Kantonsspital St.Gallen

How bone quality may influence intraoperative and early postoperative problems after angular stable open reduction-internal fixation of proximal humeral fractures

Christian Spross,Rebeca Zeledon,Vilijam Zdravkovic & Bernhard Jost

BACKGROUND
With the introduction of the deltoid tuberosity index (DTI), a simple radiographic tool has become available to measure bone mineral density of the proximal humerus. The aim of this study was to assess the influence of local bone mineral density on the early failure rate after angular stable open reduction-internal fixation of proximal humeral fractures (PHFs).

METHODS
We retrospectively followed up all patients treated with angular stable implants for PHFs from 2007 to 2014. The fractures were classified according to Neer, and the DTI, metaphyseal head extension (MHE), medial hinge displacement, and quality of reduction were assessed. Failures were defined as head screw cutouts.

RESULTS
The study included 146 patients (mean age, 66 years; range, 20-94 years). The mean follow-up period was 11 months (range, 3-94 months). Of the fractures, 91% were classified as 2- or 3-part fractures and 9% as 4-part fractures. The mean DTI was 1.44 (range, 1.19-2.11), and the mean MHE was 12 mm (range, 0-48 mm). The reduction result was at least acceptable in 80% of fractures. Screw cutouts were found in 23%. The DTI and MHE were the most significant preoperative predictors for the reduction result. The DTI ($P = .036$) and age ($P = .02$) were independent preoperative factors, and a good reduction ($P = .001$) was the only intraoperative factor influencing cutout.

DISCUSSION
This study proves that good bone quality and a long MHE are helpful for the reduction. Furthermore, good bone quality, a younger age, and a good reduction prevent later cutout. We conclude that local bone quality is a relevant factor in the treatment plan for PHFs.

Kantonsspital St.Gallen

type	journal paper/review (English)
date of publishing	12-04-2017
journal title	J Shoulder Elbow Surg (26/9)
ISSN electronic	1532-6500
pages	1566-1572