Relationship between the Length of Distal Locking Screws and Diaphyseal Screws in Volar Plate Fixation of Distal Radius Fractures

Joo-Yup Lee, Sung-Woo Huh, Yang-Guk Chung, Seok-Whan Song
Department of Orthopedic Surgery, the Catholic University of Korea

Objectives
During volar plate fixation of distal radius fractures, determining the adequate screw length may be difficult due to the metaphyseal comminution. We hypothesized that the length of distal locking screws would correlate with the length of diaphyseal screws which can be measured more easily with depth gauge. The purpose of this study was to determine the relationship between the length of distal locking screws and diaphyseal screws in volar plate fixation of distal radius fractures.

Materials and Methods
A retrospective review was performed of one hundred sixty-nine patients (mean age, 58 years) who underwent volar locking plate fixation for treatment of distal radius fractures. All patients received 2.4 mm LCP volar extra-articular distal radius plate (DePuySynthes, West Chester, PA). The length of a diaphyseal screw which was placed in the elongated hole was correlated with the length of a distal locking screw from radial most (D1) to ulnar most (D4). We also evaluated distal screw penetration of the dorsal cortex and plate removal rate.

Results
The length of a diaphyseal screw which was placed in the elongated hole strongly correlates with the length of a distal locking screw (r=0.942 with D1, 0.967 with D2, 0.955 with D3, 0.936 with D4). Average D1 screw length was 2 mm longer than the diaphyseal screw, and average D2 screw length was 4 mm longer than the diaphyseal screw. D3 and D4 screw were 6 mm longer than the diaphyseal screw. Plate removal was necessary in 13 patients (8%) due to screw irritation. These patients have significantly longer screws than average. Flexor or extensor tendon ruptures did not occur in this cohort.

Conclusions
Length of the distal locking screws can be estimated with length of a diaphyseal screw. This information may help surgeons to select adequate length of distal locking screws during volar plating of distal radius fractures.

References