

Infective Endocarditis due to *Abiotrophia defectiva* presenting as Ankle Cellulitis

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Abstract We report a case of infective endocarditis (IE) caused by *Abiotrophia defectiva* in an 8 year-old boy presented initially with left ankle cellulitis and fever. Blood culture showed Gram variable cocci which confirmed by Matrix-Assisted Laser Desorption Ionization Time Of Flight Mass Spectrophotometer (MALDI-TOF MS) as *Abiotrophia defectiva*. Vegetation seen at Mitral valve by transthoracic echocardiogram (TTE). He was diagnosed as Infective Endocarditis caused by *Abiotrophia defectiva* and was treated with intravenous gentamicin (6mg/kg/day) and ceftriaxone (100mg/kg/day) for six weeks. The patient had excellent outcome, vegetation was absent on repeated Echocardiography (ECHO), and the result showed no relapse after follow up. *Abiotrophia defectiva* should be considered as a cause of IE in patients with positive blood culture especially those caused by gram variable cocci.

Keywords: *Abiotrophia defectiva*, endocarditis, child, streptococci

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1. Introduction

Abiotrophia species is normal human flora of oral cavity, genitourinary & intestinal mucosa, previously been referred to as nutritionally variant streptococci (NVS) [1]. *A. defectiva* is a rare cause of endocarditis [2]. It accounts for about 5% of all cases of infective endocarditis and is a major cause of blood culture negative infective endocarditis [3]. Colony morphology is varying from typical gram-positive streptococci to gram-variable, enlarged, pleomorphic coccobacilli [4]. The organisms tend to form satellitism colonies around *Staphylococcus aureus*. It includes four species: *A. defectiva*, *A. adjacens*, *A. elegans* and *A. balaenopterae*. Recently *A. adjacens*, *A. balaenopterae* and *A. elegans* been reclassified in a new genus, *Granulicatella* genus [5]. In this case report, we describe a patient with IE caused by *A. defectiva* in an attempt to increase awareness about this organism and to highlight the difficulties encountered in identifying this organism, its diagnosis and antibiotics treatment.

2. Case Report

An 8-year-old boy with no previous medical problems seen at emergency department with 7 days history of intermittent fever reaching 38.5° Celsius associated with lethargy and exercise intolerance. He also complained of left ankle painful swelling for the last two days prior to this presentation. There was no history of trauma. On examination, the patient had signs of cellulitis and

pan-systolic murmur at Mitral area. He has marfenoid features such as high arched palate and high arm span. Ultrasound of left ankle showed features suggestive of cellulitis with no collection. Blood investigations showed high C-reactive protein (CRP), 139 mg/dL(<5), erythrocyte sedimentation rate (ESR) 39 (<20) and no leukocytosis. Initial transthoracic echocardiogram (TTE) showed mitral valve prolapse (MVP). The patient was admitted with initial impression of cellulitis and to roll out infective endocarditis. He was treated with intravenous Cloxacillin (500 mg divided every 6 hours) as empirical therapy for his cellulitis. First blood culture taken from emergency room showed Gram variable pleomorphic bacteria from three sets. Due to persistent bacteremia, a second TTE was done three days after first ECHO which showed markedly dysplastic mitral valve, mild mitral regurgitation, 8 mm echo-dense pedunculated mass in the left atrium. With the Echocardiography findings, the antibiotic regimen was changed to intravenous gentamicin and ceftriaxone. The decision was made to treat him as infective endocarditis with antibiotics and follow up echo.

Blood culture growth on chocolate and blood agars showed gram variable pleomorphic coccobacilli. It was identified by an automated identification system (Phoenix) as *Gemilla*. However it is difficult to grow on standard media and it makes satellitism colonies around *Staphylococcus aureus*. The strain of this bacteria was identified as *A. defectiva* by MALDI TOF. The antibacterial susceptibility testing which done on non-standardized media showed it is sensitive to ceftriaxone, gentamycin, and vancomycin but has high minimum inhibitory concentration (MIC) for penicillin. Then after confirmation of the identification, the antimicrobial

regimen was continued on intravenous ceftriaxone (100mg/kg/day) for six weeks and intravenous gentamicin (6mg/kg/day) for five weeks only and then gentamycin was stopped as the patient developed nephrotoxicity in form of raised creatinine level but no ototoxicity observed and drug level monitored. During his admission, he showed clinical improvement in his left ankle swelling, his fever and his well being improved and gradually regained his normal activities with repeated ESR before discharge returned to normal. The patient was discharged after 6 weeks of admission. On subsequent follow up patient did not showed a relapse of his infection and continue his regular follow up with cardiology service. The patient had excellent outcome, vegetation was absent on repeated Echo. which done four weeks after starting the treatment with normalization of his serum creatinine level.

3. Discussion

Studies have estimated that *A. defectiva* is responsible for about 1-5% of all cases of IE [3,4,6]. The aggressive nature of *A. defectiva* might be due to the secretion of exopolysaccharide and also the ability to adhere to fibronectin [7]. Patients with IE caused by *A. defectiva* can experience sub-acute non-specific symptoms [8]. *A. defectiva* has been associated with various serious infections including bacteremia, endocarditis, brain abscess, septic arthritis and total knee arthroplasty infections [9,10,11,12]. Endocarditis caused by *A. defectiva* carries greater morbidity and mortality than endocarditis caused by other streptococci [13]. These complications such as heart failure has been reported even in otherwise healthy patients [14]. There is a case report from Saudi Arabia where the patient present with cellulitis like our patient, possibly it is septic emboli phenomena. Septic embolization as complications of infective endocarditis caused by this organism has been reported in the Kidney and spleen [16,17]. The identification of *Abiotrophia* is difficult because of its growth requirement and it is confusing gram stain appearance. It needs high clinical suspicion and may form a diagnostic challenge that may require more advanced diagnostics modalities such as PCR and Matrix associated laser desorption ionization time of flight mass spectrophotometer (MALDI-TOF-MS). MALDI-TOF-MS is simple and inexpensive method of identification [18]. Treatment is another challenge because of two main reasons, first; there is no standard method of testing susceptibility of this organism and the second reason is absence of well evaluated treatment regimes due to paucity of the cases. It is recommended to treat with penicillin or ampicillin plus an aminoglycoside and in case of resistance to treat with vancomycin for 4 to 6 weeks [15]. On the other hand it is known that infective endocarditic due to *Abiotrophia* has high rate of failure and relapse. Surgical intervention may be required as the medical therapy alone can fail to treat *Abiotrophia* I.E as reported by Maria et.al [19]. Previous studies have shown a relapse rate of as high as 17% and bacteriological failure in 41 % of cases, despite antibiotics use [20,21]. American Heart Association recommends treating I.E caused by this organism as Enterococcus regimen with penicillin and

gentamicin for total of six weeks [22]. The history of left ankle cellulitis in our patient was most likely a septic embolus and the likely source of entry was oral cavity in spite it remain obscure.

4. Conclusion

Abiotrophia defectiva can present as a serious infection like septicaemia and endocarditis .It can carry both diagnostic and treatment challenge. Therefore it need high index of suspicion and close monitoring of response to treatment. It should be considered especially in those caused by fastidious gram variable cocci. This case of *A. defectiva* infective endocarditis is the first case reported in Oman and it showed excellent response with intravenous antibiotics therapy for 6 weeks with complete resolution of the vegetation without need for surgical intervention as he was showing clinical improvement on medical treatment. It also demonstrated that ceftriaxone can be successfully used as an alternative option to penicillin in susceptible organism.

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