

Bacterial Endocarditis of Double-Chamber Right Ventricle

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Abstract

A 13-yrs-old girl had fever for last 4 months. She had significant weight loss during this period. Echocardiography revealed she was having double chamber right ventricle (DCRV). There were large number of vegetations attached right ventricular outflow tract (RVOT) and tricuspid valve. A plain computed tomography chest revealed consolidation of lower lobe of the right lung. Blood culture yielded *Staphylococcus aureus* which was sensitive to ceftazidime and gentamicin. She was treated adequately for infective endocarditis (IE) for four weeks and was sent for cardiac surgery. This is an extremely rare case report of DCRV associated bacterial endocarditis with evidence of vegetations in the RVOT, over the TV and embolization into lung.

Keywords: Bacterial Endocarditis; Double Chamber Right Ventricle; Right Ventricle Out Flow Tract; Tricuspid Valve; Lung Embolization

Introduction

Double chamber right ventricle (DCRV) associated with infective endocarditis is rare. It has not been reported earlier that a patient with DCRV with bacterial endocarditis has vegetations in the RVOT, over the tricuspid valve and evidence of embolization into lung field in a single patient. An earlier case report by Wilder T, *et al.* [1] has shown their patient had DCRV associated with vegetation in the RVOT and evidence of embolization lung.

Case Report

A 13-year-old girl was referred for echocardiography for having fever for last 4 months. The fever was associated with chill and rigor. Some symptomatic treatment which included antibiotics was given for productive cough. Room air oxygen saturation was 97%. Her body mass index was 18.4 kg/m². Cardiovascular examination revealed a harsh ejection systolic murmur in the left lower parasternal border just before echocardiography. Routine laboratory test for pyrexia of unknown origin showed total leucocyte count of 24900/cmm, absolute neutrophil count of 23750/cmm, haemoglobin of 8 gm/dl, microcytic hypochromic anaemia, total serum bilirubin was 1.9 mg/dl, direct bilirubin was 0.5 mg/dl, liver enzymes were in normal range, normal blood sugar level, normal thyroid function, normal renal function. Antinuclear antibody test and ds-DNA antibody test were normal. Direct coomb's test was normal. Mantoux test was not reactive. Viral markers like HIV, HCV and HbSAg were not reactive. Subcutaneous biopsy from the forehead revealed nonspecific small vessel neutrophilic vasculitis. The ANCA test was normal. A 12 lead EKG showed marked right ventricular hypertrophy (Figure 1). Chest X-ray revealed fullness of pulmonary bay and right atrial enlargement (Figure 2). Transthoracic echocardiogram [TTE] and Transesophageal echocardiography were performed. There was small peri-membranous ventricular septal defect (Figure 3). She had DCRV with significant intraventricular obstruction (Figure 4 and 5). There were large number mobile vegetations found attached to the RVOT, TV and to the

orifice in muscular partition on its RVOT site. Dilatation of the outlet portion of the right ventricle (3.3 cm) and right atrium (4.3 cm) were noted. There was significant right ventricular hypertrophy (RV free wall: 1.5 cm, Interventricular septum at basal level was 1.1 cm and post wall of the left ventricle was 0.6 cm). There was more than moderate right ventricular dysfunction as evidenced by TAPSE of 1.1 cm. Inferior vena cava was dilated and with normal respiratory variation of the diameter. There was mild pulmonary valve regurgitation without echocardiographic evidence of vegetation over pulmonary valve. Tricuspid valve regurgitation was moderate. Pulmonary computed tomography (CT) angiography [CTPA] revealed hyper attenuated irregular patchy opacities in the right lower lobe of the lung possible due to infective aetiology. Serial blood culture from three different sites revealed *Staphylococcus aureus* which was sensitive to ceftazidime and gentamicin. The patient responded very well to the treatment as evidenced by significant reduction in the number and size of the vegetation and tricuspid regurgitation also reduced. After 4 weeks of treatment, she was referred for intracardiac repair.

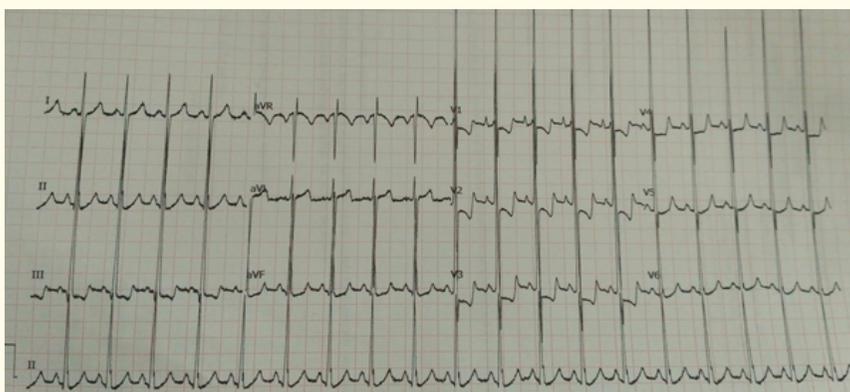


Figure 1: A 12 lead EKG shows sinus rhythm, tachycardia, right axis deviation, right atrial abnormality right and right ventricular hypertrophy with strain.



Figure 2: Chest X-Ray posterior anterior (PA) view shows increase in cardiothoracic ratio, right atrial enlargement, full of pulmonary bay and almost normal pulmonary vascularity.



Figure 3: 2D echo in parasternal short axis view shows restricted peri-membranous ventricular septal defect.

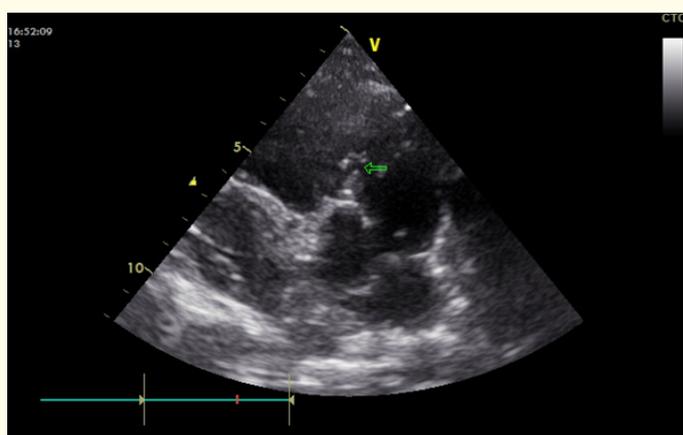


Figure 4: 2D echo in parasternal short view anomalous muscle bundle (green arrow mark) dividing right ventricle into proximal and distal chamber.

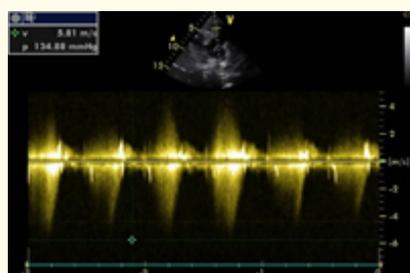


Figure 5: Continuous wave Doppler echo in parasternal short view shows anomalous muscle bundle dividing right ventricle into proximal and distal chamber with significant obstruction at the level of muscle bundle. The gradient between proximal and distal chamber was more than 130 mmHg.



Figure 6: Parasternal short axis view with anterior swipe of the echo probe shows multiple, large and mobile vegetation attached to the muscle bundle, right ventricular outflow tract and pulmonary valve.



Figure 7: Apical 4 chamber view shows large mobile vegetation attached atrial side of tricuspid valve causing moderate tricuspid valve regurgitation.

Discussion

DCRV is rare a congenital heart disease. The associated cardiac defects and the degree of hemodynamic obstruction can be well assessed by echocardiography [2]. DCRV is rarely associated with infective endocarditis. Because of significant mid-cavitary obstruction, the site of obstruction in the anomalous muscular partition, RVOT and pulmonary valve become the site of vegetation like that of tetralogy of Fallot [3-6] because of impinging high velocity jet induced injury. It is very rare or not have been reported earlier that DCRV with infective endocarditis has vegetation in RVOT, tricuspid valve and simultaneous embolization of vegetation into the lung as seen in case report where the patient's primary symptoms were fever and cough [7,8]. This patient's primary presentation was off and on fever for last 4 months associated cough which is an unusual presentation for a patient with a DCRV. As this patient belongs to developing country, where the quality care heart diseases is still in developing stage, delayed diagnosis with or without complications is not an unusual encountered [9].

Conclusion

DCRV is a rare congenital defect. Infective endocarditis associated with DCRV is unusual. Mobile vegetations in the RVOT, over the anomalous muscle bundle diving RV, in the TV and embolization of vegetation into lung in single patient is very rare or has not been reported as reported in this case report.

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