

Executive Summary

Publication	Outcome of a modular tapered uncemented titanium femoral stem in revision hip arthroplasty. Hoberg M, Konrads C, Engelen J, Oschmann D, Holder M, Walcher M, Rudert M. Int Orthop. 2015 Sep;39(9):1709-13. doi: 10.1007/s00264-015-2699-5. Epub 2015 Feb 18. https://www.ncbi.nlm.nih.gov/pubmed/25690924
Study	Retrospective, single-center, consecutive study
Implant	Cementless modular revision stem MRP-TITAN (PETER BREHM GmbH, Germany)
Patients	136 consecutive patients, of which 89 patients (43 female, 46 male) with an average age of 72.3 years (range, 52-95) were re-examined. 23 patients (16.9%) could not be re-examined ("lost to follow-up"). 24 patients with a non-revised stem (17.6%) died for reasons not related to implants.
Follow-up	The mean follow-up was 55 months (range, 24-117 months).
Method	In the hospital's own database of the Orthopaedic Hospital Koenig-Ludwig-Haus (Julius-Maximilians-University, Würzburg, Germany) 136 patients were identified who received with a 200 mm curved cementless modular MRP-TITAN revision stem between 2005 and 2011. The main diagnoses leading to THA were primary osteoarthritis (78%), post-traumatic osteoarthritis (4%) and others (18%). The stem revision was performed on average 109 months (range, 1-420) after primary surgery. If necessary, cup revision, liner exchange or synovectomy were performed. A lateral approach was used in all cases. The radiological findings were available pre- and postoperatively for all patients. The radiographs were evaluated for signs of implant loosening according to the <i>Kavanagh and Fitzgerald</i> criteria and periprosthetic radiolucent lines according to <i>Gruen et al.</i> zones 1-7. Preoperative femoral defects were classified according to <i>Pak et al.</i> (1993). Periarticular ossifications were classified according to <i>Brooker</i>. Clinical findings included HHS, VAS, <i>Merle d'Aubigné</i> and <i>Postel</i> Score. The health-related quality of life of the patients was determined with the VAS. The revision of a MRP-TITAN stem was defined as failure if a re-revision was performed for any reason. The <i>Kaplan-Meier</i> method and the <i>log-rank test</i> were used for survival analysis.
Results	According to the <i>Paprosky</i> classification, preoperatively 9.1% of patients had a type I bone defect, 38.6% a type IIA, 18.1% a type IIB and 10.3% a type IIC. Distinct type IIIA bone defects were present in 15.8% of cases and type IIIB bone defects in 8.1% of cases. Neither the bone defect situation nor the revision reason had a significant influence on the investigated parameters. The Kaplan-Meier survival rate was 85.6% after 9.75 years.

	Implant failure was observed in 6 cases (6.8%) due to early infection (n=3), recurrent dislocation (n=2) and fascia defect (n=1). In no case did the MRP-TITAN revision stem have to be changed. There was neither a stem fracture nor a failure of the modular components. The patients achieved 75.1 points in the HHS score postoperatively and 14.4 points in the <i>Merle d'Aubigné</i> and <i>Postel</i> score. The average VAS value was 0.7. The patients were predominantly without pain (89.7%). The majority of patients (88.4%) were satisfied with the treatment result, only 10.1% were partially satisfied and only 1.5% were not satisfied. The radiological examination showed a stable stem fixation in 96% of the cases. Only 4% of the patients showed a radiolucent line of less than 1 mm according to <i>Gruen</i> zone 1 without any signs of aseptic loosening. No postoperative subsidence or axial migration was observed. The functional results improved significantly in the postoperative course. Compared to the preoperative status, a significantly increased range of motion was observed in the follow-up period.
Key Points	This is one of the largest medium-term analyses of the modular cementless MRP-TITAN revision stem, using the 200mm curved stem, to investigate the benefits of this diaphyseal fixed system in hip revision. The Kaplan-Meier survival rate of 85.6% after 9.75 years is encouraging as literature reports aseptic loosening rates of 4-16% with other revision stems. The medium-term results with the cementless modular revision stem MRP-TITAN in a large patient group confirm the promising clinical results of other publications (<i>Wirtz et al. 2014 and 2000, Wimmer et al. 2013, Mumme et al. 2004 and 2007</i>). The MRP-TITAN revision stem proved equally reliable in femoral bone defects according to <i>Paprosky</i> type I-III. The use of the MRP-TITAN revision stem tended to produce better results, including a lower rate of re-revision, compared to the results available in the literature for cementless modular revision stems.
Abbreviations	HHS – Harris hip score, THA – total hip arthroplasty, VAS – visual analog scale