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## **Wrist fractures: Aspects of surgical methods and outcome**

AKADEMISK AVHANDLING

Som för avläggande av medicine doktorsexamen vid Karolinska Institutet offentlig försvaras i  
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av

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## ABSTRACT

Wrist fractures are the most frequently occurring fractures in any emergency setting. Treatment regimens range from a plaster cast to a combination of advanced surgical methods. Many fractures heal without remaining morbidity but 15 – 30% of patients report remaining disability of the hand and wrist. The aim of this thesis was to investigate the epidemiology and outcome for patients with distal radius fractures.

In Study 1, the Patient Rated Wrist Evaluation (PRWE) questionnaire was translated from English to Swedish and validated by allowing 124 patients to be investigated twice with the Disability of the Hand Arm and Shoulder (DASH) and PRWE questionnaires. The Swedish version of the PRWE (PRWE-Swe) showed good validity, stability and responsiveness. The PRWE-Swe is a useful tool for evaluating wrist fracture patients in the scope of everyday clinical practise or future research.

In Study 2, a dataset was retrieved from the Swedish National Board of Health and Welfare containing all in- and outpatient visits of patients with wrist fractures in Sweden during the years 2005 to 2010. The analysis showed that the incidence of wrist fractures in adult patients was 26 per 10 000 person years. The proportion of surgical treatment increased from 16% to 20% between 2005 and 2010. Plating procedures increased by more than threefold and the use of external fixation diminished by 67%.

In Study 3, reoperations after wrist fracture surgery were investigated by means of a nation-wide registry study. All wrist fracture patients undergoing fracture surgery during 2001 – 2009 were extracted from a dataset from the Swedish National Board of Health and Welfare. The incidence for reoperation was highest after plating and lowest after external fixation (EF). EF patients suffered early reoperations whereas plated patients were reoperated on more than 3 years after wrist fracture surgery. New fracture surgery in the early postoperative period was the most usual reoperation in EF patients. Extraction of internal fixation material occurred most frequently in plated patients. Tendon repair and median nerve release occurred more often in plated patients than in patients with EF.

In Study 4, 140 patients 50 – 74 years of age, presenting with a dorsally displaced distal radius fracture were allocated to operation with either a volar locking plate or an external fixation in the context of a randomised controlled trial. All baseline data were equal between groups. The primary outcome measure, DASH, did not differ at 3 and 12 months. The radiographic evaluation showed better restoration of radial length in the volar locking plate group. Quality of life, as measured by EQ-5D, was better for the plate group at 2 and 6 weeks but at 3 and 12 months the results were equal in both groups. Range of motion did not differ between groups at 3 months and 1 year. Grip strength was better for the volar plate group at 3 months but the difference was no longer significant at one year.

In conclusion, the PRWE is a useful patient-reported outcome measure for wrist fracture evaluation. Volar plate fixation of a wrist fracture yields faster recovery of grip strength and quality of life than external fixation but entails a higher risk of reoperations in the long term. The clinical end-result after volar plating and external fixation is equal after wrist fracture surgery in patients 50 – 74 years of age.