

Chronic polymicrobial knee prosthetic joint infection without prolonged systemic antibiotics: a single-stage success

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Introduction & Aim:

Chronic prosthetic joint infection (PJI) following total knee arthroplasty remains a major challenge, particularly in elderly patients with multiple comorbidities. While two-stage revision is traditionally considered the gold standard, single-stage revision combined with optimized antimicrobial strategies is increasingly being explored in selected cases. This report aims to describe the clinical outcome of a chronic polymicrobial knee PJI treated with single-stage revision and local antibiotic therapy without prolonged systemic antibiotic administration.

Methods

We report the case of a 77-year-old female with multiple comorbidities presenting with chronic infection of a right total knee arthroplasty performed 2.5 years prior. The clinical course was complicated by a draining sinus. Preoperative joint aspiration identified *Enterococcus faecalis*. The patient underwent a single-stage revision procedure including implant removal, extensive surgical and chemical debridement, and reimplantation with a constrained prosthesis. Local antibiotic therapy was delivered using calcium sulfate carriers loaded with vancomycin and gentamicin. Multiple intraoperative cultures were obtained.

Results

Intraoperative cultures confirmed a polymicrobial infection with *Enterococcus faecalis* and a beta-lactamase-producing *Escherichia coli*. The postoperative course was uneventful, with no early complications. Based on the high local antibiotic load and emerging evidence, systemic antibiotic therapy was discontinued after 16 days.

At 12-month follow-up, there were no clinical or laboratory signs of infection recurrence. The patient reported minimal pain (VAS 1/10), with a range of motion of 5–105°, and ambulated with walking aids. Functional outcome was satisfactory, with an Oxford Knee Score of 32. Radiographs demonstrated a well-fixed implant with no signs of loosening or infection relapse.



Figure 1. Clinical and functional outcome at 12-month follow-up: (A) Healed surgical incision demonstrating complete resolution of the previous sinus tract without local signs of infection; **(B)** Active flexion achieving 105° with satisfactory joint stability.

Conclusions

This case suggests that single-stage revision combined with high-dose local antibiotic therapy may be an effective strategy for selected cases of chronic PJI, even in the presence of polymicrobial infection. The successful omission of prolonged systemic antibiotic therapy highlights the potential role of local antimicrobial delivery, although careful patient selection remains essential. Further evidence is required to support wider adoption of this approach.

References

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