Clinical outcomes of treatment with locking compression plates for distal femoral fractures in a retrospective cohort

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Abstract

Background: Plate fixation is one of the standard surgical treatments for distal femoral fractures. There are few reports on the relationship between the screw position and bone union when fixing by the bridging plate (Relative Stability) method.

Methods: This retrospective study included 71 distal femoral fractures of 70 patients who were treated with the Locking Compression Plate for Distal Femur (DePuy Synthes Co., Ltd, New Brunswick, CA, USA). The following measurements were evaluated and analyzed: (1) Bone union rate, (2) Bridge span length (distance between screws across the fracture), (3) Plate span ratio (Plate length/bone fracture length), (4) Number of empty holes (number of screw holes not inserted around the fracture), and (5) Medial fracture distance (bone fracture distance on the medial side of the distal femur). Patient demographics (age), comorbidities (smoking, diabetes, chronic steroid use, dialysis), injury characteristics (AO type, open fracture, infection) were obtained for all participants. Univariate analysis was performed on them.

Results: Of 71 fractures, 26 fractures were simple fractures and 45 fractures were comminuted fractures, 7 fractures resulted in non-union. Non-union rate was significantly higher in comminuted fractures with bone medial fracture distance exceeding 5 mm.

Non-union was founded in simple fractures with bone medial fracture distance exceeding 2 mm, but not significant (P = 0.06). In cases with simple fractures, one non-union case had

one empty hole and one non-union case had four empty holes, whereas in cases with comminuted fractures, five non-union cases had more two empty holes.

Conclusions: We concluded that bone fragment distance between fracture fragments is more important than bridge span length of the fracture site and the number of empty holes. Smoking and medial fracture distance are prognostic risk factors of nonunion in distal femoral fractures treated with LCP as bridging plate.

Key words: distal femur fracture, relative stability, bridging plate, locking compression plate, empty hole