Treatment of Septic Prosthetic Joints with a Single-Stage Noncemented Arthroplasty and Intraarticular Antibiotics

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PURPOSE

Infection is one of the most devastating complications following total joint arthroplasty, and the treatment of infection is difficult. It often requires multiple surgical procedures, prolonged hospitalization, and long-term intravenous antibiotic therapy. Failure rates are high for resistant organisms and mixed-flora infections.

METHODS

The treatment protocol includes a single-stage surgery in which the components are removed, the joint is debrided thoroughly, new components are implanted without cement or bone graft, and two indwelling Hickman catheters are placed.

The patient then receives organism-specific intra-articular antibiotics through the Hickman catheters for 6 weeks.

Antibiotic serum levels are comparable to those achieved by intravenous routes. Intraarticular levels are hundreds of times higher than can be achieved with intravenous antibiotics.

RESULTS

Since 1999 we have treated 31 patients (31 knees) with virulent organisms.

We have had 2 failures with a 93% success rate. One of the failures occurred in a patient in whom we were unable to obtain an adequate closure for a large, soft tissue deficit with repeated attempts.

The second failure occurred in a patient who was initially treated elsewhere and we were unable to identify the infecting organism.

Case example:

A 76-year-old woman presented with a swollen, painful right total knee and fever up to 103°F. She had a chronic patellar tendon rupture. Cultures grew Methicillin-sensitive Staph. aureus, E. coli, and Pseudomonas. The patient was treated with direct exchange arthroplasty and given 6 weeks of piperacillin/tazobactam 2.25g and ceftazidim 1g intraarticularly twice daily for 6 weeks. Four months later the patient underwent a delayed reconstruction of her extensor mechanism with a gastroc flap. Cultures taken at that time were negative for any organisms.

CONCLUSIONS

This regimen appears to be highly effective in the more difficult cases of infection. Bone stock is improved by this procedure, and revision is a simple procedure because cement and bone graft are not present.

Directly infusing antibiotics into the infected area maintains a high local concentration level while minimizing systemic toxicity. Antibiotic-loaded cement spacers deliver antibiotics for only a few days, and can harbor resistant bacteria on the surface. Kuechle et al. reported that no commercially available bone cement will elute more than 15% of the antibiotics contained within the cement.

We have adopted a direct exchange method with antibiotics infused directly into the joint using Hickman catheters to achieve extremely high levels of intraarticular antibiotics for a full six weeks.

Bibliography
