Myocarditis mimicking a complete heart block in heart failure with reduced ejection fraction

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Abstract:

Background: In a arsenal of investigations a ecg can be of the most confusing one. Myocarditis is a inflammatory stage of the heart which can mimic any ecg changes. Myocarditis even though has grave acute prognosis if treated acutely has very minimal effect on patients quality of life**. Case presentation:** Here is a case of 32 year old man presenting with breathlessness, sever left sided chest pain, fever and blood in stools with severe joint pain. patient is a known case of diabetes and was on insulin belonging to lower socio economic status.ECG showed complete heart block and Patient was taken up for angio and a temporary pace maker was implanted. Blood culture and viral markers were sent which came out to be positive for dengue fever. **Conclusion:** In a myraid of changes that a ecg can offer a common public health disease can mimic a cardiac condition with a poor diagnosis. The above case discussed is one example of it. Here a case of dengue myocarditis which itself has a grave prognosis but with active and agressive management is curable and the presentation of the which was that of a complete heart block. The above case discussed also points at the need for a uniform and guideline based diagnosis and management of myocarditis.

Key words: complete heart block, myocarditis, dengue, temporary pace maker, bradycardia, two dimensional echo

Introduction:

Acute myocarditis represents a challenging diagnosis as there is no pathognomonic clinical presentation. It ranges from asymptomatic infection to fulminant heart failure and sudden death. Various electrocardiographic abnormalities have been reported in patients with myocarditis. It includes abnormalities in the ST-T wave segment, Q waves, atrioventricular block or bundle branch blocks . It is rare to see heart block as the first-and-only presentation of infectious myocarditis. The diagnosis should be considered when physicians encounter a young patient with high-degree heart block associated to atypical symptoms of infection

Infectious myocarditis is usually observed in pediatric age group whereas the presentation in adults is not a regular finding.Mithun J Varghese et al in their study have shown in pediatric age group diphteria caused complete heart block and was resolved in majority of case with the use antibiotics to either full recovery or with a permanent conduction block[1]. MIKIO ARITA et al demonstrated in adults a permanent pacemaker was essential in the treatment of mumps myocarditis[2]. Mohammad Hossein Nikoo (MD) et al in the case of post covid myocarditis demonstrated that in viral myocarditis use of steroids can not only help in the treatment but also help in recovery and early removal of pacemaker[3].

Dengue is the most common mosquito borne infection involving various systems. Recent health services update aim at reducing the mortality and morbidity due to such common infectious cause. Hence a atypical presentation which tend to have a high risk of mortality or morbidity pose a treat to traditional training of medicine in public health work[3]. Here we present a adult patient prsenting with a atypical presentation of dengue with regards to haemodynamic and cardiac profile of the disease.

Case presentation:

A 32 year old non smoker non alcoholic patient presented with chest pain since 1 hour radiating to back and jaw with history of orthopnea, aggravated with walking. Patient also complained of fever which was not relieved by local medication associated with retro-orbital and joint pain since 7 days.

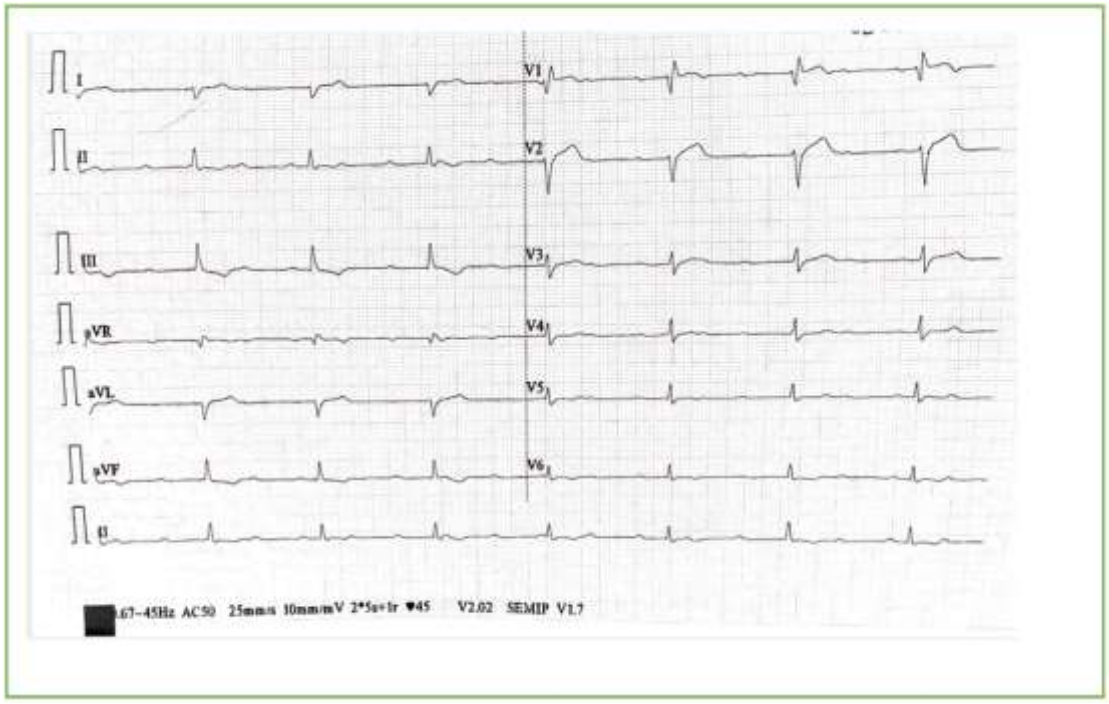
Patient was a known case of diabetes and on injection Mixtard 30/70 12-0-8 subcutaneous with no previous surgical history

On Examination patient was febrile restless with no pallor or icterus nor any lymphnodes were palpable.blood pressure of 90/60 , pulse rate 40 respiratory rate of 26 cycles/minute. On auscultation heartsounds were muffled with bilateral coarse crepitations present.

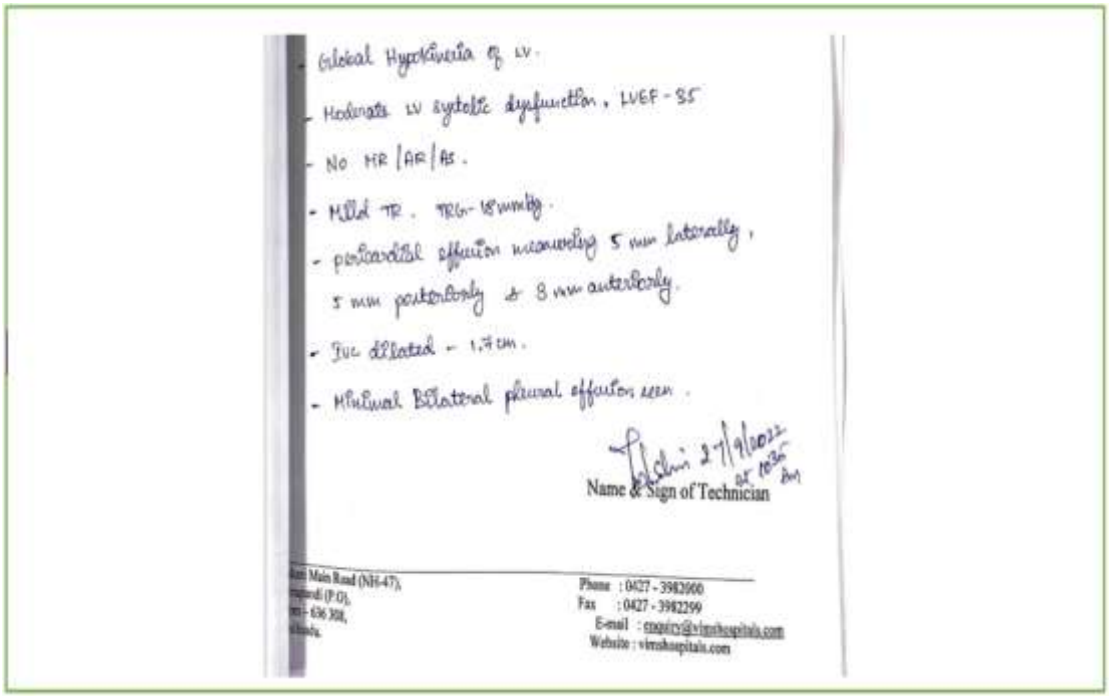
On investigation with the help of echocardiography it was seen that the patient had global hypokinesia of LV/ LVEF-35%/ Mild TR/ pericardial effusion 5mm laterally 5mm posteriorly and 3mm anteriorly, ecg presented as complete heart block which was diagnosed as myocarditis and heart failure with reduced ejection fraction. Following table shows the course of relevant investigation and their trend throughout the treatment

Investigation	On Admission	14th Day	31st Day
Haemoglobin	13.2	11.3	12.9
Total count	15300	11500	9600
Platelet	89000	92000	116900
CKMB	22	-	-
HbA1C	8.6	8.4	7.6
Potassium	4.8	4.0	4.2
Troponin	5.2	-	-
ABG	pH-7.49 pCO2-32.1 pO2-62.2 HCO3-22.3	-	-
Dengue : NS1 positive , IgG negative, IgM positive (on the day of admission)			
ECHO: global hypokinesia of LV/ LVEF-35%/ Mild TR/ pericardial			

effusion 5mm laterally 5mm posteriorly and 3mm anteriorly.



Ecg before intervention


- Global Hypokinesia of LV.
- Moderate LV systolic dysfunction, LVEF - 35
- No MR/AR/AS.
- Mild TR. TRG - 18 mmHg.
- pericardial effusion measuring 5 mm laterally, 5 mm posteriorly & 8 mm anteriorly.
- IVC dilated - 1.7 cm.
- Minimal Bilateral pleural effusion seen.

27/9/2022 at 10:30 Am
Name & Sign of Technician

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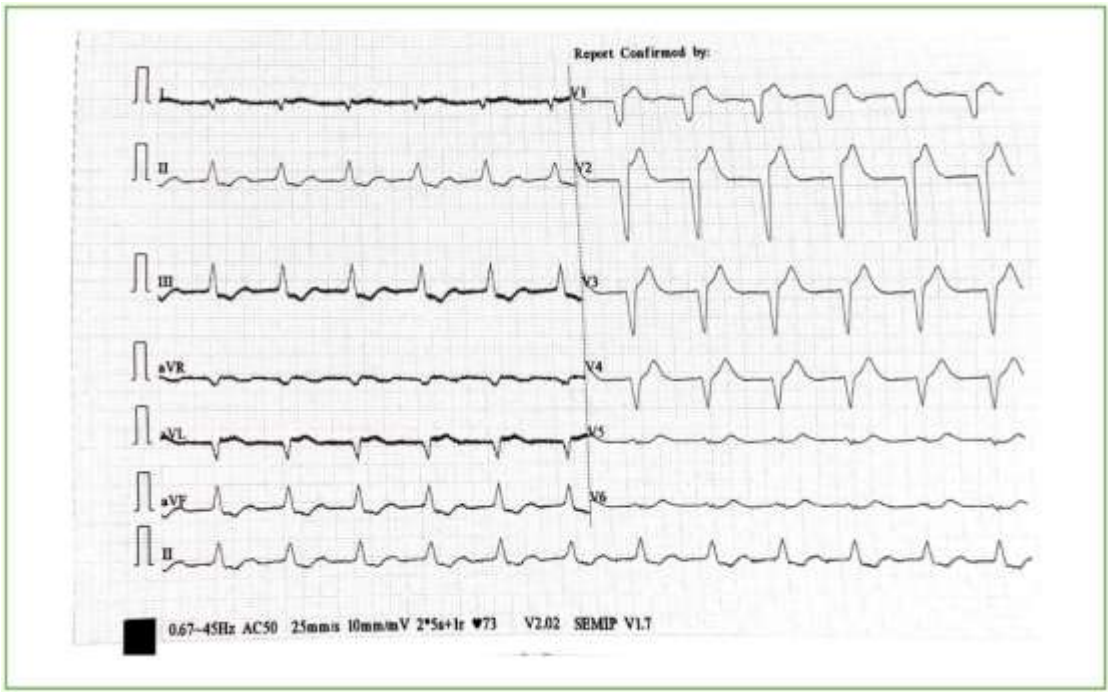
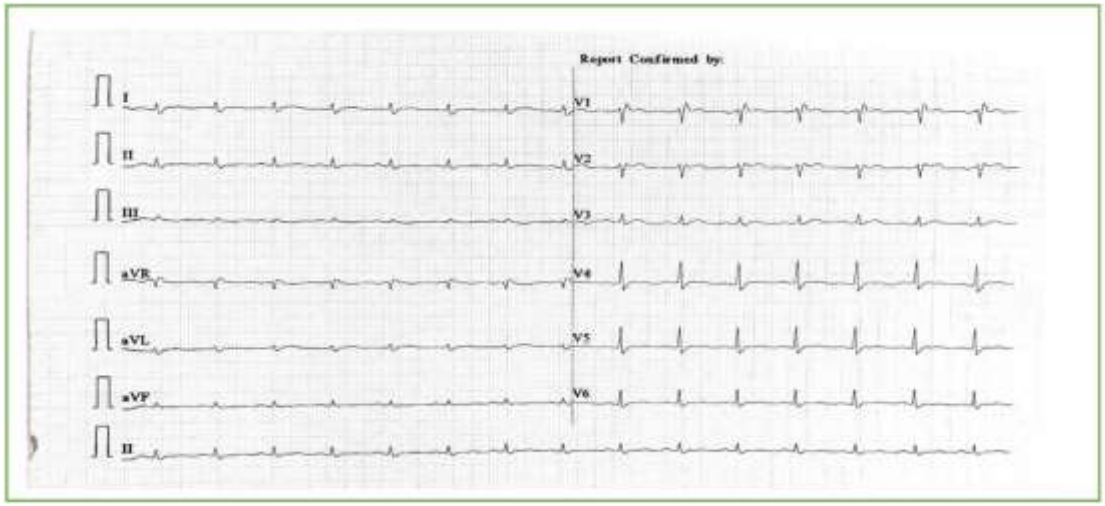
Echo report on admission

Patient was taken up in cathlab and TPI with CAG was done which showed normal coronaries following which patient was treated with 7 days of prednisone 10mg BD for first week followed by titration of half the dose every week under the coverage of intravenous piperacillin and tozabactum 1gram 6th hourly for 7 days followed by intravenous ceftriaxone 1gram twice daily.



Ecg after intervention

TPI was removed on 7th day following which patient remained asymptomatic until discharge. Serial cardiac monitoring was done to ensure the patients recovery to sinus rhythm. At one month followup the patient made a full recovery with ejection fraction of 58% without any cardiovascular symptom or ecg with echo cardiographic finding



Ecg at recovery (31st day)

Discussion:

Heart and infectious diseases are linked together through ages of time. Some infection affecting heart to a greater extent while few in moderation. Literature for dengue affecting the circulatory sysytem is vast but the pathophysiology and treatment regarding dengue and rhythm disorder is less known.it raises a huge question of how to manage dengue and rhythm disorder with conduction defect. As fluid resuscitation remains the mainstay of treatment of dengue whereas its restriction is manditory for heart failure.

Conduction anomaly in dengue is tachycardia which generally occur in febrile phase or when

the disease progression has reached a phase of haemmorhage which is a dreaded complication of dengue. Other manifestation may include t wave changes, ectopics and fibrillation but generally maintaining a higher heart rate[4]. Recent health care policies tend to decrease the incidence and prevalence of infectious disease. Effective diagnosis and treatment has reduced the mortality and morbidity of many major infectious diseases. A knowledge about atypical presentation of common disease may go a long way in reducing mortality from a treatable cause[7]. Bradycardia and rarely atrioventricular dissociation is seen in parasympathetic phase which denotes convalescent or recovery stage.

The pathophysiology in development of conduction anomalies in infectious etiology is a lesser studied topic but the most favourable cause in this case report is cytokine storm which happen due to viral agent attacking the myocytes starting a inflammation cascade leading to large amount of cytokine release. One of the proinflammatory marker under study is angiotensin II which is seen to be raised in the viral myocarditis[5]. Electrolyte imbalance due to haemmorage and fluid leakage can also be a factor in development of conduction anomalies but pertaining to case no such incidence of lysis was noted. The most favourable diagnosis was viral myocarditis because of non availabilty and condition of the patient being poor endomyocardial biopsy was not performed. Prior any drug abuse or addiction might complicate the condition further.

In the present study the use of fluids was judicially monitored to avoid any untoward volume overload senario by the use of daily ultrasound abdomen to check IVC callibre. Any sign of fluid overload was taken with due seriousness and was resolved with use of minimal diuretics.

The bradycardia in febrile state on dengue was a atypical finding which was observed and elevated cardiac markers denoted the cardiac insult. Hence a diagnosis of viral myocarditis due to dengue was made and treated with temporary pacemaker along with fluid resuscitation even though two dimensional echocardiography denoted a heart failure with reduce ejection fraction[6]

Conclusion:

Complete heart block is a ominous finding and require immediate intervention. Infectious myocarditis in a patient with heart failure is difficult but reversible cause of cardiac conduction abnormalities that should be considered in differential diagnosis of heart block before resorting to invasive intervention especially in a young healthy adult patient. Suggestive history and physical examination coupled with ecg finding and also backed with echo finding with positive angio finding helps in the definitive diagnosis of this serious but preventible undue complication. This report describes the clinical signs, symptom and treatment of myocarditis in heart failure with reduced ejection fraction and its ability to mimic different pathologies. However proper guidelines is required in treatment of such multisystem cases.

Ethical Clearance:

Patient gave written informed consent for publication of this case report. The case report including the electrocardiogram and echocardiogram reports were de-identified to protect patient's privacy and maintain confidentiality.

Conflict of interest:

All authors declare no conflict of interest in this paper

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