

Case report

Bilateral Erosive Septic Hip Arthritis Following Pregnancy

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ABSTRACT

We report on a 34-year-old female whose normal spontaneous vaginal delivery was complicated by Group B streptococcus (GBS) colonization. She developed postpartum, bilateral, rapidly destructive septic hip arthritis. She was treated with bilateral articulating, antibiotic-impregnated spacers, 6 weeks of parenteral antibiotics, and subsequent conversion to total hip arthroplasties. In pregnant women, GBS can result in bacteremia, urinary tract infection, endometritis, and pneumonia. Less commonly, GBS can lead to endocarditis, sacroiliitis, or septic arthritis. Septic arthritis of the hip following pregnancy has been described in a limited number of case reports, yet none, to our knowledge, with rapid bilateral destruction requiring two-staged conversion to total hip replacement.

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Introduction

Group B streptococcus (GBS) is a common organism which can colonize the birth canal in pregnant women. GBS is associated with early pregnancy loss or preterm delivery and, if transmitted to the neonate, causes increased neonatal morbidity and mortality [1]. In pregnant women, GBS can result in bacteremia, urinary tract infection, endometritis, and pneumonia [1]. Less commonly, GBS can lead to endocarditis, sacroiliitis, or septic arthritis [2–4]. Septic arthritis of the hip following pregnancy has been described in a limited number of case reports [5–8]. Treatment in these reports involved irrigation and debridement of the affected hip at the time of diagnosis [5,6,8] with delayed primary total hip arthroplasty in 2 cases [5,7].

We report an unusual case of indolent bilateral septic hip arthritis caused by GBS and methicillin-susceptible *Staphylococcus aureus* (MSSA) following normal spontaneous vaginal delivery in an otherwise healthy 34-year-old female. Once the condition was diagnosed, she was treated with placement of bilateral articulating, antibiotic-impregnated spacers, 6 weeks of intravenous antibiotics, and subsequent staged conversion to bilateral total hip arthroplasty. This is the first case report, to our knowledge, of a two-

staged procedure to treat rapidly destructive bilateral septic hip arthritis following childbirth.

Case history

The patient was informed that data regarding this case were going to be submitted for publication, and she has agreed to the submission.

The patient is a 34-year-old healthy female who developed bilateral hip pain approximately 5 weeks following vaginal delivery. Her pregnancy course was complicated by GBS bacteriuria diagnosed on routine screening at 8–10 weeks gestation. She was treated with clindamycin for 5 days following diagnosis in the first trimester due to a penicillin allergy. Urine cultures subsequently revealed the GBS to be resistant to clindamycin. She then received vancomycin from the time of induction to delivery. The patient had an induced vaginal delivery at 37 weeks due to hepatic cholestasis. She had an uncomplicated delivery without an episiotomy and no prolonged rupture of membranes (PROM). A first-degree laceration was repaired following the delivery.

Five weeks following her delivery, the patient developed progressive bilateral hip pain. She was initially evaluated by a sports medicine provider who noted significantly limited range of motion and weakness secondary to pain. Radiographs at that time were normal and notably without evidence of osteonecrosis, fracture, or degenerative changes (Fig. 1a). A magnetic resonance imaging was obtained and demonstrated abnormal muscle signal and bony changes in the acetabulum and femoral

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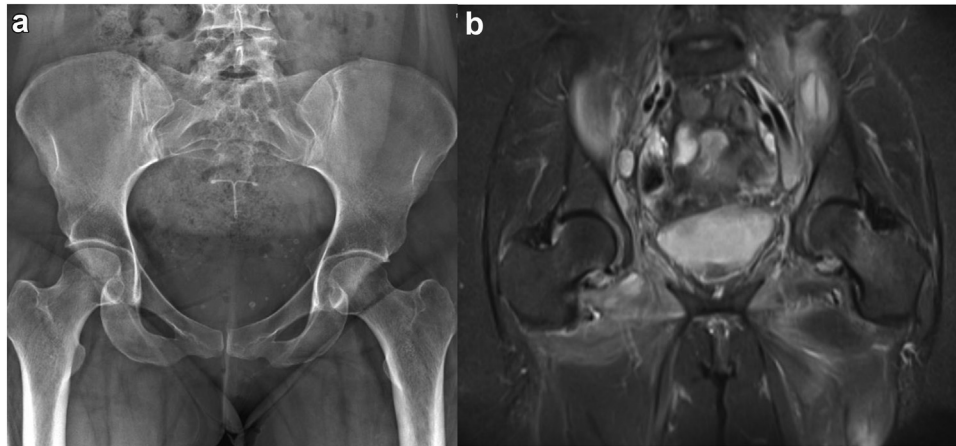


Figure 1. AP radiograph (a) and coronal MRI (b) upon initial presentation 5 weeks postpartum. AP, anteroposterior; MRI, magnetic resonance imaging.

neck suggestive of microtrabecular fracture or bone bruise. No significant joint effusions were identified (Fig. 1b). She was initially treated conservatively with symptomatic measures and physical therapy. Over the course of the next several weeks, the pain and stiffness progressed such that she became largely wheelchair bound.

Two months later, she presented to our clinic and repeat radiographs showed bilateral erosive osteoarthritis with superior-lateral head migration and acetabular and femoral head bone loss (Fig. 2a). Inflammatory markers were elevated with an erythrocyte sedimentation rate of 93 mm/hr and a C-reactive

protein of 26 mg/dL. Due to the severe pain and disability, along with the abnormal laboratory findings, the patient was then admitted to the hospital for pain control and further workup. Repeat bilateral hip magnetic resonance imagings revealed bilateral small hip joint effusions and significant synovitis (Fig. 2b and c). Aspiration of bilateral hip joints was attempted twice, both yielding dry taps even with fluid lavage. Blood cultures were negative. Rheumatology was consulted, and workup was negative for inflammatory arthritis. The infectious disease service was consulted and felt the diagnosis was most consistent with inflammatory arthritis.

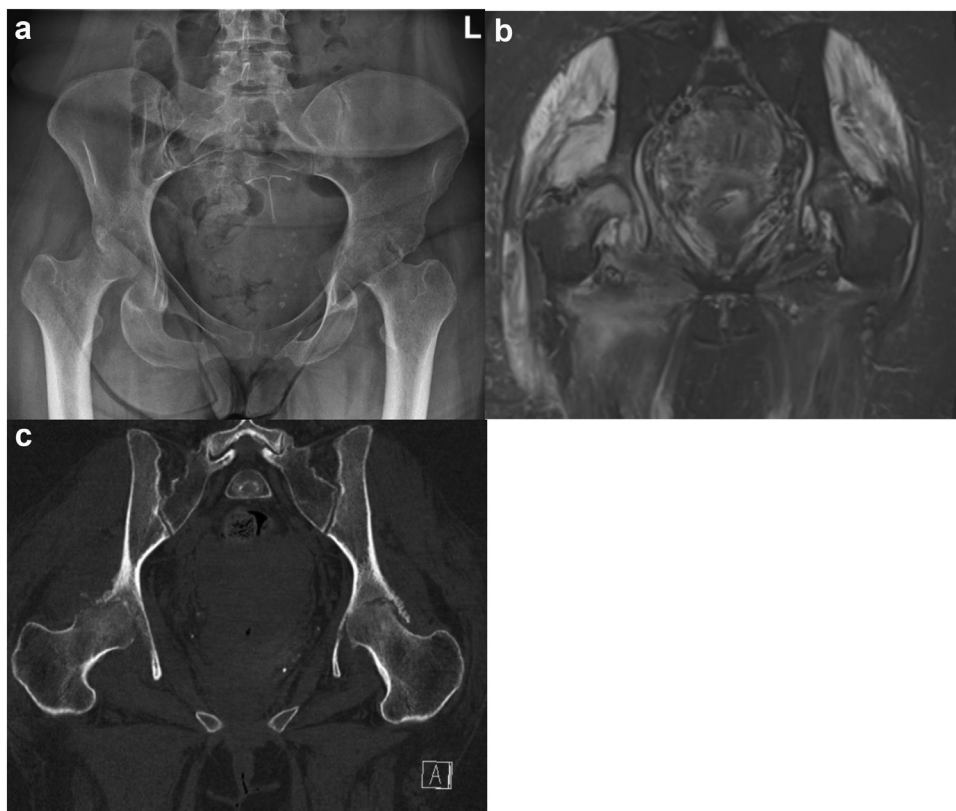


Figure 2. AP radiograph (a), coronal MRI (b), and coronal CT scan (c) at 3 months postpartum. AP, anteroposterior; MRI, magnetic resonance imaging.

Given our high suspicion for septic arthritis, we decided to proceed to surgery. As the patient was experiencing progressive bone loss and disabling pain, we did not feel that an isolated culture with irrigation and debridement alone was appropriate. We wanted to avoid a Girdlestone procedure to preserve her function. To prevent further bone loss, we decided to place an articulating antibiotic spacer on the right hip (the more painful and damaged of the 2) in addition to a thorough debridement with multiple cultures. Given the previous dry taps with aspiration attempts, we felt that obtaining additional cultures and biopsy of the left hip would improve our potential diagnostic yield. We therefore performed a limited open biopsy and culture of the left hip under the same anesthetic. If cultures returned negative, we would subsequently proceed with a left total hip arthroplasty and return at a later date to convert the right hip spacer to a total hip arthroplasty. If cultures returned positive, we planned to return to perform a similar spacer on the left.

On the right side, a standard posterior approach was performed with no purulence noted upon entry of the hip joint. The femoral head had extensive collapse and degeneration, and the acetabulum had significant superior-posterior bone loss. Intraoperative frozen section returned positive for chronic inflammation but negative for acute inflammation. A DePuy (J&J Medical, Raynham, MA) Prostalac spacer was cemented in place with a total of 3 40-gm batches of cobalt cement (Zimmer, Warsaw, IN). Each batch included 3 g of ceftazidime and 2 g of vancomycin. Two screws were placed in the superior acetabulum to provide additional support for the acetabular component given the bone loss. On the left side, a mini-posterior approach was used to perform open biopsy, cultures, and irrigation of the hip. No purulence was noted upon entry of the left hip joint.

The patient's cultures grew GBS in multiple right hip cultures and MSSA in 1 left hip culture. She was placed on intravenous cefazolin per the infectious disease consultant's recommendation. One week after her initial surgery, the patient then returned to the operating room for placement of an identical articulating spacer of her left hip (Fig. 3).

The patient was treated with 6 weeks of intravenous cefazolin. Inflammatory markers gradually normalized. Nine weeks after her initial surgery, the patient underwent right stage 2 total hip arthroplasty via a posterior approach. The acetabulum had a significant superior-posterior defect necessitating the use of a

trabecular metal augment (Zimmer, Warsaw, IN). An OsseoTi G7 acetabular component (Zimmer, Warsaw, IN) was inserted with good press fit and secured with multiple screws. The construct was unitized with cement. On the femoral side, a Wagner Cone Prosthesis Hip Stem (Zimmer, Warsaw, IN) was used. She was discharged on doxycycline for 2 weeks per the infectious disease consultant's recommendations. Intraoperative cultures were subsequently finalized as negative.

Four weeks later, the patient returned for stage 2 revision of her left total hip arthroplasty. On the acetabular side, a superior-posterior largely cavitory defect was identified. An acetabular augment was not felt to be necessary on this side. Excellent press fit of the cup was obtained, and multiple screws were used to augment the fixation (Fig. 4). She was discharged on Bactrim for 2 weeks per the infectious disease consultant's recommendation. Intraoperative cultures returned negative.

The patient is now 6 months from her first surgery and has returned to household and community ambulation with the use of a cane for longer distances. She remains infection free at this time.

Discussion

Pelvic girdle pain including hip and low back pain is a common complaint among women during pregnancy, affecting nearly half of pregnant women [9,10]. The etiology is felt to be secondary to increased workload, changes in center of gravity, hormonal changes, and joint laxity [11]. While the pain typically resolves after delivery, about 25% of patients have persistent pain longer than 3 months postpartum [12,13]. Septic arthritis of the hip, sacroiliac joint, and pubic symphysis have all been described following pregnancy [4–8,14]. While these entities are rare, early diagnosis is critical to prevent irreversible joint damage. Sacroiliac and pubic symphysis septic arthritis are typically treated with antibiotics alone, whereas standard treatment for septic arthritis of the hip requires urgent joint drainage via arthrocentesis, arthroscopy, or arthrotomy in addition to parenteral antibiotics [15].

The diagnosis of septic hip arthritis can be difficult without a high index of suspicion. Patients often present with severe hip or groin pain with the inability to bear weight [16]. Peripheral blood leukocyte (white blood cell [WBC]) counts may be within normal limits, whereas erythrocyte sedimentation rate and C-reactive



Figure 3. AP radiograph of bilateral articulating antibiotic-impregnated spacers. AP, anteroposterior.

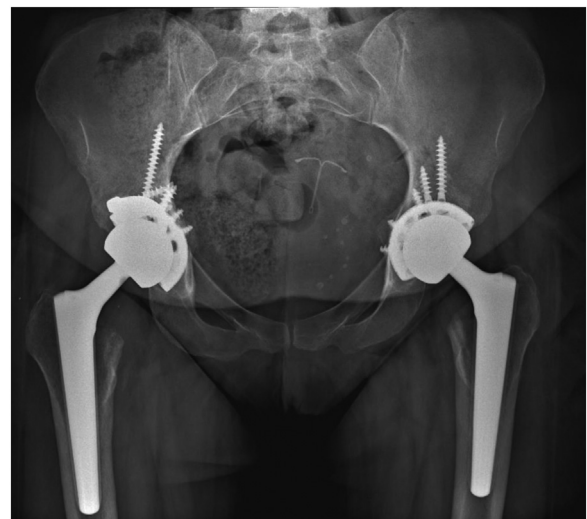


Figure 4. AP radiograph of bilateral stage 2 total hip arthroplasty. AP, anteroposterior.

protein are typically elevated [16]. Radiographs are useful to rule out other causes of hip pain including transient osteoporosis of the hip, osteoarthritis, fracture, or osteonecrosis. However, they often appear normal in the case of acute septic hip arthritis [16]. The gold standard of diagnosis is microbiological confirmation via cultures [15]. Since septic arthritis requires urgent surgical treatment to prevent rapid cartilage destruction, waiting for cultures to return is not always possible [15]. Patients are therefore typically treated empirically for septic arthritis when synovial fluid WBC count exceeds 50,000 cells/mm³ on joint aspiration [15]. In 1 study, however, one-third of patients with septic arthritis had synovial fluid WBCs of less than 50,000 cells/mm³ [17]. In another study, 50% of patients had synovial fluid WBC counts less than 28,000 cells/mm³ [18]. In our case, a delay in diagnosis due to normal radiographs and low index of suspicion led to significant joint destruction prior to her presentation to our clinic.

Septic hip arthritis following pregnancy is most commonly reported following GBS colonization [5–8]. Patients with GBS bacteriuria diagnosed on routine urinalysis performed at 8–10 weeks, like our patient, are treated with antibiotics at the time of diagnosis and again during delivery [19]. Routine screening during pregnancy typically occurs at 36–37 weeks gestation with antibiotic prophylaxis administered during labor to prevent transmission to the neonate [19]. Patients with PROM are at an increased risk for maternal and neonatal complications related to GBS [20]. Other organisms isolated from septic joints following pregnancy include *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Mycoplasma hominis* [5]. Our patient grew GBS and MSSA, which likely spread hematogenously from her birth canal following delivery.

Previous case reports describe GBS septic arthritis following spontaneous abortion, dilation and evacuation, and vaginal delivery [4–8,14]. Four of these cases describe septic arthritis of the hip, 1 of which resulted in bilateral septic hip arthritis [5–8]. Femoral head osteomyelitis was documented in 2 cases [7,8]. Risk factors of PROM and perineal laceration requiring repair were discussed in 2 cases [5,6]. Treatment included irrigation and debridement in 3 cases, which occurred between 4 weeks and 3 months after the onset of hip pain [5,6,8]. Delayed total hip arthroplasty was performed in 2 cases, 1 of which required impaction bone grafting for acetabular defects [6,7].

Similar to other case reports, our patient had a delay in diagnosis by 2 months. She had GBS bacteriuria during pregnancy and a perineal laceration requiring repair after delivery. With femoral head osteomyelitis upon diagnosis and severe acetabular erosions, her infection would have been difficult to eradicate with irrigation and debridement alone. In this setting, a two-stage procedure can be performed with a temporary Girdlestone procedure or antibiotic spacer implantation [21]. Two-staged arthroplasty in the setting of late-stage septic hip arthritis allows for high rates of infection control and typically provides good to excellent functional outcomes [21].

Summary

Septic hip arthritis following pregnancy is a rare but devastating complication of GBS colonization during pregnancy. The purpose of this case report is to highlight the importance of early diagnosis in the postpartum patient who presents with hip or pelvis pain. In our case, diagnosis was challenging even with high index of suspicion as attempted hip aspirations did not yield fluid, despite 2 separate attempts bilaterally. Given our high level of suspicion and subsequent positive cultures, we ultimately performed staged bilateral two-stage total hip arthroplasty, with 1 side requiring additional acetabular augmentation due to significant cavitory bone loss. At 6

months from her index surgery, there were no clinical signs of recurrent infection.

Conflicts of interest

Michael J. Archibeck is a reviewer/editor of the *Journal of Arthroplasty*; Christopher E. Pelt receives royalties from Total Joint Orthopedics, is a member of the speakers bureau at Total Joint Orthopedics, 3M, Zimmer Biomet, and Smith & Nephew, is a paid consultant at Total Joint Orthopedics, 3M, Zimmer Biomet, Smith & Nephew, Haereus, and Immunis, holds stock or stock options at Joint Development LLC, receives research support from Zimmer Biomet, and is a board member of the American Association of Hip and Knee Surgeons and American Academy of Orthopaedic Surgeons; the other author declares no potential conflicts of interest.

For full disclosure statements refer to <https://doi.org/10.1016/j.artd.2019.12.004>.

Informed patient consent

The author(s) confirm that informed consent has been obtained from the involved patient(s) or if appropriate from the parent, guardian, power of attorney of the involved patient(s); and, they have given approval for this information to be published in this article.

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