Reviewer’s report

Title: Impaction grafting in the femur in cementless modular revision total hip arthroplasty: A descriptive outcome analysis of 243 Cases with the MRP-TITAN Revision Implant

Version: 1 Date: 31 July 2012

Reviewer: Mathias Glehr

Reviewer’s report:

I.) General impression and comments

The authors present a descriptive analysis within a prospective controlled trial of revision hip arthroplasty using the MRP-TITAN stem with distal diaphyseal fixation and metaphyseal defect augmentation. Postoperative clinical function was evaluated using the Harris Hip Score in a maximal follow up time of ten years. Postoperative radiologic examination evaluated implant stability, axial implant migration, signs of implant loosening, periprosthetic radiolucencies, as well as bone regeneration and resorption.

The topic seems of interest for surgeons in the field of orthopaedic revisions. But the study offers many weak points which require major revisions. Especially parts of the methods seem not appropriate and are not well described. At the moment it is not possible for me to decide on acceptance or rejection until the authors have responded to the major compulsory revisions.

II.) Major Compulsory Revisions

II. 1. )

Background, chapter six

Please state the exact aim and question of this prospective study. Please describe, how the study was initially planned (was it “prospective” planned to perform a descriptive analyses?)

II. 2. )

Methods, chapter one, line one
Within the scope of a prospective multicenter study…

What were the initial parameters of the clinical trial. What where the exact inclusion and exclusion criteria of the study protocol?

II. 3.)
Methods, page two, second chapter, line six:
'The decision whether the impaction grafting technique was used or not was at surgeon's discretion and based on his subjective evaluation of the intra-operative situation.'

Please describe the parameters for this “subjective evaluation”. What was influencing the decision of the surgeons.

II. 4.)
Methods, radiographic evaluation, second chapter:
Was the radiographic evaluation done digital or analogue? What were the ways of standardisation, was there a millimetre standard on every x-ray? How was it possible to evaluate the exact millimetre progression?

Was the person, who did the radiographic evaluation blinded or did the person know, in which patient impact grafting was used?

II. 5.)
Methods, Implant, second chapter, line three:
'…available as a straight-stem model in 140 mm and 200 mm length, and curved-stem version to fit the physiologic anterior bow of the femur in 200 mm length…'

How many of each model were used? Did the outcome differ between the curved and the straight version?

II. 6.)
Methods, Surgical Technique, first chapter:
'In patients with osteopenic or osteoporotic bone structure, the femur was also stabilized with cerclage wire proximal and distal to the cortical window.'

How many patients had osteopenic and osteoporotic bone structure, in how many patients you used a cerclage? Did the use of cerclages effect the outcome? Was the distribution the same in both groups (impact grafting and non impact grafting)?

II. 7.)
Results, Radiographic Evaluation, second chapter:
'Evaluation of periprosthetic bone remodelling demonstrated a significant reduction in proximal stress shielding in the study group compared with the control group.'

Did these patients complain about pain, was the stress shielding clinical relevant
Please describe these factors which could influence the results of the study:

a.) How many surgeons take part on the study?
b.) How was the distribution of the surgical technique for each surgeon?
c.) Did the outcome between the surgeons differ?
d.) How was the surgical experience of the different surgeons (cases of hip revision, years of surgical experience)?

Limitations
Please state and describe the limitations of the study detailed in a chapter.

III.) Minor Essential Revisions

III. 1.)
Background, 2 chapter, line three and four:

a.)
'The bone cement cannot provide an intrusive, interlocking bond in a smooth-walled osteolytic femoral canal.'
Please ad citations

b.)
'Cemented fixation can be combination with impaction grafting.'
Please ad citations

III. 2.)
Discussion
Please update literature and discussion. There some publication about impaction grafting of the femur in hip arthroplasty revisions published in the last years, e.g.:

Midterm results of femoral impaction bone grafting with an allograft combined with hydroxyapatite in revision total hip arthroplasty.
Oshima S, Yasunaga Y, Yamasaki T, Yoshida T, Hori J, Ochi M.

Femoral revision surgery with impaction bone grafting: 31 hips followed prospectively for ten to 15 years.
Ten Have BL, Brouwer Md RW, van Biezen FC, Verhaar JA.
Cancellous impaction grafting in femoral revision THA.
Padgett DE, Kinkel S.

Impaction bone grafting for femoral revision hip arthroplasty with Exeter Universal stem in Japan.
Iwase T, Otsuka H, Katayama N, Fujita H.

III. 3.)
Quality of written English:
The paper needs some language corrections before being published.

III. 4.)
Statistical review:
In my opinion the statistic seems to be done well but this manuscript should be seen by an expert statistician.

The reviewer declares that he has no competing interests.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I have no competing interests