Correspondence

Gentamicin-free bone cement does not alter proteinuria after hip arthroplasty

Sir—In a previous study (Nergelius et al. 1997), we followed urinary excretion of proteins after THR (total hip replacement), with or without systemic cloxacillin, or TKR (total knee replacement). We found signs of postoperative glomerular and tubular renal impairment in all groups, but no differences between the groups, i.e., no indication that isoxazolyl penicillin was the cause of the renal impairment, as previously suggested (Isacsson and Collert 1984, Hedström and Hybbinette 1988, Wahlström et al. 1992).

To evaluate one other possible cause of this renal affection, we studied 10 patients undergoing THR with gentamicin-free bone cement. Gentamicin is known to be nephrotoxic and gentamicin concentrations can be measured in the urine for several months after cemented THR is performed using gentamicin-impregnated cement (Törholm et al. 1983). Patients with coxarthrosis and no previous history of renal disease, diabetes or rheumatoid arthritis were studied consecutively (Table). 7 patients were on antihypertensive treatment and 5 had previously used NSAIDs, which were discontinued 8 days before surgery. The prostheses used were Optima or Scan-Hip (both Mitab®, Sweden) and the bone cement was Palacos® (Essex, Schering Corp., USA). During the first 24 hours, blood loss was 1.0 *0.3* L (mean *SD*), i.v. fluid administration was 4.1 *0.6* L and urinary output 1.4 *0.5* L. 1 patient received 4 units of SAG(saline-adenine-glucose) suspension (packed red blood cells) and 1 received 2 units.

Urinary markers for glomerular (albumin, IgG) and tubular (protein HC) function as well as serum levels of creatinine, CK (creatine kinase) and cystatin C (Grubb 1992) were measured preoperatively and on days 1, 2, 4, and 8 postoperatively. All patients were operated under spinal anesthesia with bupivacaine and morphine in sterile enclosure, using a Hepafilter® (Crossworth, UK). Systemic antibiotics were administered: cloxacillin i.v. 1 g × 4 for 24 hours, followed by flucloxacillin orally for 3 days. DVT prophylaxis was given as the low molecular weight heparin, enoxaparin.

Postoperatively, urinary protein levels followed the same pattern and the maximum levels were in the same range in the present study as in the 17 patients operated on with gentamicin-impregnated bone cement and systemic cloxacillin in the previous study (Nergelius et al. 1997). There was a significant postoperative increase ($p < 0.05$; Wilcoxon signed-rank sum test, Bonferroni-corrected for multiple comparisons, when appropriate) in albumin and IgG on days 1 and 2 and in protein HC on day 2 (Figures 1–3). Of the serum markers only CK changed statistically significant with increased levels on days 1, 2, and 4 (Figure 4).

Demographic data. Mean *SD*

Sex (women / men)	5 / 5	
Age, years (mean and range)	75 (55—89)	
Weight, kg	81	*15*
Height, cm	174	*11*
Body surface, m^2	1.95	*0.24*
BMI, kg/m^2	26.7	*3.4*
S-creatinine, mmol/L	72	*19*
CL-creatinine, mL/ min/1.73 m^2	80	*28*

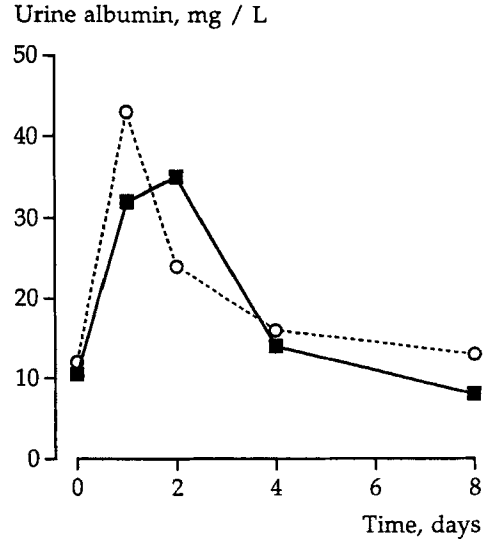

Figure 1. Urinary levels of albumin (median levels) in patients undergoing hip arthroplasty without (■, n 10, present study) or with bone cement (○, n 17, data from Nergelius et al. 1997) containing gentamicin.

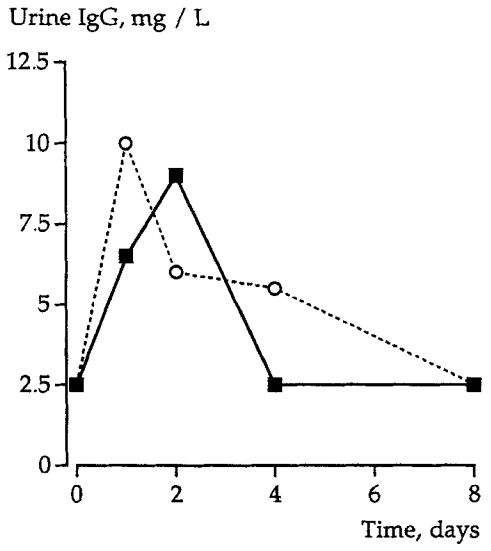

Figure 2. Urinary levels of IgG (median levels) in patients undergoing hip arthroplasty without (■, n 10, present study) or with bone cement (○, n 17, data from Nergelius et al. 1997) containing gentamicin.

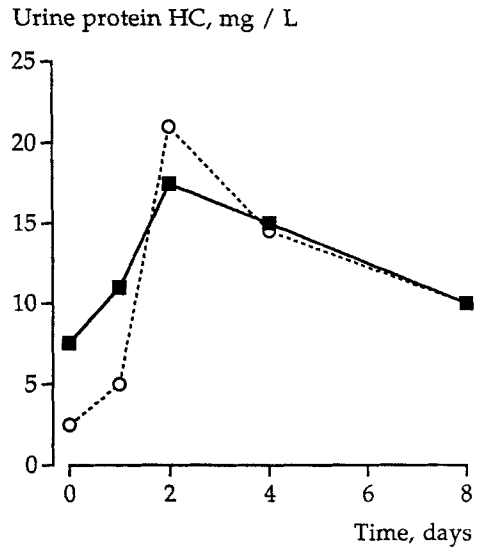

Figure 3. Urinary levels (median levels) of protein HC in patients undergoing hip arthroplasty without (■, n 10, present study) or with bone cement (○, n 17, data from Nergelius et al. 1997) containing gentamicin.

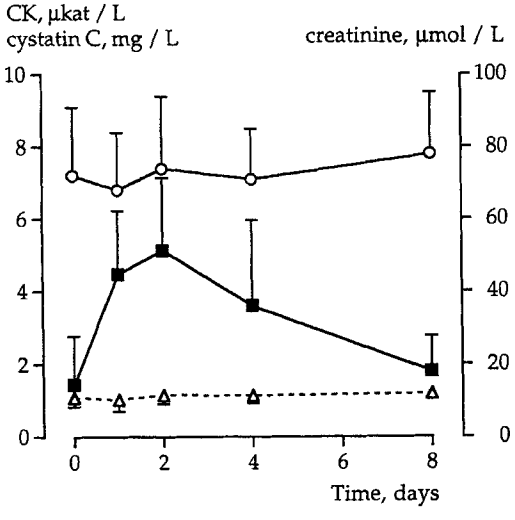

Figure 4. Urinary levels (mean and SD) of CK (■, creatine kinase), cystatin C(○) and creatinine (△) in patients undergoing hip arthroplasty with gentamicin-free bone cement (n 10, present study).

This study was undertaken to obtain an estimation of the possible influence of gentamicin on the development of renal failure after THR. Since the concentration profiles of the protein markers were essentially similar to those found after THR with gentamicin-impregnated cement (Nergelius et al. 1997), the results indicate that gentamicin is probably not the main cause of postoperative renal failure after THR.

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