

# Left Ventricular Pseudo Aneurysm in a Child with Dengue Fever

Jayaprakash K, Hasan Jasheel EK, Raju George

Department of Cardiology, Government Medical College, Kottayam\*.

## ABSTRACT

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Left ventricular (LV) pseudo aneurysms develop when rupture of the free wall of the left ventricle is contained by pericardial adhesions or scar tissue.<sup>1</sup> Although left ventricular pseudo aneurysms are not common, the diagnosis and prompt management are of paramount importance as they are prone to rupture leading to catastrophic complications.<sup>2-5</sup> Thus, a high index of suspicion is needed; one can use many tools, including echocardiography, cardiac catheterization, computed tomography, or magnetic resonance imaging to confirm the diagnosis. Moreover, the need to distinguish a left ventricular aneurysm from a pseudo aneurysm is important because of the different methods of treatment recommended. The pseudo aneurysm requires urgent surgical resection, whereas most true aneurysms can be managed medically.

Herein, we report for the first time in world literature, a case of Left ventricular pseudo aneurysm complicating Dengue fever in a child, which resolved spontaneously on follow up with conservative management, as the parents refused surgery.

**Keywords:** Left ventricular pseudo aneurysms, Dengue fever

\*See End Note for complete author details

## BACKGROUND

Left ventricular (LV) pseudoaneurysms develop when rupture of the free wall of the left ventricle is contained by pericardial adhesions or scar tissue.<sup>1</sup> Although left ventricular pseudoaneurysms are not common, the diagnosis and prompt management are of paramount importance as they are prone to rupture leading to catastrophic complications.<sup>2-5</sup> Thus, a high index of suspicion is needed; one can use many tools, including echocardiography, cardiac catheterization, computed tomography, or magnetic resonance

imaging to confirm the diagnosis. Moreover, the need to distinguish a left ventricular aneurysm from a pseudoaneurysm is important because of the different methods of treatment recommended. The pseudoaneurysm requires urgent surgical resection, whereas most true aneurysms can be managed medically.

Dengue is the most important arthropod-borne viral infection of humans. Worldwide, an estimated 2.5 billion people are at risk of infection, approximately 975 million of whom live in urban areas in tropical and subtropical countries in Southeast Asia, the Pacific and the

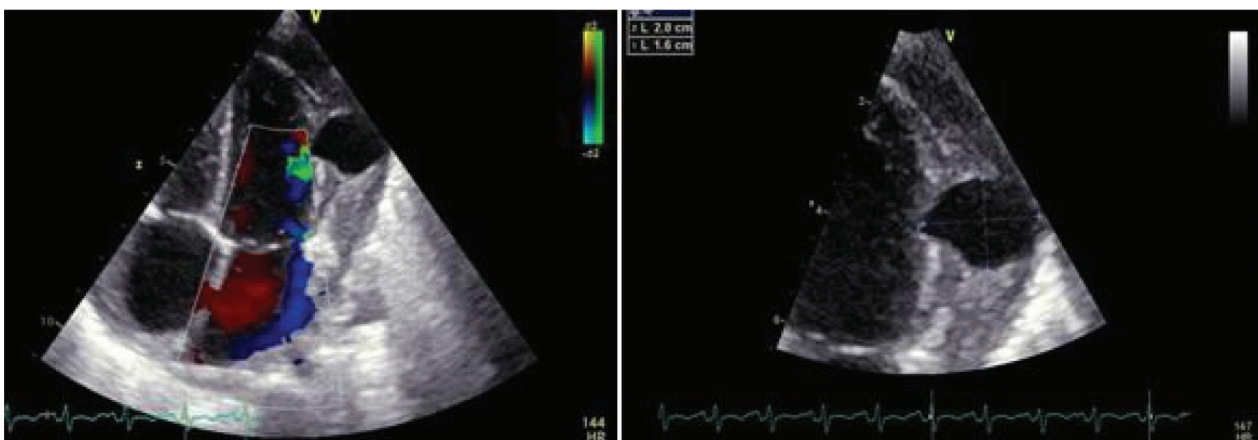


Figure 1a & 1b. Apical 4chamber view of Echocardiogram showing the outpouching from the LV free wall with a narrow neck and color flow into the sac

### Corresponding Author:

Dr. Jayaprakash K, Associate Professor, Government Medical College, Kottayam.  
E-mail : jayaprakashpillai@gmail.com

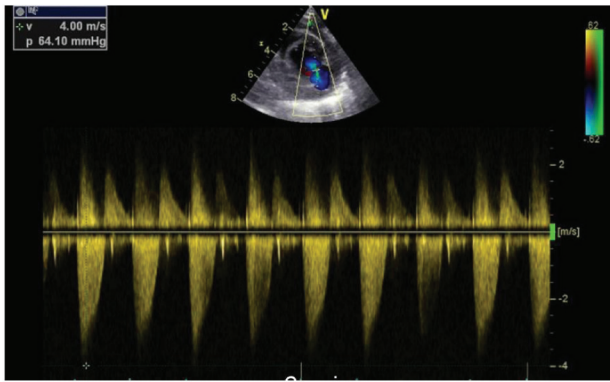


Figure 2. Pulse wave doppler interrogation showing to and fro flow of blood into the pseudoaneurysm through the narrow neck

Americas. Each year, there are about 50 million dengue infections and approximately 500,000 individuals are hospitalized with dengue haemorrhagic fever. Cardiac complications in dengue are not common.<sup>6</sup> Myocarditis is the most common documented cardiac pathology in dengue, however, only a few cases are reported in the literature.

Herein, we report for the first time in world literature, a case of Left ventricular pseudoaneurysm complicating Dengue fever in a child, which resolved spontaneously on follow up with conservative management, as the parents refused surgery.

### CASE SUMMARY

A 4 year old boy presented to our hospital in the pediatric department with history of high grade remittent fever of one week duration and shortness of breath for two days. He had been treated at the local hospital for five days and was referred to our hospital as there was no clinical improvement. Fever was not associated with

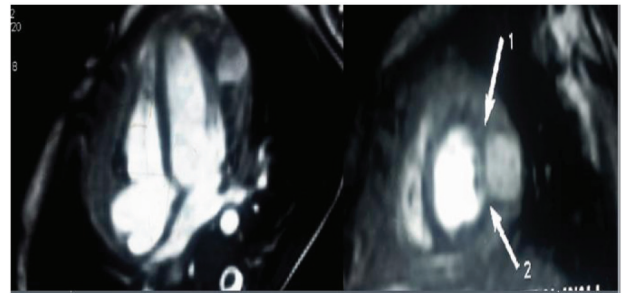


Figure 3. MRI Chest showing the pseudoaneurysm arising from the posterolateral LV free wall and the narrow neck of the sac

bleeding manifestation or skin rashes.

During presentation he was looking sick, tachypnoeic, febrile (oral temperature 102<sup>o</sup>F) & his heart rate was 130 per minute. Blood pressure was normal (100/70 mmHg). The systemic examination was not much revealing except for a pericardial rub.

The baseline laboratory findings were as follows: Hb 10.1 g/dl, WBC 11400/mm<sup>3</sup>, Platelets 3.2 Lakhs/mm<sup>3</sup>, ESR 100 mm/hr, Blood urea 24mg/ dl, Creatinine 0.6mg/dl, RA factor and ANA negative, Blood Culture Negative, Glucose: 96 mg/dl, SGPT 28 U/L, PT 16sec, INR 1.2, APTT 31sec. ECG showed diffuse ST elevation in all leads except in aVR & V1 suggestive of pericarditis. His Chest X- Ray was showing mild cardiomegaly with CT Ratio of 55%. Cardiac TroponinT assay was positive. 2D Echocardiography performed on day 2 of hospital admission showed mild pericardial effusion (10 mm posteriorly) with good biventricular function. The coronary arteries appeared normal, without any ectasia or aneurysm. The subsequent blood results were showing positivity for the three standard tests for dengue fever including IgM Dengue, Dengue RTPCR & Dengue NS A. Other investigations



Figure 4. Apical 4chamber and PSAX views of follow-up echocardiogram after 3 months showing normal LV anatomy and complete regression of the pseudoaneurysm

including blood culture and connective tissue disease profile were negative. Following this he was on conservative management with broad spectrum antibiotics and other supportive measures in the paediatric department and remained clinically stable over a span of 10 days, but tachycardia was persisting. He was referred to our department for a re-evaluation of cardiac status.

Repeat echocardiogram revealed that the pericardial effusion had increased in size and we could see a globular echolucent chamber of size 2X1.6 cm communicating with the LV cavity through a narrow neck at the level of the papillary muscle, in the posterolateral wall of left ventricle in the modified PLAX view (Figure 1). The pulse wave doppler evaluation demonstrated flow of blood into the paraventricular cavity during systole and out in to the LV cavity during diastole.

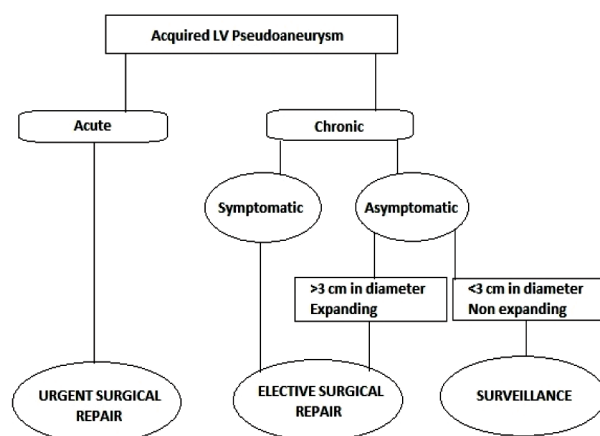
The illustrated echo features are consistent with the pseudoaneurysm of LV. We proceeded with further investigations including CECT Thorax & Cardiac MRI as we were planning for the emergency surgical repair of the pseudoaneurysm. The findings were confirmed and cardiovascular surgeon accepted the case for surgery.

However the parents denied any invasive management and not willing for a coronary angiogram also. At this juncture we were forced to keep him under medical follow-up. For next 3 weeks he was monitored in the hospital and was discharged thereafter as the child remained clinically stable. Patient was called for weekly follow up in OPD for echocardiographic evaluation. After 2 months we noticed marked reduction in the size of the pseudoaneurysm with complete resolution of hemopericardium. After one more month the echo was showing a normal endocardial border of the entire LV with no evidence of pseudoaneurysm or regional wall motion abnormality and normal LV function (Figure 4).

## DISCUSSION

Dengue is a mosquito-borne infection found in tropical and sub-tropical regions around the world. In recent years, transmission has increased predominantly in urban and semi-urban areas and has become a major international public health concern. Cardiac complications in dengue are not common. Myocarditis is the most common documented cardiac pathology in dengue, however, only a few cases are reported in the literature.

Pseudoaneurysm develops as a result of ventricular rupture contained by adherent pericardium and fibrotic



Ref: Preter R et al.; Ann Thorac Surg 2000; 70: 553-557

Figure 5. Algorithm for management of acquired LV pseudoaneurysm<sup>8</sup>

tissue.<sup>7</sup> It is characterized by the absence of myocardial tissue in its wall and the Left ventriculography reveal a paraventricular chamber filling via a relatively narrow neck. Prompt recognition and management is highly important because of its propensity to rupture, leading to cardiac tamponade and death.

Surgery is considered as the appropriate treatment for LV pseudoaneurysm, since untreated pseudoaneurysms have an approximately 30% to 45% risk of rupture. However, few reports have been published on survival of patients with nonsurgically treated LV pseudoaneurysms that developed as a result of acute myocardial infarction. The proposed algorithm for management of acquired LV pseudoaneurysm<sup>8</sup> is given in Figure 5.

In conclusion, we present the case of a four year old child with Dengue fever who has developed a rare cardiac manifestation of this disease, i.e., LV pseudoaneurysm, which is not so far reported to our knowledge in the literature. The case was managed conservatively as parents denied surgery. There was complete regression of the pseudoaneurysm on follow up at 3 months. The case demonstrates the favorable natural history in LV pseudoaneurysm which was treated conservatively.

## END NOTE

### Author Information

1. Dr. Jayaprakash K, Associate Professor, Department of Cardiology, Government Medical College, Kottayam. Phone: 9447418144. Email: jayaprakashkpillai@gmail.com
2. Dr. Hasan Jasheel EK, Senior Resident, Department of Cardiology, Government Medical

College, Kottayam.

3. Dr. Raju George, Professor and HOD,  
Department of Cardiology, Medical College  
Kottayam. Phone: 9447253072

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