Temporary Stabilization of Tibia Fractures: Does External Fixation or Temporary Plating Result in Better Outcomes?

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Purpose: Provisional stabilization of high-energy tibia fractures using temporary plate fixation (TPF) or external fixation (ex-fix) prior to definitive intramedullary nailing (IMN) is a strategy common in damage control orthopaedics, but there is a lack of comprehensive data evaluating outcomes between these. This study compares outcomes of patients temporarily stabilized with either TPF or ex-fix, or treated with early acute definitive IMN only, assessing complications such as nonunion and deep infection.

Methods: A retrospective review was performed on all adult patients with tibia fractures treated with IMN followed until fracture union at a single Level I trauma center from 2014 to 2022. Medical records were evaluated for nonunion and deep infection. Demographics, injury characteristics, and fixation methods were recorded. Significance between patients who underwent TPF and ex-fix was compared with a matched cohort of early IMN.

Results: 81 patients were included for analysis; 27 were temporarily stabilized with TPF (N = 12) or ex-fix (N = 15). 54 early IMN cases defined the matched cohort. All groups had similar patient and fracture characteristics, including open fracture rates of 9 (75%, TPF), 10 (67%, ex-fix), and 38 (70%, early IMN, P = 0.877). The difference in rates of nonunion between groups was significant, with TPF, ex-fix, and early IMN groups at 17, 40, and 11% respectively (P = 0.027). Early IMN had lower rates of nonunion (11% vs 40%, P = 0.017) and deep infection (13% vs 40%, P = 0.028) compared to ex-fix. There was no significant difference in complication rates between early IMN and TPF. The average months of follow-up based on group included: TPF 13.2 ± 12.7, ex-fix 26.2 ± 23.7, and early IMN 12.7 ± 12.3 (P = 0.010).

Conclusion: Temporary ex-fix followed by staged IMN was associated with a higher rate of nonunion and deep infection. There was no difference in complication rates between TPF and early definitive IMN. These data suggest that ex-fix followed by IMN of tibia fractures should be avoided in favor of early definitive IMN when possible. If temporization is needed, TPF may be a better option than ex-fix.