

The Power of Phage Therapy: A Salvage Approach for Complex Bone and Joint Infections

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INTRODUCTION

THE PROBLEM

- Biofilm on bone and implants shields bacteria from antibiotics
- Sometimes, relapse persists despite repeated surgery and prolonged antibiotics

PHAGES

- Lyse their specific bacterial host
- Self-amplify at the site of infection
- Degrade biofilm and act synergistically with antibiotics

WHAT WE KNOW

- 71–78% success reported in bone and joint infection series
- 77% clinical improvement in 100 magistral phage cases

Two complex MSSA infections treated with adjunctive phage therapy

1 Spinal infection

55 y, male

Previously independent

MSSA bacteraemia

Infection	Cervical and lumbar epidural empyema, leptomeningitis, paravertebral abscesses
Pathogen	MSSA: blood cultures and surgical samples
Surgery	4 debridement surgeries
Antibiotics	5 sequential regimens over 21 days before phage
Phage	7 days, 6 h/day, added to systemic antibiotics, after the 3 rd debridement surgery

21 Nov 2025

Septic shock
1st debridement

24–26 Nov

2 further
debridements

11–18 Dec

DEBRIDEMENT +
PHAGE THERAPY

19 Dec

Washout
cultures negative

23 Mar

Antibiotics
stopped



Figure 1. Sagittal MRI at admission

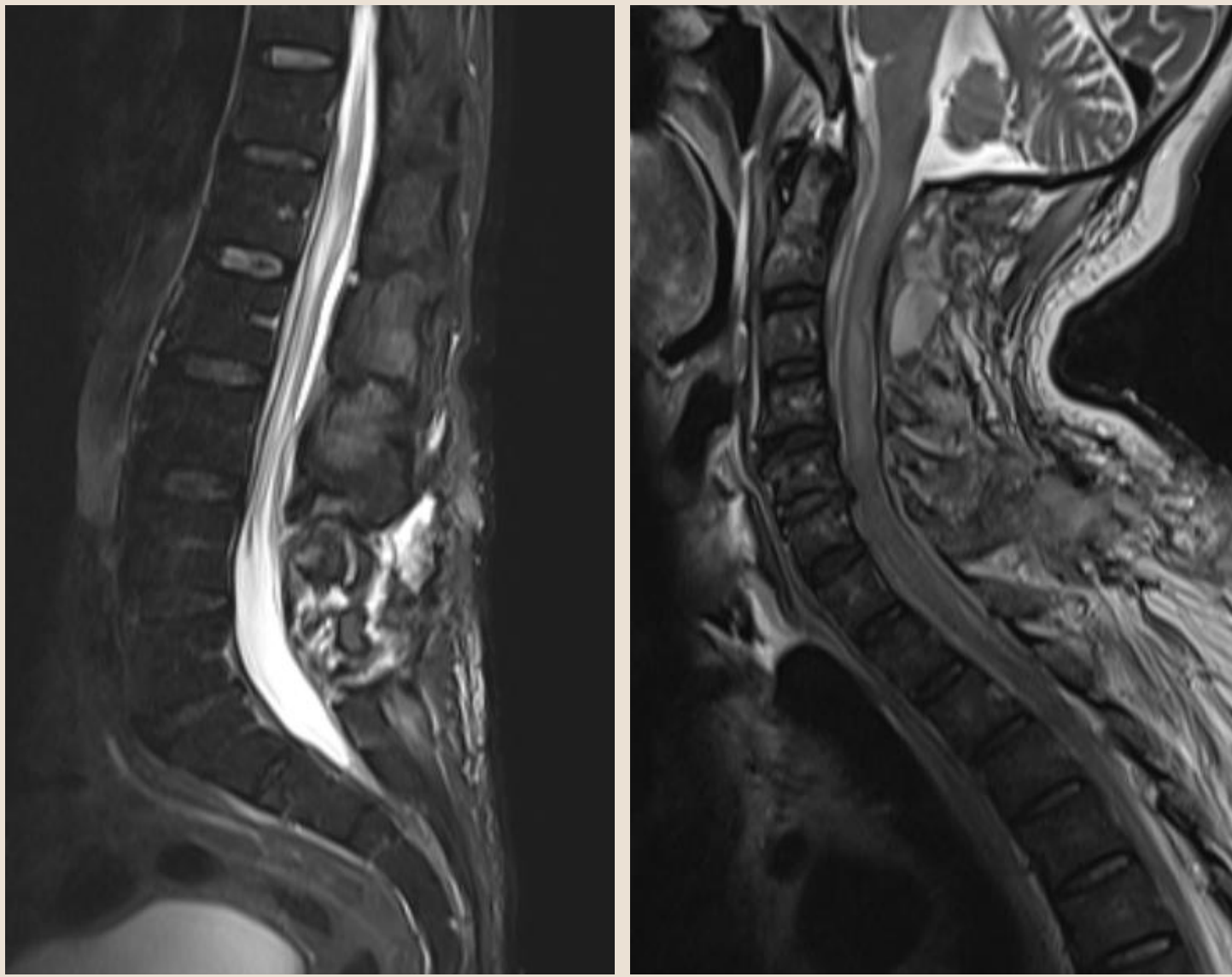


Figure 2. Sagittal MRI before the phage therapy



Figure 3. Sagittal MRI after the stoppage of antibiotics

2 Chronic hip PJI

64 y, male

Smoker · HCV · HIV

3 failed revisions

Infection	Chronic hip PJI in Girdlestone; draining sinus since 2021
Pathogen	MSSA: pre- and intra-operative samples
Surgery	Two-stage revision: spacer, then reimplantation
Antibiotics	Co-trimoxazole and rifampicin for 6 weeks
Phage	15 mL intra-operative, then 10 mL/8 h via drain, 10 days

19 May 2025

1st stage revision:
Antibiotics spacer

26 May

Ipsilateral femur fracture:
Spacer exchange and
cerclage wiring

21 Jul

2nd STAGE REVISION
+ PHAGE THERAPY

31 Jul

Phage ended
discharge

+6 weeks

Oral antibiotics
completed

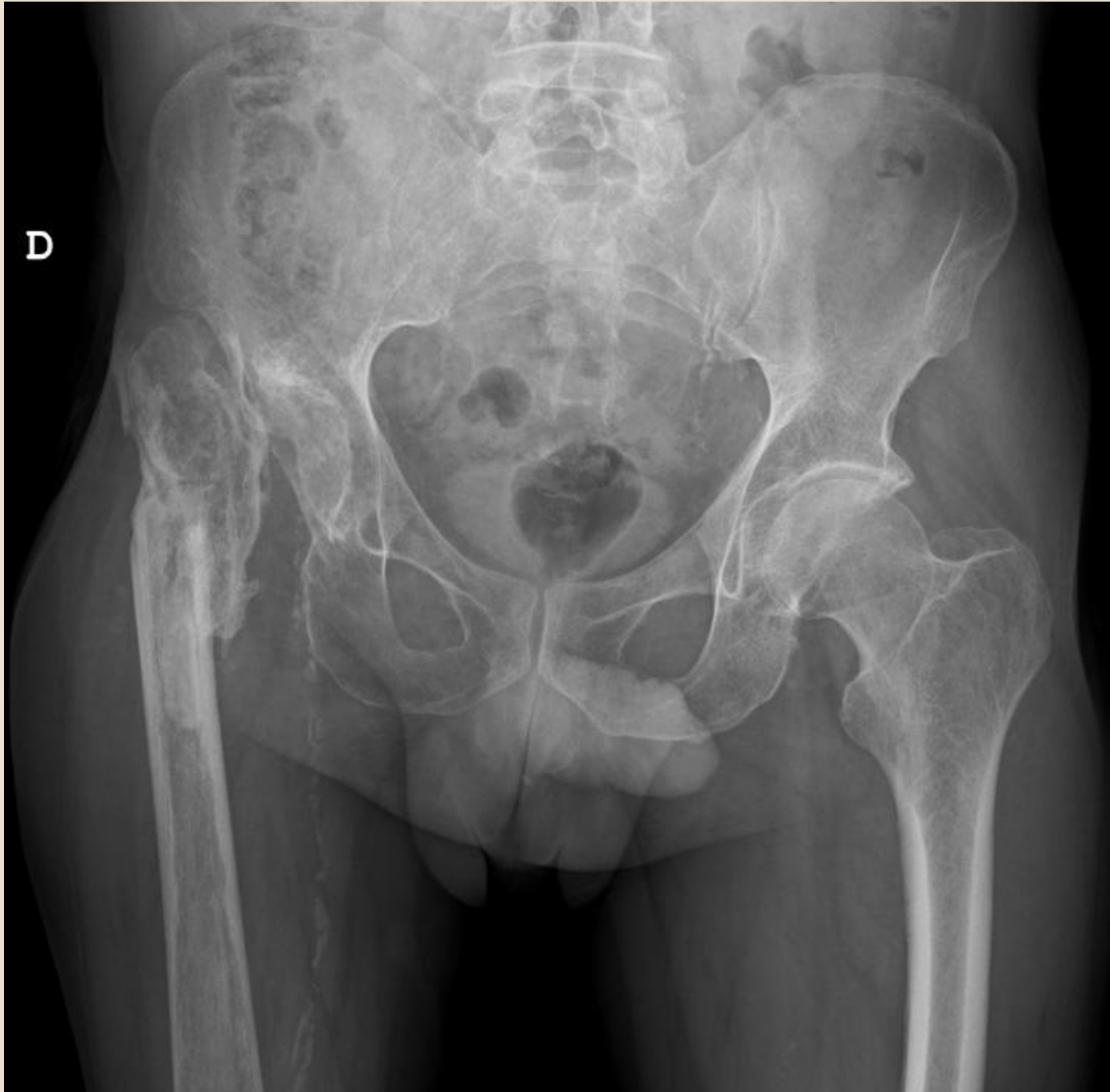


Figure 4. Radiograph at the admission

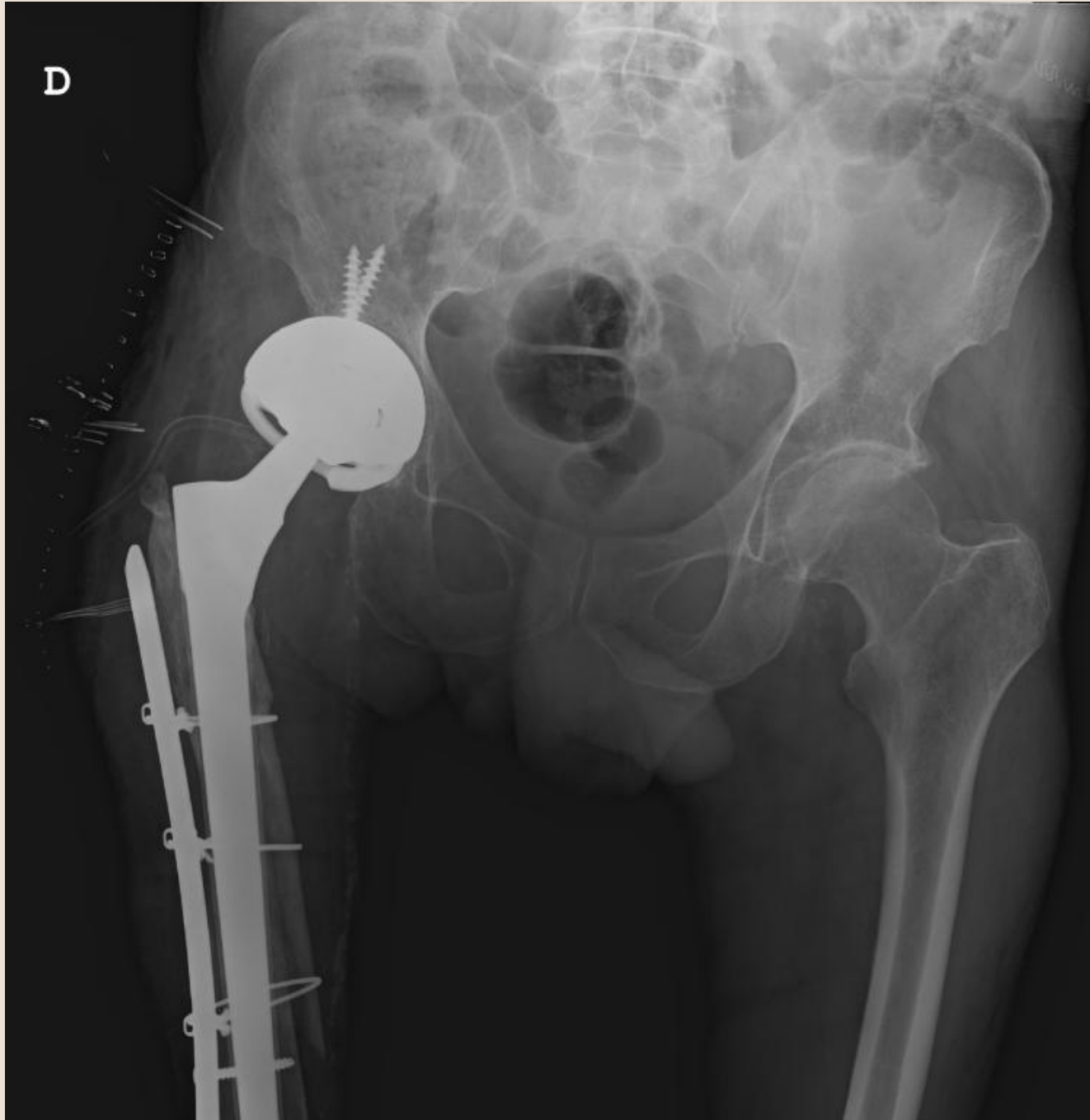


Figure 5. X-Ray after the 2nd stage revision surgery

RESULTS

Outcome	Case 1	Case 2
Phage course	7 days	10 days
Microbiology	Reevaluation cultures negative	No recurrence
Status at last follow-up	Off antibiotics, no relapse	Sinus healed, no relapse, discharged
CRP (mg/L)	13	11

Neither patient had an adverse reaction attributable to phage therapy, and neither required further source-control surgery.

CONCLUSIONS

- Adjunctive phage therapy was feasible and well tolerated in two complex MSSA bone and joint infections, with rapid clinical and biological improvement.
- Local delivery — intra-operative instillation and through the drain — was simple, reproducible and matched the route most reported in these infections.
- Although they are a good complement, they do not replace, debridement and antibiotics; controlled studies are needed to define indications, dose and duration.