Chronic Bilateral Periprosthetic Hip Joint Infection Treated with One-Stage Exchange: Case Report and Literature Review

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INTRODUCTION

Periprosthetic joint infection (PJI) after total hip arthroplasty remains a serious complication. Acute hematogenous infection caused by Staphylococcus aureus may rapidly involve multiple prosthetic joints, and bilateral PJI is rare, posing a significant therapeutic challenge — particularly regarding the timing of treatment between the two joints. In cases of staphylococcal infection with multiple prosthetic involvement, previous practice typically consisted of a one-stage exchange on one side combined with a two-stage exchange on the contralateral side. We report a case of bilateral PJI managed with simultaneous one-stage bilateral exchange, and discuss the rationale supporting this approach.

MATERIALS & METHODS

We report the case of a 59-year-old man presenting with chronic PJI of a total hip arthroplasty, secondary to methicillin-sensitive Staphylococcus aureus (MSSA) infection, in the context of bilateral hip arthroplasty.

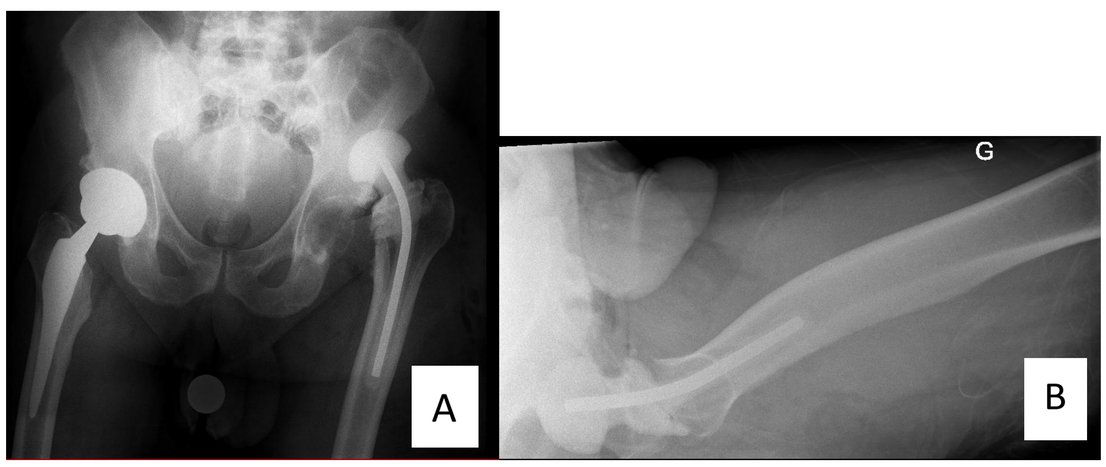
The patient was initially managed for 2 weeks at a peripheral institution, four weeks after symptom onset — a delay consistent with chronic PJI. Blood cultures were positive, and management consisted of debridement, antibiotics, and implant retention (DAIR) of the symptomatic hip, an approach generally reserved for acute infection. Following treatment failure, the patient underwent explantation of the prosthesis with insertion of an antibiotic-loaded spacer, complicated by spacer dislocation at 24 hours. Given this treatment failure, the patient was subsequently transferred to our institution for further management.

On admission, CT imaging demonstrated bilateral collections within the lesser pelvis. Aspiration of the contralateral (right) hip, clinically asymptomatic at the time, yielded the same organism (MSSA). Taken together with the pelvic collections identified on CT, these findings were consistent with haematogenous dissemination to the contralateral prosthesis, establishing bilateral involvement: a chronic infection at the initially affected site, and a more recently acquired infection at the contralateral site.

A combined bilateral revision strategy was undertaken via a posterior approach in a single operative session: completion of a two-stage exchange on the left (removal of the dislocated spacer, extensive debridement, and reimplantation), together with a one-stage exchange on the right (explantation of the infected prosthesis, extensive debridement, and immediate reimplantation), along with drainage of an associated pelvic collection via an ilio-inguinal approach.

Intravenous cefazolin was started preoperatively and continued postoperatively pending culture results. Intraoperative samples confirmed MSSA on both sides, on the prosthesis and in the pelvic collection. Following a good clinical (dry wound) and biological course, therapy was switched to targeted oral treatment (levofloxacin plus rifampin), for a total planned duration of 12 weeks.

Clinical, radiological, and functional follow-up was performed at 6 weeks, 3 months, and 6 months; functional outcome was assessed using the EQ-5D-5L questionnaire.



A- Radiograph AP and B-Radiograph Axial after explantation of the infected left-sided prosthesis and placement of an antibiotic-loaded cement spacer

Figure 1. *Radiographe preoperatoire*

RESULTS

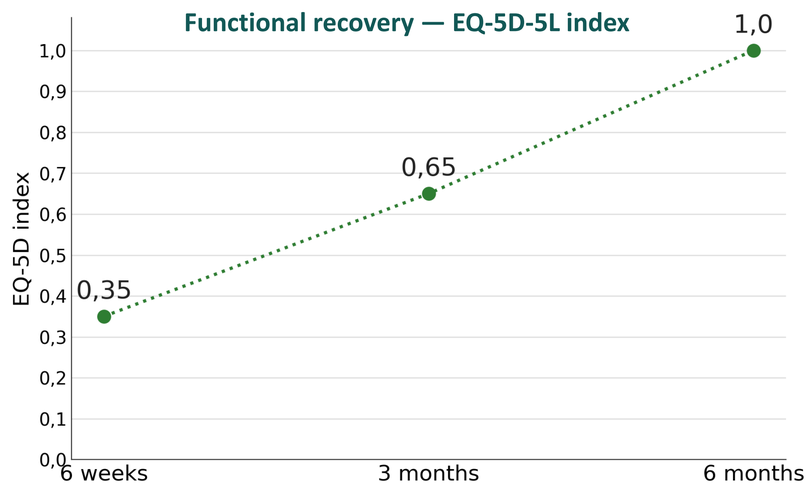
- Intraoperative blood loss: 2 L; 4 units of packed red blood cells transfused
  Postoperative: 2 units of packed red blood cells transfused;

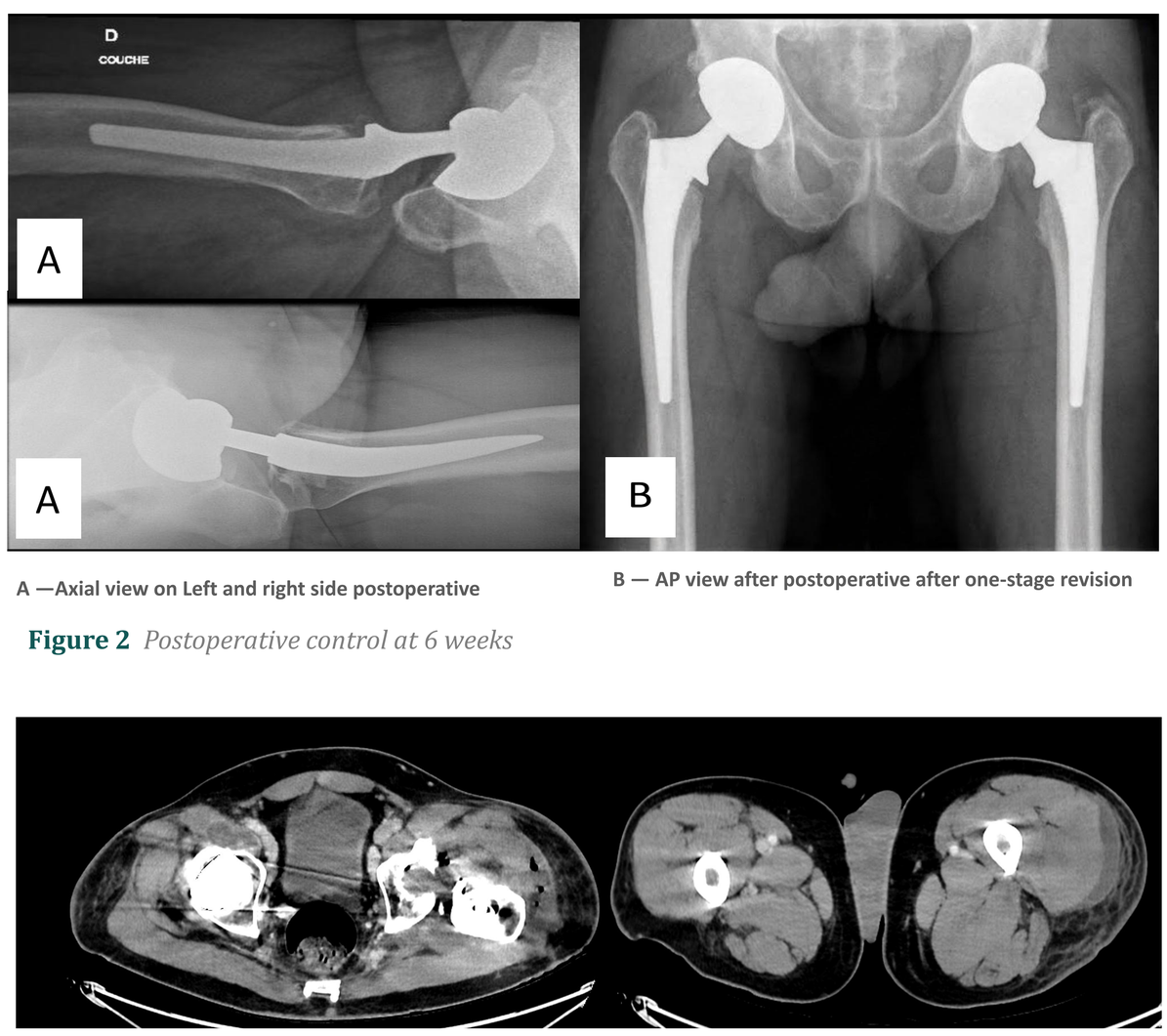
Follow-up at 6 weeks
- Walking with two crutches
- Surgical wound clean, without inflammatory signs

Follow-up at 3 months
- Walking without crutches, stable gait
- Pain decreased to mild levels

Follow-up at 6 months
- Walking without crutches
- No pain
- Normal muscular strength

Overall outcome
- No signs of infection recurrence during follow-up
- All radiographs during follow-up showed well-integrated prosthesis, with no radiographic signs of infection
- Return to work at 4 months





A —Axial view on Left and right side postoperative

B — AP view after postoperative after one-stage revision

Figure 2 *Postoperative control at 6 weeks*

Figure 3 *CT scan of the pelvis, coronal view, showing bilateral collections*

CONCLUSION

A thorough infectious work-up is essential in the setting of staphylococcal PJI, and should include, at minimum, imaging (CT), joint aspiration, and blood cultures to screen for haematogenous dissemination. In this patient, identification of a fully susceptible organism (MSSA) supported the decision for simultaneous bilateral one-stage exchange, with drainage of the pelvic collections, despite the severity of the presentation — including stable bacteraemia and the need for intraoperative repositioning during the bilateral procedure. This approach avoided the multiple planned procedures required by a conventional two-stage strategy.

No signs of infection recurrence were observed throughout follow-up, as confirmed by clinical examination, radiographic assessment, and functional outcome measures. The EQ-5D index improved progressively from 0.35 at 6 weeks to 0.65 at 3 months and 1.0 at 6 months, with return to work achieved at 4 months.

While current literature suggests that one-stage exchange is not inferior to two-stage revision in terms of infection eradication, evidence remains limited for chronic PJI following DAIR failure and for bilateral involvement. This case supports the feasibility of bilateral one-stage exchange in carefully selected patients, though larger prospective studies are needed to confirm its comparative efficacy and morbidity.