

An Uncommon Bacteria Causing Septic Arthritis: Streptococcus Agalactiae

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Disclosure Information	Authors and Co-authors have no relevant financial relationships to declare.
Supplemental Video	Supplemental Video
Category	Medicine & Medical Subspecialties

Abstract

Introduction

Septic arthritis is an orthopedic emergency requiring intervention to prevent joint and bone destruction. The most commonly identified organism causing septic arthritis is Staphylococcus aureus, followed by Streptococcus pyogenes. Risk factors for septic arthritis in adults include >50 years of age, joint disease, joint prosthesis, immunosuppression, diabetes mellitus, and skin infections. Group B streptococcus (GBS) or Streptococcus agalactiae is an uncommon pathogen of septic arthritis. GBS is known for colonizing vaginal flora and causing neonatal infections. There have been cases reported of septic arthritis secondary to GBS after a patient experienced trauma to the vagina from a pelvic exam or giving birth. This report presents a unique case of septic arthritis caused by GBS in a patient without history of vaginal or shoulder trauma.

Case Presentation

History:

A 56-year-old woman with a past medical history of type 2 diabetes mellitus was transferred from an outside hospital due to septic arthritis of the right shoulder and for work up for an NSTEMI.

Prior to admission, the patient had right shoulder pain for two weeks. The patient denied any recent trauma to the right shoulder or breaks in skin overlying the right shoulder. She did report that her dog scratched her left medial thigh causing her to bleed a month prior to presentation. The scratch had since healed, leaving a scar. Her past medical history includes type 2 diabetes mellitus, hypertension, coronary artery disease requiring stent placement, and hyperlipidemia. She had a urinary tract infection a few days prior to presenting the emergency department. The patient had not had a pelvic exam or pap smear for the past few years. The patient had a cholecystectomy one month before presenting to the emergency department. Her family medical history was non-contributory. She denied tobacco, alcohol, and illicit drug use.

She was administered a cortisone shot for pain relief. Two days afterwards, the patient presented to an emergency department with altered mental status, vomiting, and weakness. Her blood glucose was 604, and she was admitted to the hospital for diabetic ketoacidosis. She was also diagnosed with NSTEMI, as troponin was 0.24 and ECG showed nonspecific ischemic changes. After resolution of her DKA, the patient had a left heart catheterization performed, which showed multivessel coronary artery disease.

Upon evaluation of continued right shoulder pain, a CT scan was obtained revealing prominent gas and air collections with surrounding inflammation at the superior and anterior aspect of the humeral head and proximal humerus. Additionally, there was an extensive abscess involving the short and long heads of the biceps muscles, the deltoid muscle, subacromial space, and subcoracoid space. Follow-up MRI found numerous intramuscular abscesses throughout the right shoulder girdle musculature, extending to involve the biceps and triceps muscles. Two drains were placed into the right shoulder to drain the abscess and the patient was empirically started on vancomycin and piperacillin-tazobactam. She was then transferred to our facility for higher level of care.

Physical Exam:

On examination, the patient was alert and oriented, and in no acute distress. The temperature was 97.8 F, heart rate 75 beats per minute, the respiratory rate 17 breaths per minute, the blood pressure 123/81 mm Hg, and the oxygen saturation 97% while breathing on room air. Her right shoulder had 2 catheters draining clear, yellow fluid. There was no erythema,

warmth, or induration. Upon palpation of the right shoulder, mild tenderness was present. Significant edema extended from her fingertips to her bicep. Range of motion of the right shoulder was limited due to pain.

Laboratory Values:

The patient's BMP, CBC, CRP, and ESR can be seen in the table below.

- Hemoglobin 10.8
- Hematocrit 33.8
- Platelet 221
- WBC 11.6
- Differential Count %
 - o Neutrophils 82
 - o Lymphocytes 7
 - o Monocytes 8
 - o Eosinophils 1
 - o Basophils 0
- Na 135
- K 3.5
- Cl 102
- HCO₃ 28
- BUN 11
- Cr 0.6
- Glucose 153
- CRP 6.56
- ESR 67

Tests and Results:

A transesophageal echocardiogram was negative. The patient was evaluated by cardiology and found to be stable and no further cardiac intervention was needed at this time. From the previous hospital, blood cultures were negative and the cultures from the drains were positive for GBS. Urine culture from her prior diagnosis of UTI was positive for *Klebsiella pneumoniae*. Repeat blood cultures were negative, and the repeat drain culture was also positive for GBS. A right shoulder CT scan showed septic bursitis and arthritis with abscesses, which was consistent with the patient's prior imaging. Sensitivities for the cultures resulted that the organism was sensitive to penicillin.

Final Diagnosis: Septic arthritis of the right shoulder secondary to GBS

Management/Outcome:

Vancomycin and piperacillin-tazobactam were discontinued and the patient was started on a continuous infusion of penicillin. The patient's shoulder did not improve after several days of antibiotics. Orthopedics performed an incision and drainage of the right shoulder to evacuate the abscess. Eight days following the procedure, the patient had an additional incision and drainage due to failure of improvement of symptoms. Her symptoms gradually improved the days following the repeat procedure. The patient's antibiotic was switched from penicillin to ceftriaxone for ease of drug administration once the patient was discharged from the hospital. Outpatient antibiotic administration was arranged for the patient for an additional 6 weeks.

Discussion

The patient's diagnosis of septic arthritis secondary to GBS is not typical. Although the patient had a risk factor of diabetes mellitus, there was no associated trauma to the right shoulder that resulted in breaks to her skin. Potential sources of infection may have been her urinary tract infection, cholecystectomy, and dog scratch wound. The urinary tract infection is a less likely source because the urine culture was positive for *Klebsiella*, not GBS. The cholecystectomy is a possible source of infection because of the surgical incision. The dog scratch wound may have been the site of entry because of its proximity to the vagina. Some cases of pyogenic arthritis due to GBS have been associated with concomitant infection, such as positive blood cultures. This patient's blood cultures were consistently negative.

The patient did have a cortisone shot to the right shoulder, but the patient had symptoms 2 weeks prior to its administration. In addition, the patient did not have any recent vaginal trauma secondary to a pelvic exam or childbirth, which are other potential sources of infection. Additionally, the patient does not have a history of joint disease or joint prostheses that would increase her susceptibility to this type of infection.

Although the source of infection for this patient is impossible to determine, there is a concern for the rising number of cases of septic arthritis of native joints secondary to GBS. This particular case brings to attention that there are unsuspected sources of GBS colonization. The patient did not have prosthetic joints and did not have vaginal or pelvic trauma, which are major risk factors. Further investigation needs to be conducted to identify additional sources of GBS colonization that can cause serious infections in patients.

Learning Objectives

Describe the common risk factors of septic arthritis.

Identify the bacteria that often cause septic arthritis.

Discuss the complications of *Streptococcus agalactiae* infections.