

Subacute Corynebacterium Striatum Tricuspid Valve Endocarditis, A Rare Case Report

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Abstract: *Corynebacterium diphtheria* is the well-known cause of pharyngitis and other upper respiratory tract infections. With the advent of efficient vaccination system, the incidence of these infections has been significantly reduced in developed countries. However, in the recent past, non-toxigenic strains of *Corynebacterium diphtheriae* has been associated with a variety of systemic infections especially in immunocompromised. They may cause infective endocarditis, septic arthritis, bacteremia etc. In this case we are going to present a case of right sided endocarditis caused by a relatively less virulent *Corynebacterium diphtheriae* species.

Keywords: NTCD; Non-toxigenic *Corynebacterium* strains, IE; Infective Endocarditis

1. Introduction

Worldwide, over 120 species of genus *Corynebacterium* have been discovered [1]. *Corynebacterium* species are also called “diphtheroids” are aerobic, pleomorphic gram-positive bacilli and these species are considered an important part of normal skin and mucous membrane flora and they are more often mis-identified on microbiology and assumed as contaminants[2]. *Corynebacterium diphtheriae* is an important component of this genus and cause a variety of infections like skin infections and pharyngitis. However, more recently it has been more commonly associated with a spectrum of infectious diseases e.g. bacteremia, septic arthritis, stroke and infective endocarditis etc. Endocarditis caused by these non-virulent species has much more aggressive course[3]. Although, *Corynebacterium* is well-known for involving the prosthetic cardiac valves but in certain rare cases it may involve the native heart valves. Furthermore, left sided heart valves are more commonly effected than the right sided valves [3,4].

2. Case Report

A 59 y/o male with past medical history of Asthma, hypertension, Alcohol abuse, presented to Emergency department, with chief medical complaint of fever and confusion. His symptoms persisted for 2 weeks. Patient explains that he has been having low grade fever off and on, for last two months. initially, he visited his primary care physician, who referred him to a local hospital. At that time, he was treated with Rocephin and discharged home on 7 days course of Keflex.

Patient developed fever again and was admitted to the hospital and further worked up for fever of unknown origin. He denies any chest pain, shortness of breath, abdominal pain.

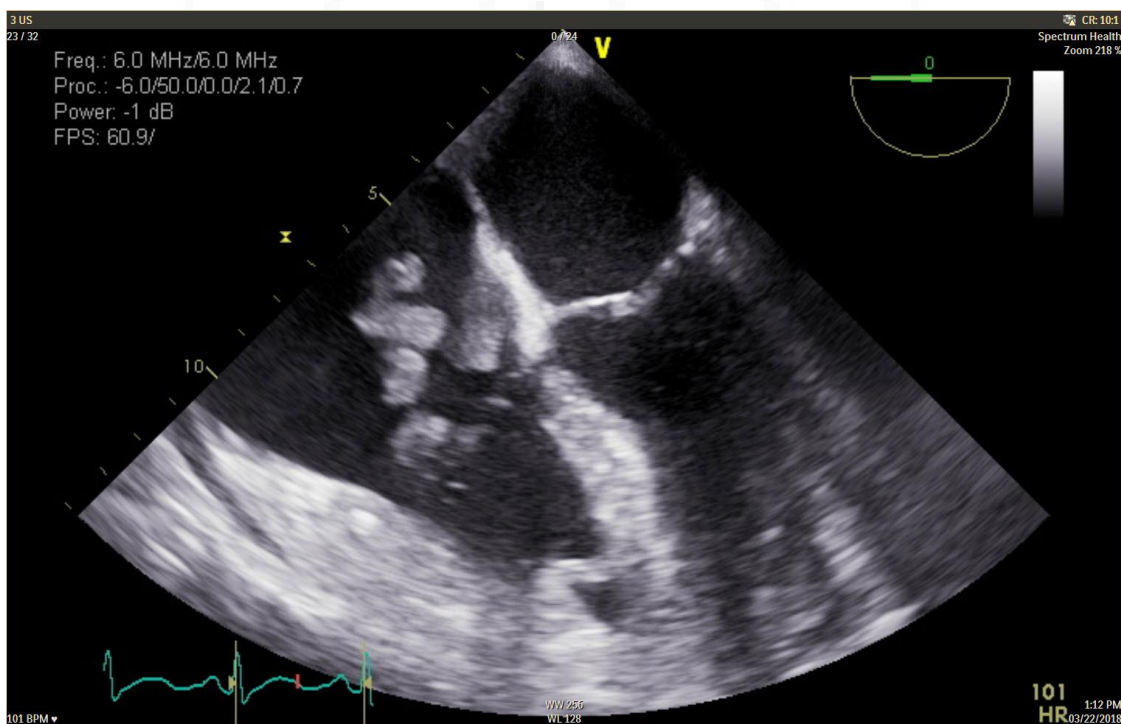
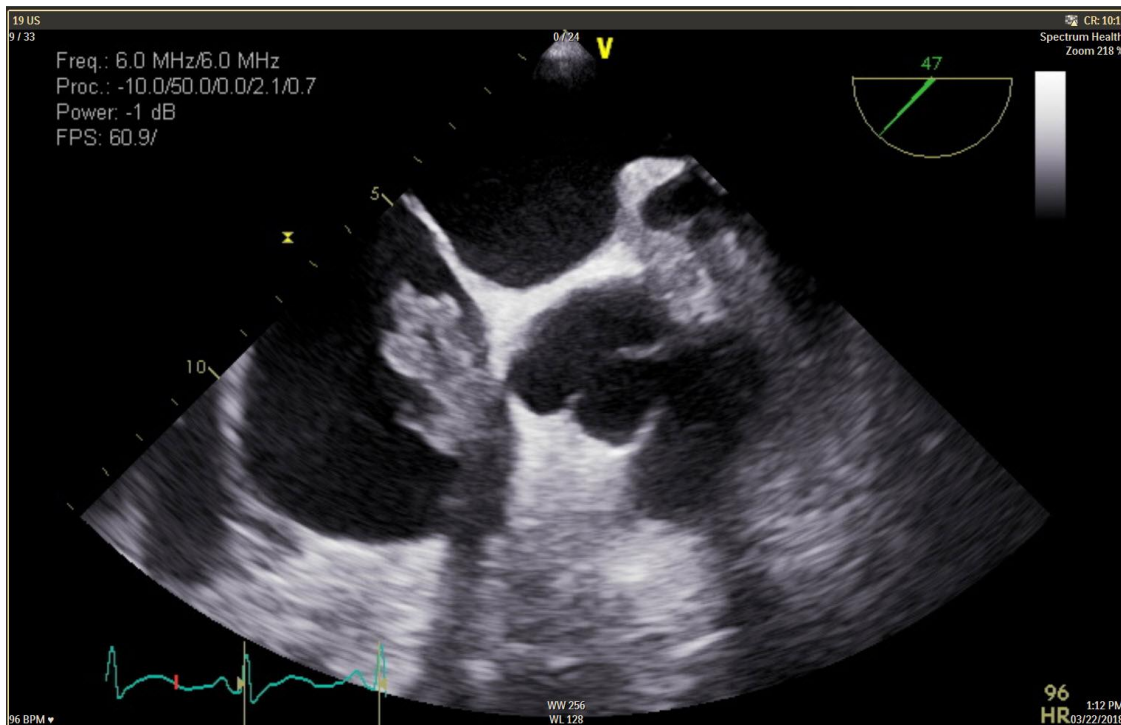
On Physical examination, he was febrile and tachycardic and chest auscultation revealed grade 3/ 6 diastolic murmur heard best at the tricuspid area. No rash, janeway lesions or osler nodes were appreciated. Rest of the physical exam was perfectly within normal limits. The initial laboratory investigation showed leukocytosis with WBCs 17. His blood culture was positive for diphtheroid species in three different samples.

Patient has no prosthetic valve in situ, and he had never been diagnosed with any congenital heart disease. He has remote history of cocaine abuse but denies any drug use in the recent past. He is no more drinking alcohol.

Transthoracic Echocardiography came back positive, showing a 2.7 cm friable vegetation associated with the atrial septum and tricuspid valve (shown in pictures, A and B). CT scan chest revealed pulmonary emboli in the peripheral vessels. Initially, Treatment was started with vancomycin. He received vancomycin for 10 days. Vancomycin stopped due to the side effects i.e. rash and AKI (Creatinine 2.5 from baseline 1.0) and was replaced with daptomycin. He continued to have positive blood cultures despite on daptomycin.

Cardio-thoracic surgery was consulted for surgical evaluation of the cardiac valve. Patient was scheduled for tricuspid valve replacement surgery and ended up having surgical replacement of his tricuspid valve with bioprosthetic valve. Repeated blood cultures were negative, and patient remains afebrile. Patient was discharged from the hospital. He completed his daptomycin full course of 4 weeks.

Pic A,B. Echocardiography showing Tricuspid valve vegetation.



3. Discussion

In developed countries the infections caused by corynebacterium diphtheriae species are very rare due to their very efficient immunization programs. Corynebacterium diphtheriae is a very rare cause of infective endocarditis. Corynebacterium endocarditis is associated with significant morbidity and mortality and is very aggressive disease. The very first case was reported in 1893. Recently, the incidence of infective endocarditis caused by these non-toxicogenic species is

increasing in many countries like Brazil, India, United states, United Kingdom, Poland and New Zealand[9,10,11,12].

Lately, several predisposing factors for NTCD infections have been identified; and these factors include low socioeconomic status, alcoholism, intravenous drug abuse, homelessness, dental caries, hepatic cirrhosis and certain other chronic diseases like diabetes mellitus. In addition to that immune status of patient is also major predisposing factor for these infections[5,6,7,8,]. Cardiac abnormalities including the

congenital and acquired (Prosthetic cardiac valves) cardiac anomalies were reported the most significant predisposition risk factors for corynebacterium diphtheriae endocarditis. However, there is enough evidence of occurrence of these infections in the absence of any cardiac pathology and chronic disease, as in our case the patient never had any cardiac conditions before he was infected [13]. Moreover, a major proportion of these cases have been treated conservatively with antibiotics except some of them, which need surgical valvular repair as in our case [3].

Historically, left sided heart valves are more commonly affected by Corynebacterium diphtheriae than the right sided valves. But, in our case we have noticed the involvement of tricuspid valve and this is the first ever case reported. NTCD endocarditis is considered to be much more aggressive and destructive disease with significant number of complications including heart failure and thrombo-embolic events (septic emboli) [3,4]. According to Mocchegiani et al, rates of systemic emboli due to NTCD IE ranges from 22% to 50% and different neurological develop in approximately 20% to 40% of patients [14]. It has been described that nearly 70% of the patients who develop cardio-embolic stroke secondary to the NTCD IE, achieve full functional neuro recovery after cardiac surgery [15].

Corynebacterium infections are generally treated conservatively with antibiotics except some of them, which need surgical valvular repair as in our case [3].

Antibiotics including penicillins, cephalosporins, vancomycin and aminoglycosides are very effective against these organisms [5, 6]. Penicillins in combinations with gentamycin are used for treatment. However, certain corynebacterium species with multi-drug resistance are also emerging and reported recently [11]. Since, NTCD IE, is considered very destructive and dangerous disease, special measures should be taken to diagnose the disease. Frank use of lab technology and advanced cardiac imaging is required to diagnose this infectious endocarditis.

4. Conclusion

NTCD species can cause infective endocarditis even under normal circumstances (native valves). Moreover, it can involve both right and left side of heart contrary to typical left sided involvement reported previously. Since this infection if left untreated, leads to significant complications, therefore, one should be more aggressive in taking laboratory and radiological measures for diagnosis. This may also help in starting proper anti-biotic treatment timely. Involvement of previously completely normal heart valves does not exclude the diagnosis of NTCD IE.

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