Case Report

*Klebsiella pneumoniae* sacroiliac septic arthritis: First case report

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**A B S T R A C T**

Infective sacroiliitis is a rare disease with misleading clinical signs that often delay diagnosis. We report a case of pyogenic sacroiliac joint septic arthritis caused by *Klebsiella pneumoniae* that has not been reported in the literature highlighting it as one of the important etiologies of infective sacroiliitis especially among diabetics.

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**Introduction**

Infective sacroiliitis or septic arthritis of the sacroiliac joint is a relatively rare disorder, affecting between 1% and 2% of all patients with septic arthritis [1]. It remains a diagnostic challenge given its protean manifestations mimicking other musculoskeletal pathologies like degenerative spine disease and spondyloarthritis. Due to its clinical heterogeneity and lack of symptom specificity, the diagnosis is often delayed. Gram-positive cocci are the most frequently isolated pathogenic agent with predominance of staphylococci. When the infection is caused by a Gram-negative bacillus, *Salmonella* spp. and *Pseudomonas aeruginosa* are most commonly encountered [1]. *Klebsiella pneumoniae* associated septic arthritis is rare and has only been reported in certain special settings including trauma, neonates, elderly, intravenous drug abuser and immune-compromised patients [2]. Pyogenic infection of the sacroiliac joint by *Klebsiella pneumoniae* however has not been reported in the literature. Herein, we describe the first case of *Klebsiella pneumoniae* bacteremia associated with septic arthritis of the sacroiliac joint in a diabetic patient highlighting the importance of recognizing pyogenic articular infection as a rare complication of *Klebsiella pneumoniae* bacteremia.

**Case**

A 62-year-old lady with history of long standing poorly controlled diabetes presented with fever and unwell for 5 days duration. Upon arrival, she was noted to have high spiking fever and was biochemically in diabetic ketoacidosis. She was resuscitated accordingly and initial blood culture grew gram-negative bacilli that were subsequently identified to be *Klebsiella pneumoniae*. She made good recovery with intravenous antibiotics (Cefuroxime), adequate hydration and insulin infusion. However, during the second week of admission, she developed gradual dull aching pain over the right gluteal region that was aggravated by movement. The pain however worsened over the next one week and she was unable to ambulate by then due to intense pain upon weight bearing. A CT scan of the pelvis showed mild widening with marked erosion and sclerosis involving the articular surface of the right sacroiliac joint (Fig. 1). Attempts were made to obtain microbiological diagnosis from the affected joint via CT guided percutaneous joint aspiration. However, the procedure was encountered with technical difficulty and unfortunately the joint aspiration was dry. In the presence of *Klebsiella pneumoniae* bacteremia with imaging findings that were consistent with sacroiliac joint septic arthritis, she subsequently underwent extensive debridement and arthroscopy washout of the right sacroiliac joint with deployment of gentamicin bone cement. Intraoperative samples taken from adjacent tissue, curatted bone and pus all grew *Klebsiella pneumoniae*. She further completed 8 weeks of intravenous antibiotics and made uneventful recovery.

**Discussion**

Non-brucellar and non tuberculous infective sacroiliitis is a rare disease with misleading signs that can delay diagnosis. There are only about 350 reported cases collected from year 1878 to date with the largest retrospective study conducted in France in 2012
monas respectively. Therefore, antibiotic agents such as cloxacillin are recommended as the initial drugs of choice for empirical therapy and since gram-negative organisms are also occasionally implicated as the pathogenic organism in several series, clinicians should therefore prescribe antimicrobials with coverage of gram negative pathogens in patients with poor response to initial empirical antibiotic therapy. Since 2007, methicillin-resistant Staphylococcus aureus has also emerged as a causative agent of infective sacroiliitis, including community-associated methicillin-resistant Staphylococcus aureus [6,7]. Among all isolated case reports and case series, Klebsiella pneumonia has not been reported as the pathogenic cause of pyogenic infection involving the sacroiliac joint.

Gram-negative bacteria related septic arthritis is only rarely reported in certain clinical circumstances including trauma, intravenous drug abuse, neonates, elderly and immune-compromised patients. Klebsiella pneumoniae is one of the most common pathogens in several clinical entities including severe community acquired pneumonia, lung abscess, liver abscess and necrotizing fasciitis. Numerous case series have attributed Klebsiella pneumoniae joint infections to underlying co-morbid conditions such as diabetes mellitus and liver cirrhosis [8–10]. Although the close relationship between Klebsiella pneumoniae and diabetes mellitus is uncertain, this association has been repeatedly demonstrated in various Klebsiella pneumoniae infections such as meningitis, liver abscess, urinary tract infections, and bactereemia. Our patient in this case study has underlying poorly controlled diabetes on insulin therapy also suggest that physicians should always consider Klebsiella pneumoniae as one of the possible pathogens causing septic arthritis, especially in patients with poorly controlled diabetes.

The definitive microbiological diagnosis may be based on blood cultures, joint fluid by CT-guided percutaneous puncture, or surgical investigations. Sacroiliac joint synovial fluid aspiration is technically difficult. In our patient, several attempts failed to obtain synovial fluid sample despite CT guidance. Dry tap of the joint fluid is not uncommon [6] and previous literature recommended injection of 3–4 mls of normal saline into the joint may increase microbiological yield in the event of dry tapping [11].

Magnetic resonance imaging is considered to be a reliable method for early diagnosis of infectious sacroiliitis [12]. The MRI findings of septic sacroiliitis include primarily unilateral, changes in both the bone and the surrounding soft tissues: fluid abundantly filling the joint space very early after the onset of the disease, and peri-articular oedema present in the adjacent bone. However, computed tomography has been shown to perform inferiorly to MRI caused by the obvious inability of CT to display changes related to factors like joint fluid, edema, and inflammatory infiltration of the imaged bone. Computed tomography focuses primarily on morphological changes such as erosions, osteosclerosis, and the mass effect of fluid collection within the joint. As all these are features of chronic sacroilitis, they cannot contribute to the establishment of an early diagnosis [5]. Wu et al. in their series of patients reported that CT has low sensitivity in detecting pyogenic sacroiliitis, where only 40% of adult patients showed positive findings hence suggesting that CT is more suitable for detecting cortical bone destruction especially in elderly patients with inherent osteoporosis that are more prone to develop cortical bone destruction early in the course of pyogenic sacroilitis [6]. CT scans can be normal in up to 22% if performed early in the course of the disease, although they may be used while performing procedures (i.e biopsy, arthrocentesis, drainage) [1,12]. Scintigraphic bone scan has also been proposed to be the primary method of evaluating pyarthritides of the sacroiliac joints due to its ease of performance, low cost and low radiation exposure. As to

![Fig. 1. Axial and coronal sections of contrast enhanced CT scan of the pelvis (bone window) showing erosion with sclerosis involving the articular surface of right sacroiliac joint (SIJ).](image-url)
other types of scan, although bone scans are not specific, they may be useful in localizing the infection [13].

Surgery is indicated in cases of failure of conservative measures, abscess formation from the beginning, bone destruction, septicemia or neurological deficit. Ahmed et al in their series of 22 patients who had received surgical treatment (either debridement only or debridement and arthrodesis) for sacroiliac joint infection reported good functional outcome in 40% while 20% had poor outcome. Complications include recurrent infection, delayed wound healing and chronic pain [14].

Conclusion

Our case contributes to the body of existing literature on the diagnosis, management and outcome of sacroiliac joint septic arthritis. It is a challenging diagnosis to be made and should be suspected in patients who present with confusing clinical symptoms like coxofemoral pain, pubalgia, abdominal pain and psoriasis. This is also the first reported case of pyogenic sacroiliac joint infection caused by *Klebsiella pneumoniae* in the literature highlighting the need for clinicians to be aware of *Klebsiella pneumoniae* as one possible etiology of septic arthritis of the sacroiliac joint especially among diabetics and health care associated infections.

Credit author statement

Chee Yong Chuan: Conceptualization, Methodology, Investigation, Writing-Original Draft, Project Administration.

Lim Chong Hong: Conceptualization, Writing-Review & Editing, Supervision, Project Administration.

Author disclosures

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