

When the host defines the outcome: the challenge of infection in a compromised proximal humerus fracture

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1. Introduction

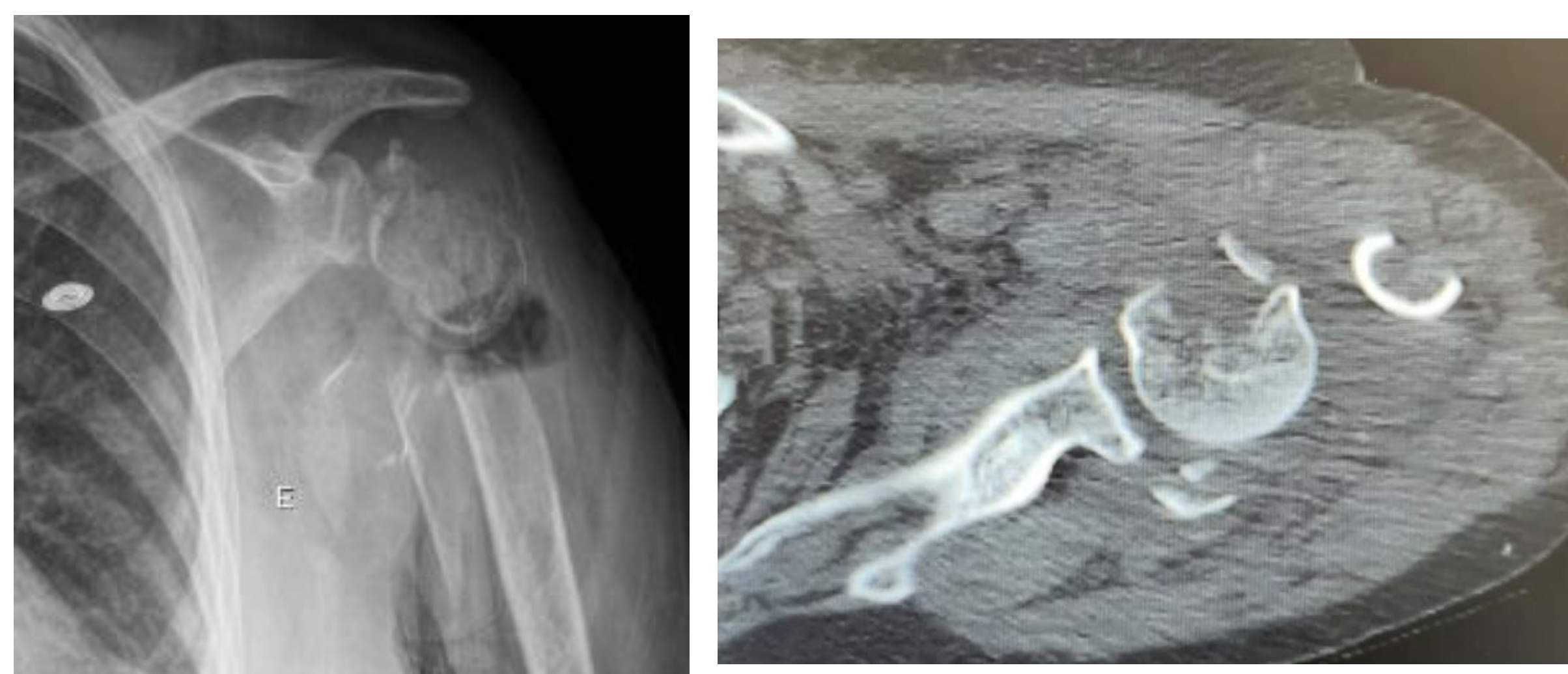
Fracture-related infection remains a major challenge in orthopaedic surgery, particularly in patients with significant host-related risk factors. Social vulnerability, psychiatric disease, substance abuse and poor treatment adherence may increase the risk of complications and negatively influence treatment outcomes. Effective management therefore requires consideration of both the infection and the host.

2. Case report

Initial presentation – February 2025

51-year-old woman with multiple comorbidities and significant social and behavioural risk factors.

Low-energy fall resulting in a displaced proximal humerus fracture.

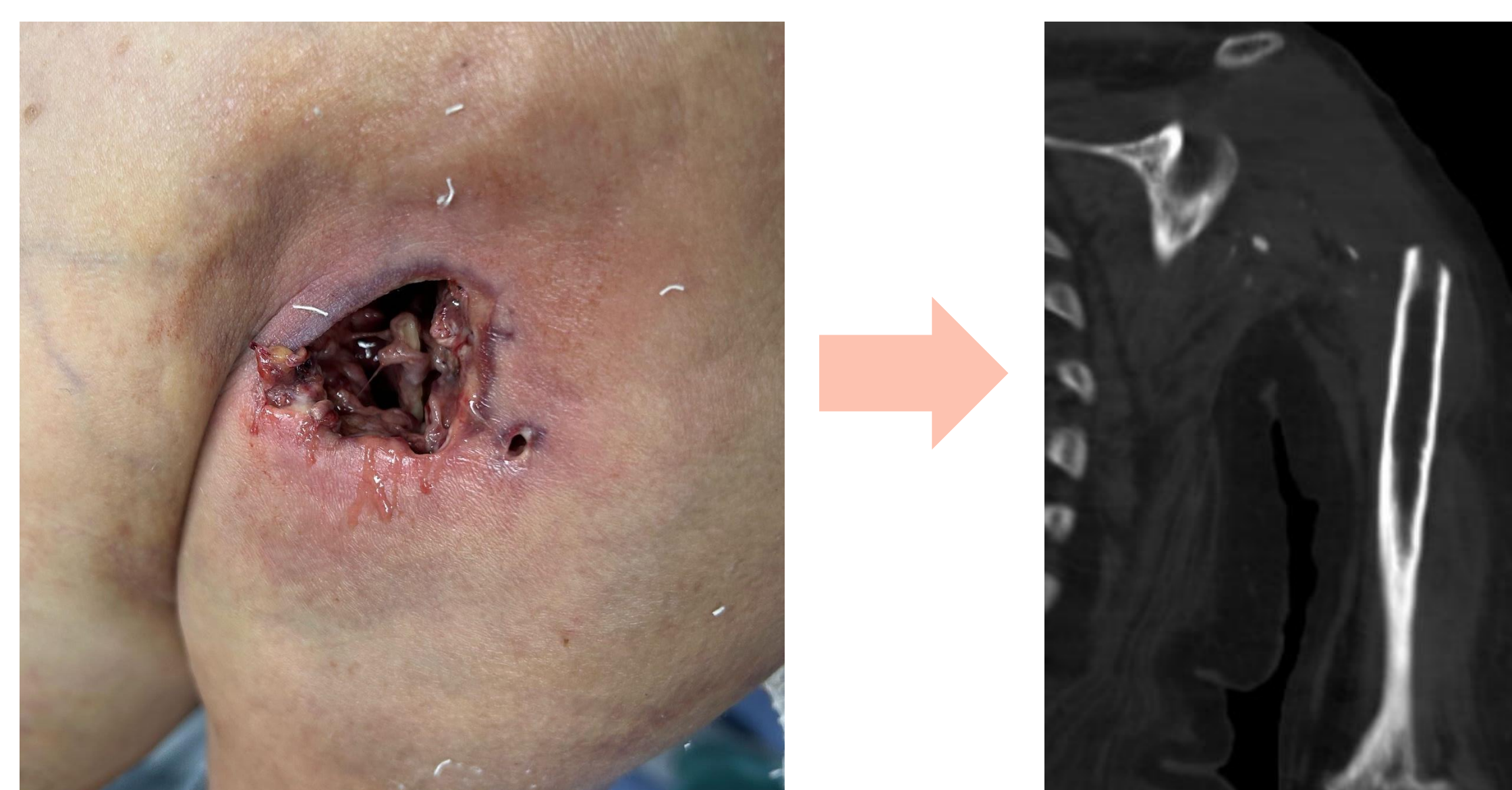


Given the high surgical risk and poor expected adherence to postoperative rehabilitation, conservative treatment was initially chosen.

First deterioration – February 2025

New fall 2 weeks later, with a deep ulcerated wound, foul odor and exposed bone.

Urgent debridement and humeral head resection due to non-viability.

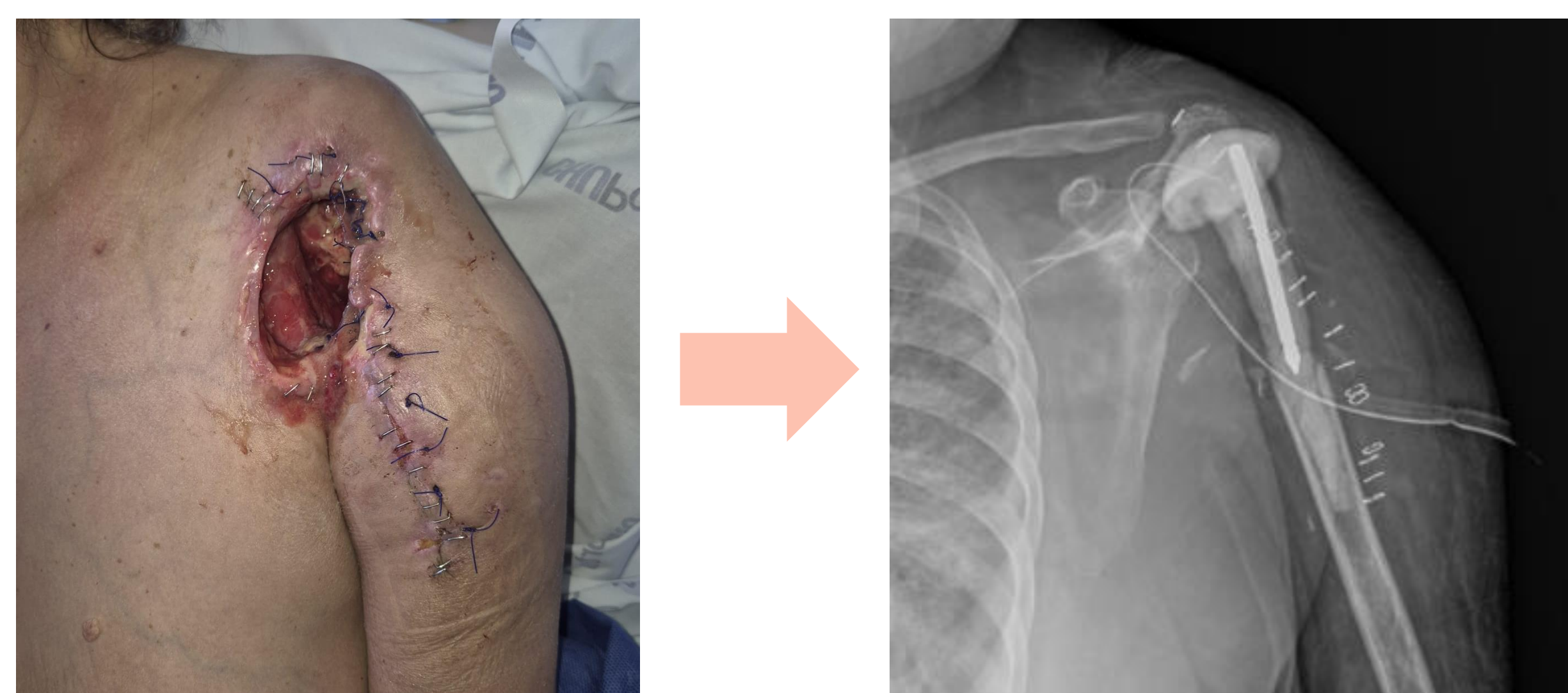


Intraoperative cultures: methicillin-sensitive Staphylococcus aureus.

Progressive infection and soft-tissue failure – March 2025

Persistent wound dehiscence and purulent collection, aggravated by repeated wound manipulation.

Debridement and antibiotic-loaded cement spacer placement.



Despite negative subsequent cultures and targeted antibiotic therapy, progressive wound dehiscence with spacer exposure persisted, leading to new debridement.



Definitive soft-tissue reconstruction – May 2025

Persistent soft-tissue defect and drainage despite repeated debridement.

Multidisciplinary decision with Plastic Surgery for pedicled latissimus dorsi musculocutaneous flap coverage.



Early flap compromise required further debridement.



The patient was discharged after complete wound healing, with no clinical signs of infection.

Follow-up

Progressive wound healing with maintained closure.

No clinical signs of infection and negative inflammatory parameters.

At 8 months: pain-free, adapted to activities of daily living, with a healed wound and no signs of infection.



3. Discussion

Host-related factors can substantially influence both treatment selection and the risk of complications in fracture-related infection. In this case, social vulnerability, severe psychiatric disease, heavy alcohol use, smoking and diabetes contributed to a high-risk clinical context and influenced the initial decision for conservative management.

Despite repeated debridement, antibiotic therapy and antibiotic-loaded cement, progressive wound dehiscence and soft-tissue loss persisted. Recurrent wound manipulation and impaired host factors further compromised wound healing, highlighting the need to anticipate soft-tissue failure early.

When local soft-tissue healing could no longer be achieved, multidisciplinary management with Plastic Surgery was required. Pedicled latissimus dorsi flap coverage provided definitive soft-tissue reconstruction.

4. Conclusions

Host-related factors can significantly influence the course and outcome of fracture-related infection.

Early recognition of soft-tissue failure and timely multidisciplinary reconstruction are essential to achieve infection control and successful wound healing.