

Delto-Pectoral vs Deltoid split approach for proximal Humerus fracture fixation with locking plate: A prospective Randomized study (HURA)

Purpose The ideal treatment for proximal humerus fractures (PHF) is still a matter of debate, but plate fixation has gained in popularity since the introduction of the locking plate technology. The aim of our study was to compare two surgical approaches, the deltopectoral (DP) and deltoid split (DS), for displaced proximal humerus fracture fixation, using a monoaxial locking plate within a prospective randomized trial. The primary hypothesis of the study was that patients operated with the DS approach would have a better functional outcome than patients operated with the DP approach.

Methods From 2007 to 2015, all patients with a PHF Neer II/III, were invited to participate. Exclusion criteria were: pre-existing pathology to the limb, patient refusing or too ill to undergo surgery, patient needing another type of treatment (nail, arthroplasty), and axillary nerve impairment. After consent, patients were randomized to one of the two treatments using the dark envelope method. Functional outcome was evaluated by validated questionnaires (SF-12v2, Q-DASH,) with a minimum follow-up of 12 months. Complications were noted.

Results 85 patients (44 DS, 41 DP) were randomized (mean age of 62). Groups were equivalent in terms of age, gender, BMI, severity of fracture and pre-injury scores. Mean follow-up was 26 months. All clinical outcome measures were in favor of the deltopectoral approach. The Q-DASH, was better in the DP group (12 vs 26, $p=0,003$) and patients had less pain and better quality of life scores than with the DS (VAS: 1/10 vs 2/10, $p=0,019$ and SF-12v2: 56 vs 51, $p=0,049$, respectively). There were more complications in DS patients. Calcar screws were used for a majority of DP fixations (57%) vs a minority of DS (27%) ($p=0,012$).

Conclusions The primary hypothesis on the superiority of the deltoid split incision was rebutted. The DP approach should be used during Neer II and III PHF fixation. If the deltoid split approach is chosen for some fracture patterns, optimizing proximal fixation and adding more proximal locking screws, especially in the calcar, could be beneficial. This could be the subject of future studies.