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Characteristics and functional outcomes of varus displaced proximal humerus fractures

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Introduction and Background

A varus displaced fracture has been regarded as unstable fracture type and it remains unclear why a high proportion of initial varus displacement is related to poor outcomes and how much head shaft angles should be achieved to recover the shoulder biomechanics in varus displaced fractures. This study was performed to compare fracture characteristics and functional outcomes between patients with and without initial varus displacement.

Material and Method

A retrospective review of 325 patients with proximal humerus fractures was performed. Patients with initial varus displacement were placed in Varus cohort and were age- and sex-matched 1:1 with a second cohort presenting proximal humerus fractures without varus displacement, referred to as Fracture cohort. Varus fracture displacement was defined when the most proximal aspect of humeral head was below the most proximal aspect of greater tuberosity on initial radiographs, and the head shaft angle was $< 130^\circ$.

Results

There were significant differences in initial horizontal offset, initial anterior angulation angle, postoperative head shaft angle, last head shaft angle, difference for head shaft angles, postoperative horizontal offset, last horizontal offset, difference for offsets, complications (15 vs. 7 cases), and revision surgery (7 vs. 1 case) between two cohorts. Overall satisfactory results were achieved in most patients, pain-VAS and Constant scores in V cohort were inferior to the scores in F cohort. The cut-off value of postoperative head shaft angle for good/excellent outcomes was 135.5° using receiver operating characteristic curve analyses.

Conclusions

Varus displaced proximal humerus fractures were accompanied by decreased horizontal offset and increased anterior angulation, and had a course of more varization and horizontal shortening. Patients with varus displaced fractures were associated with worse functional outcomes, and these characteristics might affect functional outcomes.

