

The influence of local bone quality on fracture pattern in proximal humerus fractures

Ruben A Mazzucchelli, Katharina Jenny, Vilijam Zdravkovic, Johannes B Erhardt, Bernhard Jost & Christian Spross

INTRODUCTION

Bone mineral density and fracture morphology are widely discussed and relevant factors when considering the different treatment options for proximal humerus fractures. It was the aim of this study to investigate the influence of local bone quality on fracture patterns of the Neer classification as well as on fracture impaction angle in these injuries.

MATERIALS AND METHODS

All acute, isolated and non-pathological proximal humerus fractures admitted to our emergency department were included. The fractures were classified according to Neer and the humeral head impaction angle was measured. Local bone quality was assessed using the Deltoid Tuberosity Index (DTI). The distribution between DTI and fracture pattern was analysed.

RESULTS

191 proximal humerus fractures were included (61 men, mean age 59 years; 130 women, mean age 69.5). 77 fractures (40%) were classified as one-part, 72 (38%) were two-part, 24 (13%) were three- and four-part and 18 (9%) were fracture dislocations. 30 fractures (16%) were varus impacted, whereas 45 fractures (24%) were classified as valgus impacted. The mean DTI was 1.48. Valgus impaction significantly correlated with good bone quality (DTI ≥ 1.4 ; $p = 0.047$) whereas no such statistical significance was found for the Neer fracture types.

DISCUSSION

We found that valgus impaction significantly depended on good bone quality. However, neither varus impaction nor any of the Neer fracture types correlated with bone quality. We conclude that the better bone quality of valgus impacted fractures may be a reason for their historically benign amenability to ORIF. On the other hand, good local bone quality does not prevent fracture comminution.

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