

Distal Radioulnar Joint: Arthroplasty and Strength assessments

AKADEMISK AVHANDLING

Som för avläggande av medicine doktorexamen vid Sahlgrenska akademien, Göteborgs Universitet kommer att offentlig försvaras i Hörsal Arvid Carlsson, Academicum, Medicinargatan 3, Göteborg, fredagen den 2 mars, 2018, kl. 13.00

av

PETER AXELSSON

Leg läkare

Fakultetsopponent:

Docent ELISABET HAGERT

Institutionen för klinisk forskning och utbildning,
Karolinska Institutet, Stockholm

Avhandlingen baseras på följande delarbeten:

- I Axelsson P, Sollerman C, Karrholm J.
Ulnar Head Replacement: 21 Cases; Mean Follow-Up, 7.5 Years.
J Hand Surg Am. 2015;40(9):1731-8.
- II Axelsson P, Sollerman C.
Constrained implant arthroplasty as a secondary procedure at the distal radioulnar joint: early outcomes.
J Hand Surg Am. 2013;38(6):1111-8.
- III Axelsson P, Karrholm J.
New methods to assess forearm torque and lifting strength: reliability and validity.
(In press, J Hand Surg Am.)
- IV Axelsson P, Fredrikson P, Nilsson A, Andersson JK, Karrholm J.
Forearm torque and lifting strength: normative data.
(In press, J Hand Surg, Am.)
- V Axelsson P, Sollerman C, Karrholm J.
Validity and responsiveness of forearm strength measurements in the evaluation of distal radioulnar joint implant arthroplasty.
(In manuscript)

GÖTEBORG 2018



GÖTEBORGS UNIVERSITET

Distal Radioulnar Joint: Arthroplasty and Strength assessments

PETER AXELSSON

Department of Orthopaedics, Institute of Clinical Sciences,
Sahlgrenska Academy at University of Gothenburg, Sweden

Abstract

The growing interest in distal radioulnar (DRUJ) disorders underlines the need for further improved evaluations of treatment outcome. Load-bearing and optimising torque are important features of the DRUJ, but they are rarely measured when assessing DRUJ interventions. To make these measurements easily accessible in clinical situations, we developed two methods for quantifying lifting strength and forearm torque. In this thesis, we report the outcomes after surgery with two types of DRUJ implant arthroplasty and the result of our evaluation of the new strength measurement methods.

In Study I, we reviewed 21 patients treated with the Herbert ulnar head prosthesis and, in Study II, we included nine patients treated with the Scheker total DRUJ prosthesis after previously failed DRUJ surgery. For both types of arthroplasty, the patient-reported outcome was satisfactory, scores for pain were low and there were no signs of radiographic loosening. There was one re-operation (Herbert prosthesis), but no other major complications.

In Study III, we assessed the reliability and validity of our methods in quantifying lifting strength and forearm torque. Intraclass correlation coefficient calculations showed that the inter- and intrarater reliability was excellent and the new methods were also valid when the Baltimore Test Equipment was used as a reference.

In Study IV, we measured 499 healthy volunteers to obtain normal values for our new test methods. Normative data were defined and we were able to compute predictive equations based on gender, age and height.

In Study V, we evaluated the responsiveness and validity of the new strength measurement methods in 18 patients treated with DRUJ implant arthroplasty. We found that forearm torque was more sensitive to change than grip strength. Forearm torque also had a stronger correlation to the other outcome variables.

In conclusion, it was confirmed that the Herbert and Scheker implants are efficient and safe, in the mid-term perspective, in a selected group of patients. Our methods for measuring strength for lifting and forearm rotation were reliable and valid and normative values were defined. Forearm torque outperformed grip strength in the evaluation of DRUJ implant arthroplasty.

Keywords: *Distal radioulnar joint arthroplasty, Forearm torque and lifting strength measurements, Normative data, Reliability, Validity, Responsiveness*

ISBN: 978-91-629-0390-9 (PRINT)

ISBN: 978-91-629-0391-6 (PDF)

<http://hdl.handle.net/2077/54529>