UMEÅ UNIVERSITET

Umeå University Medical Dissertations, New Series No 2279

FRACTURES OF THE DISTAL RADIUS

Radiological measurements and clinical outcomes

Viktor Schmidt

Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av medicine doktorsexamen framläggs till offentligt försvar i Aulan, Sundsvalls sjukhus, onsdagen den 8 maj, kl. 09:00.

Avhandlingen kommer att försvaras på svenska.

Fakultetsopponent: Docent, Maria Wilcke

Karolinska Institutet, Institutionen för klinisk forskning och utbildning, Södersjukhuset, Handkirurgi, Stockholm, Sverige

Department of Diagnostics and Intervention (Orthopaedics)
Umeå University

Organization
Umeå University
Department of Diagnostics and Intervention (Orthopaedics)

Document type
Doctoral thesis

Date of publication
17 April 2024

Author
Viktor Schmidt

Title
FRACTURES OF THE DISTAL RADIUS: Radiological measurements and clinical outcomes

Abstract
The most common fracture is the distal radius fracture (DRF). Wrist function is of importance for the ability to perform activities of daily living, work-related tasks and leisure activities. Treatment generally focuses on restoring anatomical alignment and providing adequate rehabilitation.

To improve our knowledge of DRFs, this thesis explores factors affecting clinical and radiological outcomes in the short- and long-term after a DRF.

Paper I analysed the magnitude of radiographic malalignment leading to deterioration in clinical outcomes. Some 366 patients with prospective data were analysed 1 year after fracture. A nonlinear association between radiographic and clinical outcome was found for dorsal tilt. Larger malalignment resulted in increasingly worse outcomes, starting from about 5° of dorsal tilt and progressing with increasing malalignment.

In Paper II, a novel predictor of instability was assessed, namely marginal secondary displacement. The study included 165 patients with prospective data treated non-operatively with complete radiological follow-up and acceptable alignment 10-14 days after injury. Marginal secondary displacement was an important predictor of late displacement with malunion in DRFs. Clinicians should not unequivocally accept general guidelines for alignment. They should also assess the deterioration in fracture alignment at radiographic follow-up and be aware of the potential need for surgery to avoid malunion, even if radiographic measures are within acceptable limits.

Paper III investigated the long-term effects of DRFs in a large prospective study 11 to 13 years post-injury and found that clinical outcomes improve with time. A decade after the fracture, patient-reported function, health-related quality of life, grip strength and range of motion were restored at the group level. Neither osteoarthritis nor pseudoarthrosis of the ulnar styloid affected the outcomes. Dorsal tilt, radial inclination and ulnar variance did not affect long-term clinical outcomes or the risk of osteoarthritis. Recovery after a DRF is an ongoing process lasting years. A decade after injury, recovery was achieved regardless of radiological outcomes.

Paper IV evaluated the potential consequences of the fast-tracks introduced in the Swedish National Guidelines in a retrospective study. Some 1,609 patients with DRFs 4-7 years before the introduction of the national guidelines were studied. The patients' treatment was compared to how they would have been treated had the guidelines been followed. The results suggest that the fast-track treatment pathway will probably i) identify unstable fractures, ii) lead to more patients being treated with early primary surgery and iii) result in delayed primary surgery being avoided in most cases.

To conclude, clinical outcomes are affected by the degree of radiological alignment 1 year after a DRF. However, patients continue to recover over a long period. After a decade, normal function is restored at the group level, irrespective of the radiological outcome. Clinical outcomes at 1 year can most likely be ameliorated by identifying unstable fractures and following protocols promoting early surgery for these fractures.

Keywords
Distal radius fracture, clinical outcome, radiological outcome, displacement, long-term results, outcomes, patient-reported outcome measure, functional outcomes, grip strength, range of motion

Language
English

ISBN
print: 978-91-8070-249-2
PDF: 978-91-8070-250-8

ISSN
0346-6612

Number of pages
112 + 4 papers