

Periprosthetic Distal Femur Fractures: A Multicenter Retrospective Review of Outcomes Based on Treatment Type

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Purpose: The management of periprosthetic distal femur fractures is of increasing importance for orthopaedic surgeons. Treatment is often complex due to issues obtaining fixation around implants and dealing with osteopenic bone or compromised bone stock. These injuries frequently occur in the elderly, where early restoration of function and ambulation is critical. There remains controversy concerning the optimal treatment, with some advocating for locked plating (LP), others retrograde intramedullary nailing (RIMN), and others distal femoral replacement (DFR). The literature comparing these treatments is limited and commonly restricted to single-center studies. The purpose of this study was to retrospectively evaluate a large series of operatively treated periprosthetic distal femur fractures from multiple centers and compare treatment strategies.

Methods: Patients treated operatively for a periprosthetic distal femur fracture at 8 centers across North America between 2003 and 2018 were retrospectively identified. Baseline characteristics, surgical details, and postoperative clinical outcomes were collected. We included any displaced operatively treated periprosthetic distal femur fracture with documented 1-year follow-up. Patients with other major lower-extremity trauma or ipsilateral total hip replacement were excluded. Patients were divided into 3 groups depending on the type of fixation: LP, RIMN, and DFR. Follow-up was reviewed at standard intervals until 1 year postoperatively. Outcome and covariate measures were assessed using basic descriptive statistics. Categorical variables, including the rate of reoperation, were compared across the treatment groups using Fisher exact test.

Results: In total, 121 patients (79% female) from 8 centers were included in our analysis. 67 patients were treated with LP, 15 with RIMN, and 39 with DFR. At 1 year, 64% of LP patients showed radiographic union compared to 77% in the RIMN group ($P = 0.747$). Between the 3 groups, we did not find any significant differences in ambulation, return to work, and complication rates at 6 months and 1 year. Reoperation rates at 1 year were 27% in the LP group (17 reoperations), 16% in the DFR group (6 reoperations), and 0% in the RIMN group. These differences were not statistically significant ($P = 0.058$).

Conclusion: We evaluated a large multicenter series of operatively treated periprosthetic distal femur fractures. We did not find any statistically significant differences at 1 year between treatment groups. There was a trend toward a lower rate of reoperation in the RIMN group that should be evaluated further with prospective studies.