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Case Report

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Late Prosthetic Joint Infection of a Rotating Hinge Knee Prosthesis Due to Streptococcus Gallolyticus 18 Years After Primary Implantation

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Abstract

We report an extremely late prosthetic joint infection (PJI) caused by Streptococcus gallolyticus occurring 18 years after primary total knee arthroplasty (TKA) in an 84-year-old woman. The patient presented with pain and swelling of the knee without systemic symptoms. Synovial cultures revealed S. Gallolyticus, a rare cause of PJI strongly associated with gastrointestinal lesions. The infection was managed by complete prosthesis removal and implantation of a static antibiotic-loaded cement spacer reinforced with metal rods. The patient declined further reconstructive surgery. This case underscores the possibility of very late hematogenous seeding of a knee prosthesis by S. gallolyticus and highlights the importance of gastrointestinal evaluation in such infections.

Keywords: Streptococcus Gallolyticus, Prosthetic Joint Infection, Total Knee Arthroplasty, Late Infection, Static Spacer, Colonoscopy.

Introduction

Prosthetic joint infection remains one of the most feared complications after total knee arthroplasty. Behind every percentage in epidemiological tables there is a story, the story of a patient who suddenly sees the stability, comfort, and confidence restored by surgery disappear under the weight of infection. It is a complication that transforms a technical success into a human struggle, often years after everything seemed resolved.

Most infections arise early, within the first two postoperative years, when bacteria exploit surgical wounds or transient contamination. Much rarer are those that appear long after the event the late hematogenous infections, in which microorganisms, coming from distant organs, silently reach a prosthesis that has been perfectly integrated for years. Among the possible culprits, Streptococcus gallolyticus — a microorganism once known as Streptococcus bovis — occupies a singular place. Usually a quiet inhabitant of the intestine, it can become dangerous when it enters the bloodstream, not only for its ability to cause endocarditis, but for its strong association with colonic polyps and neoplasms.

This case tells the story of an 84-year-old woman who, after almost two decades of normal life with her prosthetic knee, began again to feel that familiar pain, the swelling, the subtle fear that something was wrong. Behind that discomfort was not wear or mechanical failure, but the distant echo of an intestinal lesion — an invisible bridge between gut and joint. Her story is not only about infection, but about time, fragility, and the silent persistence of risk even after many years of well-being.

Case Presentation

An 84-year-old woman presented with progressive pain, swelling, and reduced mobility of the right knee over the previous month. She had undergone a primary cemented total knee arthroplasty 18 years earlier for severe osteoarthritis with a rotating hinge prosthesis, with complete functional recovery and no complications until the current episode. The patient denied any recent dental procedures, trauma, urinary or gastrointestinal infections. On examination, the knee was swollen, warm, and moderately tender, with a range of motion limited to 10–60°. There were no signs of fistula or wound dehiscence. She was afebrile, and her general condition was good.

Laboratory tests showed elevated C-reactive protein (CRP 38 mg/L) and erythrocyte sedimentation rate (ESR 72 mm/h), with normal white blood cell count. Plain radiographs revealed mild periprosthetic osteolysis and a radiolucent line beneath the tibial component. Joint aspiration produced turbid synovial fluid, with a leukocyte count of 136,000 cells/mm³ (95% neutrophils). Culture grew Streptococcus gallolyticus, susceptible to penicillin, ceftriaxone, and vancomycin. Blood cultures were negative. A transesophageal echocardiogram excluded endocarditis, while colonoscopy revealed an adenomatous sigmoid polyp, which was removed. The infection was classified as a late hematogenous PJI according to the 2021 EBJIS criteria.

Treatment

Given the chronicity of symptoms and radiographic evidence of component loosening, the surgical team opted for complete prosthesis removal and extensive debridement. A static antibiotic-loaded cement spacer, reinforced with metallic rods for stability, was implanted. The spacer contained gentamicin and vancomycin. The patient received intravenous Teicoplanin 600mg x 2 /day fot the first two days and then 600 mg/day for six weeks, coupled with piperacillin 4.5 gr every 6 hours for six weeks. At 12-week follow-up, inflammatory markers had normalized and the wound was healed. The patient reported good pain control and was able to mobilize with a walker. Due to her advanced age and personal choice, she declined the second-stage reimplantation and elected to retain the spacer permanently. At one-year follow-up, she remained free of clinical or laboratory signs of infection, with acceptable function for her daily activities.

Figure 1

Discussion

Prosthetic joint infection (PJI) caused by Streptococcus gallolyticus represents a rare but clinically significant entity, particularly when it occurs nearly two decades after the index arthroplasty. The extreme latency observed in this case challenges the traditional concept that late infections are exceptional events and reinforces the notion that a prosthesis remains biologically vulnerable for life. Even in the absence of local symptoms or mechanical failure, the prosthetic joint exists in continuous dialogue with the host immune system, and this balance may be disrupted at any moment by transient bacteremia originating from distant mucosal surfaces [1].

The pathophysiological link between S. gallolyticus bacteremia and colonic disease is well established. Formerly classified as Streptococcus bovis, this organism has a strong association with colorectal carcinoma, adenomatous polyps, and premalignant lesions [2, 3]. Its identification in blood cultures or periprosthetic samples should therefore never be considered incidental. In our patient, the diagnosis of PJI prompted colonoscopic investigation that revealed an adenomatous polyp, likely representing the source of bacterial translocation. In this sense, the infection functioned as a sentinel event, transforming an orthopedic complication into an opportunity for early detection of gastrointestinal pathology [4]. Late hematogenous PJIs remain particularly insidious because they occur in patients who perceive their prosthesis as definitively healed. This perception often delays presentation and diagnosis, especially in elderly individuals who may show atypical inflammatory responses [5]. Unusual microorganisms, such as S. gallolyticus, should therefore raise immediate suspicion of a distant infectious focus and prompt a systemic evaluation rather than a purely orthopedic response.

Therapeutic decision-making in elderly patients with PJI remains complex and ethically nuanced. Although two-stage revision is considered the gold standard for chronic infection in many guidelines, this approach is not always appropriate in fragile patients with limited physiological reserve. Increasingly, contemporary PJI management emphasizes individualized strategies that integrate patient age, comorbidities, expectations,

and quality of life [6, 7]. At 84 years of age, our patient clearly refused the prospect of repeated surgery and prolonged functional decline. Respecting her autonomy, we opted for a static antibiotic-loaded cement spacer as a definitive treatment rather than a bridge to reimplantation. Static spacers are traditionally associated with inferior functional outcomes compared to articulating spacers; however, they may offer significant advantages in selected elderly patients by reducing operative time, mechanical failure, and perioperative morbidity [8]. When carefully molded and reinforced, they can provide sufficient stability for transfers and limited ambulation while ensuring effective local antibiotic delivery. In our patient, this approach resulted in stable infection control and acceptable functional comfort, supporting the concept that definitive spacer retention may be a valid option in selected cases.

From a microbiological standpoint, S. gallolyticus remains highly susceptible to β-lactam antibiotics, allowing for effective targeted antimicrobial therapy [9]. This susceptibility likely contributed to the favorable outcome observed in our case. At one-year follow-up, the absence of clinical or laboratory signs of recurrence confirmed durable infection eradication. In elderly patients, where surgical aggressiveness must be balanced against frailty, achieving control rather than anatomical perfection may represent the most meaningful therapeutic endpoint.

This case also aligns with the recent emphasis on host optimization and personalized care highlighted in international consensus meetings, including the International Consensus Meeting on Musculoskeletal Infection (ICM) (Parvizi et al., 2025). In elderly individuals, host optimization often means respecting biological limits, minimizing surgical burden, and prioritizing autonomy over reconstruction. The equilibrium achieved in our patient represents a personalized balance between infection eradication, functional preservation, and psychological well-being.

Ultimately, this case reinforces that PJI is not solely a microbiological or mechanical failure but a systemic and deeply human event. It underscores the importance of vigilance, as infection can emerge even decades after implantation; of listening, because clinical decisions must reflect the patient's values; and of humility, because sometimes the best outcome is achieved not by doing more, but by doing what is most appropriate for that individual.

Late S. gallolyticus PJI reminds us that time does not immunize prostheses against infection, but it can grant clinicians the wisdom to replace rigid algorithms with thoughtful, compassionate medicine.

Table 1: Summary of Reported Cases of Streptococcus Gallolyticus Prosthetic Joint Infections

Author (Year)	Joint involved	Time from implantation	Treatment strategy	Outcome
García-Lechuz et al. (2017)	Knee	12 years	Two-stage revision	Infection eradicated
Sendi et al. (2011)	Hip	8 years	DAIR + antibiotics	Successful
Zeller et al. (2019)	Knee	15 years	One-stage revision	No recurrence at 2 yrs
Li et al. (2019)	Hip	10 years	Prosthesis removal + spacer	Cured
Spinarelli et al. (025)	Knee	18 years	Static spacer only	Infection-free at 6 months

Conclusion

This report describes an exceptionally late prosthetic joint infection caused by Streptococcus gallolyticus, occurring 18 years after total knee arthroplasty in an 84-year-old woman, and highlights several important clinical lessons. First, it reinforces the concept that prosthetic joints remain biologically vulnerable for life and that hematogenous seeding may occur even decades after implantation, often in the absence of obvious predisposing events. Second, the isolation of S. gallolyticus should never be considered incidental, as it frequently reflects an underlying colonic pathology; in our case, the infection led to the diagnosis of an adenomatous polyp, confirming the importance of systematic colonoscopic evaluation in these patients.

From a therapeutic perspective, this case underscores the necessity of individualized decision- making in elderly and fragile patients. Although revision arthroplasty remains the standard of care in many settings, aggressive surgical strategies may not always align with patient priorities or physiological reserve. In selected individuals, a static antibiotic-loaded cement spacer can provide durable infection control while preserving comfort, stability, and autonomy, representing a definitive and ethically sound therapeutic solution rather than a temporary compromise. Ultimately, this case illustrates that successful management of late prosthetic joint infection extends beyond microbiological eradication and surgical technique. It requires lifelong vigilance, multidisciplinary collaboration, and, above all, respect for the patient's values and quality of life. Late S. gallolyticus PJI serves as a powerful reminder that in modern medicine, the highest form of success lies in achieving a balance between scientific rigor and human compassion.

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