

BIOPROSTHETIC VALVE-ASSOCIATED INFECTIVE ENDOCARDITIS (CLINICAL CASE)

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Abstract. The clinical signs and symptoms of infective endocarditis may vary depending on the patient's risk factors. The risk of developing endocarditis is considered to be higher, particularly within the first year after surgery, in patients who have undergone valve replacement (bioprosthetic or mechanical valves). One of the main reasons for this is the potential exposure to nosocomial pathogens during the intracardiac surgical procedure.

This article presents the clinical case of a 71-year-old male patient who underwent bioprosthetic aortic valve replacement and received treatment for endocarditis twice within the first year after the surgery. The patient presented to the outpatient clinic with complaints of high fever, chills, shivering, weakness, and shortness of breath. Considering the patient's history of endocarditis, he was hospitalized and a transesophageal echocardiography (TEE) examination was performed.

Although no vegetation was detected during the initial examination, the patient's clinical symptoms persisted. Since blood culture revealed methicillin-resistant *Staphylococcus aureus* (MRSA), TEE was repeated 7 days later. During the repeated examination, a vegetation measuring 5 × 4 mm was detected on the bioprosthetic valve.

The patient received a 6-week course of antibiotic therapy, and no vegetation was detected on the follow-up examination after completion of the treatment.

Key words: endocarditis, bioprosthetic valve, high fever

Introduction

Infective endocarditis (IE) is an infectious disease that occurs as a result of damage to the endocardial layer of the heart. In developed countries, the incidence of endocarditis is 6 per 100,000 people. It is noted that the incidence of IE has increased in recent years, and it is the 4th infectious disease with a high risk of death after sepsis, pneumonia, and intra-abdominal infections. Infective endocarditis (IE) most commonly affects the left-sided heart valves, particularly the mitral and aortic valves. In contrast, infective endocarditis of the right-sided heart valves (pulmonary and tricuspid valves) accounts for approximately 5–10% of cases. (1)

Right-sided infective endocarditis is most frequently observed in patients with cardiac implantable electronic devices (CIEDs), those with central venous catheters (CVCs), individuals with congenital heart disease, and patients with intravenous drug use (IVDU)(2).

Infective endocarditis (IE) occurs more frequently in patients with a history of previous endocarditis, those with underlying valvular heart disease, congenital heart defects, or the presence of intracardiac foreign material. It is also more commonly observed in individuals with intravenous drug use, patients undergoing chronic hemodialysis, and those who have received solid organ or hematopoietic stem cell transplantation. In the clinical case that we will present, we will discuss the approach to the patient in cases where the risk of IE is high (2)

Experimental part

A 71-year-old male patient. He was admitted to the clinic with complaints of high fever, chills, weakness, and shortness of breath. He considers himself sick for 1 month. The patient's medical

history includes aortic valve repair in 2018 and aortic valve bioprosthetic in 2024. 2 weeks after the operation, the patient was diagnosed with endocarditis. He received treatment for a prolonged time. However, he does not remember what treatments he received.

The objective examination during admission to the hospital also assessed the patient's condition as moderately severe. Consciousness is clear, but he cannot adequately answer questions. Temperature-38 ° C, Heart sounds are muffled, a murmur of 4/6 intensity is heard over the aortic valve. During auscultation, coarse breathing is heard over the lungs. SpO₂-97%. In the neurological status, hypomimia, bradykinesia, postural instability and cogwheel phenomenon are noted. The patient was previously diagnosed with Parkinson's in another institution. Laboratory tests: WBC-8.68 x 10³/μL; Hgb-7.5 g/dL; PLT-136 x 10³μL; CRP-99 mg/L; PCT-0.29 ng/mL; LDH-343 U/L.

Immediately, 3 sets of blood cultures are taken from the patient at 30-minute intervals, and an empirical vancomycin+ceftriaxone combination is started. The patient's transesophageal echocardiography examination does not reveal vegetation. However, due to the high risk, antibiotic therapy is continued as is. Other causes of fever of unknown origin are investigated in the patient who continues to have a high temperature for the next 4 days. Since the patient's blood culture shows the development of Methicillin-resistant *Staphylococcus aureus* (MRSA), another TEE is planned. Vegetation measuring 5x4mm is detected on the bioprosthetic layer. Subsequent treatment is changed to vancomycin+gentamicin+rifampicin. The blood culture obtained at the 48th hour of treatment is negative. Gentamicin is completed in 10 days, and other antibiotics in 6 weeks. Improvement is noted in the patient's clinic and vegetation is not detected during the control TEE.

Results and discussion

IE is more common in patients with previous endocarditis, valve problems, congenital heart defects, intracardiac foreign bodies, intravenous drug users, chronic hemodialysis patients, and organ and hematopoietic stem cell transplants. In our patient, the previous 2 aortic valve surgeries increased the risk of IE.

The first examination performed to detect changes in heart valves is transthoracic echocardiography (TTE). TTE should be performed in every patient with suspected endocarditis. Transesophageal echocardiography (TEE) should be performed in patients with poor TTE images and clinical suspicion of IE but normal TTE. The presence of vegetation on the valves, abscess around the valve, pseudoaneurysm, intracardiac fistula, or new separation in the prosthetic valve on echocardiography are the main reasons for suspecting IE(2).

If a patient has high clinical suspicion and vegetation is not detected during the initial TEE, a repeat TEE is recommended after 5-7 days. In this clinical case, vegetation on the aortic valve was also detected during the second TEE. The diagnostic criteria for IE are mainly the DUKE criteria and the response obtained as a result of histopathological examinations. Depending on the responses obtained, patients with 2 main or 1 main + 3 auxiliary or 5 auxiliary criteria, and with vegetation, abscess, embolism due to bacteremia on histopathological examination, are fully diagnosed with infective endocarditis. Patients who meet 1 main + 1 auxiliary or 3 auxiliary criteria are treated as suspected endocarditis. In patients who have symptoms suggestive of IE that have decreased, improved, or do not have bacteremia despite taking antibiotics for less than 4 days, and no changes in the valves are detected during instrumental examinations, the diagnosis of IE is denied(3).

In adults, in cases of subacute and chronic non-hospital natural and late prosthetic valve endocarditis, it is recommended to give ampicillin-sulbactam to cover the main pathogens, staphylococcus, streptococcus, and enterococcus, and gentamicin to increase the synergistic effect. In acute cases, empirical treatment should be given considering MRSA (methicillin-resistant *S.aureus*) bacteremia.

In nosocomial natural, early, and late prosthetic valve endocarditis, both gram-negative bacteria and MRSA should be considered in the treatment (2).

Conclusion

Endocarditis should be investigated in every patient with a history of prolonged high fever and risk factors for IE. The absence of vegetation during TTE does not rule out endocarditis. If the patient still has a high risk, additional examinations are definitely needed. Blood cultures should be taken every 48 hours from every patient with infective endocarditis, depending on the course of treatment, and the culture should be negative. These patients should remain under the regular supervision of a cardiologist and an infectious disease specialist.

References

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