Revision of infected hip replacement

Two-stage procedure with a temporary gentamicin spacer

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We revised 5 infected totally-replaced hips in 2 stages. At the first operation a gentamicin-loaded modelled cement spacer was inserted, and the definitive prosthesis was inserted 3–8 weeks later. 9–24 months after the last operation, there was a recurrent infection in 1 case. 2 of the patients could walk in the interval.

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In infected knee arthroplasties, a two-stage revision procedure with the use of spacer blocks has proved successful (Booth and Lotke 1989). We report 5 cases of infected hip arthroplasties when two-stage revision with the use of gentamicin-loaded cement spacer was used.

Patients and methods

Our 5 patients had an infection after cemented total hip arthroplasty, performed for primary arthrosis (Table 1).

The gentamicin-loaded cement spacer was constructed as follows. First, the thoroughly cleaned acetabulum was filled with gentamicin cement, and then the head of the removed stem was used to mold the cement into the shape of an acetabular cup. The stem was formed by hand and was tested in the extracted cup before definitive curing of the cement. At this point it is important to find the correct neck angle, and we measured the length in order to preserve the offset and leg length for the next operation. In Cases 4 and 5 the prosthesis was molded in one piece without an acetabular component, but instead with a large head fitting the acetabulum (Figure 1).

Table 1. Patients and results

	Case 1	Case 2	Case 3	Case 4	Case 5
Age (years)	73	55	68	76	75
Sex	female	female	female	female	male
Type of prosthesis	Lubinus	Charnley	Lubinus	Lubinus	ITH
Primary/revised infection	primary	primary	primary	primary	revised
Months primary op-revision	12	85	18	13	15
ESR at revision	56	64	64	35	40
CRP at revision	34	64	77	20	26
Bacterial cultures at revision	*Enterococcus*	*Propionibacteria*	*Klebsiella/CNS*	*Streptococcus B*	*CNS*
Antibiotic treatment before revision (weeks)	0	0	0	Flucloxacillin 4	0
Complications	fracture	0	luxation	0	0
Weeks between operations	3	5	8	7	4
Antibiotic treatment	Cephalosporin	Cephalosporin	Clindamycin/Cloxac.	Cephalosporin	Cloxacillin
ESR at rearthroplasty	56	100	24	12	20
CRP at rearthroplasty	36	21	<10	<10	<10
Bacterial cultures at rearthroplasty	0	0	0	0	0
Prosthesis at rearthroplasty	Lubinus 20 cm	PCA long stem	Lubinus	Lubinus	Lubinus
Postoperative antibiotic treatment (months)	Cephalosporin 6	Cephalosporin 4	Flucloxacillin 12	*Cephalosporin* 4	*Flucloxacillin* 6
Follow-up (months)	12	24	12	9	9
Outcome	good	infection	good	good	good

Figure 1. Case 5. The inserted interim prosthesis.

Results

There were 2 complications. Case 1 had a subtrochanteric fracture during removal of the femoral component and had to stay in bed with traction until the next operation. Case 3 had a dislocation between the spacer components when she tried to stand up, and she was thereafter treated in bed. After that incident, the prosthesis was molded in one piece in the next cases and the patients could be ambulatory without weight bearing. Case 2 has a persistent infection. She was revised with a cementless prosthesis and bone grafting because of marked bone resorption. She was recovering well during the first 12 months, with a marked improvement of the cortical bone in the femur, but after 2 years a persistent infection was still manifest.

Discussion

After one-stage revisions using bone cement with antibiotics, primary healing of infections has been reported in 75–91 percent (Buchholz et al. 1981, Wroblewski 1986, Sanzén et al. 1988). There are no prospective studies to compare one- or two-stage revisions, but a two-stage procedure with gentamicin/PMMA beads is often chosen in clinically and radiographically more severe infections (Sanzén et al. 1988). The two-stage procedure involves some problems. In many cases, the patient is bedridden between the 2 operations and traction is used to avoid shortening. With our method the patient can sit up, and even walk, although without weight bearing. We were successful in this respect in the 2 cases where the prosthesis was molded in one piece. The length of the leg can be well preserved and this makes the second operation technically easier. The large amount of gentamicin-containing cement may also contribute to the healing of the infection.

References

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