (15/133, 11%) ($P = 1.0$).

Conclusion: We were unable to detect a difference in rates of infection, nonunion, malunion, or implant removal in patients with closed tibia fracture treated with provisional plating and intramedullary nailing compared with standard reduction techniques and intramedullary nailing.