

Acetabular Revisions

Risk Factors & Prediction of Re-revision

Maziar Mohaddes

Department of Orthopaedics, Institute of Clinical Sciences at
Sahlgrenska Academy, University of Gothenburg
Gothenburg, Sweden 2015

ABSTRACT

Hip replacement is a successful intervention when treating patients with hip osteoarthritis. Approximately 10% of all patients undergoing primary hip replacement surgery require further surgical interventions (revisions) during their lifetime. Acetabular component (cup) failure is the most common reason for a revision. Cemented fixation in acetabular revision surgery was a common method until the mid-1980s. Low survival rates reported for cemented revision cups and encouraging results. There are, however, no studies comparing the results of revision surgery based on the method of fixation for the acetabular component. In 2006, a highly porous trabecular metal (TM) tantalum cup was introduced in the Swedish market and, in 2013, this cup was the most commonly used acetabular revision component in Sweden. The primary aim of this thesis was to compare cemented and uncemented fixation in acetabular revisions using radiostereometric analysis (RSA). Further, a comparative analysis of the TM cup and other cup designs frequently used in acetabular revisions was performed. Data from the SHAR, on 18,593 first-time revisions, were used in the first study to analyse differences relating to the risk of re-revision between cemented and uncemented cups. The overall risk of acetabular component failure did not differ between the two modes of fixation. In this analysis, cemented revision cups were re-revised more often due to aseptic loosening but less often due to dislocation. In Paper II, TM cups were compared with the other two cups most frequently used in first-time revisions recorded in the SHAR. The short-term re-revision rate of the TM design did not differ from that of the other two designs. The third paper addressed the influence of proximal migration on the risk of aseptic loosening. An analysis of 312 acetabular revisions followed

with RSA for two to 20 years showed that proximal migration measured with RSA can be used a predictor of aseptic loosening of the acetabular component. In the fourth paper, 45 patients (47 hips) undergoing surgery with cemented or uncemented fixation were followed prospectively for 17 years. Radiostereometry was used to monitor the migration and rotation of acetabular components. Cups installed using cemented fixation showed a higher rate of early migration. In a randomised prospective study (Paper V), the RSA migration pattern of the TM cup was compared with that of a cemented cup in hips with large bone defects. The TM design showed less proximal migration compared with the cemented design, indicating a lower risk of aseptic loosening when the TM cup is used in hips with large bone defects. To summarise, there was no difference in the overall risk of re-revision based on the method of fixation, according to data from the SHAR. Proximal migration measured with RSA is a predictor of late aseptic loosening in acetabular revisions. The TM cup shows promising short-term results in the SHAR. The low early proximal migration of the TM design suggests that it has the potential to reduce the risk of late aseptic loosening in revision surgery, but this remains to be demonstrated in clinical studies with longer follow-up.

Keywords: Acetabular revision, Radiostereometry, Trabecular metal, Register studies, Cemented/ Uncemented fixation, Bone impaction grafting

ISBN: 978-91-628-9529-7 (paper)

ISBN: 978-91-628-9530-3 (e-pub)

<http://hdl.handle.net/2077/39540>

Correspondence to: maziar.mohaddes@gmail.com



Acetabular Revisions

Risk Factors & Prediction of Re-revision

Akademisk avhandling

som för avläggande av medicine doktorsexamen vid Göteborgs Universitet kommer att offentlig försvaras i föreläsningssalen Arvid Carlsson, Academicum, Medicinargatan 3, Göteborg, fredagen den 2 oktober 2015, klockan 09.00

av

Maziar Mohaddes

Leg. läkare

Fakultetsopponent:

Martyn Porter

MB ChB, FRCS (Ed), FRCS Ed (Orth)

Centre for Hip Surgery, Wrightington Hospital,

United Kingdom

Avhandlingen baseras på följande delarbeten:

- I. Maziar Mohaddes, Göran Garellick, and Johan Kärrholm. Method of fixation does not influence the overall risk of rerevision in first-time cup revisions. *Clinical Orthopaedics and Related Research*® 471, no. 12 (2013): 3922-3931.
- II. Maziar Mohaddes, Ola Rolfson, and Johan Kärrholm. Short-term survival of the trabecular metal cup is similar to that of standard cups used in acetabular revision surgery: Analysis of 2,460 first-time cup revisions in the Swedish Hip Arthroplasty Register. *Acta Orthopaedica* 86, no. 1 (2015): 26-31.
- III. Tina Klerken, Maziar Mohaddes, Szilard Nemes, and Johan Kärrholm. High early migration of the revised acetabular component is a predictor of late cup loosening: 312 cup revisions followed with radiostereometric analysis for 2-20 years. *Hip International* (2015), Advance Online Publication.
- IV. Maziar Mohaddes, Peter Herberts, Henrik Malchau, Per-Erik Johanson, and Johan Kärrholm. High Proximal Migration in Cemented Acetabular Revisions Operated with Bone Impaction Grafting; 47 Revision Cups Followed with RSA for 17 years. *Submitted*
- V. Maziar Mohaddes, Bitu Shareghi, and Johan Kärrholm. Bone Impaction Grafting with a Trabecular Metal Revision Cup Show Promising Early Results. *Submitted*

