

Abiotrophia defectiva – silent invader and real diagnostic challenge

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SÚHRN

Abiotrophia defectiva je bežnou súčasťou mikrobióty dutiny ústnej, tráviaceho a urogenitálneho traktu. Výnimočne, v 1 – 3 % všetkých prípadov, môže táto baktéria spôsobiť infekčnú endokarditídu. Hoci endokarditída spôsobená *Abiotrophia defectiva* nie sú časté, vyznačujú sa vysokou mortalitou a množstvom komplikácií. Zdlhavý, atypický priebeh a zložitá kultivácia vyžadujúca si špeciálne kultivačné médium prispievajú k neskorej diagnostike. Infekčná endokarditída spôsobená *A. defectiva* je známa svojou agresívnou povahou, ktorá sa manifestuje vytváraním veľkých vegetácií vedúcich k devastácnym systémovým embolizáciám, deštrukcii srdcových chlopní a v neposlednom rade k progresívnemu srdcovému zlyhaniu. Popisujeme prípad 43-ročného muža s infekčnou endokarditídou mitrálnnej chlopne, ktorá sa prejavila nespočtým množstvom embolických príhod.

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ABSTRACT

Abiotrophia defectiva belongs to the normal human microbiome of the oral cavity, gastrointestinal and urogenital tracts. Rarely, about 1–3% of all infective endocarditis, it can be the cause of infective endocarditis. Although uncommon, it is associated with high mortality and complication rates. The chronic course and difficult isolation requiring specialized culture media are contributing to a delayed diagnosis. Moreover, infective endocarditis by *A. defectiva* is known for its aggressive nature characterized by the development of large vegetations leading to massive, life-threatening systemic embolizations, valves destructions, and progressive heart failure. Here, we report a serious case of 43 y.o. previously healthy man diagnosed with *A. defectiva* infective endocarditis presenting with multi-organ septic embolizations.

Keywords:

Abiotrophia defectiva

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Infective endocarditis

Introduction

Infective endocarditis (IE) due to *Abiotrophia* species, previously referred to as nutritionally variant streptococci, occurs rarely, only between 1–3% of all IE and typically presents with indolent or prolonged course.^{1,2} *Abiotrophia defectiva* is a gram-positive coccus, which is a part of the normal flora of the oral cavity, intestinal and urogenital tracts.

Despite its harmless nature, it can lead to severe IE with development of large vegetations (> 10 mm), excessive embolic events, and congestive heart failure due to valve destruction.^{3,4} Endocarditis in general occurs most often in adults over age 60, however patients with *A. defectiva* IE are usually younger (around 48 years old).² The most common risk factors include previous valvular heart disease,

congenital heart disease, heart valve prosthesis or immunodeficiency, on the other hand, 39% of cases showed no evidence of risk factor.¹ Additionally, *A. defectiva* is very difficult to grow and identify under standard laboratory methods, that is why it is often associated with blood-negative cultures. The incidence of serious complications, delayed diagnosis and treatment failure cause high mortality and need for valve replacement (around 50%).⁵ Our patient, a previously healthy man, with no risk factors, developed insidious course of infective endocarditis with valve destruction and multiple embolizations.

Case presentation

A 43-year-old male reported ongoing sporadic fevers, fatigue, night sweats, joint swelling, pain and substan-

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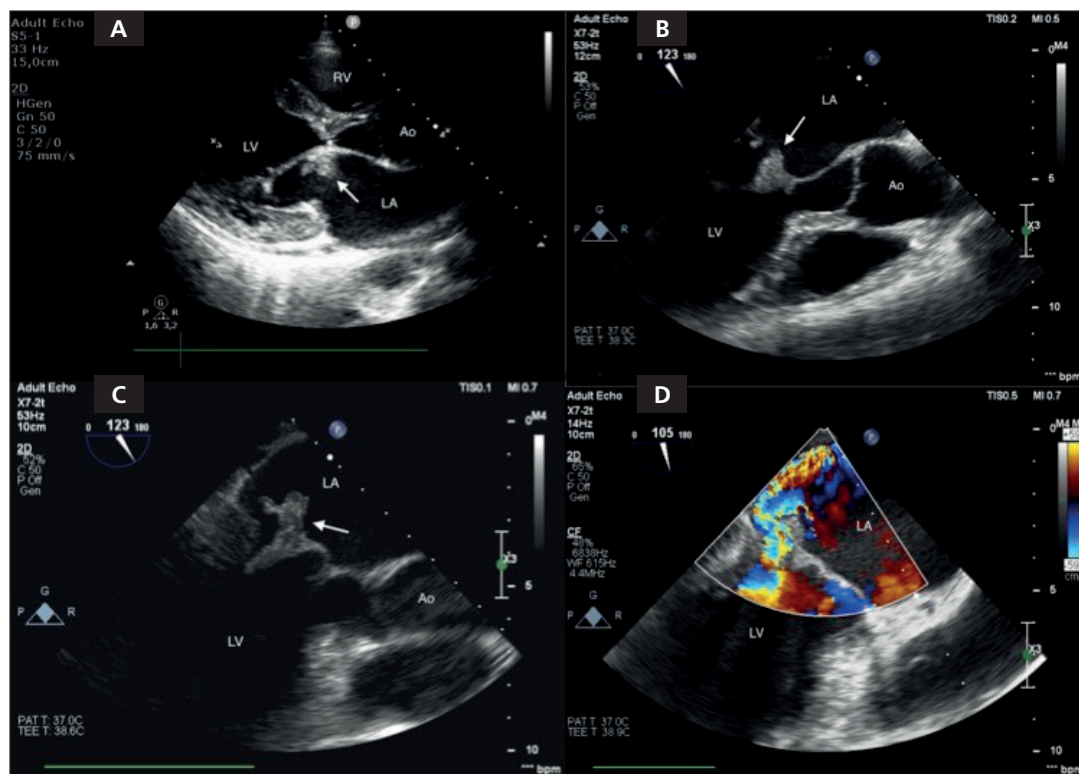


Fig. 1 – Echocardiography. (A) Transthoracic echocardiography apical three-chamber view and transesophageal echocardiography long-axis view (B) show large vegetation (arrow) on the anterior leaflet of the mitral valve on the atrial side (C). The vegetation measures 20 mm in length (arrow). (D) Color flow image shows severe mitral regurgitation.

Ao – aorta; LA – left atrium; LV – left ventricle; RV – right ventricle.

tial weight loss of 11 kg over a year. Following multiple rounds of antibiotic treatment with inadequate response, a systemic rheumatic disease was suspected.

After suffering with a sudden onset of left-sided leg pain and left-sided vision loss, the patient was admitted to department of internal medicine. An arterial Doppler ultrasound revealed embolic occlusion of the left popliteal artery. Upon eye examination, left-sided retinal hemorrhage and right-sided macular hemorrhage was detected. On the fourth day following admission, *A. defectiva* was identified from blood cultures. Under the suspicion of infectious endocarditis, transthoracic echocardiography was performed and large vegetations on mitral valve were found. According to antimicrobial susceptibility testing, an initial antibiotic regimen comprising ceftriaxone and gentamicin were administered, and the patient was referred to our medical centre.

On admission to our hospital, a physical examination revealed a slight underweight and multiple Janeway lesions on the left palm and on the right sole. A laboratory analysis showed an elevated inflammatory response with moderately elevated white blood cell counts ($12 \times 10^9/l$) and C-reactive protein (81 mg/l), elevated NT-proBNP (902 ng/l) and mild microcytic anaemia (Hgb 112 g/l). Transthoracic and transesophageal echocardiography showed normal systolic function of the left ventricle, severe mitral regurgitation with multiple vegetations on the mitral valve predominantly in the anterior leaflet (Fig. 1). Coronary angiography presented a subtotal embolic occlu-

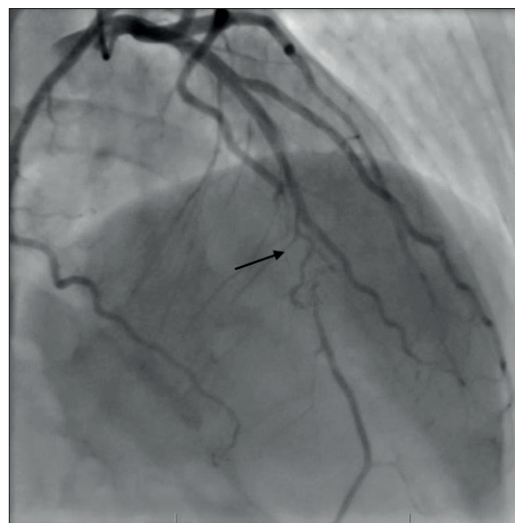


Fig. 2 – Coronary angiography. A subtotal embolic occlusion (arrow) of the left anterior descending coronary artery.

sion of the left anterior descending coronary artery (LAD) (Fig. 2). Abdominal computed tomography (CT) revealed splenic infarction and bilateral renal infarction (Fig. 3). A head CT discovered fusiform aneurysm of the right medial cerebral artery, intracerebral hemorrhage in the right parietooccipital lobe and infarction in the left fron-

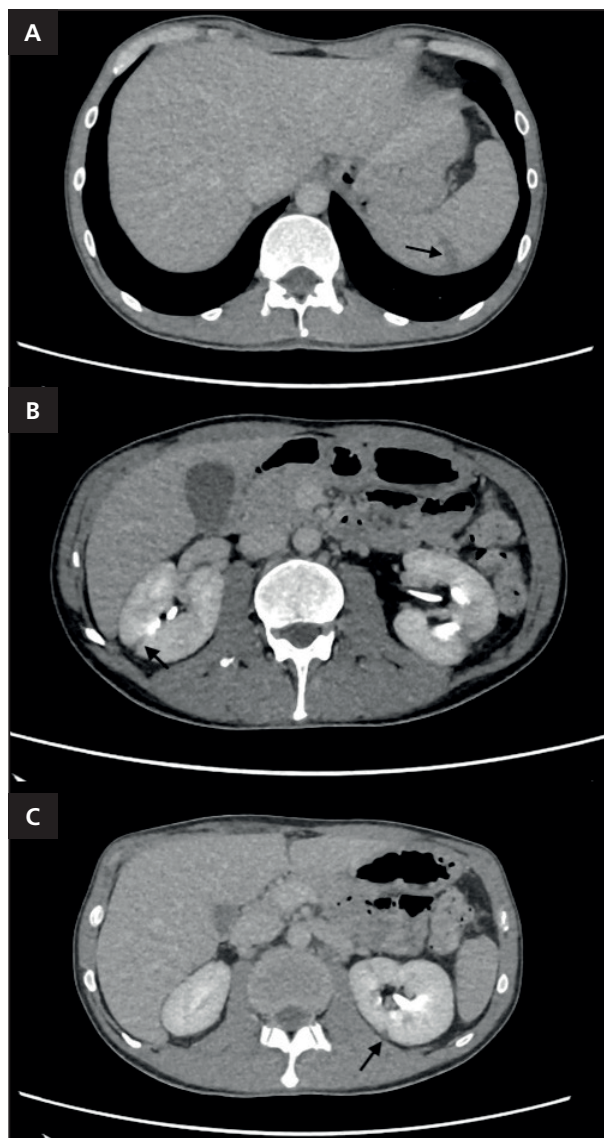


Fig. 3 – Computed tomography of abdomen. (A) Splenic infarction. (B,C) Bilateral renal infarction

tal lobe. The fusiform aneurysm was successfully treated by seven coils placed inside the aneurysm (Fig. 4). After a week, the patient's health condition deteriorated with new neurological symptoms and progression of mitral regurgitation and size of vegetations despite adequate antibiotic therapy worsened. Mitral valve replacement using a 29 mm biological valve (C-E Perimount PLUS) and LIMA to LAD bypass grafting were performed. The post-operative course was uneventful, he was discharged 3 weeks after surgery after completing 6 weeks of antibiotic therapy. No relapse of IE was observed during the 2 years of follow-up at our cardiovascular center.

Discussion

A. defectiva infective endocarditis usually occurs in patients with congenital or preexisting heart disease, a history of previous cardiac surgery or immunocompromised state. Additional risk factors that can also predispose the patients to IE include: older age, indwelling cardiovascular devices, intravenous catheter, intravenous drug use, chronic hemodialysis, poor dentition and invasive dental, gastrointestinal or genitourinary tract procedures.⁷ In our case, the patient had neither of predisposing factors nor the history of dental or any other invasive procedure. However, not only oral procedures, such as tooth extractions, but also routine oral hygiene activities, such as brushing or flossing can facilitate bacterial entry into the bloodstream, which could potentially lead to the development of IE.⁶

The leading cause of difficulty in the diagnosis is related to indolent course, atypical presentation, and difficult isolation. *A. defectiva* IE should be considered in patients with unusual manifestation of infection. Some patients do not even develop fever, but they suffer from nonspecific symptoms, such as weight loss, fatigue or functional decline over a prolonged period of time. Laboratory findings often include anemia and slightly elevated inflammatory markers.⁸ In these cases, use of echocardiography and blood cultures are crucial.

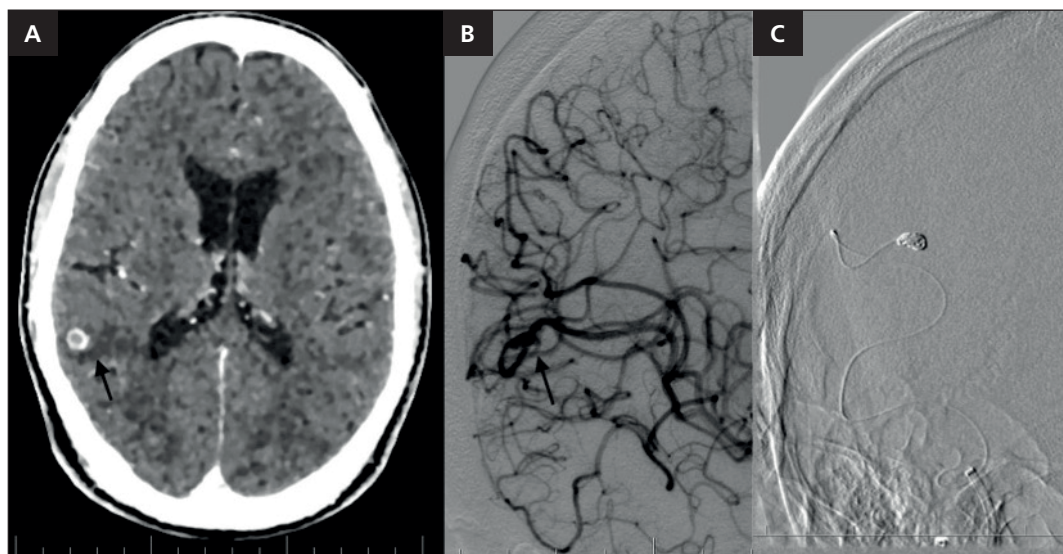


Fig. 4 – Brain imaging. (A) Head computed tomography shows fusiform aneurysm of the right medial cerebral artery and intracerebral hemorrhage in parietooccipital lobe (arrow) on axial view. (B) Digital subtraction angiography (DSA) shows aneurysm (arrow) of the right medial cerebral artery. (C) Seven coils were inserted into the aneurysm.

The name "Abiotrophia" literally means life nutrition deficiency which refers to the species requirements for enhanced culture media for growth. Nowadays, it seems that some isolates may have adapted to grow without the addition of vitamin B₆ or cysteine and can be grown on routine media (as with our patient). Unfortunately, using routine media may not always identify *Abiotrophia* species because of overgrowth of other bacteria or limited growth due to insufficient nutrients. Therefore, enriched media allow selective growth and are more reliable in isolating *A. defectiva*.^{9,10}

According to the current ESC guideline-recommended antibiotic therapy, penicillin G, ceftriaxone, or vancomycin should be used for 6 weeks combined with an aminoglycoside for at least the first 2 weeks. Despite the use of appropriate antibiotics, approximately 50% of cases also need surgical management. Surgical treatment combined with concurrent antimicrobial therapy result in better prognoses, and the main indications for surgery are: recurrent emboli, persistent sepsis, mobile vegetations, and severe heart failure.^{4,11} In our case, despite antibiotic therapy, the patient's condition was deteriorating rapidly due to progressing valve destruction and heart failure, new vegetation development, and recurrent brain embolization. Surgical resection of vegetations and complete mitral valve replacement were inevitable to save the patient.

IE caused by *A. defectiva* is known for its embolization potential. Embolic events are frequent and often life-threatening complications. Several previous studies recognized many predictors for embolic event. The vegetation size (>10 mm), mobility, location and even shape (globular) all increase the risk of embolic complications. Also, the vegetation on the mitral valve has a significantly higher embolic potential. The size of the anterior leaflet, its rapid and forceful movement during valve closure, and the production of negative pressure on the valve by atrial contraction may lead to destabilizing attached vegetations.^{12,13} In the presented case, the size of the vegetation exceeded 20 mm, the embolic rate was higher than usual and caused harm to many organs.

Conclusion

IE caused by *A. defectiva* is rare and easy to miss, but aggressive and leads to a poor prognosis. Atypical manifestation of infection, negative blood cultures and adjunct embolic events should always raise suspicion of *A. defectiva* endocarditis. Role of echocardiography and use of specialized culture media for blood culture is critical in making the right diagnosis.

Conflict of interest

The authors declare that there is no conflict of interest.

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None.

Ethical statement

Approval for the publication was granted by the Ethical Committee of the hospital where the patient underwent evaluation.

Informed consent

We obtained the patient's relative consent in order to publish the article. Any information concerning the patient's identity has been omitted.

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