

Modular porous tantalum acetabular cup: clinical and radiological experience

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Introduction Acetabular aseptic loosening is the main cause of failure in prosthetic hip surgery and the first cause of revision. Uncemented hemispherical cups are widely used and different bio-materials have been developed to obtain primary and secondary stability through osteointegration. Porous tantalum's structure is similar to cancellous bone and presents with mechanical and biological characteristics aimed to enable rapid and complete osteointegration and improve the survival of the prosthesis.

Materials and methods From May 2004 to June 2007 one hundred TMT modular acetabular components were implanted in 97 patients for primary THA. For this study we assessed 89 prostheses in 86 patients with 56 months (42–77 months) follow-up, both clinically and radiographically.

Results At the last follow-up no implant appeared mobilized. Harris Hip Score changed from 52.75 points preoperatively to 95.72 post-operatively ($p < 0.0001$). Oxford Hip Score improved from 37.16 to 14.78 points ($p < 0.0001$). Gaps at the bone-prosthesis interface were documented at the immediate postoperative X-rays in 51 implants (57%), mostly in zone II. At the last radiographic assessment they appeared completely filled in 87% of the cases (mean time to fill 1 year), partially filled in 10%, leaving less than 1 mm gap, while in 2 cases they remain unchanged. Osteointegration signs according to Moore and McAuley were also considered: at least three signs were present in all cases indicating complete osteointegration of the implants. There was no evidence of radiolucent lines at last follow-up. One dislocation occurred in one case at 21 months and it was reduced in narcosis with no recurrence.

Discussion Medium-term results of this cup are comparable with those reported in literature for porous tantalum monoblock components. The presence of the titanium layer in the metal-back of the modular component, that theoretically could affect the biomechanical characteristics of the cup, does not seem to affect host bone biological response when compared to the monoblock socket. Thanks to its mechanical characteristics and excellent osteoconduction, this biomaterial provides a good primary stability and excellent osteointegration of the component.

Conclusions The results reported suggest that this cup represents at a medium-term follow-up a good implant for acetabular arthroplasty.

Tantalum metaphyseal cones in revision knee arthroplasty

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Introduction The use of Tantalum cones (TMT) in revisions of total knee arthroplasty allows a better management of severe bone loss, which ranks as an alternative to allografts or tumor prosthesis. The best treatment of such bone defects is not yet well described in literature.

Materials and methods Thirty-two Tantalum cones, 19 tibial and 13 femoral were used in 45 revisions of total knee arthroplasty, 27 CCK-L[®], 5 RHK[®]. Inclusion criteria were: IIB-III bone defects (AORI). The surgical technique consists in the placement of cones using the "3-point fixation technique". All patients were followed by clinical and radiographic evaluation for an average follow-up of 5.1 years (range, 4.2–7.4).

Results The HSS score increased from a pre-operative average value of 31 to a post-operative value of 88 (survival 94%). Radiographic study (Knee-Society) demonstrated in all cases signs of bony-ingrowth. No-progressive radiolucent lines were observed at bone-cones interface in 9 cases.

Discussion The clinical results reported in the literature, according to our study, demonstrate that Tantalum cones represent a true option in the treatment of severe bone defects. The use of "3-point fixation technique" showed satisfactory results at 5-year follow-up, but further analysis with longer follow-up and comparative studies are necessary to establish its efficacy.

Revision of total hip arthroplasty after fracture of a ceramic component

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Introduction Mechanical properties of the ceramic components in total hip arthroplasty markedly improved due to the progress in the process of manufacture. Nevertheless, fractures of any ceramic component are still encountered. The aim of this study is to examine the results of revision of total hip replacement performed specifically to treat a fracture of acetabular component or ceramic femoral head, and to identify technical factors that affected the outcome in short and medium terms.

Materials and methods In our Hospital, two surgeons performed 24 surgical revisions of total hip arthroplasties to treat a fracture of a ceramic component in the period 2000–2010. It was examined the clinical and radiographic documentation related to the time before the first arthroplasty and that related to the admission to the hospital for the revision. The patients were recalled and re-evaluated both clinically and radiologically; the radiographs of the last follow-up were compared with those of the post-operative time. The success of the revisions was evaluated by the survival analysis of Kaplan–Meier. The follow-up lasted from 3 months to 10 years.

Results The use of polyethylene acetabular components and ceramic heads with titanium sleeves, allowed us to obtain better results in short and medium terms, as regards to previously published reports. In fact we had no more precocious mobilization, osteolysis and new fracture of the heads.

Discussion To obtain a good result, key factors seem to be the accurate removal of ceramic debris, a complete synovectomy, and a gap as short as possible between the fracture and the revision. In our casuistry, fractures were more frequent in the acetabular side. Sometimes, fractures were connected with impingement mechanisms, due to the placement of the components, or to some eterotopic ossifications which caused extra-articular impingement, or even (especially in young patients) to the utilization of the hip with a high ROM. Otherwise, we did not find mechanical causes.

Conclusions The fractures either of the head, or of the acetabular component, are exceptional complications; but they are dangerous.