Distal Radius Fractures
Aspects on radiological and clinical outcome and evaluation of a new classification system

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Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av medicine doktorsexamen framläggs till offentligt försvar i Aulan plan 1 sektion blått, Sundsvalls sjukhus, fredagen den 15:e april, kl. 09:00.
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Abstract
Distal radius fracture (DRF) is the most common fracture encountered in clinical practice. There is a correlation between malalignment and function following DRF. An issue is that many fractures are unstable despite an acceptable position on initial radiographs or following a successful closed fracture reduction. Improvement in initial assessment of DRF may prevent both overtreatment and undertreatment and benefit a large group of patients. Numerous classification systems have been developed for evaluation of DRF in order to predict the outcome. However, the values of these are limited since they have not shown satisfactory reliability. Furthermore, the utility of these systems to predict radiographic or clinical outcome is not yet proven. Requests for a new classification system of DRF, predictive of outcome and easy to use, have been made. We investigated the interobserver and intraobserver reliability of a new classification system for DRF (the Buttazzoni classification) by evaluating the radiographs of 232 patients. The new classification showed fair to substantial interobserver and intraobserver reliability. A prospective multicenter cohort study on 428 DRF was conducted. The predictive value of initial position, cortical comminution and intra-articular involvement, as well as the new classification system, on stability in DRF was investigated. Initial position of the fracture, volar comminution and dorsal comminution predicted later displacement, while intra-articular involvement did not. Volar comminution was the strongest predictor of displacement. Volar comminuted fractures need to be treated surgically if malunion is to be avoided. The new classification system, which is the first to include volar comminution as a separate parameter, was highly predictive of fracture instability. Clinical follow-up of the patients was made at one year. Initial displacement was associated with a worse quickDASH score, worse EQ-5D score, reduced grip strength and reduced total range of motion. Dorsal comminution was associated with a worse quickDASH score, reduced flexion and reduced pronation-supination ability. Volar comminution was associated with loss of extension. Intra-articular involvement was associated with a reduced flexion-extension arc and a worse EQ-5D score. There was a significant difference in range of motion between non-comminuted and comminuted Buttazzoni classes. QuickDASH, EQ-5D, pain VAS and grip strength were comparable among Buttazzoni classes. Late displacement of DRF after 10-14 days was common and occurred in approximately 1/3 of cases. Late displaced fractures had a significantly higher loss of range of motion and grip strength at one-year follow-up compared to fractures that did not displace. To detect late displacement, distal radius fracture should be followed for more than 2 weeks.

Keywords
Distal radius fracture; Buttazzoni classification; volar; comminution; reliability; radiological outcome; clinical outcome; late displacement