

Aortic valve replacement due to infective endocarditis in a 24-week pregnant patient

Aortic valve replacement in pregnant patient

Ali Akdogan¹, Ahmet Coskun Ozdemir², Engin Erturk¹

¹ Department of Anaesthesiology and Intensive Care

² Department of Cardiovascular Surgery, Faculty of Medicine, Karadeniz Technical University, Trabzon, Turkey

Abstract

Infective endocarditis in pregnant women is mostly associated with a history of rheumatic or congenital heart disease and is very rare. Surgical mortality is high both for the mother and the fetus. In most cases, infective endocarditis in pregnancy has a subacute course and includes the mitral valve, but it may also rarely involve the aortic valve, as in our case. Hypothermia and rewarming during the cardiopulmonary bypass period may trigger fetal hypoxia and uterine contraction in these patients, which may adversely affect both the mother and the fetus. We present a 28-year-old female patient with extensive vegetations on the aortic valve due to infective endocarditis, who applied to the emergency department with complaints of dyspnea and consciousness at the 22nd week of her pregnancy.

Keywords

Cardiopulmonary Bypass, Infective Endocarditis, Aortic Valve Replacement, Pregnancy, Pulsatile Flow

DOI: 10.4328/ACAM.21696 Received: 2023-03-18 Accepted: 2023-05-05 Published Online: 2023-05-14 Printed: 2023-09-25 Ann Clin Anal Med 2023;14(Suppl 2):S207-209

Corresponding Author: Ali Akdogan, Department of Anaesthesiology and Intensive Care, Faculty of Medicine, Karadeniz Technical University, 61080, Trabzon, Turkey.

E-mail: draliakdogan@yahoo.com P: +90 462 377 57 41 F: +90 462 325 53 98

Corresponding Author ORCID ID: <https://orcid.org/0000-0001-7592-3844>

Introduction

Infective endocarditis (IE) in pregnant patients lead to high maternal and fetal mortality [1,2]. Symptoms and findings that occur due to physiological changes during pregnancy may mask the findings of IE and challenge the diagnosis. Surgical mortality is high both for the mother and the fetus. In this article, an aortic-valve replacement of a 24-week pregnant patient who was diagnosed with aortic valve endocarditis is reported.

Case Report

A 22-week pregnant patient was admitted to the emergency room due to shortness of breath and exhaustion. The patient was transferred to the intensive care unit upon the detection of hemorrhage and infarction in brain MRI as she developed unconsciousness, disorientation and cooperation disorder on the second day. Upon the detection of the bicuspid valve, moderate aortic regurgitation and aortic valve vegetation on the patient's Transthoracic Echocardiography, a Transesophageal echocardiography was performed. Two large vegetations, one at the tip of the non-coronary leaflet and one just beneath the aortic annulus were seen. *Streptococcus gordonii* was detected in the series of blood cultures. Surgery was recommended due the existent cerebral embolism and the vegetation that is larger than 1 cm. Heparinization of the patient was found risky by the Department of Neurology and it was decided to continue antibiotic treatment. Transesophageal echocardiography that was performed a week later showed that the vegetation on the ventricle surface reached 20x8 mm. Surgery was recommended again. The patient was informed about the maternal and fetal risks and she was operated on the following morning.

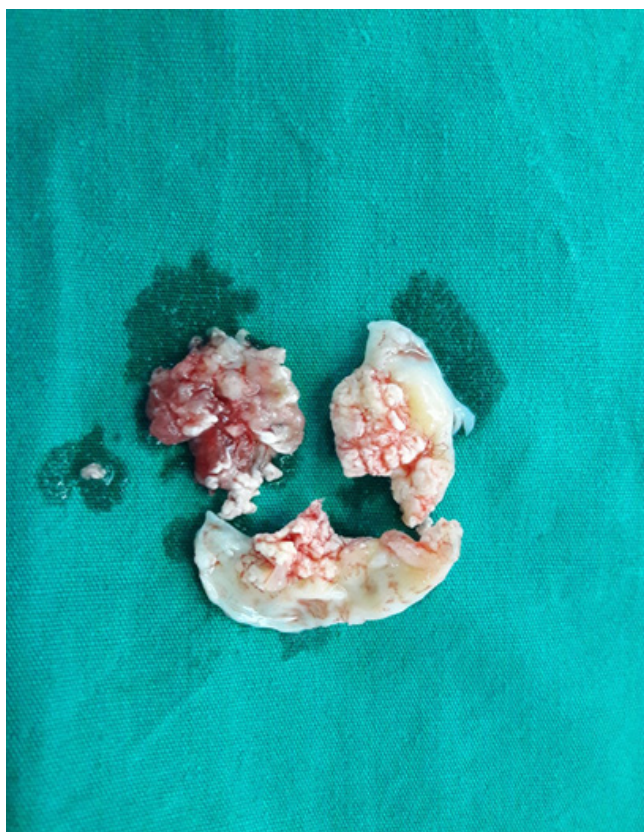


Figure 1. Extracted vegetation material on the aortic valve.

After median sternotomy and routine cannulation extracorporeal circulation was established. The patient was not cooled and the body temperature was not allowed to drop below 34 degrees Celsius. After x-clamping of the ascending aorta, the flow was switched to pulsatile flow. Magnesium-free isothermic blood cardioplegia was given in a retrograde fashion. The bicuspid aortic valve and destroyed tips of the cusps were seen. There was a large vegetation at the tip of the non-coronary leaflet and another one holding onto the endocardium extending into the left ventricle just beneath the right coronary cusp. Vegetations were excised (Figure 1). Below the right coronary and non-coronary commissure was a cavity about the size of 2x1 cm, filled with destructed myocardial tissue. These tissues were excised. A 23 Medtronic Hancock II (Medtronic Inc., Minneapolis, MN, USA) bioprosthesis valve was implanted using 16 pledgeted 2/0 polyester sutures. The surgical procedure was completed in routine fashion. The patient was extubated on the 5th postoperative hour. Fetal movements were normal in the fetal ultrasonography performed on the first postoperative day. The prosthetic aortic valve was found to be functioning normally during postoperative echocardiography. The patient was transferred to the infectious diseases department where the patient would be receiving further antibiotherapy. She was discharged uneventfully on postop 2st day.

A preoperative consent form was obtained from the patient.

Discussion

IE is rarely seen in pregnant patients and the incidence is reported to be 6/100000. Cardiac diseases during pregnancy are seen in 1-3% frequency and are responsible for 10-15% of maternal mortality [1,2].

Cardiac diseases that develop and generate during pregnancy can generally be treated medically as they have high maternal and fetal mortality. However, surgical treatment is sometimes needed in patients with IE. Treatment options for pregnant women with IE should be selected according to the intensity of endocarditis and the gestational age. Continuing without surgery should be a priority in cases where valve functions and structures are preserved, when the vegetation is in regress and when the risk of embolization is low. Criteria that are used in making a decision to operate should be the same as in a non-pregnant patient. The surgical option should always be considered to prevent maternal mortality.

Surgery was preferred in this case due to recurrent systemic embolization. Since the 24th week of the pregnancy is a critical stage for the fetus, the operation took place during pregnancy. Hypothermia during cardiopulmonary bypass has been shown to cause uterine contractions and reduce placental blood flow. Moreover, hypothermia reduces the placental oxygen exchange [3]. Similarly, the warming phase after hypothermia causes contractions in the uterus, which initiates preterm labor [4]. For this reason, in this case, hypothermia was not applied, and the body temperature of the patient was kept above 33 degrees by using a heater blanket to tolerate the loss of heat from the surgical field. Magnesium was not added to the cardioplegia as it may reduce the heart rate of the fetus.

The pulsatile flow was used to increase fetal survival by creating physiological conditions. Even though this method is widely

used in open heart surgeries during pregnancies nowadays, the superiority of pulsatile flow other than its theoretical advantages has not yet been proved [5]. Fetal bradycardia, which is formed during cardiopulmonary bypass, is prevented by increasing the pump flow. Fetal heart rate was monitored during surgery.

The delivery of the fetus in the last trimester of the pregnancy before the operation is seen a safe option. In this case, the cardiac operation was done during pregnancy as the patient was at the 24th week of the pregnancy.

In IE during pregnancy, one should be dynamic to prevent maternal mortality and the decision to operate should not be delayed due to pregnancy. Avoiding hypothermia during the operation and not adding magnesium in the cardioplegia is important to prevent uterine contractions. Besides that, the use of pulsatile flow has theoretical advantages.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

References

1. Rex S, Devroe S. Cardiac disease in pregnancy. *Best Pract Res Clin Anaesthesiol.* 2022;36(1):191-208.
2. Meller CH, Grinenco S, Aiello H, Córdoba A, Sáenz-Tejeira MM, Marantz P, et al. Congenital heart disease, prenatal diagnosis and management. *Cardiopatías congénitas, diagnóstico y manejo prenatal. Arch Argent Pediatr.* 2020;118(2):e149-e61.
3. Kapoor MC. Cardiopulmonary bypass in pregnancy. *Ann Card Anaesth.* 2014;17(1):33-9.
4. Becker RM. Intracardiac surgery in pregnant women. *Ann Thorac Surg.* 1983;36(4):453-8.
5. Parry AJ, Westaby S. Cardiopulmonary bypass during pregnancy. *Ann Thorac Surg.* 1996;61(6):1865-9.

How to cite this article:

Ali Akdogan, Ahmet Coskun Ozdemir, Engin Erturk. Aortic valve replacement due to infective endocarditis in a 24-week pregnant patient. Ann Clin Anal Med 2023;14(Suppl 2):S207-209