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

Joseph Larson, Nick G Bostrom, Sandy Vang, Mir Ibrahim Sajid, Hassan Riaz Mir, Gennadiy Busel, Mai P Nguyen

INTRODUCTION: The purpose of this study is 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 September 2024 at three trauma centers. Inclusion criteria were adult patients 18 years or older with distal femur fractures treated with single plating (SP) or dual implant (DI: nail/plate or dual plate). Exclusion criteria were patients with less than three months of follow up or with pathologic fractures. Data was collected for analysis on patient demographics, injury characteristics, treatment, operative statistics, time to weightbearing, complications (90-day mortality, 90-day readmission, reoperations, and deep venous thrombosis), and nonunion. Comparative analyses were performed between the SP vs. DI groups with statistical significance set at <0.05.

RESULTS: 361 patients with distal femur fractures were included in this study including 273 (75.6%) in the SP and 88 (24.3%) in the DI group. Patient sex, BMI, and smoking status distributions were similar in both groups ($p>0.05$). Procedure duration, estimated blood loss, and transfusion rates were higher for DI compared to SP group (3.2 hours vs. 2.2 hours $p<0.001$, 292 cc vs. 229 cc $p=0.008$, 30.7% vs. 19.5% $p=0.028$, respectively). DI patients advanced to full weightbearing significantly faster than SI patients (5.2 weeks vs. 9.0 weeks, respectively; $p<0.001$). Compared to SI, DI patients had more reoperations for wound infections (5.7 % vs. 0.4%, $p<0.001$) and septic non-unions (2.3% vs. 0, $p=0.01$). No significant difference was observed in the aseptic nonunion rate (2.3% DI vs. 4.0% SI $p=0.4$). The total complication rates were similar in both groups (25.0% in DI vs. 16.8% in SP, $p=0.10$).

DISCUSSION AND CONCLUSION: While DI allows for a shorter time to full weightbearing, it is associated with longer surgical time, more blood loss, and a higher transfusion rate which may contribute to higher infection rates for the DI group.