

Does Concurrent Fibular Fixation and Intramedullary Tibial Nailing Increase Rates of Tibial Nonunion?

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Purpose: Fibular osteosynthesis at the time of intramedullary (IM) fixation of tibia fractures can be beneficial for a number of reasons. There is a lack of objective evidence indicating whether or not fibular fixation increases rates of tibial nonunion after IM nailing. The purpose of this study is to determine the rates of tibial nonunion in patients who have undergone tibial IM nailing with concurrent fibular fixation.

Methods: A retrospective review of a prospectively collected database was performed at a single Level I academic trauma center. All tibia fractures treated with IM nailing from 2005 to 2014 were screened and all those treated concurrently with fibular fixation were analyzed. All patients 18 years and older with a tibia and fibula fracture treated with tibial IM nailing and concurrent fibular fixation who were determined radiographically and clinically healed or had a minimum 1-year follow-up were included for final analysis. Nonunion was defined as a fracture with no radiographic progression towards healing at 9 months after surgery on consecutive radiographs over a minimum 2-month period. Demographic data and injury characteristics, time to union, rates of union, rates of implant removal, and postoperative complications were recorded. A matched cohort of patients who underwent tibial IM nailing without fibular fixation was used for comparison.

Results: 166 patients met inclusion criteria after concurrent tibial IM nailing and fibular fixation during this time period. Mean follow-up was 20.6 months. There was an 11% rate of tibial nonunion. 57% of fractures were open. There was a 30% rate of smoking and 5% rate of diabetes in this cohort. In a matched cohort of 174 patients who underwent IM nailing without fibular fixation, there was no significant difference in patient demographics, injury characteristics, infection rates, postoperative complications, or rates of tibial nonunion. When the cohorts were pooled, the rate of nonunion was significantly higher in patients with open fractures, postoperative infections, and diabetes.

Conclusion: In these well matched cohorts, fibular fixation did not affect rates of union after tibial IM nailing. The rate of tibial nonunion in both cohorts is comparable to published rates of tibial nonunion after IM nailing without fibular fixation. This indicates that fibular fixation does not increase the rate of tibial nonunion after IM nailing. Open fractures and postoperative infection were seen at a significantly higher rate in the fractures that went on to nonunion in both cohorts, indicating that these are primary risk factors for tibial nonunion.