

Septic Arthritis in Pregnancy: The Great Imitator

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Abstract

Background: In light of increasing intravenous drug use in reproductive age women, it is important to create a high index of suspicion for septic arthritis (SA) in the antepartum population.

Case series: Patient 1 presented after a fall and was thought to have avascular necrosis. Patient 2 presented with lower extremity pain and weakness and was treated with steroids. Patient 3 presented with and was treated for pyelonephritis. All women reported a history of intravenous drug use. Two of the three women were afebrile with normal white blood cell count, whereas the third presented acutely septic. Each patient was ultimately diagnosed with SA.

Conclusion: If there is even a remote history of intravenous drug use, one must consider SA in the differential diagnosis of back and extremity pain.

Keywords: Septic arthritis; Pregnancy; Antepartum; Intravenous drug abuse

and blood cultures have been found to be positive only about 50% of the time [1]. Presumptive diagnosis is often made based on clinical presentation and imaging findings alone.

A common consequence of SA is that delayed treatment can lead to irreversible joint destruction, as well as a reported all cause fatality of 11% [2].

Diagnosis of SA requires that a least one of the following four conditions be met:

- Isolation of pathogenic organism from affected joint.
- Isolation of pathogenic organism from blood/another source in the context of erythematous, painful joint.
- Typical clinical features and turbid joint fluid after previous antibiotics.
- Postmortem or pathologic features suspicious for septic arthritis [2].

In addition to the poor synovial fluid and blood culture sensitivity, diagnosis is particularly difficult in cases where access to synovial fluid is problematic, such as the sacroiliac joint [1]. *Streptococcus pyogenes* and *staphylococcus* species are the most common causative organisms [3]. Magnetic Resonance Imaging (MRI) is a particularly effective imaging modality, especially when the joint is difficult to aspirate. Pain is a presenting symptom in 85% of cases, while fever has only a 57% sensitivity [4]. Consequently, a high clinical suspicion for the condition must be maintained.

Septic arthritis has been produced by bacterial seeding from illicit drug injection. Rates of intravenous (IV) and injection drug use are increasing in reproductive age women [5]. Immuno-compromised women, IV drug users, diabetics, women with rheumatoid arthritis, and women with a history of intra-articular steroid injection are at a significantly higher risk of developing SA. Pregnancy itself is an immune-compromised state, with both pro- and anti-inflammatory periods [5], and perhaps these factors contribute to the growing number of cases of SA in the antepartum period. Women presenting with joint pain, swelling, and/or immobility should prompt evaluation for a septic joint in high-risk antepartum populations. We present a case series illustrating different manifestations and diagnostic challenges of septic arthritis in the pregnant patient with intravenous (IV) drug abuse.

Introduction

Septic arthritis is a rare and often challenging diagnosis in the adult medical population, and perhaps more so in pregnant patients. Because septic arthritis can mimic many other common ailments, this "great imitator" presents a diagnostic challenge for obstetricians and gynecologists who are often the primary team caring for this patient during pregnancy. The literature is sparse regarding septic arthritis in this particular population.

Understanding this diagnostic challenge requires a basic understanding of the anatomy of human joints. An anatomic joint is the connection between bones of the axial and appendicular skeleton which link the skeletal system into a functional whole. Any of these joints can be infected by bacteria, viruses or fungi to cause septic arthritis (SA). The mechanism of spread can occur by hematogenous dissemination, contiguous spread, or trauma. Synovial fluid analysis has poor sensitivity

Case Series

Case 1

A 19-year-old G2P0101 presented at 28 weeks 6 days complaining of pain in her left hip with radiation to the knee. The pain began five days prior to presentation after a fall on her hip. Her pain progressively worsened and she began complaining of bilateral lower extremity weakness. Her medical history was notable for well-controlled type-1 diabetes, hepatitis C and substance abuse. She attended buprenorphine clinic daily for maintenance medication dosing. She had one prior indicated preterm birth accomplished vaginally at 36 weeks for preeclampsia. On admission, she admitted to injecting oxymorphone two weeks prior to admission. Her vital signs were stable and white blood cell count was 8,200 cells/ml³. On physical exam, she had impaired sensation below her left knee and decreased strength bilaterally below both knees.

She was admitted for lower extremity weakness and neurology was consulted. Neurological exam demonstrated sensory loss in the left lower extremity with normal reflexes. Differential diagnosis included peripheral neuropathy, vasculitis and trauma. Magnetic Resonance Imaging (MRI) spine showed no significant abnormalities, however; the MRI pelvis showed left sacroiliac joint effusion and subchondral marrow edema suspicious for left sacroiliac septic arthritis with possible osteomyelitis (**Figure 1**). Orthopedics, interventional radiology, and infectious disease teams were consulted. Vancomycin and cefepime were started. Blood cultures and a transthoracic echocardiogram were ordered to evaluate for endocarditis. The echocardiogram showed no evidence of septic vegetations. Antibiotics were narrowed to vancomycin, which maintained coverage for methicillin resistant staphylococcus aureus. She continued on intravenous (IV) antibiotics and a Peripherally Inserted Central Catheter (PICC) line was placed.

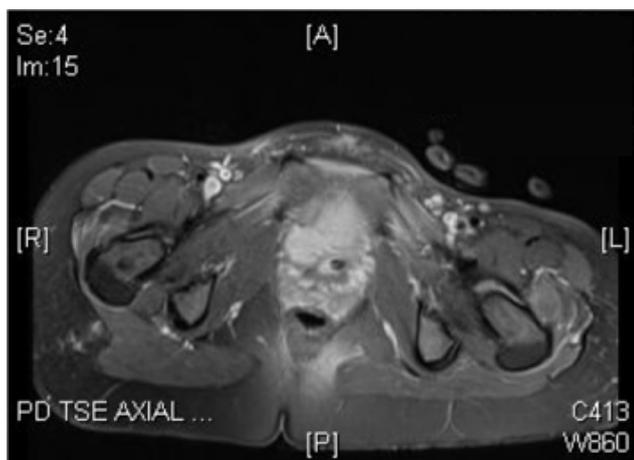


Figure 1 L SI joint, joint effusion and mild subchondral marrow edema seen in L SI joint.

Ultimately, she improved clinically and was transitioned home with home health for IV vancomycin for a total of six weeks due to suspicion of methicillin resistance. She remained afebrile, and

her blood and joint aspirate cultures were negative throughout admission. She was discharged after nine days as an inpatient. She was monitored in the high-risk obstetrics office with weekly drug screens and vancomycin levels in the infectious disease office.

Case 2

A 24-year-old G2P1001 presented at 33 weeks and 3 days as a transfer for a two-week history of right-sided lower back pain radiating to right buttock and lower limb. She reported awakening with pain one morning, having been completely well the day prior, and having no apparent injury. She also complained of left lower extremity pain and swelling over the last week. She was seen in the ER at time of onset and given a muscle relaxant and a two-week taper of steroids. Initially, there was improvement, but the pain increased once the steroids were completed. She described the pain to be constant and sharp in character, and unrelieved by position changes and Tylenol. She also complained of urinary frequency and urgency. Her past medical history was significant for hepatitis C, Hodgkin's lymphoma as a child, anxiety/depression, migraines and substance abuse. She had one prior cesarean delivery at term. Initial white blood cell count was 6,600 cells/ml³, and she remained afebrile throughout her hospital admission. Her urine sample indicated a urinary tract infection, so she was started on nitrofurantoin. Exam was significant for tenderness on the right lower back and intact sensation in bilateral lower extremities.

Despite narcotics and muscle relaxant, pain persisted prompting imaging. MRI lumbar spine was significant for hydronephrosis but no spinal cord abnormalities. The patient's pain continued to worsen despite an increase in pain medication. MRI was expanded to the hip given history of intravenous drug use and returned with right sacroiliitis consistent with a septic joint (**Figure 2**). Orthopedics was consulted, and they ordered Computed Tomography (CT) guided aspiration of right sacroiliac joint fluid.

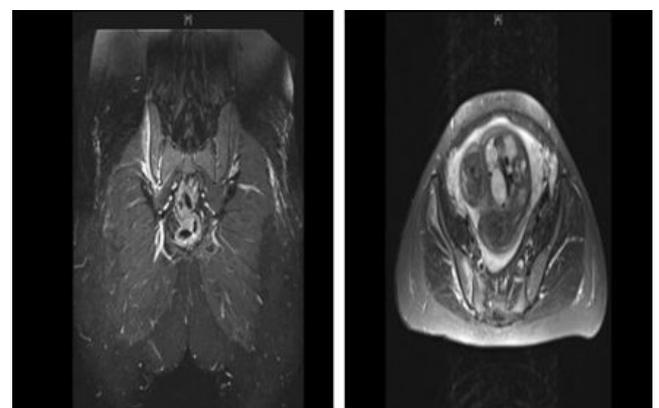


Figure 2 R SI joint effusion with inflammatory stranding.

Aspirate cultures and blood cultures both returned negative. Infectious Disease (ID) was consulted and she was started on IV vancomycin, with the recommendation to continue antibiotics for one month. She was discharged after eight days as an

inpatient. She was monitored in her primary obstetrics office with weekly drug screens and vancomycin levels in the infectious disease office.

Case 3

A 22-year-old G2P1001 presented at 20 weeks and 4 days gestation in transfer from an outside facility where she presented with a history of several days of urinary urgency, nausea, vomiting and right flank pain radiating to her right hip, and was being treated for sepsis secondary to pyelonephritis. Before the onset of urinary symptoms and with complaints of chronic back pain, her primary obstetrician had sent her to outpatient orthopedics where dexamethasone trigger point injections were performed for presumed sciatic pain with minimal relief. Renal ultrasound showed right hydronephrosis and Urology was consulted. A stent was placed. After surgery, she became febrile to 103°F and tachycardic in 120-130 s beats/min (bpm). Methicillin Resistant Staphylococcus Aureus (MRSA) returned from her original urine cultures. At this point, she was transferred to tertiary care facility for higher level of care given presumed MRSA urosepsis. It was unclear if the IV antibiotics she was given at the outside hospital had MRSA coverage. Her past medical history was significant for hepatitis C and substance abuse. She reported her last IV drug use to be greater than 18 months ago. She had one prior full-term vaginal delivery.

On arrival, she appeared septic with temperature of 101.6°F, tachycardic at 139 bpm and tachypneic at 36 breaths/min. Blood pressure was 118/55 and oxygen saturation was 92% on six liters nasal cannula oxygen. Physical exam was unremarkable with the exception of pain in the right lower extremity with movement and therefore refusal to move that leg. Upon further questioning, she admitted to injecting buprenorphine the week prior. With this information, the admitting team had strong suspicion for septic arthritis. She was started on cefepime and vancomycin and admitted to Intensive Care Unit (ICU) for sepsis. Initially, she continued to spike fevers despite being on broad-spectrum antibiotics. Her leukocytosis was mild with an admission elevation of 11,200 cells/ml³ and a neutrophil count of 10,000 cells/ml³, perhaps related to outside antibiotic treatment. Transesophageal echocardiogram showed no evidence of vegetation with mild mitral and tricuspid regurgitation. MRI revealed an abscess on her right gluteus medius and osteomyelitis of the right hip joint widening with subchondral marrow inflammation and large joint effusion extending underneath right iliacus muscle (Figure 3). While in the ICU, her respiratory status decompensated, and she developed pneumonia. She was maintained on a nonrebreather oxygen mask. Her blood cultures returned positive for MRSA and antibiotics were narrowed to vancomycin only and she began to clinically improve. Orthopedics and general surgery did not feel a sample of synovial fluid would be beneficial, as a diagnosis had already been made. Patient improved daily over her hospital course. The patient was discharged after 12 days to a short-term rehab facility for 6 weeks of IV antibiotics and physical therapy, and she went on to deliver at full term gestation.



Figure 3 R SI joint widened with subchondral marrow inflammation and large joint effusion extending underneath R iliacus muscle.

Discussion

While the literature reporting SA is sparse, there have been a few case reports describing the difficulty of diagnosing SA. In a 2014 study, Raiser et al. explained that not only can SA seed from other sources, but its associated symptoms are nonspecific and common in normal pregnancy [6]. A number of atypical presentations of SA in pregnancy have been described, such as Bartholin gland abscess causing chorioamnionitis and SA with rapid necrosis of the sternoclavicular joint, Group B strep hip SA immediately post-partum, and gonococcal sternoclavicular SA [7,8].

Considering the difficulties in diagnosing SA, the use of MRI cannot be underestimated, especially when the joint in question is difficult to aspirate. MRI can also detect coexistent osteomyelitis and estimate the degree of infectious tracking into the soft tissues [3].

Pregnancy is an immune-compromised state, so it warrants special consideration. Cunningham describes the suppression of maternal immunologic function to accommodate “a semi-allogenic fetal graft” [2]. In addition, Karaaslan et al. described the “changing face of SA” in the context of immunosuppressants where pain can present in a milder intensity [9].

SA is a serious condition. A 2% incidence of infective endocarditis (IE) has been found in a population of patients presenting with SA, while an incidence of 60% of inter-articular infection was present in a group of patients presenting with IE [10,11]. Maternal morbidity of SA-associated IE is as high as 33% [12]. For every 3 pregnant women with endocarditis, 2 require urgent cardiac surgery. Surgery usually occurs after 28 weeks to

decrease risks of fetal demise and complications of prematurity if delivery is necessary due to fetal bradycardia [13].

Conclusion

It is thus evident that physicians must be vigilant in identifying risk factors and recognizing symptoms associated with SA. We have shown the potential for SA to imitate other pathologic conditions that may be associated with pregnancy. Septic arthritis is a medical emergency, and, in spite of advances in diagnostic techniques and therapeutic interventions, morbidity has not changed in recent decades. Our case series highlights the possibility of SA as a diagnosis particularly in the pregnant IV drug user and demonstrates the variation in the presentation of SA.

If there is even a remote history of intravenous drug use, one must consider SA in the differential diagnosis of back and extremity pain.

Conflict of Interest

The authors report no conflict of interest.

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