CASE REPORT

Postcaesarean open-heart surgery for *Streptococcus sanguinis* infective endocarditis

Kiattisak Kongwattanakul,¹ Sirirat Tribuddharat,² Sompop Prathanee,³ Orathai Pachirat⁴

¹Department of Obstetrics and Gynecology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

²Department of Anesthesiology, Khon Kaen University, Khon Kaen, Thailand

³Department of Surgery, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

⁴Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Correspondence to

Dr Kiattisak Kongwattanakul, glucoachosk@gmail.com

SUMMARY

A 33-week pregnant (gravida 3), 29-year-old woman was transferred for management of *Streptococcus sanguinis* infective endocarditis. A vegetation was present on the posterior leaflet of the mitral valve with moderate mitral regurgitation. On admission (day 1), the ultrasound examination revealed splenic abscesses and retarded intrauterine growth albeit with normal vessels. The fetal heart rate was 140 bpm. On day 11, the baby was delivered by Caesarean, and then the mother underwent tubal ligation followed by a mitral valve repair. The splenic abscess was treated with antibiotics. The woman was clinically stable and recovered uneventfully. This successful outcome was achieved by a strategic (optimal and sequential) timeline for selecting the mode of delivery and type of mitral valve correction.

BACKGROUND

This case shows a successful treatment for a pregnant woman with preterm restricted fetal growth and congestive heart failure from *Streptococcus sanguinis* endocarditis with mitral valve vegetation and splenic abscesses. The incidence of infective endocarditis (IE) during pregnancy is between 0.006% and 0.0125%^{1–5} with the respective maternal and fetal mortality being 22.1–33% and 14.7–29%.^{5–7} To minimise these high rates, early multidisciplinary consultation is recommended to determine the specific therapeutic management and prospective surgical timing as demonstrated in our patient.

CASE PRESENTATION

A 29-year-old woman with a 33-week intrauterine pregnancy (gravida 3, para 2002) was transferred to our tertiary hospital. Her antenatal care history indicated an uncomplicated pregnancy until 8 days before when she had been admitted to a secondary care centre after onset of fever and progressive dyspnoea. Her medical history indicated no congenital conditions, valvular heart abnormalities or congestive heart failure.

The physical examination revealed (1) a temperature of 38.5°C with shaking chills, (2) respiration of 24 breaths/min and (3) fine crepitation in both lungs. Soon after admission, the patient had progressive dyspnoea, tenderness at the left upper abdominal quadrant and waking up in distress due to shortness of breath. She needed endotracheal intubation with mechanical ventilation, so the cardiology service was consulted.

Her initial suspected diagnosis was congestive heart failure and IE with pregnancy. She was

treated with antibiotics, diuretic and inotropic drugs. Seven days later, the maternal vital signs and general physical examination were: temperature 37.8°C, pulse rate 100 bpm, blood pressure 110/72 mm Hg, with slight dyspnoea despite oxygen therapy.

A single intrauterine pregnancy with intact membranes was confirmed. The patient was referred to our tertiary referral centre for further management.

INVESTIGATIONS

On admission, the maternal vital signs were stable and acceptable albeit with slight dyspnoea. Examination of the heart showed a grade 3 pansystolic murmur at the apex with fine crepitation in both lower lung fields. The haemoglobin content was 9.9 g/dL and the white blood cell count was 14 300/mm³ with 86% polymorphonuclear cells and 3% band form. The chest X-ray revealed mild cardiomegaly with pulmonary congestion. The ECG showed a sinus rhythm of 86 bpm without any specific changes to the ST wave or T wave. Transthoracic echocardiography demonstrated a large vegetation (1.5 cm) attached at the posterior of the left atrium just beneath the posterior leaflet of the mitral valve with moderate mitral regurgitation and mild dilation of the left atrium. The left ventricle ejection fraction was good (63%; figure 1). The upper abdominal ultrasonographs showed two ill-defined hypoechoic lesions of sizes 2.8×2.6 and 3.6×2.8 cm². Suspected splenic abscesses from septic emboli were noted (figure 2). Blood cultures from three specimens taken 30 min apart were positive for *S. sanguinis*.

The ultrasonographic examination demonstrated a single viable male fetus (vertex presentation) with a normal amniotic fluid index. The estimated fetal weight was 1603 g, which is below the 10th centile for gestational age 30 weeks, so intrauterine growth restriction with normal vessels was diagnosed. The fetal heart rate was 140 bpm.

TREATMENT

Following the diagnosis of streptococcal IE, the patient was placed on antibiotic therapy with ceftriaxone 2 g intravenous once daily. The cardiac surgeon was consulted on the appropriate therapeutic approach.

On day 11 of hospitalisation (gestation time 35 weeks and 4 days), the maternal vital signs and her general physical condition were improved. She expressed a strong desire not to have any more children. The elective delivery by Caesarean with

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Figure 1 Transthoracic echocardiogram showing (A) vegetation 1.5 cm in diameter (white arrow) attached at the posterior part of the left atrium just beneath the posterior leaflet of the mitral valve, (B) moderate mitral regurgitation and eccentric jet flow.

tubal resection was performed immediately before doing cardiac surgery with a cardiopulmonary bypass (CPB). She delivered a 1770 g male infant with an Apgar score of 8 and 9 at 1 and 5 min, respectively.

The intraoperative findings revealed normal mitral valve leaflets with severe regurgitation from annular dilation and a vegetation at the posterior annula. The operation involved removal of the vegetation and repairing the mitral valve (with a valve ring).

OUTCOME AND FOLLOW-UP

The surgery was successful. Postoperatively, the patient recovered uneventfully: the clinicals were stable and there were no immediate complications. The patient received warfarin within 24 h of surgery and was weaned off the ventilator; the endotracheal tube was removed the day after the surgery.

The patient regained full consciousness and had no signs or symptoms of clinical heart failure. Repeated blood cultures were negative. Warfarin was continued for 1 week. About 2 weeks after the operation, the patient was discharged and returned to the referring hospital where antibiotic therapy was maintained for treatment of the splenic abscesses. The low-grade fever and leucocytosis subsequently resolved within 2 weeks.

The neonate was clinically stable and was discharged on day 14 of life; weighing 1928 g. At the follow-up, 1 and 2 months later, the child had normal growth and a good clinical picture.

DISCUSSION

Our patient was diagnosed of IE by the Duke criteria with two major criteria.⁸ IE in pregnancy is extremely rare but it is life-threatening to the mother and requires a well-managed strategy to save the mother as well as the child. The high mortality of the mother is mostly from congestive heart failure and/or an embolic event.⁵⁻⁷ Emergency valve surgery is recommended during the acute stage to save the mother's life.^{5-7 9-12} The most debated issue is which procedure should be performed first: cardiac surgery or Caesarean section since these are rare cases without conclusive evidences. After conducting an extensive review, we found that the decision to perform valvular surgery with CPB before the Caesarean can lead to fetal mortality between 17% and 30%,^{7 13} whereas previous case reports with Caesarean before valvular surgery with CPB revealed that the mothers as well as the fetuses survived.^{3 9 14 15} Cardiac surgery is risky to the fetus because CPB induces systemic inflammation, non-pulsatile flow, hypotension and hypothermia.⁶ We therefore set up a multidisciplinary conference for proper planning of the management based on current knowledge and evidence. The conclusion was that after proper supportive treatment until the patient was stable, a Caesarean section with tubal resection should be performed first followed immediately by valvuloplasty. We chose mitral valve repair because there is a significantly lower risk of in-hospital and late cardiac death, better preservation of left ventricle, a lower risk

Figure 2 Upper abdominal ultrasonographs showing two ill-defined hypoechoic lesions of sizes 2.8x2.6 and 3.6x2.8 cm², respectively.

of subsequence IE, with no need for long-term anticoagulation compared to mitral valve replacement.¹⁶ This appropriate plan yielded an uneventful recovery of the mother as well as the child.

The porte d'entrée of the splenic abscesses was speculated to be embolisation of bacterial thrombus from left atrium to splenic artery. The treatment includes conservative treatment with appropriate antibiotics and surgical procedure.¹⁷ The success rate of non-operative management was around 65%.¹⁸ Our patient responded to medical treatment well, so we decided to continue conservative treatment in order to avoid any risk from surgery.

In conclusion, we treated a case of active IE with splenic abscesses in a pregnant woman, by proper antibiotic administration and mitral valve repair immediately after fetal delivery by Caesarean section. Splenic abscess was treated by medical treatment with good results. The mother and the child were saved.

Learning points

- ▶ Although the overall incidence of infective endocarditis during pregnancy is rare, between 0.006% and 0.0125%, it can be life-threatening.
- ▶ Fetal mortality ranges between 14.7% and 29%.
- ▶ The decision to perform valvular surgery with cardiopulmonary bypass (CPB) before the Caesarean section can lead to fetal mortality between 17% and 30%.
- ▶ All previous case reports on Caesarean section before valvular surgery with CPB revealed that the mothers as well as the fetuses survived.

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