Two-stage treatment protocol for isolated septic acetabular cup loosening

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Introduction:

The use of antibiotic-loaded spacers is an established method in the treatment of hip joint infections. However, not every infection after total hip arthroplasty involves both prosthesis components. In some cases with a septic acetabular cup loosening but no involvement of the stem, the orthopaedic surgeon is confronted with the dilemma to explant one or both prosthetic components. This decision might be even harder in the presence of osteoporotic bone or bone weakened by previous surgical revisions which might result to a subsequent femoral fracture during the stem explantation, and, hence, endanger the later prosthesis reimplantation as well as the functional outcome.

The aim of the present study was to evaluate the treatment of septic acetabular cup loosening at no involvement of the prosthesis stem by insertion of an antibiotic-loaded spacer head and at stem retention.

Materials - Methods:

Between 1999 and 2008, 14 patients (5 men, 9 women; mean age 70 years) could be identified which have been treated with this procedure. Primary surgical indications included primary total hip replacement (9x), revision surgery for aseptic acetabular socket (3x) and stem loosening (1x) and dual head prosthesis implantation (1x). The diagnosis of infection was made on the basis of clinical criteria (local redness, tenderness, draining sinus or fistula), operative findings of purulence, laboratory parameters (C-reactive protein > 20 mg/L, leucocyte blood account > 10,000/µl) and histopathological findings. All patients had positive preoperative findings of antigranulocyte scintigraphy (99m technetium) indicating septic acetabular cup loosening but no involvement of the stem. A preoperative hip joint aspiration was performed in all cases. All patients records have been retrospectively studied with regard to following parameters: primary surgical indication, time between primary surgery and infection manifestation, time between infection manifestation and revision surgery, causative bacterium, cement impregnation, systemic antibiotics, surgery time at the first and second stage, respectively, intraoperative blood loss and postoperative blood substitution for both stages, type of implant at reimplantation (cemented versus cementless), comorbidities, and general postoperative complications (thrombosis, acute renal or hepatic failure, allergic reactions). Specific attention was also paid on mechanical complications (spacer dislocation, femoral fracture) as well as the infection eradication rate.

Results:

At a mean follow-up of 52 [12-83] months, an infection eradication was achieved in 92.3 % of the cases. S. epidermidis and S. aureus were the two most common identified organisms. The mean spacer head implantation time was 88 [35-270] days.

The mean operation time at the first and the second stage was 210 [105-330] min and 190 [125-260] min, respectively. The mean postoperative blood loss, measured by the volume collected in the drains, was 910 [340-1470] ml after the first and 1010 [260-1940] ml after the second stage, respectively. After the first stage, meanly 2 blood units [1-4] had been transfused, whereas after the second stage also 2 blood units [0-12] had been mainly transfused per patient.

At cup reimplantation, all frozen sections did not indicate any signs of active infection; microbiological findings were also negative. Prosthesis reimplantation was performed in 12 patients. Cemented components were used in 5 cases, whereas cementless ones in 7 cases. One patient (case No. 2) denied a prosthesis reimplantation. In this case, the patient started to increase weight-bearing on the leg 3 months after spacer implantation. 13 months later, X-rays revealed an asymptomatic acetabular fracture without any spacer dislocation. At a follow-up of 52 months the patient is still free of any infection signs and has no complaints at an almost free range of motion.

Complications included draining sinus in two cases, spacer dislocation in one case and prosthesis dislocations in three cases. One patient passed away after prosthesis reimplantation due to cardiopulmonary decompensation.

Discussion:

To our knowledge, this is the first study which tried to evaluate the results of a two-stage protocol in the management of isolated septic acetabular cup loosening at no involvement of the prosthesis stem. Our results demonstrate success rates to those after removal of all hardware and spacer implantation. We conclude that this method is an elegant option for treatment of isolated septic acetabular cup loosening at well-fixed stem, especially in cases with of osteoporotic bone or bone weakened by previous surgical revisions.