

# TUBERCULOUS PROSTHETIC JOINT INFECTION FOLLOWING TUMOR ENDOPROTHETIC RECONSTRUCTION FOR PROXIMAL TIBIAL CHONDROSARCOMA: A RARE CASE REPORT

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## INTRODUCTION

- Deep infection complicates about 10% of lower-limb tumor endoprostheses [1]; tibial replacement is an independent risk factor [2].
- Mycobacterium tuberculosis* causes only ~0.2% of prosthetic joint infections (PJI), mostly after hip or knee arthroplasty [3,4].
- Pakistan has the fifth-highest tuberculosis (TB) burden worldwide [5].
- TB-PJI mimics bacterial PJI and can be masked when a faster-growing bacterium is isolated first [4].

**Aim:** to describe TB-PJI of a proximal tibial tumor endoprosthesis that was initially masked by MRSA and was managed with implant retention.

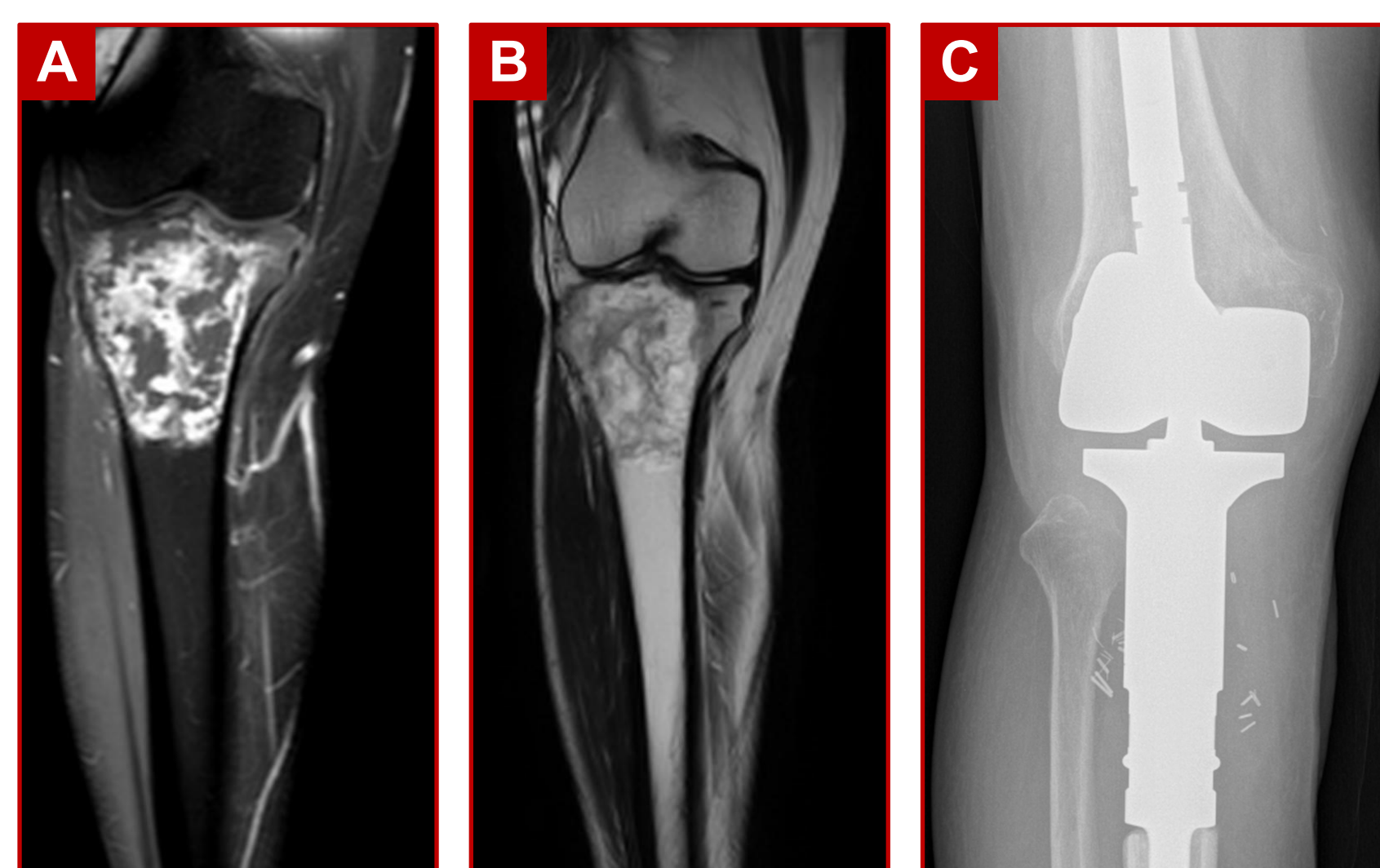
## CASE PRESENTATION

### Index diagnosis and surgery

- 52-year-old man from a TB-endemic region of north-western Pakistan with 3 months of right leg pain and swelling.
- MRI: 7.6 cm intramedullary lesion of the proximal tibial metaphysis and epiphysis, without a soft-tissue mass.
- Trucut biopsy (June 2024): atypical cartilaginous neoplasm, grade 1 chondrosarcoma.
- Staging CT: no metastases; bronchiectasis in both lower lobes and the right upper lobe.
- August 2024: wide resection and proximal tibial tumor endoprosthesis.

### Presentation with infection (December 2024)

- Acute knee swelling, erythema, pain and fever about 16 weeks after surgery.
- CRP 293.7 mg/L, ESR 91 mm/h; WBC normal ( $6.78 \times 10^3/\mu\text{L}$ ) with 85.3% neutrophils.
- Ultrasound: collection from distal thigh to mid-leg; no loosening on radiographs.

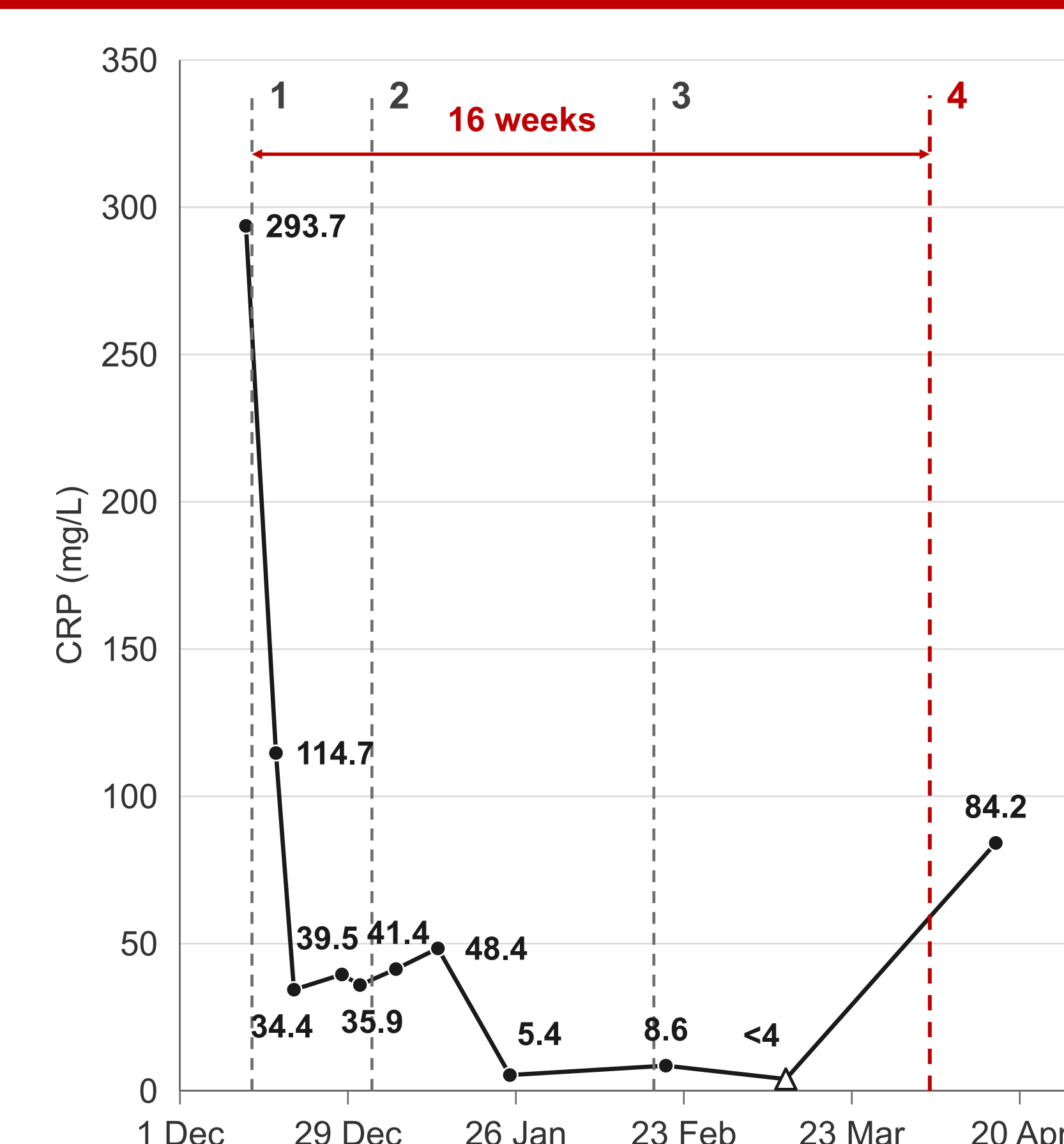


**Figure 1.** (A, B) Pre-operative coronal MRI (two sequences): intramedullary lesion of the right proximal tibia. (C) Anteroposterior radiograph after wide resection and tumor endoprosthetic reconstruction.

## CLINICAL COURSE & MANAGEMENT

- JUN 2024**  
Trucut biopsy: atypical cartilaginous neoplasm (grade 1 chondrosarcoma)
- AUG 2024**  
Wide resection and proximal tibial tumor endoprosthesis
- DEC 2024**  
Acute PJI. **Debridement 1:** ~700 mL of pus, heavy MRSA growth. GeneXpert MTB/RIF, acid-fast bacilli (AFB) smear and mycobacterial culture negative
- DEC 2024 – JAN 2025**  
CRP plateau at 34–48 mg/L despite targeted antibiotic therapy
- JAN 2025**  
**Debridement 2** with antibiotic-loaded cement beads; AFB smear and mycobacterial culture negative again
- FEB 2025**  
**Procedure 3:** periprosthetic fluid, implant tissue and implant sleeve sent for culture
- APR 2025 · DIAGNOSIS**  
**Pan-susceptible *M. tuberculosis* complex** grown from periprosthetic fluid after 6 weeks of culture, 16 weeks after debridement 1 → antituberculous therapy for 12 months
- AUG 2026 · OUTCOME**  
Wound healed, no clinical signs of infection; endoprosthesis retained and stable without loosening

## LABORATORY COURSE



**Figure 2.** Serum C-reactive protein (CRP, mg/L) at every measurement, 12 December 2024 – 16 April 2025; reference < 5 mg/L. Dashed lines: 1, debridement 1; 2, debridement 2; 3, procedure 3; 4 (red), *M. tuberculosis* reported. Red bracket: 16 weeks from debridement 1 to TB diagnosis. Triangle: below assay limit (< 4 mg/L).

## DIAGNOSTIC ASSESSMENT

**Table 1.** Microbiological results by procedure

| SPECIMEN                                      | RESULT                                                                                                                                                                         |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Debridement 1 (Dec 2024) · pus                | Heavy growth of MRSA. GeneXpert MTB/RIF, AFB smear, 6-week mycobacterial culture and fungal culture negative                                                                   |
| Debridement 2 (Jan 2025) · pus                | AFB smear, 6-week mycobacterial culture and fungal culture negative; anti-HIV non-reactive                                                                                     |
| Procedure 3 (Feb 2025) · periprosthetic fluid | <i>M. tuberculosis</i> complex at 6 weeks (smear-negative), susceptible to all first-line drugs tested. <i>A. flavus</i> , light growth (day 10). Bacterial culture: no growth |
| Procedure 3 · implant tissue                  | <i>S. epidermidis</i> , light growth (day 9); flagged as a possible skin contaminant                                                                                           |
| Procedure 3 · implant sleeve                  | <i>A. flavus</i> , light growth (day 10)                                                                                                                                       |

## DISCUSSION

- Atypical profile:** age 52 (pooled mean 68 years), a tumor endoprosthesis, and onset within 16 weeks of implantation [4].
- Delayed recognition:** heavy MRSA growth, negative early mycobacterial tests and slow culture growth hid the TB; co-infection is common in TB-PJI [4].
- Implant retention** can succeed with antituberculous therapy; <9 months of treatment is linked to failure [4,6].
- Drug interaction:** rifampicin lowers voriconazole exposure by ~96%; the measured level was subtherapeutic (<0.5 µg/mL) [7].

## CONCLUSION

In TB-endemic regions, infection that persists after tumor endoprosthetic reconstruction despite appropriate antibacterial therapy should prompt repeated mycobacterial sampling.

### Take-home messages

- Culture for mycobacteria and fungi at every revision, not only the first.
- Heavy MRSA growth does not exclude *M. tuberculosis*.
- Retention plus 12 months of antituberculous therapy preserved the limb.

## REFERENCES

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