World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

Beyond infection: Incidental discovery of a bone metastasis after multiple revision surgeries

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World Journal of Advanced Research and Reviews, 2026, 30(02), 2539-2542

Publication history: Received on 21 April 2026; revised on 27 May 2026; accepted on 29 May 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.30.2.1500

Abstract

Periprosthetic fractures complicated by infections represent a major challenge in orthopedic surgery. However, the persistence of infectious symptoms despite well-managed medical and surgical treatment should raise the suspicion of other underlying etiologies. We report the case of a 70-year-old patient treated for an infection following internal fixation of a periprosthetic fracture, in whom iterative revision surgeries ultimately revealed a bone metastasis originating from a primary metastatic bronchopulmonary cancer

Keywords: Periprosthetic Fracture; Surgical Site Infection; Bone Metastasis; Revision Surgery; Histopathology; Case Report

1. Introduction

The management of periprosthetic hip fractures is complex, and postoperative septic complications considerably worsen the functional and vital prognosis of patients [1,2]. Although the diagnosis of osteoarticular infection is often favored in the presence of local inflammatory signs and hardware failure, it is crucial not to overlook an underlying tumoral pathology that can mimic a similar clinical picture [3]. This clinical case illustrates the diagnostic difficulty faced with a recalcitrant septic presentation concealing an unexpected primary neoplastic lesion.

2. Case Report

A 70-year-old patient, with a history of chronic smoking and bilateral hip osteoarthritis treated with total hip arthroplasties (THA) (with the right revision dating back two years), was admitted for the management of a right femoral periprosthetic fracture, classified as Vancouver B [1]. The patient initially underwent internal fixation [figure 1,2].

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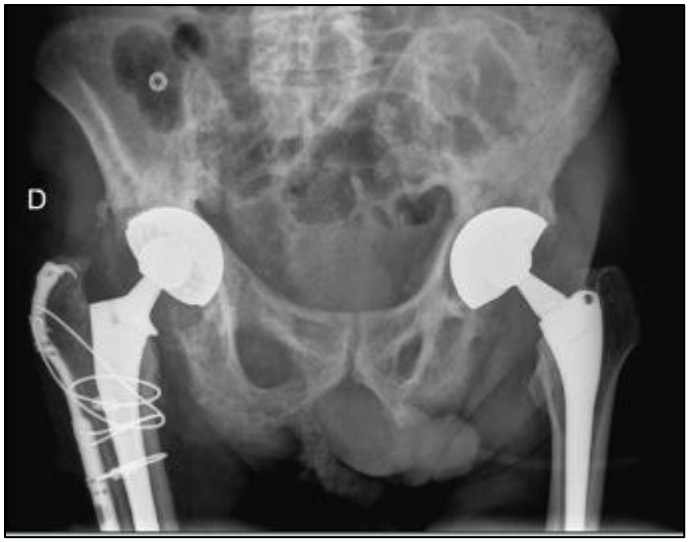

Figure 1 Postoperative pelvic radiograph following internal fixation

Figure 2 Postoperative hip radiograph

The early postoperative period was marked by the appearance of clinical and biological signs suggestive of an acute surgical site infection [2]. Aggressive management was initiated, consisting of articular lavage-debridement with multiple bacteriological samplings, followed by targeted antibiotic therapy adapted to the antibiogram. Despite this management, the clinical evolution was unfavorable, characterized by a persistent infectious syndrome.

Faced with this failure, a revision surgery was decided, consisting of the removal of the osteosynthesis hardware and the prosthesis, followed by the placement of a spacer coupled with new bacteriological samplings [figure 3].

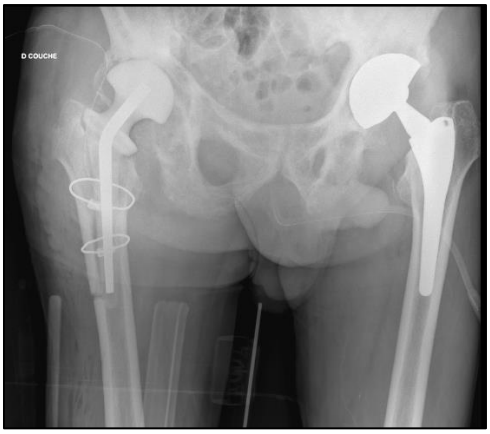

Figure 3 Postoperative pelvic radiograph after spacer placement

Three weeks after this second intervention, a clear reappearance of local and general signs of infection was noted. A third surgical intervention was then performed for a new articular lavage and iterative samplings. During this procedure, the atypical appearance of the surrounding bone tissue prompted a bone biopsy [4].

The histopathological examination of the bone biopsy surprisingly revealed the presence of malignant tumor cells compatible with a bone metastasis [5]. In order to identify the primary tumor, a thoraco-abdomino-pelvic CT scan (body scan) was performed. The imaging revealed a necrotic pulmonary mass highly suspicious of malignancy (consistent with the patient's chronic smoking history), associated with multiple secondary hepatic lesions [figure 4].

Figure 4 Chest CT image showing a suspicious lung mass

3. Discussion

This clinical case highlights the rare but dreadful phenomenon of bone metastasis mimicking or superimposing on a periprosthetic infection [3]. In this patient, the initial clinical presentation of an early postoperative infection was entirely classic, which logically guided the management towards standard septic protocols (lavage, debridement, spacer, antibiotic therapy) [2]. However, the refractoriness of the lesion to well-conducted surgical and antibiotic treatment is the main warning sign.

Chronic inflammation, bone destruction, and severe pain are signs shared by both osteoarticular infections and neoplastic processes [3]. The patient's smoking history constituted a major risk factor for pulmonary neoplasia, although attention had initially been focused on the acute orthopedic problem.

This case underscores the fundamental role of systematic histological analysis (histopathology) of suspicious tissues during prosthesis or internal fixation revision surgeries [4], particularly in cases of repeated failures, atypical bone

destruction, or unexpected intraoperative findings [5]. The late discovery of this metastatic dissemination radically alters the patient's prognosis and redirects the therapeutic plan towards oncological and palliative care rather than orthopedic reconstruction [6].

4. Conclusion

Behind a clinical picture of periprosthetic or recurrent internal fixation infection, a malignant pathology may be hidden. The failure of well-conducted septic management should systematically prompt a reassessment of the initial diagnosis. Intraoperative histopathological analysis should be considered essential during iterative revision surgeries, allowing the avoidance of diagnostic delays and major, unnecessary surgical interventions, while optimizing the oncological management of the patient.

Compliance with ethical standards

Acknowledgments

The authors declare that no specific funding was received for this study.

Disclosure of conflict of interest

The authors declare no conflicts of interest in relation to this article.

Statement of informed consent

Informed consent was obtained from the patient for the publication of this case report.

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