



## ***Significant Sinus Bradycardia Associated with Hepatitis and Coexisting Scrub Typhus: A Frequently Underdiagnosed Condition***

**Sonali Ghosh<sup>1</sup>, Subhajit Chatterjee<sup>2</sup>, Tirupati Shelke<sup>2</sup> and Kaushik Ghosh<sup>2\*</sup>**

<sup>1</sup>Department of Emergency Medicine, IPGME&R and SSKM Hospital, Kolkata-700020, West Bengal, India

<sup>2</sup>Department of Medicine, Raiganj Government Medical College and Hospital, Raiganj-733134, Uttar Dinajpur, West Bengal, India

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### ***Abstract***

*Scrub typhus, caused by Orientia tsutsugamushi, is a common acute febrile illness in the Asia-Pacific region, with clinical manifestations ranging from mild fever to multiorgan dysfunction. Hepatic involvement is frequently reported; however, severe hepatitis with jaundice is uncommon. Cardiac complications such as arrhythmias are recognised, although sinus bradycardia remains a rare finding. The coexistence of severe hepatitis and bradyarrhythmia is unusual and may pose diagnostic challenges.*

*We report the case of a 46-year-old woman who presented with a 7-day history of fever, progressive jaundice, and oliguria. She exhibited severe sinus bradycardia, hypotension, metabolic acidosis, and laboratory evidence of acute hepatitis and kidney injury. Serology confirmed scrub typhus. The patient was treated with intravenous doxycycline and supportive therapy, including vasopressors. Bradycardia was managed conservatively and resolved without pacing. She achieved complete recovery, with normalisation of hepatic, renal, and cardiac parameters within a week.*

*This case highlights an atypical presentation of scrub typhus characterised by severe hepatitis and sinus bradycardia. Early recognition and timely initiation of doxycycline are essential for favourable outcomes and may prevent unnecessary invasive interventions in endemic regions.*

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**\*Corresponding author:** Kaushik Ghosh, Professor and Head, Department of Medicine, Raiganj Government Medical College and Hospital, Raiganj- 733134, Uttar Dinajpur, West Bengal, India.

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## Introduction

Scrub typhus, an acute febrile illness caused by *Orientia tsutsugamushi*, is endemic in the Asia-Pacific region and accounts for a substantial proportion of undifferentiated febrile illnesses in India. The disease manifests as a multisystem vasculitic infection with a broad clinical spectrum, ranging from mild fever and rash to severe multiorgan dysfunction. Hepatic involvement is common and typically presents as transaminitis, whereas fulminant hepatitis with jaundice is relatively rare. Cardiac manifestations are increasingly recognised and include myocarditis, pericarditis, heart failure, and arrhythmias. Although tachyarrhythmias are more frequent, bradyarrhythmias and conduction disturbances such as sinus bradycardia or atrioventricular (AV) block are seldom reported.

The concurrence of severe hepatic dysfunction and clinically significant bradyarrhythmia is uncommon and only rarely documented. Early recognition is essential because prompt initiation of doxycycline markedly improves outcomes. This report describes a case of scrub typhus presenting with acute hepatitis, acute kidney injury, and severe sinus bradycardia, all of which resolved following timely diagnosis and appropriate therapy.

## Case Report

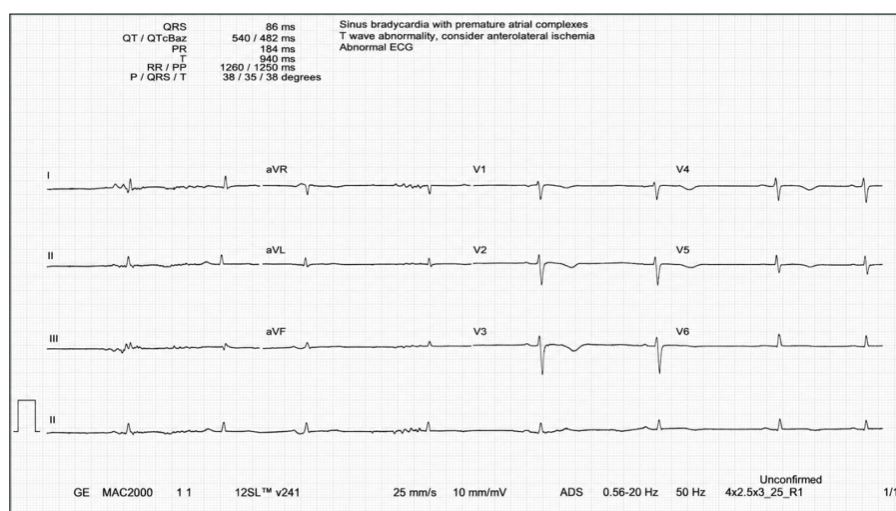
A 46-year-old woman presented to the emergency department with a 7-day history of high-grade fever accompanied by chills, malaise, and progressive jaundice. She also reported generalised weakness, decreased urine output, and shortness of breath over the preceding 2 days. She had no history of chronic liver disease, cardiac illness, hypertension, or diabetes. On examination, she was afebrile (temperature 98.7°F), icteric, and drowsy. Her pulse rate was markedly low at 40 beats per minute, blood pressure 80/50 mmHg, respiratory rate 24/min, and oxygen saturation 85% on room air. Chest auscultation revealed bilateral wheeze. Cardiovascular examination demonstrated bradycardia without murmurs. Abdominal examination revealed mild epigastric tenderness with no organomegaly. No eschar was initially evident.

Arterial blood gas analysis indicated metabolic acidosis with hypoxemia (pH 7.26, HCO<sub>3</sub> 16 mmol/L, PO<sub>2</sub> 65.8 mmHg, PCO<sub>2</sub> 35.1 mmHg, lactate 3.24 mmol/L). Electrocardiography revealed marked

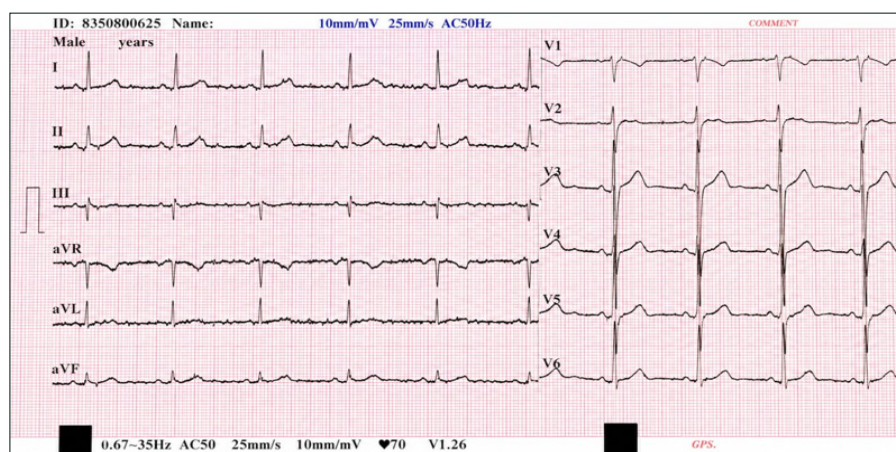
sinus bradycardia with a ventricular rate of 40 beats per minute (**Figure 1**) and no conduction block. Laboratory findings showed a haemoglobin level of 9 g/dL, a leukocyte count of 4120/μL, a platelet count of 2.1 lakh/μL, and a normal coagulation profile (prothrombin time, 15.6 s; activated partial thromboplastin time, 33 s; international normalised ratio, 1.2). Liver function tests revealed markedly elevated aspartate aminotransferase (AST 1254 U/L), alanine aminotransferase (ALT 2546 U/L), and total bilirubin 9.6 mg/dL, consistent with acute hepatitis. Renal function tests were deranged (serum creatinine, 2.3 mg/dL; urea 76 mg/dL), and serum electrolytes were within normal limits (sodium 144.8 mmol/L; potassium 4.58 mmol/L). Chest X-ray demonstrated normal broncho-vascular markings. Echocardiography exhibited normal chamber dimensions, preserved left ventricular ejection fraction, and no pericardial effusion. Abdominal ultrasonography revealed altered hepatic echotexture with mild ascites.

Given the endemic setting and clinical suspicion, a fever profile for malaria, dengue, typhoid, leptospirosis, and scrub typhus was performed. Only the IgM ELISA for scrub typhus tested positive, whereas blood and urine cultures were sterile. The patient was started on intravenous doxycycline along with supportive care that included oxygen supplementation, fluid resuscitation, vasopressors, intravenous fluids, and hepatoprotective therapy. Bradycardia was managed conservatively with continuous monitoring, and temporary pacing was not required.

Over the following days, the patient showed steady clinical improvement. By the second day, metabolic acidosis had resolved, and she regained consciousness. From day three onward, her mental status, hemodynamic parameters, and hepatic and renal functions improved progressively, allowing discontinuation of vasopressors within 48 hours. Fever subsided, jaundice gradually resolved, urine output increased, and biochemical parameters normalised. Sinus rhythm (**Figure 2**) was restored, with heart rate returning to the normal range by day six of therapy. She was discharged in stable condition on day seven and advised to return for follow-up.



**Figure 1:** ECG Showing Sinus Bradycardia with Occasional Premature Atrial Complexes



**Figure 2:** ECG Showing Normal Sinus Rhythm

## Discussion

Scrub typhus, caused by *O. tsutsugamushi*, is a major cause of acute undifferentiated febrile illness in the Asia-Pacific region. It presents with a broad range of clinical manifestations, from mild fever to severe multiorgan dysfunction resulting from vasculitis and endothelial injury [1]. Hepatic involvement is common and typically manifests as high aminotransferase levels, whereas severe hepatitis with jaundice, as observed in this case, is relatively uncommon [2,3].

Cardiac complications are increasingly recognised in scrub typhus and include myocarditis, pericarditis, heart failure, and various arrhythmias [4,5]. Although tachyarrhythmias are more frequently reported, bradyarrhythmias such as sinus bradycardia or atrioventricular block remain rare and are probably underdiagnosed [6,7]. The coexistence of marked hepatitis and sinus bradycardia, as observed in this

patient, is unusual and indicates the systemic nature of the infection.

The precise mechanism underlying bradyarrhythmia in scrub typhus is not fully understood. Proposed mechanisms include direct myocardial involvement, autonomic imbalance secondary to systemic inflammation, and cytokine-mediated vasculitic injury to the sinoatrial node [5,6]. Reported cases suggest that bradyarrhythmias are usually transient and resolve following specific antimicrobial therapy [7,8]. In this case, sinus bradycardia resolved with doxycycline and supportive treatment, without the need for pacing, indicating a reversible infectious rather than structural cause.

The renal dysfunction observed in this patient is consistent with the multisystem vasculitic process of scrub typhus, which can lead to acute kidney injury in

severe infections [8]. The concurrent hepatic, renal, and cardiac involvement reflects the diffuse endothelial injury that characterises the disease.

Early recognition and prompt initiation of doxycycline are critical for recovery, as treatment delays are associated with increased morbidity and mortality [1,9]. Clinicians practicing in endemic regions should maintain a high index of suspicion for scrub typhus in patients presenting with unexplained fever, hepatic dysfunction, or arrhythmias. Awareness that bradyarrhythmias in such cases are often reversible can help avoid unnecessary invasive cardiac interventions when timely antimicrobial therapy can lead to complete recovery.

### Conclusion

Scrub typhus may rarely present with atypical complications such as severe hepatitis and marked sinus bradycardia. Recognition of these uncommon manifestations is essential, as prompt doxycycline therapy results in rapid clinical improvement and favorable outcomes. Maintaining clinical vigilance in endemic settings remains crucial for preventing diagnostic delays and optimising patient management.

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