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Septic abortion complicated by infective endocarditis, mitral valve vegetation, and septic and reactive arthritis: A case report

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ABSTRACT

Background: Septic abortion with multisystem involvement is associated with significant morbidity and mortality. Access to care and legalization of abortion have greatly diminished the incidence of serious sequelae worldwide. Two complications, infective endocarditis and septic arthritis, are rarely encountered in contemporary practice.

Case: A 30-year-old woman developed infective endocarditis, septic arthritis, and reactive arthritis concurrently one week after undergoing dilation and curettage for an incomplete abortion with perioperative administration of doxycycline. She required systemic antibiotics, drainage and debridement of her right ankle, and a robotic-assisted mitral valve replacement due to septic vegetation.

Conclusion: Septic abortion with life-threatening systemic complications is rarely encountered in modern practice. Prompt surgical uterine evacuation and broad-spectrum antibiotics are indicated to prevent systemic complications. Multispecialty consultation is usually required when endocarditis, arthritis, and other systemic complications are encountered.

1. Introduction

Septic abortion with systemic involvement is rarely encountered in the era of legal abortion and sterile operating conditions, and it may be associated with significant morbidity and even mortality. The incidence of serious obstetrical complications associated with infection and blood loss have decreased significantly worldwide due to attention paid to women's reproductive rights and access to medical care. Complications such as septic shock, septic embolization, hysterectomy, and maternal death have become rare, and many physicians have never encountered such cases [1,2]. Septic abortion may be complicated by infective endocarditis (IE) in approximately 1 in one million cases, and only a few cases of post-abortal septic arthritis have been reported [3]. Unlike hemorrhage, infectious complications of medical termination and obstetrical dilation and curettage (D&C) may be delayed. Some women undergoing medical or surgical termination for miscarriage may not initially appear particularly ill or meet sepsis criteria. We present such a case in a woman who developed rare complications of septic abortion, specifically IE, septic arthritis, and reactive arthritis (ReA) following D&C.

2. Case Presentation

A 30-year-old multiparous woman presented to the emergency department with vaginal spotting and a positive urine pregnancy test. She had no chronic diseases. Transvaginal ultrasound demonstrated an irregular gestational sac and no visualized fetal pole, consistent with an anembryonic pregnancy. Her CBC was normal, without anemia or leukocytosis. Gonorrhea and chlamydia testing by polymerase chain reaction (PCR) were negative. The patient refused medical and surgical intervention for the nonviable pregnancy, and she was given discharge warnings with instruction to follow up at the outpatient clinic.

Two weeks later, the patient presented to the emergency department stating that she had passed tissue two days before. She complained of light spotting since passing tissue, increasing pelvic pain, diaphoresis, myalgias, headaches, and fever to 39.0 °C prior to admission. Transvaginal ultrasound was consistent with retained products of conception. She was afebrile (37.2 °C) with a white blood cell count of 8000/mL [3] and a normal differential. Surgical D&C was performed but intravenous antibiotics were not administered at the discretion of the attending physician due to the absence of fever or leukocytosis. She was

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discharged home the same day with doxycycline 100 mg twice daily for 7 days. Pathology demonstrated immature chorionic villi with acute and chronic inflammatory components.

Nine days postoperatively, the patient represented to the emergency room with pelvic, lower back, and right lower extremity pain. The pain had become so debilitated that she needed a walker to ambulate. She reported fever up to 39.5 °C at home despite antipyretics. In the emergency room, she was normotensive (BP 110/72 mmHg) with a resting pulse rate of 104. Physical examination showed extensive edema of the right calf with tenderness at the ankle. Distal pulses were intact and there were no signs of cellulitis. Cardiac auscultation revealed a regular rate and rhythm with a grade III/IV systolic ejection murmur. Her uterus was tender without purulent discharge. She was admitted to the hospital for further investigation and IV antibiotics for presumed septic abortion.

Chest x-ray and CT scan of the lungs, abdomen, pelvis, and spine returned no obvious abnormalities. Lower extremity venous duplex ultrasound showed no evidence of deep-vein thrombosis. Ultrasound of the uterus showed a small amount of blood and thin endometrial echo. CBC demonstrated a hemoglobin 10.1 g/dL and total white cells 10,400/mL with 95% segs, and 194,000 platelets/mL. Prothrombin and automated partial thromboplastin times were within normal limits. Blood and urine cultures were obtained, with the former returning group B β-streptococcus (GBS, specifically *S. alagactiae*) sensitive to penicillin.

Prior to culture results, IV aztreonam 1 g every 8 h and vancomycin 1 g IV every 12 h were administered. On hospital day 3, her antibiotic regimen was modified to ampicillin 2 g IV every 6 h and gentamicin 1.5 mg/kg every 8 h IV based on blood culture data. Despite antibiotic treatment, the patient continued to have fluctuating fevers to 38.2 °C, diffuse myalgias and arthralgias, and right ankle pain. A transthoracic echocardiogram showed mild to moderate mitral regurgitation with an echogenic, pedunculated, and bilobed mass measuring 1.30 × 0.38 cm on the mitral valve (Fig. 1). Cardiology believed this finding was consistent with IE with mitral valve vegetation due to GBS seeding from the pelvis, and recommended continuation of ampicillin. A CT scan of the ankles revealed diffuse soft-tissue swelling and a joint effusion of the right ankle, and orthopedic surgery was consulted. Joint aspiration also yielded GBS.

The patient continued to have excruciating back and bilateral lower extremity pain, as well as swelling of her metacarpal joints, shoulders, knees, and ankles. MRI of the spine revealed no evidence of osteomyelitis or abscess. On hospital day 6, the rheumatology service recommended a therapeutic trial of methylprednisolone 500 mg IV daily for 3 days followed by daily prednisone 5 mg due to persistent polyarthralgias suspected to be secondary to ReA. Once methylprednisolone was administered, her joint pain improved dramatically, and she began to walk for the first time since admission.

On hospital day 7, she underwent a right ankle arthrotomy with irrigation and debridement by orthopedic surgery. No frank purulent matter was encountered.

After three days without fever or significant pain, the patient again began to experience fever to 38.3 °C with recurrent back and right lower extremity pain despite continuation of IV ampicillin and gentamicin. MRI of the right ankle confirmed a periarticular abscess (Fig. 2). The patient underwent a repeat arthrotomy with incision and drainage of the abscess.

The patient remained afebrile and noted a significant improvement in her pain over the next 5 days. On hospital day 17, she was transferred to a tertiary care center for surgical management of the mitral valve vegetation. She underwent robotic mitral valve replacement without incident, and pathology verified bacterial vegetation. IV ampicillin was administered for a total of 28 days due to IE.

The patient recovered uneventfully, with no chronic cardiac or orthopedic disabilities. Despite the prolonged course of infectious and inflammatory conditions, which were frustrating for the patient, she expressed relief that she was now without any functional impairment.

3. Discussion

Given the history of fever, chills, and myalgias with passage of tissue, the diagnosis of septic incomplete abortion was highly likely prior to D&C for retained products of conception. The treatment team decided not to administer broad-spectrum IV antibiotic therapy at D&C because of the absence of an elevated white cell count or fever at admission. In retrospect, additional serum makers of inflammation or sepsis (*i.e*, C-reactive protein and procalcitonin) may have influenced decision making since the clinical history seemed at odds with laboratory and vital signs. Doxycycline alone would not be expected to sufficiently treat GBS sepsis. The delay in treatment with appropriate broad-spectrum antibiotics led to GBS bacteremia with hematologic seeding of the mitral valve and ankle.

Septic abortion is rarely associated with IE and septic arthritis, and we could identify no cases in the literature in which these three events occurred concurrently. While GBS screening is performed in the third trimester to prevent neonatal transmission, there are no

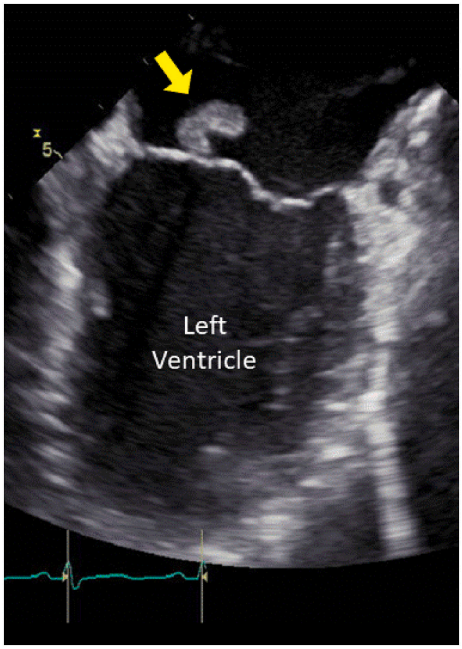

Fig. 1. 2D ultrasonic image of left heart and mitral valve vegetation (arrow).

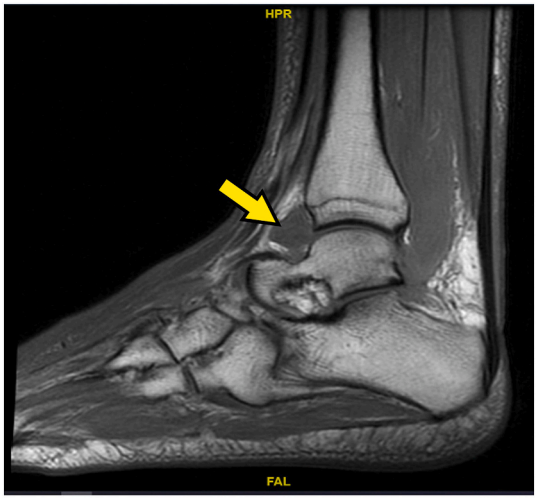

Fig. 2. MRI of right ankle with abscess (arrow).

recommendations for universal screening before D&C in the first trimester or in early pregnancy in general. The American College of Obstetricians and Gynecologists recommends perioperative oral antibiotic administration (such as doxycycline) before a D&C to diminish the risk of post-abortal endometritis and sepsis; however, doxycycline provides relatively poor coverage for GBS [4]. GBS is one of the most common pathogens isolated in septic abortion and a common pathogen leading to IE. Although *Staphylococcus aureus* is the most common infectious agent isolated in IE overall, mortality from GBS-associated IE exceeds that associated with *S. aureus* and other bacterial organisms. Mortality rates as high as 45% have been reported in cases of GBS IE, likely due to rapid valvular destruction and greater propensity for septic embolization compared with other causative organisms [5,6]. GBS-mediated septic arthritis and other non-gonococcal arthritides are less commonly encountered than is gonococcal arthritis in reproductive age women [7]. Early recognition and treatment are important to diminish the risk of joint destruction.

The polyarthritis and significant clinical response to corticosteroids were consistent with the diagnosis of ReA, a sterile inflammatory synovitis usually developing in response to pelvic or gastrointestinal bacterial organisms in genetically predisposed individuals (although not all are HLA-B27 positive). Group A β-streptococcus, *Chlamydia trachomatis*, *Ureaplasma urealyticum*, *Mycoplasma genitalium*, *N. gonorrhea,* and *Gardnerella vaginalis* tend to be the most arthritogenic agents identified with ReA, but a host of other bacterial, protozoal, and viral agents have also been implicated, even the SARS-CoV-2 virus [8,9]. Parenthetically, arthrocentesis is not often performed for diagnosis of ReA in clinical medicine if there is a rapid response to corticosteroids or non-steroidal anti-inflammatory agents [9].

This case illustrates three unusual complications of septic abortion. Before legalized, safe abortion care, maternal complications, including thrombophlebitis, shock, acute kidney injury, septic embolization, hysterectomy, and death, were frequent and unacceptable threats to maternal health [2]. Few trainees and practitioners have been exposed to the serious, life-threatening sequelae of septic abortion [1]. This case report highlights the significant morbidity and risk of mortality associated with septic abortion and the need for safe and prompt medical care.

Contributors

Raina Kishan made substantial contributions to data collection, background research, and composition of the manuscript.

Shaun Wesley made substantial contributions to data collection, background research, and composition of the manuscript.

George Barnett provided medical care, made substantial contributions to data collection, background research, and composition of the manuscript, and reviewed the final manuscript.

Robert P. Kauffman made substantial contributions to data collection, background research, and composition of the manuscript.

All approved the final manuscript.

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Patient consent

The patient has given consent for publication of her case and inclusion of the images.

Provenance and peer review

This article was not commissioned and was peer reviewed.

Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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