# Group B streptococcal endocarditis following elective surgical abortion

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A 31-year-old woman was transferred to our tertiary care hospital for the assessment and management of hypotension. Her medical history included lymphocytic colitis. She had a 17–pack-year smoking history, had minimal alcohol intake and occasionally smoked cannabis. She denied intravenous drug use. She had not recently travelled. She worked as a personal support worker at a long-term care facility. She was in a monogamous sexual relationship with a male partner and had 3 children.

Seven weeks before transfer to our hospital, she underwent an elective surgical abortion at 16 weeks' gestation. Preprocedural antimicrobial prophylaxis was not administered. However, immediately following the procedure, she was prescribed a 7-day course of metronidazole for suspected bacterial vaginosis. Six days later, she experienced the onset of fever and chest pressure, and was prescribed a 7-day course of amoxicillin by a nurse practitioner at her place of employment. Blood was not obtained for culture. Despite antibiotic therapy, she experienced ongoing fever and chest pressure that was accompanied by the onset of dyspnea and a cough productive of blood-tinged sputum. Her family doctor ordered chest radiography, which showed left lower lobe consolidation, for which she was prescribed a 5-day course of azithromycin.

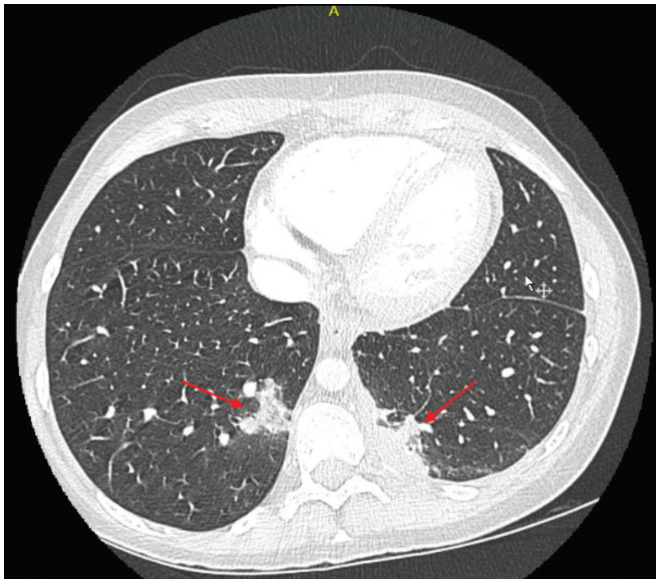


**Figure 1:** Axial contrast-enhanced computed tomography scan of the chest in a 31-year-old woman with fever and pleuritic chest pain 6 weeks after surgical abortion, showing bilateral subpleural lower lobe consolidation (red arrows), consistent with pulmonary infarction secondary to septic emboli.

## KEY POINTS

- Group B streptococci are a cause of infection in pregnant and nonpregnant adults, but infective endocarditis is an uncommon presentation of invasive disease from group B streptococci.
- Risk factors for infective endocarditis caused by group B streptococci include diabetes mellitus, malignant disease, advanced liver disease, injection drug use and elective abortion.
- Antibiotic prophylaxis should be administered to women undergoing elective surgical abortion to prevent postabortal upper genital tract infection; however, the optimal drug, dosage and duration have not been determined.

One week before transfer (6 wk following the onset of her febrile illness), she presented to an emergency department with ongoing fever, new-onset myalgia and left-sided pleuritic chest pain. A computed tomography scan of her chest showed bilateral subsegmental pulmonary emboli with right heart strain (Figure 1), and anticoagulation treatment with apixaban was started during a short hospital stay.

The patient experienced ongoing fever, worsening dyspnea and new-onset diarrhea, and on the day of transfer she returned to the same emergency department, where her systolic blood pressure was recorded to be 60–70 mm Hg. Owing to concern regarding obstructive shock caused by pulmonary thromboembolism, she was administered systemic thrombolytic therapy and was transferred to our hospital for ongoing management.

On presentation at our hospital, the patient was afebrile but diaphoretic. Her blood pressure was 90/55 mm Hg, heart rate was regular and 80 beats/min, respiratory rate was 16 breaths/min, and oxygen saturation was 100% on room air. Her body habitus was within normal limits. She had normal first and second heart sounds and a grade 3/6 pansystolic murmur best heard at the left lower sternal border on precordial examination. There were reduced breath sounds in the left lung base. There were no peripheral findings of infective endocarditis.

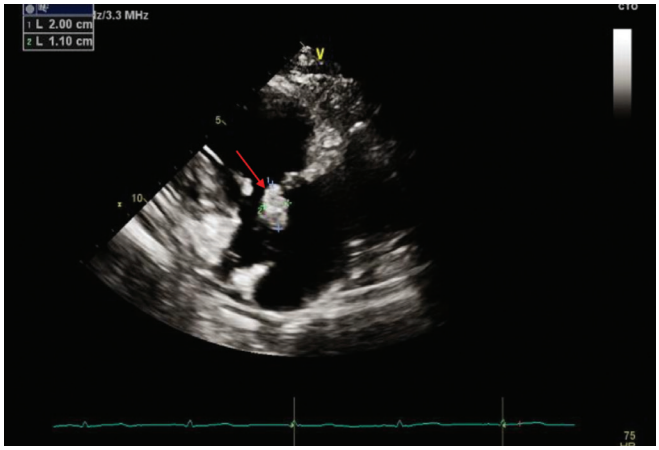


**Figure 2:** Transthoracic echocardiogram, showing a tricuspid valve vegetation (red arrow). There is a second vegetation not shown in this view. The vegetations prolapse across the tricuspid valve annulus. There is moderate to severe tricuspid regurgitation, a small pericardial effusion (8 mm) and a dilated inferior vena cava (not shown).

A complete blood count showed a hemoglobin concentration of 75 (normal range 120–160) g/L, leukocyte count of 10.4 (normal range 4.0–11.0) × $10^9$/L, neutrophil count of 8.7 (normal range 2.00–7.50) × $10^9$/L and platelet count of 116 (normal range 150–400) × $10^9$/L. Her serum creatinine and plasma lactate levels were within normal limits. A transthoracic echocardiogram showed mildly thickened tricuspid valve leaflets, moderate to severe tricuspid regurgitation and 2 large vegetations attached to the anterior (2.2 × 1.5 cm) and septal (2.5 × 1.5 cm) leaflets (Figure 2).

In consideration of a diagnosis of infective endocarditis, empiric treatment with vancomycin and ceftriaxone was administered after 3 sets of blood samples were obtained for culture. All samples grew *Streptococcus agalactiae* (group B *Streptococcus*). In response to the positive blood culture results, we performed transvaginal ultrasonography, which showed retained products of conception. The patient subsequently underwent repeat dilatation and curettage of the uterus.

One week following presentation to our hospital, the patient underwent successful tricuspid valve replacement with a bioprosthetic valve and completed 6 weeks of antibiotic therapy with aqueous penicillin G, 4 million units given intravenously every 4 hours.

## Discussion

*Streptococcus agalactiae* is a gram-positive β-hemolytic *Streptococcus* species that colonizes the genital tract and lower gastrointestinal tract in women and the lower gastrointestinal tract in men.[1] It is a well-known cause of neonatal infections, including sepsis and meningitis, and infection in pregnant adults, and is being recognized with increasing frequency as a cause of infection in nonpregnant adults.[1] Population-based surveillance in the United States from 2008 to 2016 documented an increase in the incidence of invasive group B streptococcal disease among nonpregnant adults from 8.1 cases/100 000 population to 10.9 cases/100 000 population.[2] Obesity and diabetes mellitus were the most frequent underlying conditions associated with the infection, and skin and soft-tissue infections and primary bacteremia were the most common disease presentations.[2] Group B streptococcal endocarditis accounted for about 2.1% of all cases of invasive disease.[2]

### Group B streptococcal endocarditis

Infective endocarditis refers to infection of the endocardial lining of the heart. It most commonly arises through hematogenous seeding of a preexisting valvular lesion (congenital, acquired or prosthetic) from an extracardiac focus of infection.[3,4] Normal valves may also be involved.[3] *Staphylococcus aureus* and viridans group streptococci are the most common causative organisms, whereas group B streptococci account for less than 5% of cases of infective endocarditis.[3]

Risk factors for group B streptococcal endocarditis include diabetes, malignant disease, advanced liver disease, elective abortion, alcohol use disorders and injection drug use.[4] Previous authors have reported group B streptococcal endocarditis as a complication of elective abortion.[5–9] In the current case, the patient underwent elective surgical abortion with retained products of conception. Her initial febrile presentation may have been the result of clinically unapparent intrauterine infection, with or without bacteremia, that was partially treated with orally administered amoxicillin. Her subsequent presentation with fever, shortness of breath and left lower lobe consolidation may have represented hematogenous seeding of the lungs as a consequence of septic pulmonary emboli originating from unrecognized tricuspid endocarditis. At that time, she was prescribed azithromycin. In recent population-based surveillance for invasive group B streptococcal infection from the US, about 40%–80% of group B *Streptococcus* isolates showed resistance to erythromycin.[2] Our patient's isolate was found to be resistant to both erythromycin and clindamycin.

Most available research on group B streptococcal endocarditis is limited to case reports and case series.[2,5–9] Crespo and colleagues[5] reviewed 11 obstetrical- and gynecological-related cases of group B streptococcal endocarditis from 1985 to 2003. The majority of women (64%) had no predisposing valvular lesions, and 5 cases (45%) followed therapeutic abortion. The remaining cases related to premature rupture of the membranes (1), normal vaginal delivery (1), Papanicolaou smear (1), an infected uterine fibroid (1) and genital infection not otherwise specified (2). Six cases (54%) involved the tricuspid valve.

Abid and colleagues[8] analyzed 25 cases of right-sided infective endocarditis caused by group B streptococci. The majority of cases (19 [76%]) occurred in women; 10/19 (53%) followed obstetrical or gynecological procedures.

Antibiotic therapy is the cornerstone of treatment for infective endocarditis. Current recommendations from the American Heart Association on the antimicrobial management of infective endocarditis caused by group B streptococci include intravenous treatment with penicillin or ceftriaxone for 4–6 weeks in patients without β-lactam allergy, with consideration of the addition of 2 weeks of gentamicin therapy for synergy. This is based on expert

opinion.[10] In our patient, the addition of gentamicin was considered. However, following discussion with other physicians, observation of rapid clinical improvement with penicillin monotherapy and a plan for surgical intervention, it was not administered.

## Antimicrobial prophylaxis

The Society of Obstetricians and Gynaecologists of Canada currently recommends antimicrobial prophylaxis for patients undergoing surgical abortion to reduce the risk of postabortal infection.[11] This recommendation is based on a meta-analysis of 12 randomized controlled trials in pregnant women at less than 16 weeks' gestation. In those who received periabortal antibiotics, the relative risk of upper genital tract infection was 0.58 (95% confidence interval 0.47–0.71) compared to those who did not receive periabortal antibiotics.[12] The most appropriate antimicrobial regimen (drug, dosage and duration) has not been determined.[12]

This recommendation should not be mistaken for a recommendation for the administration of antibiotics to prevent infective endocarditis in patients with underlying valvular heart disease who are undergoing genitourinary procedures, for which there is no evidence.[10] Our patient received periprocedural metronidazole for suspected bacterial vaginosis, which would not have had activity against group B streptococci.

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