

**Suggested readings**

1. Mittermayer F et al (2002) Revision of the Kotz type of tumor endoprostheses for the lower limb. *JBJS* 84(3):401–406
2. Gosheger G et al (2006) Endoprosthetic reconstruction in 250 patients with sarcoma. *Clin Orthop* 450:164–171
3. Ruggieri P et al (2007) Revision surgery in modular prostheses of the lower limb for bone tumors at long-term follow-up. 14th ISOLS, Hamburg

**Long-term results of femoral revision with the Wagner tapered stem**

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**Objective** In femoral revision surgery, implant fixation should be gained in preserved cortical bone. Fluted, tapered stems provide secure axial and rotational stability in the distal femur [1]. Long-term clinical and radiographic results with the Wagner SL stem are reported.

**Material and methods** From September 1992 to March 1998, 68 femoral revisions with use of Wagner stem were performed. Twenty-five patients (2 bilateral implants) died for unrelated causes, with a well-functioning total hip replacement in situ. The study group consisted of 41 patients, 12 males and 29 females, aged from 29 to 80 years (mean, 61 years). Bone loss included types 2 (6 hips), 3A (19), 3B (4), and 4 (12) according to Weeden and Paprosky classification. A transfemoral approach was used in 32 cases. Bone grafting was never supplemented. Ambulation was allowed 1 week after surgery, but weight bearing was delayed 2 months. Average follow-up for the survived hips was 13.9 years (range 10.4–15.8 years). Clinical evaluation was performed using Harris Hip Score (HHS). The signs of osseous integration of the stem and the progression of periprosthetic bone remodelling were assessed radiographically. Failure was considered revision of the femoral component for any cause.

**Results** In 5 hips the stem was revised because of marked complications. Two patients underwent resection-arthroplasty for deep infection. In 2 cases a significant subsidence of the stem occurred, requiring re-revision for prosthetic joint instability and for head-neck disassembly. One stem finally was replaced for old dislocation following acetabular component failure. Four hips (11.1%) dislocated, and 8 stems (19.5%) subsided. Thirty-three cases (91.6%) showed radiographically stable bone fixation of the stem. A partial restoration of the femur was detected in 95.6% of the patients, both in the proximal part and in the cortical diaphyseal bone. Average HHS improved from 36 points preoperatively to 76 points at the latest follow-up. The cumulative survival rate of the Wagner stem was 87.8% at an average of 13.9 years.

**Discussion** The stems that required further surgery were revised for the development of severe complications. Periprosthetic new-bone formation was seen to occur regularly.

**Conclusions** The absence of aseptic stem loosening documents the efficacy of fluted, tapered fixation on the diaphyseal cortical bone. Wagner SL prosthesis resulted a successful implant system in femoral revision, promoting bone stock regeneration in extended defects [2, 3]. Higher risk complications (dislocation, subsidence) should be reduced by the use of modular tapered stems.

**References**

1. Berry DJ (2002) Femoral revision. Distal fixation with fluted, tapered grit-blasted stems. *J Arthroplasty* 17[4 Suppl 1]:142–146
2. Böhm P, Bischel O (2004) The use of tapered stems for femoral revision surgery. *Clin Orthop Relat Res* 420:148–159
3. Gutiérrez del Alamo J, Garcia-Cimbrello E, Castellanos V, Gil-Garay E (2007) Radiographic bone regeneration and clinical

outcome with the Wagner SL revision stem. A 5-year to 12-year follow-up study. *J Arthroplasty* 22(4):515–524

**SESSION 10****Early results with the Revitan modular revision stem**

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**Background** A retrospective study was conducted to review early results of the Revitan (Zimmer, Warsaw, IN, USA) modular revision stem.

**Material and methods** From June 2005 to August 2007, 25 consecutive hip revision surgeries were performed with the Revitan straight stem at our institution in 25 patients. There were 12 females (50%) and 12 males (50%) whose mean age at surgery was 74 years (range 71–88 years); one patient was lost at follow-up. The indication for revision was aseptic loosening in 13 cases (54%), septic loosening in 6 cases (25%), 4 periprosthetic fractures (17%) and one stem mechanical failure (4%). Mean post-operative follow-up was 31 months (range 18–36 months). The clinical assessment consisted of the Harris Hip Score, subjective VAS pain and satisfaction evaluation. Standard AP and lateral x-rays of the hip were obtained at each follow-up visit. Various radiographic measurements were used to evaluate the results: bone ingrowth, stress shielding, and vertical subsidence. Leg length discrepancy was also investigated as a factor possibly affecting outcome.

**Results** Clinical assessment showed a significantly improved mean Harris hip score from 48.58 points (range 19–88) preoperatively to 80.66 points (range 40–96) at follow-up ( $p < 0.001$ ). The subjective VAS and satisfaction scores at follow-up were, respectively 1.63 (range 0–9) and 8.79 points (range 3–10). At last follow-up the subjective perception of pain was significantly lower in those patients that had a Wagner's femoral osteotomy ( $p = 0.18$ ). Average post-operative leg length discrepancy was  $-10.5$  mm (range  $-70$  to  $+20$ ). The only complication reported was a femoral fracture occurred during primary implant removal procedure.

**Conclusions** The clinical outcome at a mean follow-up of 31 months showed the achievement and persistence of results and complication rate comparable to those of other modular revision implants presented in literature.

**Fracture of a polyethylene post in a 9-year-old posterior-stabilized knee prosthesis: light microscopy and SEM evaluation**

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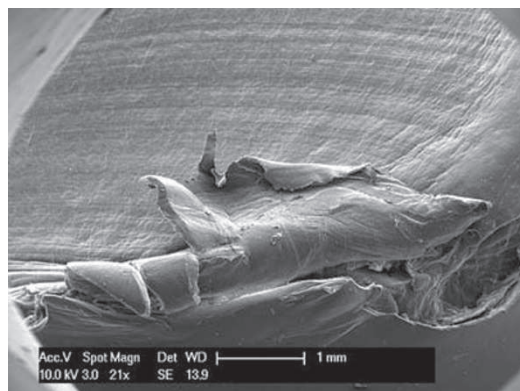
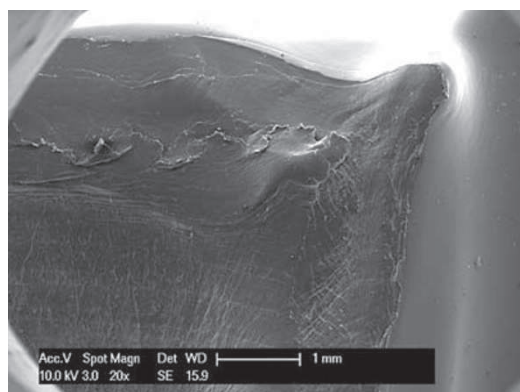
**Objective** Aim of this study is to evaluate the surface of the TKA polyethylene liner, harvested after the breakage of the post nine years

after the implant in a 63 years old female (BMI 39) after an hyper-extension trauma.

**Methods** During the revision we harvested sample of the peri-prosthetic tissue which was prepared for the light microscopy evaluation. The samples were stained using both haematoxylin-eosin and Von Kossa. The PE liner was prepared for the Scanning Electron Microscopy.

**Results** The SEM evaluation revealed two different damage patterns considering the medial part and the lateral aspect of the sample. The medial part presented a fracture line laminated in front and smooth behind and with the tear lines with a medio-lateral and anterior posterior orientation. The lateral part presented a sharp fracture line that ends anteriorly with a laminated tear paralleled to the anterior edge of the polyethylene insert, and which implies that this area could be the terminal failure area of the fractured post. The medial part of the fracture edge appears to be smooth and with a different orientation of the fracture lines.

**Conclusions** These features could be explained with a “two stage” rupture of the polyethylene post. This could have been caused by a non-optimal ligamentous balance that weakened the post, which was finally broken by a postero-anterior stress.



#### Suggested readings

- Clarke HD, Math KR, Scuderi GR (2004) Polyethylene Post Failure in Posterior Stabilized Total Knee Arthroplasty. *J Arthroplasty* 19:652
- Bal S, Greenberg D (2007) Failure of a metal-reinforced tibial post in total knee arthroplasty. *J Arthroplasty* 22:464
- Chiu YS, Chen WM, Huang CK, Chiang CC, Chen TH (2004) Fracture of the polyethylene tibial post in a NexGen posterior-stabilized knee prosthesis. *J Arthroplasty* 19:1045

#### Early acetabular revision with anatomic cup

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**Introduction** Anatomic acetabular cup, studied in 1999 by Prof. M. D’Imporzano, is born to solve the problem of acetabular revision in grade I and II mobilization (GIR) [1], respectively, characterized by widening and deformation of cavity with eventual superior or posterior wall loss. The problem in these lesions is not such bone stock reconstruction, as correct positioning of new cup. Indeed superior wall loss can set wrong collocation of the cup tending to verticalization and superior migration of rotation centre, while posterior loss can lead to retroversion [2].

**Material and methods** The hemispheric cup owns a cranial fin for iliac support with 4 holes for stabilization with spongiosa screws. In its equatorial area features 3 holes for posterior and medial screws, according to Pauwels, and circular retention cavities in order to increase the initial stability. The external shell is covered with a porous titanium layer so as to facilitate secondary osteointegration. The tapered liner is in ceramic or polyethylene eventually protruded. The originality of this cup consists in having the insertion seat of the articular liner oriented by 18° in antiversion. This choice was made in order to automatically guarantee the necessary antiversion, even if the supero-posterior iliac wall is eroded, the latter being the reason why normal symmetrical revision cups lead to undesired positioning in insufficient antiversion. Considering these features, the cup can be used, as well as in revision surgery, in treatment of Coxa Profunda, Displasic Coxo-femoral Osteoarthritis and acetabular fractures outcomes [3]. In this study we present the results of 60 revisions between 2000 and 2007, with a 1–7 years follow-up.

**Results and conclusions** The clinical outcome was good with an improvement from 55 to 88 considering the Harris Hip Score. As complications we observed only 1 case of sepsis, neither dislocation nor mobilization. Radiographical study of rotation centre pointed out a reduction of the superior migration from 1.2 to 0.8 cm after surgery. The shortness of follow-up period does not allow to conclude definitively about the effectiveness of this cup as the optimal solution in this surgery; however, we can state that it can be a valid solution for treatment of grade I and II contrasting the two principal problems of these revisions: superior migration of rotation centre and retroversion tendency.

#### References

- Pipino F, Molfetta L (2000) GIR classification of acetabular and femoral bone loss in revision hip arthroplasty surgery. *J Orthopaed Traumatol* 2:69–77
- Spoorer SM, Paprowsky WG, O’Rourke MR (2006) Managing bone loss in acetabular revision. *Instr Course Lect* 55:287–297
- D’Imporzano M, Castelli F (2001) First experience with “Anatomic” cup. Congresso Nazionale SIOT, 13 Nov 2001, Rome, Italy