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

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Purpose: The purpose of this study is to compare outcomes and complications between patients treated with dual implant versus 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, surgical statistics, time to weightbearing, complications (90-day mortality, 90-day readmission, reoperations, and deep venous thrombosis), and nonunions. Comparative analyses were performed between the SP and DI groups with statistical significance set at <0.05.

Results: In the study, 361 patients with distal femur fractures were included; 273 (75.6%) were in the SP group and 88 (24.3%) were 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 the DI group compared to the 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 SP patients (5.2 weeks vs 9.0 weeks, respectively; $P<0.001$). Compared to the SI patients, 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, $P = 0.10$).

Conclusion: Although 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.