Comparative Analysis of Supplemental Medial Buttress Plate Fixation for High-Energy Displaced Femoral Neck Fractures in Young Adults

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Purpose: The purpose of this study was to assess whether augmentation of typical fixation with medial buttress plate fixation (MBPF) improves clinical outcomes in young patients with femoral neck fractures.

Methods: We retrospectively studied 535 displaced femoral neck fractures in skeletally mature patients younger than 55 years of age at 27 Level I North American trauma centers. We compared patient demographics, injury characteristics, and outcomes from the MBPF group with a cohort of patients without MBPF (NMBPF), and then by location and type of plate. Outcomes analysis included fixation failure, nonunion, osteonecrosis, and/or need for major secondary reconstructive surgeries.

Results: Of 535 patients less than 55 years old treated operatively for a displaced femoral neck fracture, 10% (n = 51) had the definitive fixation augmented with a femoral neck buttress plate (FNBP). One or more forms of treatment failure occurred in 29% (n = 15/51) for group 1 and in 49% (239/484) for group 2 (P<0.01). When FNBP fixation was used, mini-fragment (2.4/2.7 mm) fixation failed significantly more often than small fragment (3.5-mm) fixation (42% vs 5%, P<0.01). Irrespective of plate size, anterior and anteromedial plates failed significantly more often than direct medial plates (75% and 33% vs 10%, P<0.001).

Conclusion: The use of an FNBP to augment traditional fixation in displaced femoral neck fractures is associated with improved clinical outcomes, including lower rates of failed fixation, nonunion, osteonecrosis, and need for secondary reconstructive surgery. The benefits of this technique are optimized when a small fragment (3.5-mm) plate is applied directly to the medial aspect of the femoral neck, avoiding more anterior positioning.