

Mini Review

# Persistent Lumbar Pain and Fever: Osteomyelitis as Diagnosis Challenge

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## Abstract

**Objective:** This study aimed to evaluate the clinical characteristics and diagnostic challenges associated with osteomyelitis in patients presenting with persistent lumbar pain and fever.

**Methods:** We conducted a descriptive observational study, reviewing four cases of osteomyelitis diagnosed at our hospital's Emergency Department in 2022. Data on patient demographics, medical history, clinical presentation, diagnostic methods, and treatment outcomes were analyzed.

**Findings:** The cases included middle-aged to elderly men, with predisposing factors such as urological interventions and immunodeficiency. Imaging studies, particularly CT-scan and MRI, were instrumental in diagnosing lumbar spondylodiscitis. Biopsies revealed lymphoplasmacytic infiltrates and treatment responses were positive in all cases after eight months of follow-up. The study highlights the importance of considering osteomyelitis in the differential diagnosis of lumbar pain and fever, necessitating multidisciplinary collaboration for timely management.

## Introduction

Osteomyelitis, characterized by inflammation and infection of the bone, could be caused by local dissemination or distant hematogenous dissemination. It poses diagnostic challenges, particularly when presenting with symptoms such as lumbar pain and fever [1,2]. Among the various manifestations of osteomyelitis, spondylodiscitis, an infectious process affecting the vertebral bodies and intervertebral discs, represents a formidable clinical entity. Infectious spondylitis, encompassing conditions such as spondylodiscitis, warrants prompt recognition and management due to its potential for severe morbidity and complications.

In clinical practice, the diagnosis of osteomyelitis, especially in the context of lumbar pain and fever, often requires a comprehensive evaluation to differentiate it from other causes. The presence of urological complications further complicates the diagnostic process, as seen in cases following prostatic adenocarcinoma treatments or post-surgical interventions. The interplay between predisposing factors, such as immunodeficiency, and the clinical presentation of osteomyelitis underscores the importance of a nuanced approach to diagnosis and management.

This introduction sets the stage for exploring the diagnostic challenges inherent in identifying osteomyelitis, particularly within the context of lumbar pain, fever, and associated urological complications [1-3]. By examining the clinical characteristics and outcomes of cases presenting with these features, we aim to shed light on the complexities of diagnosing and managing infectious spondylitis, thereby improving patient care and outcomes. This study exposes four different cases that happened in our hospital in 2022.

## Objective

Evaluation of patients' clinical characteristics and similitude search between the cases diagnosed at the Emergency Department in our hospital [4,5].

## Material and methods

### Observational descriptive study

**Patient information:** Patient data for this observational descriptive study were collected from medical records of individuals presenting with lumbar pain and fever at the Emergency Department of [Hospital Name] during the year 2022. The study cohort comprised four patients, herein

## More Information

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**Keywords:** Osteomyelitis; Lumbar pain; Fever; Spondylodiscitis; Infectious spondylitis; Diagnostic challenges; Urological complications





referred to as Patient 1, Patient 2, Patient 3, and Patient 4 [6-8].

**Clinical staff:** The patients were evaluated by a multidisciplinary team including emergency physicians, infectious disease specialists, radiologists, and orthopedic surgeons.

**Total number of patients:** During the study period, a total of 1480 patients visited the Emergency Department with complaints of lumbar pain and fever in one year (2022).

**Data collection:** Patient demographics, medical history, clinical presentation, diagnostic procedures, treatment modalities, and outcomes were extracted from electronic medical records. Imaging studies including CT-scan and MRI were reviewed for diagnostic purposes. Histopathological findings from bone biopsies were also analyzed. The information gathered was collated and analyzed to identify commonalities and variations among the cases [9-11] (Table 1).

## Results

There are four patients that from now on will be designed as 1, 2, 3, and 4.

**Patient 1:** 69-year-old male, with a past medical history of hypertension, prostatic adenocarcinoma treated with radical prostatectomy that had post-surgical complications requiring multiple urological manipulations (rectouterine fistula, two nephrectomies, and recurrent urinary infection (the last one caused by *C.albicans* and *E.faecium*)). The patient had the diagnosis of T9-T10 spondylodiscitis without determining the cause despite bone biopsy, infectious was assumed and improvement was obtained after long antibiotic therapy (Image 1).

**Patient 2:** A 46-year-old male, without relevant past medical history, was admitted due to lumbar pain high fever, and shivers. Thanks to blood cultures and imaging tests, methicillin-susceptible *Staphylococcus aureus* L3-L4 spondylodiscitis was diagnosed. The causal hypothesis that was concluded was micro-wounds in the lumbar region produced by branches in the field. Furthermore, during the admission, he was diagnosed with severe immunoglobulin



Image 1: Patient 1 MRI.

A deficiency, a condition that could have contributed to his pathology (Image 2).

**Patient 3:** 72-year-old male, with past medical history of prostatic adenocarcinoma treated with transurethral resection. One month after the urological surgery, he came to our emergency room with a fever and lumbar pain. He was diagnosed with L4-L5 spondylodiscitis, bone biopsies were all negative but the patient improved with Daptomycin and Meropenem intravenous (Image 3).

**Patient 4:** 35-year-old male, without relevant past medical history except for mild pneumonia one year ago with lumbar pain at the same time. He came to our hospital because of severe lumbar pain and nocturnal dysthermia. He was diagnosed with tuberculous L3-L4 spondylodiscitis (Image 4).

One hundred percent of patients presented unifocal affection and were men. The most common affection was the lumbar column (75%) and the most common symptoms were lumbar pain and fever. Fifty percent of patients had this condition after urological manipulations complicated by prostatic adenocarcinomas that needed surgical treatment. Image studies such as CT-scan and MRI were 100%

Table 1: Patient Characteristics.

Patient	Age	Gender	Past Medical History	Clinical Presentation	Diagnostic Findings	Treatment
Patient 1	69 y/o	Male	Hypertension, prostatic adenocarcinoma treated with radical prostatectomy	Lumbar pain, fever	T9-T10 spondylodiscitis, negative bone biopsies, infectious assumed	Long antibiotic therapy
Patient 2	46 y/o	Male	None	Lumbar pain, fever, chills	L3-L4 spondylodiscitis, methicillin-susceptible <i>Staphylococcus aureus</i> from blood cultures	Antibiotic therapy, identified immunoglobulin A deficiency
Patient 3	72 y/o	Male	Prostatic adenocarcinoma treated with transurethral resection	Lumbar pain, fever	L4-L5 spondylodiscitis, negative bone biopsies	Daptomycin and Meropenem intravenous
Patient 4	35 y/o	Male	Mild pneumonia one year ago	Severe lumbar pain, nocturnal dysthermia	Tuberculous L3-L4 spondylodiscitis	Antibiotic therapy

Legend: CT - Computed Tomography; MRI - Magnetic Resonance Imaging; y/o - Years old.



Image 2: Patient 2 MRI.



Image 3: Patient 3 MRI.



Image 4: Patient 4 MRI.

effective in finding the diagnosis and every biopsy revealed lymphoplasmacytic infiltrate without detecting insitu bacteria. After an eight-month follow-up, a good response to the treatment was observed in a hundred percent of our patients [12-22].

## Discussion

The cases presented in this study underscore the diagnostic challenges and clinical complexities associated with osteomyelitis, particularly when presenting with lumbar pain and fever. Our findings shed light on the varied etiologies, clinical presentations, and treatment outcomes observed in patients diagnosed with spondylodiscitis [23].

### Clinical presentations and diagnostic challenges

All four patients exhibited symptoms of lumbar pain and fever, prompting evaluation for infectious etiologies. The diagnostic process was facilitated by imaging studies, with MRI playing a pivotal role in confirming the presence of spondylodiscitis. However, it is noteworthy that bone biopsies in some cases failed to detect the causative pathogens, highlighting the limitations of traditional diagnostic methods in osteomyelitis [24].

### Association with urological complications and immunodeficiency

A notable observation in our study was the association between urological complications, particularly post-prostatectomy interventions, and the development of spondylodiscitis. Patients with a history of prostatic adenocarcinoma and subsequent urological manipulations appeared to be at higher risk, possibly due to the introduction of pathogens during invasive procedures. Additionally, the identification of immunoglobulin A deficiency in one patient underscores the potential role of immunodeficiency in predisposing individuals to infectious complications [25,26].

### Treatment outcomes

Despite the diagnostic challenges, all patients demonstrated favorable responses to treatment, with significant improvement observed following antibiotic therapy. The importance of early and targeted antimicrobial treatment cannot be overstated, particularly in cases of bacterial spondylodiscitis where prompt intervention is crucial to prevent complications such as spinal instability and neurological deficits [27].

### Comparison with literature

Our findings are consistent with existing literature highlighting the multifaceted nature of osteomyelitis and the importance of a comprehensive diagnostic approach. Studies have similarly reported the predominance of lumbar involvement in spondylodiscitis cases, as well as the efficacy of imaging modalities such as MRI in diagnosis. Moreover,



the association between urological interventions and the development of spondylodiscitis has been documented in previous research, emphasizing the need for heightened vigilance in this patient population [28].

### Limitations and future directions

One limitation of our study is its retrospective nature, which may have introduced selection bias and limited data availability. Additionally, the small sample size precludes the generalization of our findings to broader populations [29]. Future research endeavors should aim to prospectively evaluate larger cohorts to further elucidate the epidemiology, risk factors, and optimal management strategies for spondylodiscitis [30].

### Conclusion

In conclusion, our study underscores the diagnostic challenges inherent in osteomyelitis management, particularly when presenting with lumbar pain and fever [31]. The similarity in presentation with other infectious or tumor pathologies further complicates diagnosis, necessitating the inclusion of osteomyelitis in the differential diagnosis of low back pain and fever [32]. Through multidisciplinary collaboration involving specialists in Traumatology, Microbiology, and other relevant fields, along with the utilization of advanced diagnostic modalities such as MRI, timely identification and targeted treatment of osteomyelitis can be achieved [33]. This approach is crucial for optimizing patient outcomes and mitigating the potential for severe complications associated with delayed or misdiagnosed cases.

### Declaration

I, Alicia Cárdenas García, declare that I have no conflict of interest pertaining to the study described herein. I affirm that I have not received any financial compensation, including payments or private financial support, for conducting or contributing to this study. As the main author of this research, I assert that my involvement in this study was motivated solely by scientific inquiry and the pursuit of knowledge. Furthermore, I acknowledge the contributions of my colleagues, (Sara García Mateo, María Rodríguez Pérez, José Carlos Sureda Gil, María Teresa Gómez Álvarez, Francisco de Borja Hernández Moreno, and Anna Paola de Prato), who participated in this research endeavor. I hereby disclose that there are no competing interests that could potentially bias the interpretation or dissemination of the findings presented in this study.

I, Alicia Cárdenas García, hereby declare that the patients involved in the case study described herein have provided explicit consent for the study and documentation of their medical condition. The patients have been informed about the purpose and scope of the study, as well as the potential implications of their participation. They have voluntarily agreed to participate and have granted permission for the use

of relevant medical information for academic and research purposes. Confidentiality measures have been strictly adhered to throughout the study, and all efforts have been made to ensure the anonymity of the patients. I affirm that this declaration is made in accordance with ethical guidelines and standards governing medical research and patient confidentiality.

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