

# A Large Aortic Root Mycotic Aneurysm with Complete Heart Block: A Rare Complication of Infective Endocarditis

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## ABSTRACT

Infective endocarditis of aortic valve with peri-annular extension leading to a large mycotic aneurysm of aortic root is a rare yet grave complication. A 65-year-old male presented with on and off fever since 2 years, and dyspnea since 20 days. ECG showed complete heart block with narrow complex escape rhythm. Echocardiography study showed Rheumatic Heart Disease with severe mitral regurgitation and mild aortic regurgitation. There was a 53 \* 47 mm thick walled mycotic aneurysm of aortic root posterior coronary sinus. Duke's criteria were suggestive of definite infective endocarditis, though the blood culture was negative. To the best of our knowledge, this is the largest aortic root mycotic aneurysm reported till date.

**Key words:** Mycotic aneurysm, Complete heart block, Infective endocarditis.

**Key message:** Large mycotic aneurysms of the aortic root posterior coronary sinus are associated with complete heart block. In patients with infective endocarditis we should look for mycotic aneurysm by Trans-Esophageal Echocardiography and confirm with cardiac CT scan because mycotic aneurysms require surgery and portend a bad prognosis if untreated.

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Submission Date: 16-04-2017;

Revision Date: 12-05-2017;

Accepted Date: 04-07-2017.

DOI : 10.5530/jcdr.2018.1.11

## INTRODUCTION

Infective endocarditis is defined as an infection of the endocardial surface of the heart including heart valves, mural endocardium or septal defects. Periannular extension of infection may occur in 10 to 40 percent of all native valve Infective Endocarditis (IE), and complicates aortic valve IE more commonly than either mitral or tricuspid valve IE. Perivalvular extension predisposes to abscess formation, aneurysms, perforation, fistula development, and hemodynamic deterioration. A mycotic aneurysm of the aortic root is defined as an aneurysm with its origin in the aortic annulus, sinuses or wall caused by an infectious break in the internal wall forming a blind sac connected with the aortic lumen.<sup>1</sup> Aneurysm of the aortic root is often a complication of aortic root abscess due to Infective endocarditis.

We present a rare case of a patient with unattended sub-acute infective endocarditis, which progressed over many months. Rheumatic heart disease was the predisposing condition in the patient. This presentation of infective endocarditis developing into a large mycotic aneurysm is very unusual now, as medical help is mostly sought early in the disease course.

## CASE REPORT

A 65-year-old male presented with on and off fever since 2 years, for which he received intermittent short-term antibiotics at the periphery hospitals, without having a proper diagnosis established. He also had dyspnea since 20 days. ECG findings were suggestive of complete heart block (Figure 1) with narrow complex escape rhythm @ 56/ min. 2-Dimensional Echocardiography study revealed a large thick-walled cavity in communication with the posterior root of aorta facing non-coronary cusp of size 53 \* 47 mm (Figure 2). It was associated with rheumatic heart disease in the form of thickened aortic and mitral valves causing mild aortic regurgitation and severe mitral regurgitation. There was enlargement of Left Ventricle and atrium with global hypokinesia of Left Ventricle with Ejection Fraction of 45 %, possibly a result of Left Ventricle decompensation by chronic severe Mitral Regurgitation. There was no evidence of vegetation. We confirmed the findings by

Trans-Esophageal Echocardiography. Blood Culture was positive for Enterobacter in one of the 3 samples. Fundus was suggestive for Roth spots. Cardiac CT Scan (Figure 3) revealed a thick partially calcified walled aneurysm arising out of aortic root. Patient was started on antibiotics. He refused surgery, and later left against medical advice.

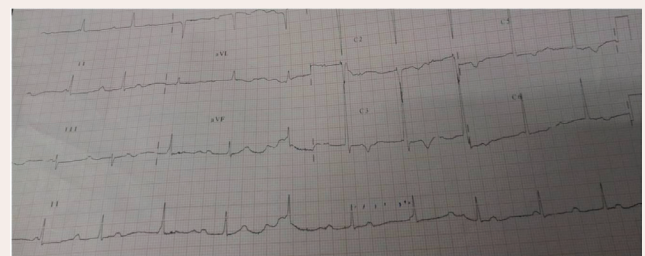


Figure 1: ECG showing complete heart block.

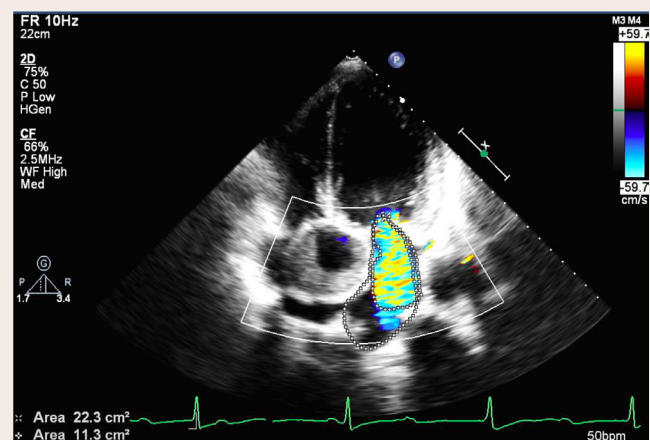
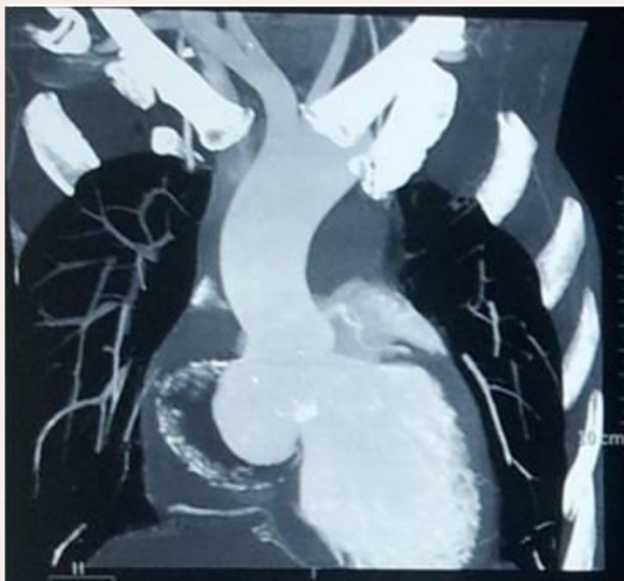


Figure 2: Dimensional Echocardiography study PLAX (Parasternal Long axis view) showing the enlarged aneurysm encroaching the left atrium, mild aortic regurgitation also seen.



**Figure 3:** Cardiac and aortic CT angiography scan showing large mycotic aneurysm in aortic root with evidence of calcification.

## DISCUSSION

Presence of Duke's criteria in this case – 1 major i.e. echocardiographic evidence of abscess and 3 minor i.e. fever, predisposing factor Rheumatic Heart Disease and Roth spots, makes the diagnosis of infective endocarditis “definite”.

Blood culture was unremarkable in this patient, as just one sample showed *Enterobacter*, which is not known to cause infective endocarditis, but is a frequent contaminant in the laboratory. Blood culture was negative in 31 % patients in the study of 233 patients of perivalvular abscess associated with endocarditis.<sup>2</sup> Also our patient received a short course of antibiotics in a peripheral hospital before being referred to our hospital.

Extension or spread of infection beyond the valve annulus is a very concerning development that usually presages the need for surgical therapy. Findings such as persistent fever and bacteremia despite antibiotic therapy, heart failure, or new conduction block should raise suspicion for this complication.

In this case, the echocardiography study showed the presence of a thick-walled aneurysmal cavity completely contiguous with the aortic root, with free blood movement between the cavity and aortic root, supports the presence of aortic root mycotic aneurysm. The diagnosis and the large size of the aneurysm were further confirmed by cardiac and aortic root CT scan. Aortomitral annular fibrosa aneurysm, originating from the left ventricular outflow tract, expands in systole and collapses in diastole.<sup>3</sup> Contrary to the aortomitral annular fibrosa aneurysm, the aneurysm in our case, expanded in diastole and reduced in systole.

In the study by Dan Feigl *et al* of mycotic aneurysm of aortic root in 20 cases, native valve infective endocarditis was present in 11 cases, posterior sinus was involved in 5 cases; and maximum size was 4 \* 2.5 cm.<sup>4</sup> On histologic examination, the thick wall of the aneurysm was composed of microabscesses and thrombus with calcium. Rheumatic valvular

disease was the background etiologic factor in 7 cases, remaining had bicuspid aortic valve. In a retrospective study of 13 cases of aortic mycotic aneurysm, 9 had native valve endocarditis, most frequently associated with bicuspid aortic valve.<sup>5</sup> Our patient had tricuspid aortic valve, and the native disease was rheumatic heart disease, with concomitant severe mitral regurgitation. Also the patient had a thick-walled partially calcified cavity with organized thrombus, as suggested by CT scan. Thick-walled partially calcified wall of cavity may be due to inflammatory exudation or thrombus.

Mycotic aneurysms are frequently associated with perforation into intracardiac chambers, pericardial tamponade, myocardial infarction by compression of coronary arteries, and conduction disturbances by encroachment of the atrioventricular node by aneurysm (mostly posterior).<sup>4</sup> In the study by R. Choussat *et al*, though conduction disturbances were present in 43 patients of 233 cases of perivalvular abscess, complete Atrio-Ventricular (AV) block constituted just 6 cases.<sup>1</sup> Complete heart block occurs in 0-14% cases of infective endocarditis.<sup>6</sup> Our patient had complete heart block as a consequence of posterior aortic sinus involvement. The posterior sinus of Valsalva lies close to the superior inter-ventricular septum and His bundle.<sup>7</sup> This explains why aortic peri-valvular abscesses that affect the posterior aortic sinus, causing mycotic aneurysm and cardio-aortic fistulas, account for most cases of complete heart block in patients with acute infective endocarditis.<sup>8</sup> A posterior root smaller mycotic aneurysm causing complete AV block was also reported by Abe M *et al*.<sup>9</sup>

Mycotic aneurysm is a rare complication of aortic root endocarditis. To the best of our knowledge, such a large mycotic aneurysm of aortic root associated with rheumatic heart disease and endocarditis, with no perforation into surrounding structures, along with complete heart block, has not been described previously.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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**Cite this article :** Khandelwal K, Khandelwal G, Agam B. A Large Aortic Root Mycotic Aneurysm with Complete Heart Block: A Rare Complication of Infective Endocarditis. *J Cardiovasc Disease Res.* 2018; 9(1):41-2.