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Research Paper

Spondylodiscitis Associated With An Invasive *Streptococcus Pneumoniae* Infection Complicated By A Psoas Abscess And Retroperitoneal Collections : A Case Report.

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Abstract:
We report a case of a 63-year-old female patient presenting with L3-L4 lumbar spondylodiscitis secondary to septic arthritis of the knee, complicated by a psoas abscess and retroperitoneal collections. The etiological diagnosis was confirmed by the isolation of Streptococcus pneumoniae from initial bacterial cultures. The course of the disease was marked by the development of a nosocomial infection with multidrug-resistant Pseudomonas aeruginosa.
This case illustrates the complexity and severity of osteoarticular infections with a locoregional origin and secondary dissemination caused by Streptococcus pneumoniae, requiring multidisciplinary management and rigorous adjustment of antibiotic therapy based on microbiological results.

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I. INTRODUCTION

Osteoarticular infections are serious conditions that can lead to severe complications if not diagnosed and treated promptly.
Among these infections, bacterial spondylodiscitis, although rare, is of particular concern due to the risk of neurological complications and septic spread.
Streptococcus pneumoniae, a bacterium typically associated with respiratory tract infections, can exceptionally cause severe osteoarticular involvement, particularly in the context of postoperative sepsis and in immunocompromised patients.
This article reports the case of a 63-year-old female patient presenting with pneumococcal lumbar spondylodiscitis complicated by retroperitoneal collections, illustrating a relatively rare but clinically significant case.

II. CASE REPORT

The patient is Ms. S.M, 63 years old, who is being treated for a heart rhythm disorder. Initially, the patient was admitted for management of septic arthritis of the knee, complicated by a fluid collection in the thigh with tendon exposure. Surgical drainage in several stages was performed, with bacterial cultures yielding *Streptococcus pneumoniae*.
A few days later, the patient reported pain upon moving her hip, particularly during flexion, as well as abdominal and lower back pain, accompanied by abnormal laboratory results.
An abdominal-pelvic CT scan and a lumbar MRI revealed L3-L4 spondylodiscitis, complicated by a large abscess of the left psoas muscle, as well as a retroperitoneal collection and perirenal phlegmonous infiltration.
Management included several surgical and radiologically guided drainages, as well as empirical antibiotic therapy initially based on ceftriaxone and levofloxacin, initiated at the first signs of sepsis.
Indeed, direct bacteriological examination of the pus following Gram staining revealed a weak cellular reaction consisting mainly of altered neutrophils and the presence of Gram-positive cocci with a “candle flame” appearance (**Figure 1**). Culture on blood agar incubated under CO_2 revealed the presence of small colonies surrounded by a zone of incomplete hemolysis. The organism’s sensitivity to optochin led to the identification of a pneumococcus. The MIC of penicillin G by E-test was 0.016 mg.

Antibiotic therapy was adjusted based on the results of successive cultures. The secondary isolation of a multidrug-resistant (carbapenemase-producing) *Pseudomonas aeruginosa* from the psoas muscle drain necessitated a therapeutic reevaluation with the introduction of broad-spectrum antibiotics (colistin) for 2 weeks.
Close biological monitoring of CRP (**Figure 2**), PCT, and complete blood count (**Figure 3**), as well as clinical monitoring, were maintained continuously.
The patient also received appropriate symptomatic treatment, as well as multidisciplinary care (neurosurgery, urology, infectious diseases, and cardiology).
The course of the disease was favorable, marked by a gradual resolution of the collections and normalization of infectious parameters.

III. DISCUSSION

Streptococcus pneumoniae, a pathogenic, encapsulated Gram-positive coccus, is a common cause of pneumonia, meningitis, acute otitis media, and septicemia, particularly in children, the elderly, and immunocompromised individuals. It is rarely implicated in osteoarticular infections, and its involvement of the spine remains exceptional **[1,2,10].**
In fact, only a few cases of S. *pneumoniae* spondylodiscitis have been described in the literature.
Generally, spinal infections are dominated by *Staphylococcus aureus*, *Enterobacteriaceae*, or *Mycobacterium tuberculosis* in endemic settings **[8,11].**
Pneumococcal spondylodiscitis is therefore a rare but serious condition; its clinical manifestations are often insidious, making diagnosis difficult and potentially masking the etiology initially. A study published in Reumatología Clínica indicates that osteoarticular infections caused by S. *pneumoniae* represent an unusual manifestation of invasive pneumococcal disease **[3].** The clinical picture generally combines spinal pain with systemic signs of sepsis (fever, chills, leukocytosis), without initial neurological signs, as in our case.
An article from the Neurosurgery Campus specifies that MRI is the gold standard for diagnosing spondylodiscitis, offering high sensitivity for detecting early lesions **[4].**
A psoas abscess is a feared complication that can arise either by direct spread from lumbar spondylodiscitis or via the hematogenous route **[9]**. In our case, the S. *pneumoniae* infection was complicated by a psoas abscess and retroperitoneal collections, indicating an unusual locoregional spread.
Treatment relies primarily on antibiotic therapy tailored to the antibiotic susceptibility test. S. *pneumoniae* is generally susceptible to penicillin G and other beta-lactams. However, resistant strains, notably Penicillin-Susceptibility-Diminished Pneumococcus (PSDP), may exist. Screening for these strains is essential for all microbiology laboratories. Initial detection of penicillin resistance can be performed using a diffusion test with a 1 µg oxacillin disc. According to CA-SFM/EUCAST 2025, an inhibition zone of 20 mm or less indicates a likelihood of penicillin resistance. Isolates with an inhibition zone of 20 mm or less should then undergo a quantitative minimum inhibitory concentration (MIC) test for penicillin and other relevant antibiotics to guide treatment **[12].**
The choice of antibiotic must therefore take local susceptibility data into account. In our case, a provisional treatment regimen consisting of C3G (ceftriaxone) and fluoroquinolones (levofloxacin) was initiated and subsequently adjusted based on the results of the antibiotic susceptibility testing.
Fluoroquinolones, such as levofloxacin and moxifloxacin, are effective alternatives to beta-lactams, particularly in cases where penicillin-resistant strains are identified or in the presence of beta-lactam allergies. These antibiotics have good bone and joint penetration, making them useful in the treatment of osteoarticular infections **[10].** Resistance to fluoroquinolones in S. *pneumoniae* is primarily due to mutations in the quinolone resistance-determining regions (QRDRs) of the parC and gyrA genes. However, the prevalence of resistance to levofloxacin and moxifloxacin remains relatively low in many regions, including North Africa **[5,6,7].**
It is important to emphasize the importance of a multidisciplinary approach in the treatment of such infections. Indeed, coordination among surgical, infectious disease, radiology, and intensive care teams is essential to optimize treatment, reduce the risk of complications, and improve long-term outcomes.

IV. CONCLUSION

Pneumococcal spondylodiscitis, although rare, should be considered in the differential diagnosis of spinal infections, particularly in the presence of comorbidities and risk factors.
Rapid detection and early antibiotic treatment significantly increase the chances of recovery, thereby preventing serious neurological or functional sequelae.
Pneumococcal vaccination may play a preventive role in certain high-risk patient groups, but its efficacy against these rare forms of deep-seated infections requires further investigation.

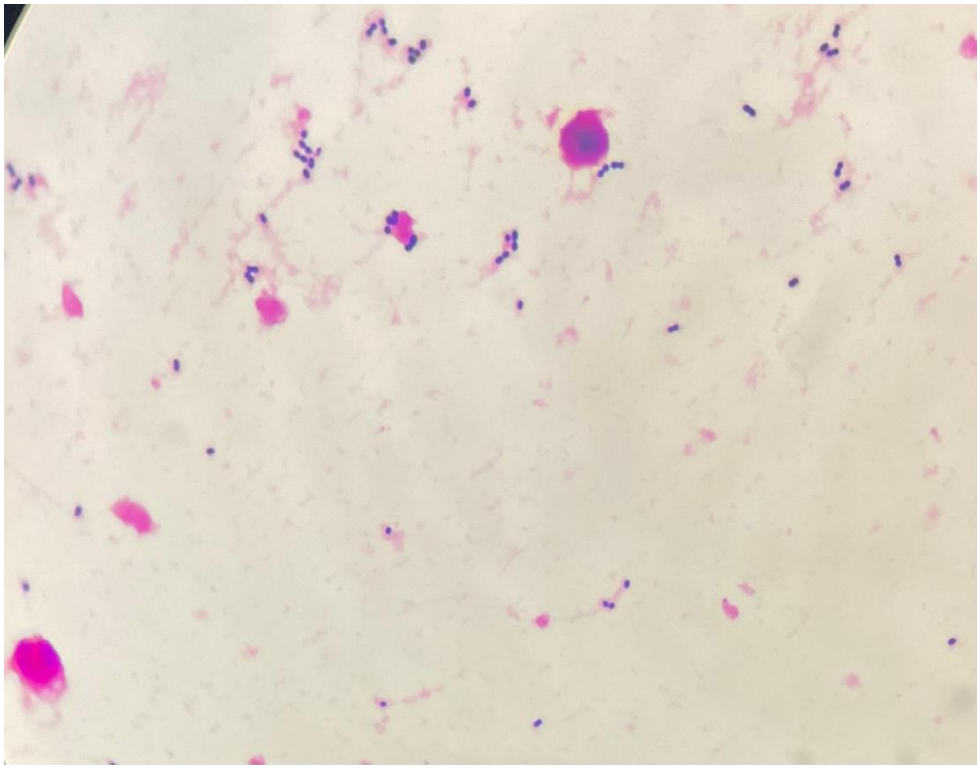

Figure 1: Gram stain of aspirated pus showing Gram-positive cocci with a "candle flame" appearance (×100).

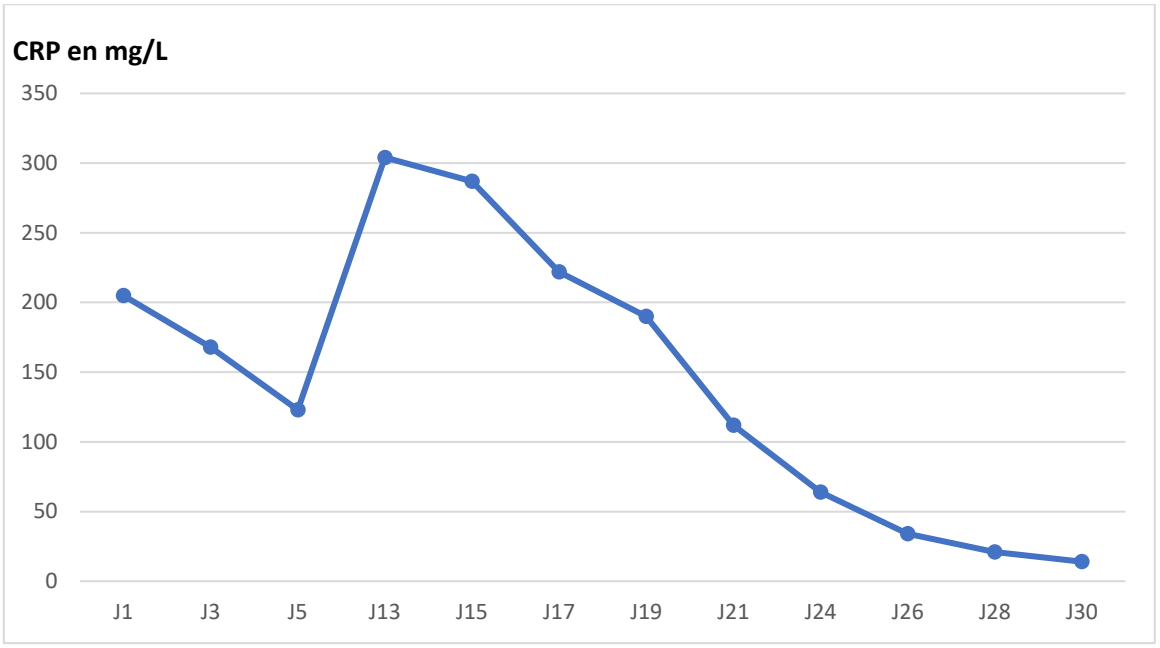

Figure 2: C-reactive protein (CRP) kinetics during hospitalization.

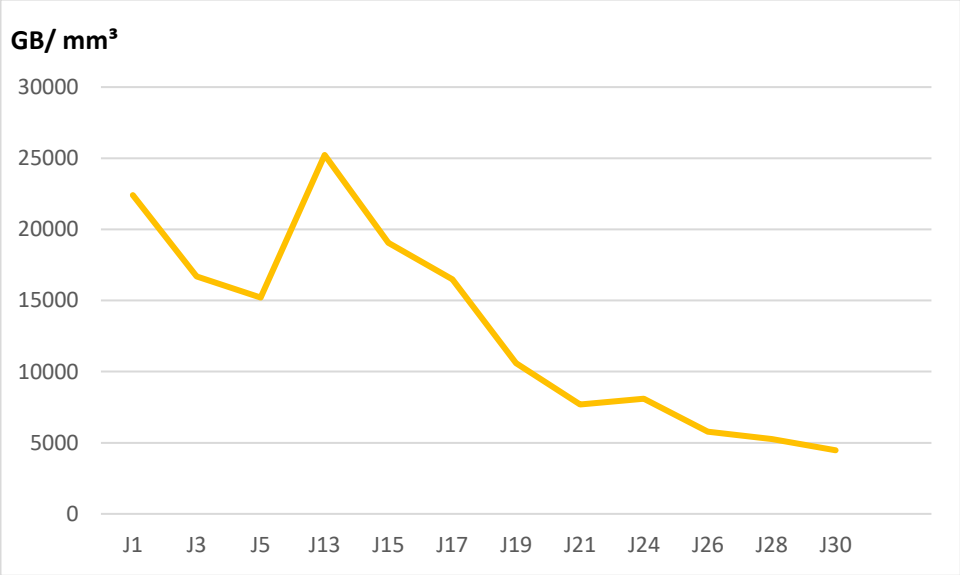

Figure 3: Evolution of white blood cell (WBC) counts during hospitalization.

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