Less Invasive Stabilization System (LISS) Plating Versus Locking Condylar Plates (LCPs) in Open and Closed Distal Femoral Fractures

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Purpose: Minimally invasive plate osteosynthesis techniques, including LISS plating and locking condylar plating, are viable treatment options for distal femoral fractures. However, there is currently no clear consensus on whether LISS or LCP plating should be used in treating these fractures. Here we compare postoperative complications rates between LISS and LCP plating techniques for open and closed distal femoral fracture fixation.

Methods: A multicenter, retrospective chart review at four institutions was performed on all patients identified through a hospital billing database who were treated operatively for supracondylar femur fractures using LISS or LCP plating techniques between January 2005 and July 2010. Patients were required to have at least 6 months of follow-up. 339 distal femoral fractures were identified among 316 patients. Preoperative radiographs were reviewed and fractures were classified according to AO/OTA guidelines. χ^2 and logistic regression analysis was performed to compare plating techniques in regard to postoperative infection and nonunion/reoperation.

Results: Of the 339 distal femoral fractures identified, 185 (54.6%) were repaired with a LISS plate and 154 (45.4%) were repaired with an LCP. In open fractures, nonunion was greater in LCPs (37.3%) compared to LISS plates (28.2%) but not statistically significant ($P = 0.20$). In closed fractures, nonunion was greater in LISS plates (17.8%) compared to LCPs (12.6%) ($P = 0.40$). In open fractures, infection occurred in 20.3% of LCPs and 11.5% of LISS plates ($P = 0.16$). In closed fractures, infection occurred in 6.3% of LCPs and 3.7% of LISS plates ($P = 0.40$). Open fractures were associated with higher rates of infection and nonunion compared to closed fractures. Multivariate analysis revealed open fractures to be a risk factor for both nonunion (odds ratio [OR] 2.27, $P = 0.01$) and infection (OR 3.47, $P = 0.02$).

Conclusion: In the largest comparison of supracondylar femur fractures reported, postoperative infection and nonunion rates are comparable between LISS and LCP plates for both open and closed distal femoral fracture fixation. Both open and closed fractures had relatively high rates of nonunion. Surgeons could consider early bone grafting in open and closed fractures to decrease the nonunion rate.

See pages 99 - 147 for financial disclosure information.