Distal Femur Fracture Outcomes and Complications of Dual Implant Fixation Compared to Single Plate Fixation – A Multicenter Review

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INTRODUCTION:
While distal femur fractures are traditionally treated with single plate fixation, this method has been associated with 20% nonunion rate. In addition, patients are usually limited with weightbearing restriction which in turn causes other complications. Recently, there has been significant interest in dual implant fixation for distal femur fractures to improve union rate and shorten time to full weight. The purpose of this study is to evaluate the utilization trend of dual implant fixation in recent years at our institution and to compare outcomes and complications between patients treated with dual implant vs. single plate for distal femur fractures.
METHODS:
A retrospective review was completed for distal femur fractures treated with surgical fixation from January 2018 through October 2022 at three trauma centers. A comparison of outcomes was performed between patients with single plate vs. dual implant fixation. Data was collected for analysis on patient demographics, injury characteristics, treatment, operative statistics, time to weightbearing, complications, and nonunions.
RESULTS:
A total of 266 patients with 269 distal femur fractures were included in the study; 234 fractures treated with single plate fixation and 35 fractures treated with dual implant fixation. Dual implant utilization increased from 4.7% to 14.3% (p=0.23). Patient demographics including age, sex, and BMI were similar between the single and dual implant cohorts, *Table 1*. There was a significant difference in smoking status, with 42.3% of the single implant cohort and 17.2% of the dual implant having a positive smoking history (p=0.005). The single plate group had a complication rate of 19.2% compared to 14.3% in the dual implant cohort, but no statistical significance was demonstrated (p=.642). Mean time to weightbearing was reduced in the dual implant cohort, but no statistical significance was observed (p=.437). Rate of nonunion was similar between groups with 5.1% in the single plate cohort compared to 5.7% in the dual implant group. Patients in the dual implant group advanced to full weightbearing faster than the single plate group at 9.4 weeks postoperatively compared to 10.1 weeks, without statistical significance (p=0.437). Procedure duration and intraoperative blood loss increased from 2:32 hours to 3:29 hours and 263mL to 349mL from the single plate to the dual implant cohort respectively, with statistical significance (p<0.05).
DISCUSSION AND CONCLUSION:
Dual implant fixation utilization is increasing in frequency at our institutions. Dual implant fixation is associated with an increased procedure duration and intraoperative blood loss. There was no significant difference in mean time to weightbearing, complication rate, or nonunion rate. Nonunion and complications were uncommon in both the single plate and dual implant groups.