

An unusual infective endocarditis case presenting as meningitis in a young man with recent dental work

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ABSTRACT

Introduction: Infective endocarditis (IE) has several clinical presentations. Here, we report a case of infective endocarditis with uncommon presentation, unusual risk factors, and a rapidly progressing course to alert clinicians to this scenario.

Case: A 39-year-old healthy man presented with altered mental status, fever, and a diffuse petechial rash. Ceftriaxone, vancomycin, and corticosteroids were started for possible meningococcal meningitis. Blood cultures grew *Staphylococcus aureus*. His condition worsened with multiple complications. Transthoracic echocardiograms (TTE) were negative for vegetations, but transesophageal echocardiogram finally showed a large aortic valve vegetation and aortic root abscess. The patient underwent cardiothoracic surgery and was successfully discharged home.

Discussion: A high index of suspicion is required to quickly diagnosis IE. A detailed physical examination is essential to establish the correct diagnosis. Transesophageal echocardiography is superior to bedside TTE in these cases. Infective endocarditis can be complicated with intracardiac abscesses, septic shock, and intracranial bleeding.

Keywords: Endocarditis, meningitis, petechial rash

INTRODUCTION

Infective endocarditis (IE) can be difficult to diagnose and requires a high index of suspicion since patients can present with non-specific symptoms.¹ Risk factors for IE include age of over 60 years, male sex, injection drug use, poor dentition or dental infections, structural heart disease, prosthetic valves, transcatheter aortic valve replacements, a personal history of IE, intravascular devices, cardiac implantable devices, chronic hemodialysis, and HIV infection.² About 50% of all IE cases are not associated with any obvious

risk, which contributes to the difficulty of diagnosing IE. In these cases, considering less-common etiologies is important.

Dental causes of IE have been controversial and poorly studied. Some literature has suggested that even routine dental cleanings can cause transient bacteremia and lead to IE, while other literature has suggested that more invasive dental manipulation in high-risk populations is required for IE development.³ A dental history and an oral examination can be important in identifying the cause of IE.

The case presented in this paper is unique in several aspects, including a lack of IE risk factors, an unusual initial presentation, and an atypical clinical course. This case offers guidance to clinicians for the early recognition and expedited management of such uncommon presentations.

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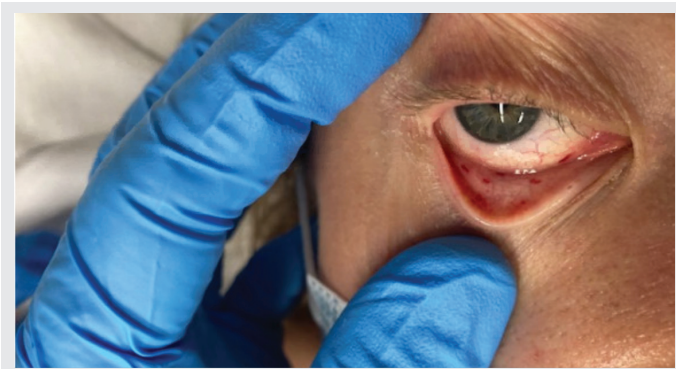


Figure 1. Conjunctival petechiae.

CASE

A 39-year-old, previously healthy man presented with confusion, generalized weakness, and fever for two days. His medical history was unremarkable. Travel history and sick contacts were negative. He denied any use of alcohol, tobacco, and illicit injectable drugs.

Initial vital signs included a temperature of 103.8°F, a heart rate of 110 beats per minute, a respiratory rate of 16 breaths per minute, blood pressure of 104/85 mmHg, and oxygen saturation of 96% on room air. Upon examination, he was oriented to self and place, had conjunctival petechiae (Figure 1), a fixed dental expander over the hard palate, a soft systolic murmur, and pinpoint petechial rash over his chest, arms, and legs (Figure 2). Laboratory tests showed a white

blood cell count of 14,000/ μ L, platelets of 67,000/ μ L, D-Dimer of 15,551 ng/mL, BUN/creatinine of 23 mg/dL/1.7 mg/dL, lactic acid of 5.0 mg/dL, and CRP of 427.4 mg/L. An ECG revealed normal sinus rhythm. Based on this presentation, meningococcal meningitis was suspected, and ceftriaxone, vancomycin, and corticosteroids were started. Computed tomography (CT) of the head showed a subarachnoid hemorrhage. A lumbar puncture showed clear cerebrospinal fluid, RBCs of 100/ mm^3 , WBCs of 285/ mm^3 , neutrophils of 98%, glucose of 81 mg/dL, protein of 82 mg/dL, and a negative Gram stain.

On day two, his blood cultures grew aerobic gram-positive cocci in pairs and groups. He developed atrial fibrillation with rapid ventricular response and elevated troponin to 41.26 ng/dL. A transthoracic echocardiogram (TTE) showed a stenotic possibly bicuspid aortic valve without obvious vegetations.

On day three, blood cultures grew methicillin-sensitive *Staphylococcus aureus*. His clinical condition further declined. Chest, abdomen, and pelvis CTs showed septic emboli and infarcts in the spleen, kidneys, and colon. An ECG revealed a prolonged P-R interval. A transesophageal echocardiogram (TEE) showed a large aortic valve vegetation and aortic root abscess (Videos 1 and 2). A cardiothoracic surgeon drained a myocardial abscess and replaced the aortic valve. The patient was successfully discharged home on antibiotics and warfarin.

DISCUSSION

The initial presentation of fever, malaise, altered mental status, and petechial rash led to suspicion of meningococcal meningitis. Garcia-Cabrera et al. reported that of 1,345 patients with left sided IE 6% presented with encephalopathy/meningitis and 4% had hemorrhages. A higher frequency of complications occurred in patients with vegetations ≥ 3 cm and *Staphylococcus aureus* infections.⁴ Clinicians must keep a high level of suspicion for IE in any infected patient with generalized CNS symptoms.

The patient in this case report had no known risk factors, at least initially. Later, it was determined that



Figure 2. Petechial rash on chest.

he had extensive dental work within the previous year, most recently an upper palate expander. He was also found to have a bicuspid aortic valve. There are very few studies on the risks of developing IE after a dental procedure.³ This case is an excellent example of minimal risk factors leading to severe IE, requiring high suspicion and expedited diagnosis.

After IE was suspected, a formal TTE and several bedside TTEs were negative for vegetations. A TEE was pursued which confirmed the diagnosis. Clinicians often hesitate to obtain invasive imaging when less invasive options are available. However, the TEE was a major turning point in this patient's care, and invasive imaging should be considered in cases of possible IE without a clear diagnosis.

Finally, this patient's symptoms started three days prior to presentation and progressed rapidly during his hospitalization. He developed multiple complications of IE, including intracranial hemorrhage, multi-system septic emboli with infarcts, and multiple intracardiac abscesses with first degree heart block. More surprising is that his most recent dental procedure was one month prior to presentation. This, again, emphasizes the difficulty of an IE diagnosis and the need for a rapid diagnosis since IE can lead to major morbidity and mortality.

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