

Synchronous Bilateral Hip Periprosthetic Joint Infection by Staphylococcus aureus via Hematogenous Dissemination

Tiago Correia · João Lucas · Patrícia Cunha · Rui M. Cerqueira · João Soeima · José L. Simões · Inês Henriques · Margarida Salvado · Jaime Loureiro · João David Costa · Frederic Ramalho

Orthopedic Department, ULS Alto Ave, Guimarães, Portugal



UNIDADE LOCAL DE SAÚDE
ALTO AVE

BACKGROUND & AIM

Synchronous periprosthetic joint infection (PJI) is rare, but is associated with bacteremia and high rates of mortality and reinfection.

AIM

Describe a bilateral hip PJI caused by *S. aureus*, present our staged management, and contextualize the case through a targeted literature review.

Retrospective case analysis + PubMed/Scopus search (10 relevant studies)

BRIEF PATIENT HISTORY

- 79-year-old man
- Bilateral total hip arthroplasties >20 years earlier
- Right hip revised for aseptic loosening 3 years prior to this presentation
- Initial radiographs and laboratory findings were unremarkable

CLINICAL COURSE

DAY 0

Left hip pain >1 month; discharged after unrevealing initial assessment.

DAY 7

Fever; CRP 339 mg/L. CT showed a left periprosthetic fluid collection.

LEFT HIP

First-stage revision: component removal + antibiotic-loaded cement spacer.

MICROBIOLOGY

S. aureus isolated from blood and intraoperative cultures.

IN-HOSPITAL

Recurrent fever; CRP 157 mg/L; new right hip swelling and collection.

RIGHT HIP

Failed DAIR → First-stage revision: component removal + antibiotic-loaded cement spacer.

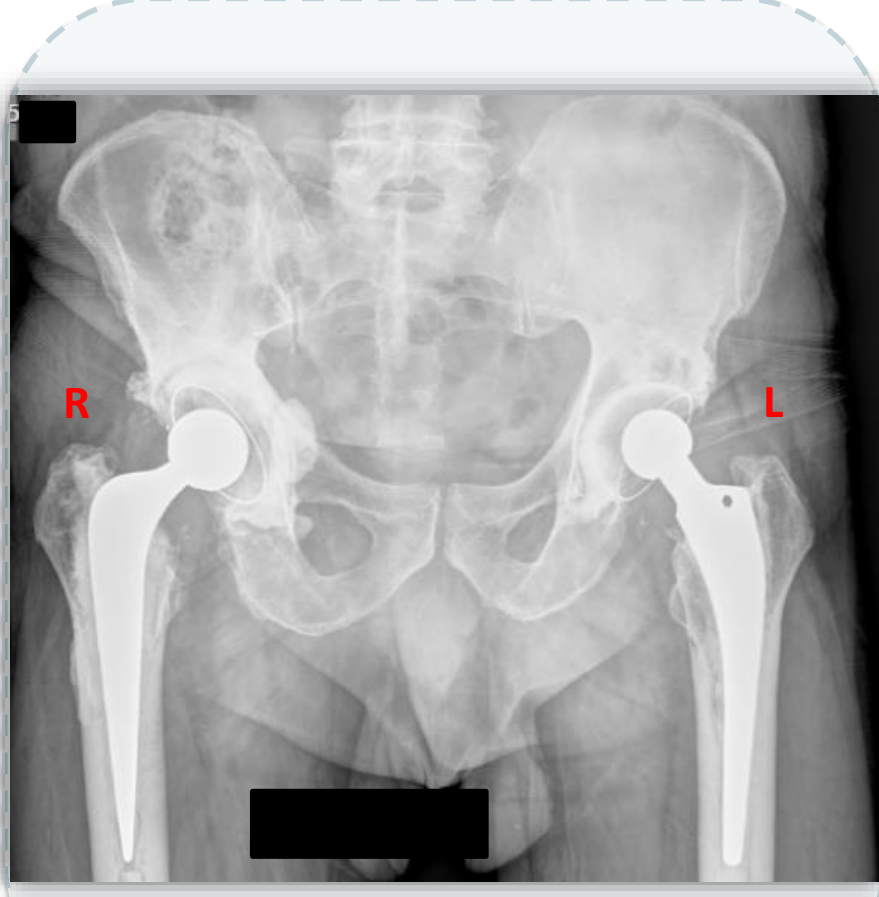
DEFINITIVE

Targeted antibiotics, clinical stabilization, then second-stage revision bilaterally (individual interventions)

>5 YEARS

No reinfection; asymptomatic and independently ambulatory.

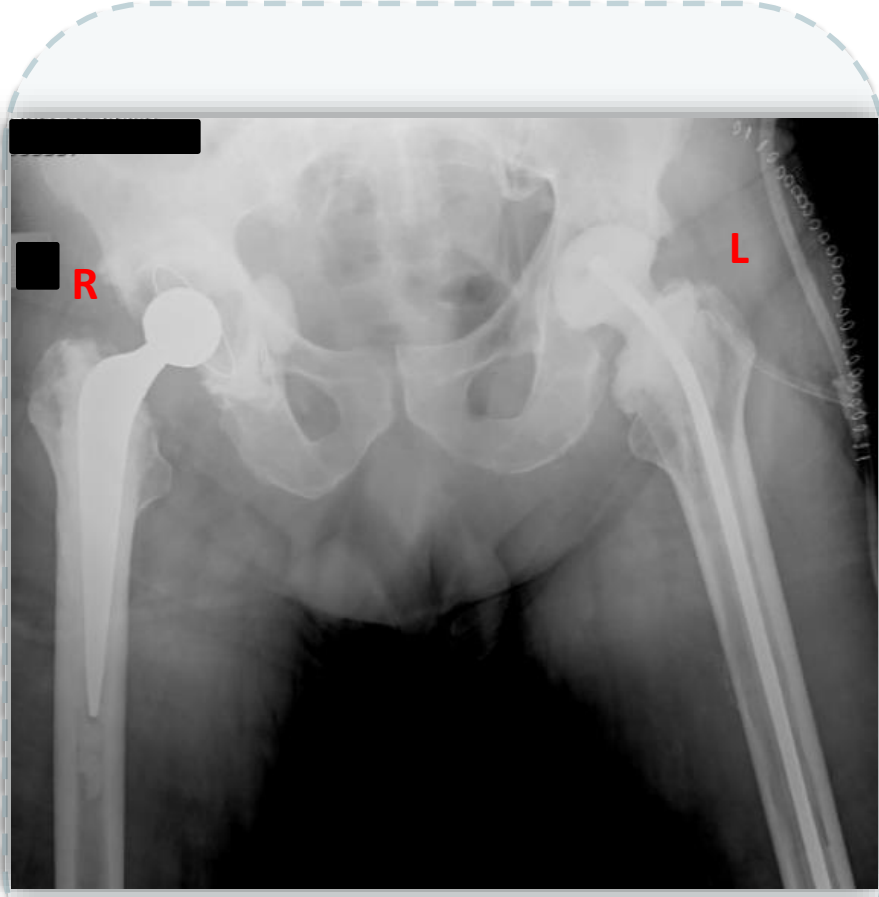
CASE IMAGING



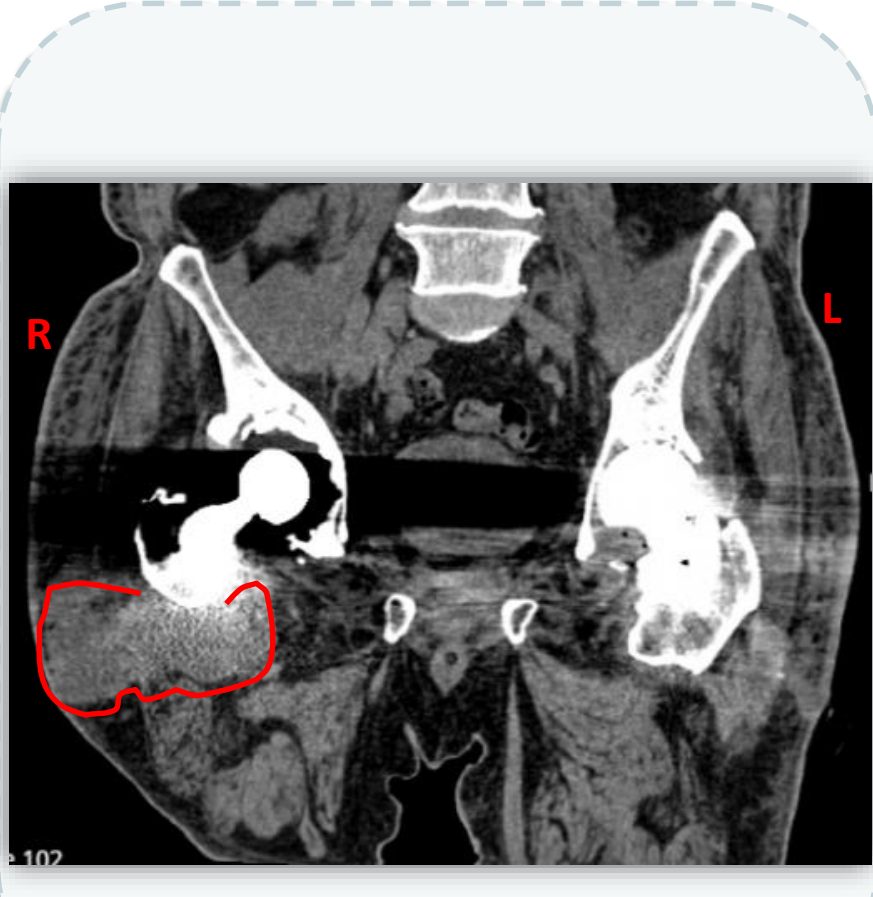
Initial AP pelvis radiograph



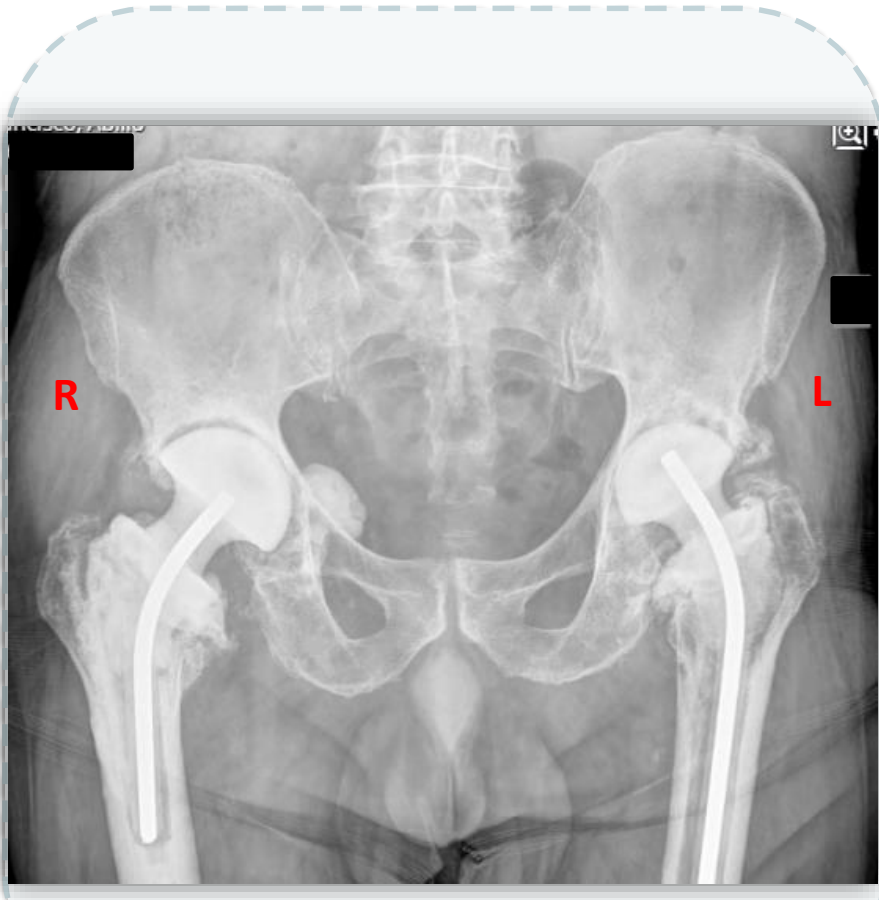
CT: left periprosthetic collection



Left hip after First-stage revision



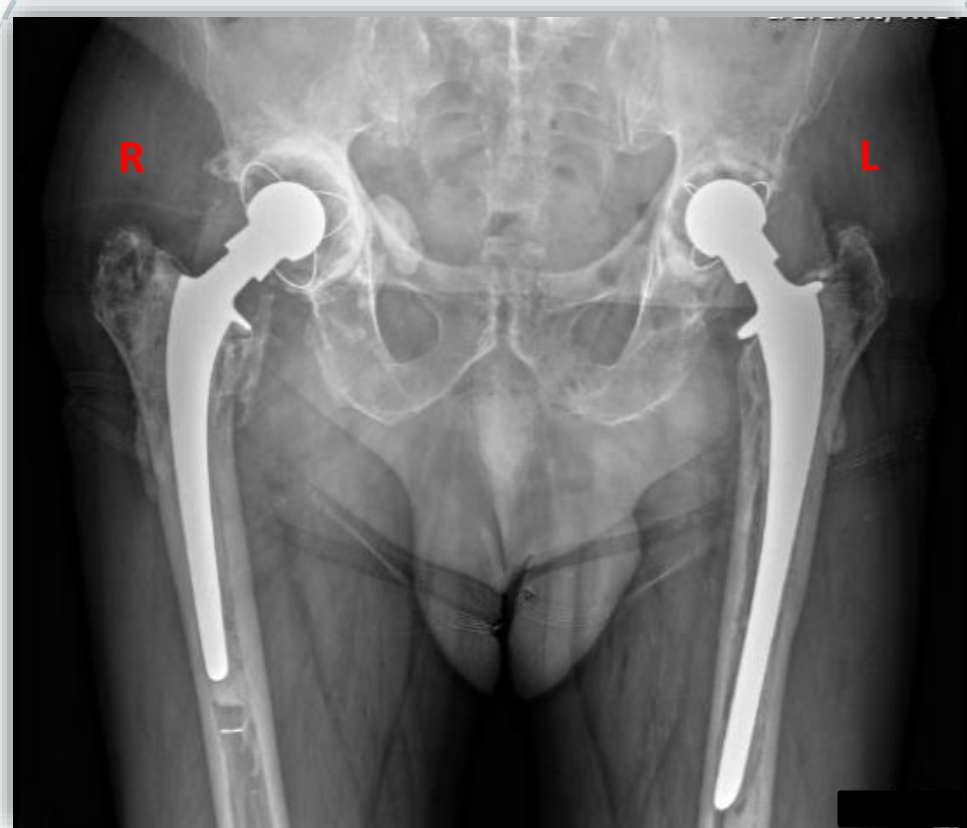
CT: right periprosthetic collection



Right hip after First-stage revision



Right hip after Second-stage revision



Final pelvis AP after bilateral reimplantation at >5 years follow-up

Serial imaging demonstrates progression from left-sided PJI to contralateral involvement, followed by staged revision and definitive reimplantation.

MICROBIOLOGY & DIAGNOSIS

BLOOD CULTURES
S. aureus

INTRAOPERATIVE CULTURES
S. aureus

Concordant bloodstream and operative isolates, sequential bilateral disease, and no early mechanical explanation supported a likely hematogenous origin.

OUTCOME

>5-YEAR FOLLOW-UP
INFECTION-FREE SURVIVAL

- Asymptomatic
- Independent ambulation
- No clinical evidence of reinfection

LITERATURE REVIEW

10
STUDIES

Evidence remains sparse and heterogeneous; the optimal surgical strategy is not established.

REPORTED RISK FACTORS

Multiple prostheses
(especially ≥3)

Bacteremia

Malignancy

Immunosuppression

Autoimmune disease

UNRESOLVED QUESTIONS

- One-stage vs two-stage revision?
- Aspiration of asymptomatic prosthetic joints?

CLINICAL IMPLICATIONS

- Examine and actively question all prosthetic joints when PJI coexists with bacteremia.
- A normal initial assessment does not exclude evolving hematogenous infection.
- New pain, swelling, fever, or persistent CRP elevation warrants repeat assessment and targeted imaging.
- Consider aspiration of another prosthetic joint when symptoms or imaging raise suspicion; routine aspiration of an asymptomatic joint remains controversial.
- Treatment strategy should be individualized according to infection severity, implant status, and patient factors, as the optimal surgical approach for synchronous PJI remains undefined.
- Coordinate orthopedic, microbiology, and infectious-disease decision-making early.

CONCLUSION

This case highlights the potential for *S. aureus* bacteremia to seed more than one prosthetic joint. Systematic consideration and assessment of all arthroplasties — and renewed investigation when inflammation persists — may allow earlier recognition of synchronous PJI. With limited comparative evidence, management should remain individualized.

REFERENCES & TAKE-HOME MESSAGE

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- Hecht CJ, Ong CB, Arnold KE, Acuna AJ, Kamath AF. Risk Factors, Diagnoses, and Clinical Characteristics of Synchronous and Metachronous Periprosthetic Joint Infections Following Total Joint Arthroplasty. 2026.
- Lee SH, Chang CH, Hu CC, Chang Y, Hsieh PH, Lin YC. The Risk Factor and Outcome of Metachronous Periprosthetic Joint Infections: A Retrospective Analysis With a Minimum Ten-Year Follow-Up. *J Arthroplasty*. 2021 Nov;36(11):3734-3740. doi: 10.1016/j.arth.2021.07.019. Epub 2021 Aug 5. PMID: 34419315.

TAKE-HOME MESSAGE

Bacteremia + many arthroplasties:
THINK MULTIPLE JOINT INFECTION

Case report prepared for scientific presentation. Patient images should be fully anonymized before insertion.