

## Medialization of Shaft Technique to Prevent Varus Collapse in Proximal Humerus Fractures

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**Purpose:** Locking plate designs have drastically changed the treatment options of proximal humerus fractures, particularly in osteoporotic bones. Decreased head-neck shaft angle (varus reduction) induced by lack of medial support is the technique-related primary prognostic factor that led to poor outcomes. Medial support to humerus head in preventing varus collapse has been well documented in literature, but the techniques to maintain medial buttress and its importance have not been well emphasized. We describe a simple intraoperative technique of medialization of the humerus shaft to provide buttress for inferomedial aspect of humeral head to resist the tension varus forces and thereby prevent loss of fixation.

**Methods:** We retrospectively reviewed a technique of medialization of the humerus shaft to provide buttress for inferomedial aspect of humeral head to resist the tension varus forces and thereby prevent loss of fixation. This study included 63 proximal humerus fractures treated by proximal humerus locking plate during 2012-2017. Patients were regularly followed at a monthly interval to evaluate for varus collapse radiologically (head shaft angle) and clinical outcome by DASH (Disabilities of the Arm, Shoulder and Hand) scores.

**Results:** Mean age of the patients included in the study is 54.2 years and the mean follow-up period was 14.8 months. A total of 6 cases were noted to develop avascular necrosis (AVN), among which 2 cases had screw penetration at follow-up, which required intervention for hardware removal. In the rest of the 4 cases where AVN is noted, only a small percentage of the humeral head was involved and hence required no intervention. Redisplacement of humerus head upon follow-up was noted in 1 patient (1.58%) who required no intervention as the fracture healed in varus as noted by loss of height at final follow-up. No cases of nonunion and failure requiring revision surgery were noted in the study group. Postoperative QuickDASH (an abbreviated version of the DASH questionnaire) scores ranged from 0 to 66.2 (mean = 22.4).

**Conclusion:** Humerus shaft medialization to restore the medial column buttress in proximal humeral injuries fixed with locking plates creates a stronger construct that can resist tension load causing varus collapse than locking plate fixation alone. This technique provides a biomechanically strong alternative to fibular allograft fixation, without the need for a more complex surgery. This may provide a good option for improving outcomes in all proximal humeral fractures.