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"BRADYCARDIA IN YOUNG, HEALTHY MALES WITH DENGUE FEVER: A WATCHFUL REMINDER AMIDST SEVERE THROMBOCYTOPENIA AND SYSTEMIC INFLAMMATION"

Internal Medicine

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ABSTRACT

Background: Dengue fever is a highly prevalent mosquito-borne viral infection worldwide. While recognized for its hematological and vascular complications, cardiovascular involvement, particularly bradyarrhythmias, remains a clinical challenge. Distinguishing between transient, benign conduction disturbances and severe myocardiopathy is crucial in determining the need for invasive procedures like cardiac pacing. **Case Summary:** This case series reports on three adult male patients (aged 38 to 49 years) with laboratory-confirmed dengue infection who developed asymptomatic sinus bradycardia. In all cases, the arrhythmia manifested concurrently with markers of severe systemic inflammation (markedly elevated ferritin levels, with one case peaking at 3159) and profound hematological impairment (severe thrombocytopenia, with nadirs ranging from 6,000 to 50,000 per µL). Minimum heart rates recorded were significantly low, ranging from 38 to 48 bpm. Critically, despite these systemic and electrophysiological disturbances, echocardiography consistently demonstrated preserved global left ventricular systolic function (LVEF≥60%). Given the preserved cardiac function and the patients' hemodynamic stability, all three were managed conservatively with rigorous monitoring. The bradycardia was self-limiting, resolving spontaneously across all cases, which successfully precluded the need for temporary or permanent cardiac pacing. **Conclusion:** All patients in this series were young males with baseline preserved cardiac function who developed significant bradycardia during the phase of dengue infection during which there was a marked decline in platelts and rise in inflammatory markers. Clinicians should remain vigilant for bradyarrhythmia in such patients and adopt a watchful, non-invasive management approach, as most cases resolve spontaneously without the need for pacing interventions

KEYWORDS

Dengue, Bradycardia, Sinus Bradycardia, Thrombocytopenia, Ferritin, Myocarditis, Conservative Management.

INTRODUCTION

Dengue fever, caused by the dengue virus (DENV), represents the most prevalent mosquito-borne viral disease globally, posing a significant public health threat with a vast geographical distribution and burden estimated in the hundreds of millions of cases annually [1, 2]. As the disease continues its global expansion, its endemic nature and rising incidence across continents make it a persistent public health challenge [3]. While the spectrum of clinical manifestations ranges from self-limiting febrile illness to severe dengue with plasma leakage, hemorrhage, and organ impairment [4], cardiovascular involvement has emerged as a critical, though often transient, complication [8].

Dengue-associated cardiovascular manifestations, encompassing myocarditis, pericarditis, and electrophysiological disturbances, are increasingly recognized, particularly in endemic regions like India, where its threat to cardiac health has been highlighted in recent longitudinal studies [5]. Amongst the electrophysiological changes, bradyarrhythmias, including sinus bradycardia and atrioventricular conduction blocks, are commonly reported findings, believed to result from direct viral injury to the conducting system or autonomic dysfunction [6, 7]. The development of bradycardia presents a clinical dilemma: while symptomatic, severe bradyarrhythmias may necessitate temporary or permanent cardiac pacing, many cases remain asymptomatic [8]. The challenge lies in distinguishing transient, benign conduction changes from true myocardiopathy requiring intensive intervention.

This case series presents three distinct instances of male patients diagnosed with dengue fever who developed asymptomatic bradycardia. All cases exhibited laboratory evidence of severe systemic disease (severe thrombocytopenia and markedly elevated ferritin) but preserved cardiac function (normal Left Ventricular Ejection Fraction) on echocardiography. This report aims to illustrate the clinical course and outcomes of these patients, reinforcing the efficacy of a conservative "wait and trust" approach supported by vigilant hemodynamic and cardiac monitoring, thereby avoiding unnecessary invasive procedures in the setting of stable, asymptomatic dengue-associated bradycardia.

Case 1: 49 Years Old

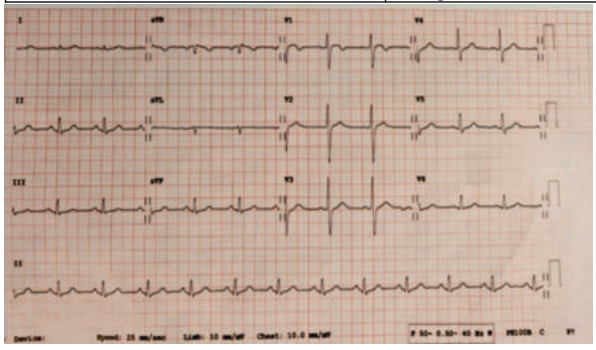
A 49-year-old male, presented with a 3-day history of fever with chills, body ache, headache, generalized weakness, and mild constitutional symptoms. Dengue infection was confirmed early via NS1 antigen testing. On hospital day 4, routine monitoring identified asymptomatic bradycardia; subsequent ECG confirmed a striking sinus bradycardia with a minimum recorded pulse rate of 38~bpm. Cardiac biomarker testing revealed evidence of myocardial strain, showing elevated high-sensitivity Troponin I (hs Troponin I) levels ranging from 4.00 - 4.60. Despite these markers, structural integrity was preserved, as confirmed by a normal echocardiogram. Given the patient's hemodynamic stability, a conservative management strategy was adopted, involving supportive care with intravenous hydration and Tab Orcibest 10~mg~TDS. Although transferred to the Intensive Care Unit (ICU) for close cardiac monitoring, the patient never required temporary or permanent cardiac pacing. The bradycardia gradually resolved during his admission, leading to a stable discharge.

Case 1: Key Laboratory and Imaging Data

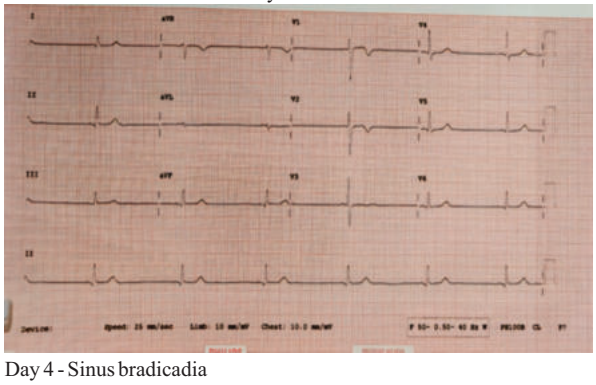
Investigation / Date	20/09/2025 (Admission)	22/09/2025 (Bradycardia Onset)	23/09/2025 (Peak Inflammation)	25/09/2025 (Recovery)	Normal Range
Hematology					
Platelets (Plt)	169,000	50,000 (Nadir)	46,000	121,000	150,000–450,000 / µL
Hemoglobin (Hb)	13.4	15.0	14.1	14.0	13.5–17.5 g/dL
White Blood Cells (WBC)	4,600	4,580	6,490	10,790	4,500–11,000 / µL
Immature Platelet Fraction (IPF)	3.0	7.1	10.2	-	<5%
Cardiac & Inflammatory Markers					
hs Troponin I	-	4.00	4.60 (Peak)	-	<0.04 ng/mL

Ferritin	-	-	3159	-	30–300 ng/mL
CRP	5.48	-	-	-	<5 mg/L
NT ProBNP	-	-	210	-	<125 pg/mL
CK MB	-	0.63	0.61	-	<1.0 ng/mL
Liver Function					
AST	70	-	-	-	10–40 U/L
ALT	37.30	-	-	-	10–50 U/L
GGT	65.50	-	-	-	9–48 U/L
Coagulation	-	-	Fibrinogen: 217	-	200–400 mg/dL
Serology (20/09/2025)					
Dengue NS1	Positive				
Dengue IgM	Negative				

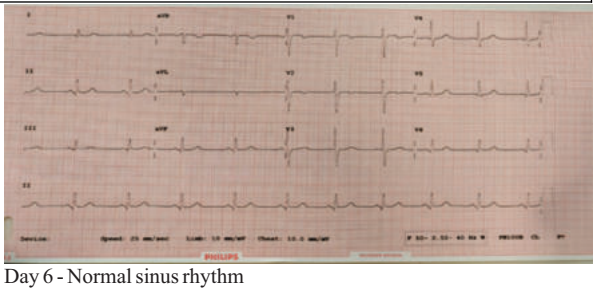
Imaging / ECG Finding	Result
Bradycardia (Onset 22/09/2025)	Sinus rhythm, minimum 38 bpm
2D Echocardiogram	Normal sized LV, LVEF: 60%, mild concentric LVH, mild LVDD, normal valves.
USG Abdomen/Pelvis	No significant abnormality



On admission - Normla sinus rhythm



Day 4 - Sinus bradicadia



Day 6 - Normal sinus rhythm

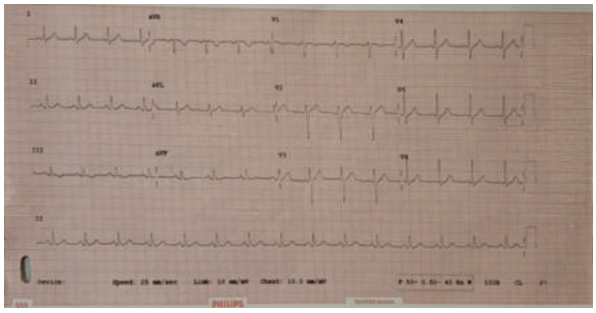
Case 2: 38 Years Old

A 38-year-old male, was admitted with a 4-day history of fever, fatigue, and gastrointestinal symptoms. Diagnosis of dengue was confirmed via NS1 antigen positivity. His clinical course was marked by severe thrombocytopenia, with platelet counts plummeting to a nadir of 17000, and a concomitant profound systemic inflammatory response, indicated by a markedly elevated ferritin level of 1257. Due to the severe thrombocytopenia, he was treated with Intravenous Dexamethasone (Inj. Dexa), which was subsequently tapered. Asymptomatic bradycardia developed on day 3 of the illness, with a minimum recorded pulse rate of 48~bpm. Comprehensive cardiac workup, including a 2D Echocardiogram, demonstrated normal LV systolic function (Ejection Fraction 60%), with no Regional Wall Motion Abnormalities (RWMA), and only trivial Mitral Regurgitation (MR). Given the patient's stability and normal cardiac function, management was strictly conservative. The bradycardia resolved spontaneously, mirroring his overall clinical and hematological improvement, thereby avoiding anti-arrhythmic drugs or invasive intervention.

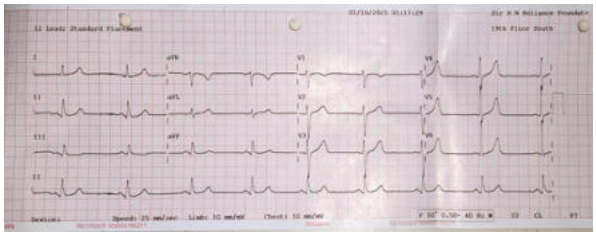
Case 2: Omkar Chandiwale - Key Laboratory and Imaging Data

Investigation / Date	**27/09/2025 (Admission)**	**29/09/2025 (Bradycardia Onset/Peak Ferritin)**	**01/10/2025 (Platelet Nadir)**	**03/10/2025 (Recovery)**	**Normal Range**
Hematology					
Platelets (Plt)	241,000	85,000	17,000 (Nadir)	110,000	150,000–450,000 / µL
Hemoglobin (Hb)	13.9	15.0	15.5	13.7	13.5–17.5 g/dL
White Blood Cells (WBC)	5,330	4,390	5,670	9,560	4,500–11,000 / µL
Immature Platelet Fraction (IPF)	-	4.0	15.4	-	<5%
Cardiac & Inflammatory Markers					
Ferritin	-	1257 (Peak)	-	-	30–300 ng/mL
CRP	-	2.20	-	-	<5 mg/L
IL-6	-	20.20	-	-	<5.9 pg/mL
Liver Function					
AST	-	79.60	-	-	10–40 U/L
ALT	-	47.20	-	-	10–50 U/L
Endocrine	-	-	-	TSH: 0.49	0.4–4.5 mIU/L
HbA1c	-	-	-	6.0	<5.7%
Serology (27/09/2025)					
Dengue NS1	Positive				

Imaging / Cardiac Finding	Result
Bradycardia (Onset Day 3)	Minimum pulse rate 48 bpm
2D Echocardiogram	Normal LV systolic function, LVEF: 60%, no RWMA, trivial MR.



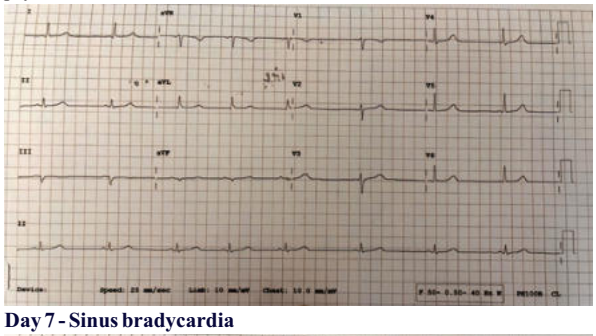
On arrival - ECG



Day 3 - Sinus Bradycardia

Case 3: 47-Year-Old Male with Bipolar Disorder

The third patient, a 47-year-old male with a history of Bipolar Disorder maintained on Lithium, was admitted with fever, body aches, and constitutional symptoms. Dengue fever was confirmed by serology, with initial investigations showing thrombocytopenia and markedly elevated ferritin levels. His course was complicated by severe thrombocytopenia, reaching a nadir of 6,000. He received RDP transfusions (total 12 units) and a course of Intravenous Dexamethasone. The patient developed mild asymptomatic bradycardia on Day 7 of admission. Following the onset of the bradycardia, a repeat 2D Echocardiogram was performed, which remained unchanged from the initial study, demonstrating a Left Ventricular Ejection Fraction (LVEF) of 60% and no regional wall motion abnormalities. The bradycardia was managed conservatively through close monitoring. Following the stabilization of his platelet counts and resolution of fever spikes, the patient was discharged in a clinically stable condition, with the bradycardia having resolved without the need for pacing, and follow-up advised for his underlying psychiatric condition.



Day 7 - Sinus bradycardia

On Discharge - Normal Sinus Rhythm

DISCUSSION

The findings from this case series contribute significantly to the contemporary understanding of the cardiovascular sequelae of dengue fever [9, 10]. Cardiac involvement in dengue is increasingly recognized, encompassing a spectrum of pathology from myocarditis and pericarditis to transient conduction system abnormalities, including various forms of bradyarrhythmia [11]. The pathogenesis is postulated to involve either direct viral cytopathic effects on the myocardium or, more commonly, a transient autonomic nervous system dysfunction that is typically reversible [10].

The severity of dengue-related bradyarrhythmias is highly variable, ranging from the benign sinus bradycardia observed in our three young male patients to potentially catastrophic outcomes such as complete heart block [12] or other severe atrioventricular (AV) conduction disorders [13]. Our three cases presented a critical clinical challenge, combining severe bradycardia (minimum rates 38 to 48 bpm) with rapid hematological deterioration (platelet nadirs 6,000 to 50,000) and severe systemic inflammation (ferritin peaking at 3159). Furthermore, signs of biochemical myocardial strain were present, with one out of three patients showing elevated Troponin I levels. This confluence of severe markers often triggers the consideration of aggressive intervention, including prophylactic temporary pacing.

A key finding across this case series was the co-occurrence, in all three young male patients, of drastic drops in platelet counts and elevated inflammatory markers alongside the preserved heart's pumping function. This normal heart function, combined with the fact that the patients had no symptoms from the slow heart rate, was the main reason we chose to manage them conservatively. The decision to avoid invasive procedures (like temporary pacing) is strongly supported by other case reports showing that even more complicated dengue-related rhythm problems, such as junctional rhythms [14] and sinoatrial exit block [15], typically resolve completely on their own.

CONCLUSION

All patients in this series were young males with baseline preserved cardiac function who developed significant bradycardia during the phase of dengue infection during which there was a marked decline in platelts and rise in inflammatory markers. Clinicians should remain vigilant for bradyarrhythmia in such patients and adopt a watchful, non-invasive management approach, as most cases resolve spontaneously without the need for pacing interventions.

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