









## Confusing processes leading to diagnosis of infective endocarditis

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**Received:** 06 November 2024

**Accepted:** 26 November 2024

**Published:** 15 February 2025

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### Abstract

Infective endocarditis (IE) is a life-threatening condition caused by infections of the heart valves or walls. Diagnosis can be challenging due to varied clinical presentations, often leading to delayed recognition and severe complications. Chronic kidney disease (CKD) patients, especially those on hemodialysis, are at increased risk of bacteremia from catheter-related infections. With the rising prevalence of CKD, associated comorbidities like diabetes and hypertension have also become more common. This case report highlights the diagnostic process of IE in a 78-year-old CKD patient initially misdiagnosed and treated for a urinary tract infection, emphasizing the need for vigilance in such cases.

**Keywords:** infective endocarditis; catheter; hemodialysis; renal failure

### Introduction

Infective endocarditis (IE) is a serious condition that occurs when the valves or walls of the heart are infected by bacteria, fungi or viruses. The diagnosis of IE patients who present to health institutions with different clinical presentations may be overlooked and patients may encounter irreversible complications until they are diagnosed. Despite all the advances in the medical world, diagnosis and treatment are still challenging. Cardiac problems are common in patients with chronic kidney disease (CKD). Many patients with end-stage renal disease require hemodialysis to survive. These patients carry a risk of morbidity and mortality due to bacteremia developing due to infection in indwelling catheters. [1,2,3]. Recently, CKD has been seen at an increasing rate (the rate in our country is 15.7% [4]) and leads to an increase in the incidence of comorbid diseases such as DM and HT. In this case report, it is aimed to emphasize this issue by presenting the process of receiving the diagnosis

You may cite this article as: Okur A, Aydin E, Cetin S, Sahin AM, Senel I, Yetkin MA. Confusing processes leading to diagnosis of infective endocarditis. *Cerasus J Med.* 2025;2(1):70-73. doi: 10.70058/cjm.1580232

of infective endocarditis in a 78-year-old chronic renal failure patient who was followed up and treated with the diagnosis of urinary tract infection.

### Case

A 78-year-old female patient who applied to the emergency department with complaints of chills, shivering, weakness, nausea, vomiting and dysuria was undergoing dialysis three times a week due to chronic renal failure. A permanent dialysis catheter was inserted into the subclavian vein 3 months ago. It was learned that the patient's complaints on admission were during dialysis. Her additional diseases were multiple myeloma, diabetes mellitus, hypertension and coronary artery disease and she had medications for these diseases. In her physical examination, fever was 36°C, arterial blood pressure was 120/80 mm/Hg, pulse was 78/minute, suprapubic tenderness on abdominal palpation and pain on stimulation in the right costovertebral region. The patient had bilateral pretibial edema and no acute pathological findings were detected in other system examinations. The laboratory parameters on admission were leukocyte count 12,710 /mm<sup>3</sup>, neutrophil count 86.9%, hemoglobin 10.6 g/dL, platelet count 230,000 hours/mm<sup>3</sup>, sedimentation rate 62 mm/hour, C-reactive protein 119.97 mg/L (normal 0-5 mg/L), urea 21 mg/dL, creatinine 1.23 mg/dL. The patient had been hospitalized for 21 days due to myocardial infarction four months ago, and also three months ago due to pulmonary edema and catheter infection due to *Enterococcus faecium*, and parenteral vancomycin treatment was applied. Multiple myeloma was diagnosed two weeks before admission and two cycles of chemotherapy were applied. The patient, who was hospitalized with a preliminary diagnosis of urinary system infection, was started on ertapenem treatment due to a recent hospitalization history. Since the urine culture taken before the treatment yielded *E. coli* that was sensitive to the treatment applied, the current treatment was continued. *Enterococcus faecalis* grew in the blood culture. The treatment was adjusted to parenteral ampicillin. Vancomycin lock therapy was added for catheter infection. There was no growth in the control blood culture taken after the treatment was started, but since growth continued in the catheter cultures despite the lock therapy, the catheter was removed. The new catheter was inserted into the right femoral vein. Since there was a history of catheter infection before, cardiology was consulted for infective endocarditis. Transesophageal echography revealed an 18x8 mm vegetation on the posterior mitral valve and severe exenteric mitral valve insufficiency, as well as

a suspected posterior mitral valve fistula. The patient's treatment was changed to parenteral vancomycin, and after two weeks of parenteral treatment, he was transferred to the cardiovascular surgery unit for cardiac surgery.

### Discussion

Infective endocarditis is a significant cause of morbidity and mortality. There are several risk factors for infective endocarditis. Any pre-existing heart condition, such as pre-existing valve disease, congenital heart defects, mitral prolapse, or degenerated heart valves, increases the risk of developing infective endocarditis. Procedures performed on the vessels, such as hemodialysis, intravenous drug use, and intravenous catheterization, can cause bacteria to mix with the blood and settle on the heart valves. The increase in intravenous devices used over the years has also caused an increase in the rate of infective endocarditis [5,6]. In our case, there was a permanent catheter due to chronic renal failure requiring dialysis and the risk of infection was high. The risk of bacteremia should be kept in mind in these patients and attention should be paid to infective endocarditis. *Staphylococcus aureus* is the most common cause, followed by streptococci and enterococci [5]. In the case report, there was enterococcus growth in the blood and catheter cultures and she had recently received treatment for another catheter infection. Despite receiving treatment for 21 days, the catheter infection had recurred. In cases where the focus of the infection is not removed in terms of treatment, there is a risk of recurrence, as seen in the case report. Various symptoms can be seen in infective endocarditis. Among the main symptoms, general signs of infection such as fever, chills, weakness, fatigue, loss of appetite, weight loss, sweating, high fever and chills are frequently seen. Cardiac findings include new heart murmur, heart failure symptoms and changes in cardiac rhythm, which are important signs suggesting infective endocarditis. Sometimes, headache, muscle-joint pain, rash, skin lesions on the hands and feet, renal failure, spleen enlargement and findings related to central nervous system involvement may occur. These various symptoms may vary depending on the patient and may make diagnosis difficult. Therefore, especially in risky patients, infective endocarditis should be suspected and appropriate diagnostic evaluations should be made without delay. [7] In the case, there were signs of infection at the time of admission, urinary symptoms were prominent, and there were no findings in the cardiac examination that would lead to suspicion of infective endocarditis. Therefore, treatment for urinary

infection was planned and there was also growth in the urine culture. Enterococcus growth in the catheter and blood cultures and due to the previous catheter infection, infective endocarditis diagnosis was made. Symptoms vary according to the severity and spread of the infection. While acute cases usually have a more severe and rapid onset, subacute cases may have symptoms that develop more slowly and insidiously. The course of the disease and the general condition of the patient are also reflected in the symptoms. In advanced cases, more severe findings such as heart valve damage, bacteremia, and brain complications may occur. In our case report, it was thought that it may have been suppressed and chronic during the treatment applied due to catheter infection and therefore may have caused the clinical course to be more vague.

More than one diagnostic method is used to diagnose infective endocarditis. The most basic step is to evaluate the patient's history and physical examination findings. Infective endocarditis is suspected when the patient's complaints and symptoms are carefully evaluated and changes in heart sounds are detected. In addition, some laboratory tests are also important in the diagnostic process. Blood culture is the most important diagnostic method in infective endocarditis. [8] The growth of the causative microorganism in the blood samples taken from the patient helps to determine the source of the infection and to plan effective treatment. At least three consecutive blood cultures should be taken from the patient. The cardiac examination was unremarkable at the time of the case's application and a blood culture was taken due to his clinical condition. Infective endocarditis was diagnosed due to the enterococcus bacteria that grew after the treatment was started.

Imaging methods play an important role in diagnosis. Echocardiography is the most basic examination in the evaluation of infective endocarditis. Vegetation located on the heart valves or endocardium, damage to the valves, and intracardiac abscess formations can be visualized with transthoracic or transesophageal echocardiography. In addition, computerized tomography and magnetic resonance imaging are also used to evaluate the extent of the disease and its complications. In the case report, vegetation was detected in echocardiography. Infective endocarditis is a serious infection that can result in death in 24% of patients if not treated promptly and appropriately [9]. The treatment approach in infective endocarditis is customized according to the patient's clinical condition, underlying risk factors, severity of infection and causative microorganisms. The first step

is to start appropriate antibiotic therapy. However, blood culture must be taken before treatment to identify the causative agent. Antibiotics are usually administered intravenously. During appropriate antibiotic therapy, the patient's clinical, biochemical and microbiological responses are closely monitored. In the case report, lock therapy was first applied for catheter infection due to the catheter growth and since growth continued despite treatment directed at the catheter, the catheter was removed to eliminate the focus. Surgical intervention may be required in patients who develop complications despite antibiotic therapy. Heart valve replacement is important to reduce the progression of tissue destruction and the risk of embolism. It is also critical to preserve the functionality of the remaining heart structure. Surgical treatment should be planned considering the patient's general condition, severity of the valve lesion and risk of embolism. In this case, there was a vegetation larger than one centimeter and surgery was indicated according to the guidelines. After 2 weeks of parenteral treatment, the patient was transferred to the cardiovascular surgery service for surgical intervention.

## Conclusion

Infective endocarditis is a very serious health problem and early diagnosis and correct treatment are vital. A multidisciplinary approach is required for the correct management of the disease. It should be addressed multidisciplinary with a team work including a cardiologist, infectious disease specialist, cardiac surgeon and other relevant specialists.

Keywords: infective endocarditis, catheter, hemodialysis, renal failure

**Acknowledgements:** None

**Conflict of interest:** The Authors declare that there is no conflict of interest.

**Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

**Authors' contribution:** Surgical and Medical Practice: A.O., E.A., S.C., I.S., M.A.Y. Concept: A.O., E.A., Design: A.O., E.A., S.C., Data collection or processing: A.O., E.A., Analysis or interpretation: A.O., E.A., M.A.Y. Literature search: A.O., E.A., S.C., I.S., Writing: A.O., E.A., M.A.Y.

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