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Case Report of Lyme Carditis Manifesting With Av Dissociation

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ABSTRACT: Lyme carditis (LC), a manifestation of early disseminated Lyme disease, most commonly presents with cardiac conduction abnormalities. It is a transient condition with good prognosis but in extremely rare cases may be life-threatening. We describe a 56-year-old female who presented with progressively repeated syncope and joint pain for last two months. She was found to have symptomatic atrioventricular dissociation resulting in a brief cardiac arrest. Intravenous (IV) ceftriaxone was commenced empirically and a temporary transvenous pacemaker was placed. In a few days he showed dramatic, rapid improvement; the pacemaker was removed, and the patient was discharged satisfactory. This case is unique due to its occurrence in an urban hospital where such cases are uncommon. Cardiac arrest, although brief in this case, is a rare occurrence.

Keywords: Lyme disease, Lyme carditis, av dissociation , Syncope, Case report

I. INTRODUCTION:

Lyme diseases (LD) is a commonly reported vector-borne illness in the United States caused by the Gram-negative spirochete Borrelia burgdorferi which is transmitted by the deer tick Ixodes scapularis. It is a multiplex disease that is categorized into three stages based on clinical signs and symptoms: early localized stage, early disseminated stage, and late stage.[1] LC is an uncommon manifestation.[2]

All layers of the heart can be involved by spirochete invasion of cardiac tissue with a marked tropism to conductive tissue.[3] Consequently, patients with LC typically present with some degree of atrioventricular nodal conduction block (AVB) in 80–90% of cases with LC.[4,5,6]

Here, we provide the first evidence that LC may present with solely sinoatrial atrioventricular dissociation . We report the case of a young otherwise healthy female who was admitted with recurrent syncope due to sinus pauses associated with B. burgdorferi infection that completely resolved under adequate antibiotic treatment.

II. CASE PRESENTATION

A 55-year-old lady presented to the emergency room after experiencing two episodes loss of consciousness . She revealed no relevant trauma after loss of consciousness and physical exam and initial blood tests were done. The patient at the emergency department was diaphoretic and appeared frightened. She was feverish, and her previous history of fever and sporadic joint pains for two months had resulted in severe bradycardia and hypotension

The 12-lead ECG exhibited and shows atrioventricular dissociation (Figure 1). It was determined that the recurring loss of consciousness was most likely caused by asystole from atrioventricular dissociation. Asystole was also observed, causing a temporary loss of consciousness. Cardiopulmonary resuscitation and transcutaneous pacing restored hemodynamic stabilization. After starting IV ceftriaxone, the patient was transferred to the cardiac care unit and immediately received a transvenous pacemaker. The post-procedure EKG indicated 100% ventricular capture (Figure 2).

A subsequent ambulatory neurological evaluation including cranial magnetic resonance imaging (MRI) and electroencephalography (EEG) did not reveal any abnormalities. Antibiotic course was initiated with 2 g ceftriaxone I.V. once daily over 7 days.

She further evaluated to know the exact cause for her atrioventricular dissociation dissociation which leads to development of her recurrent loss of consciousness and other symptoms. Cardiac marker were send which shows marginally increased troponins levels but echocardiography were normal showing no regional wall abnormalities and normal left ventricular function.

Further evaluation of patient done by cardiologist by performing coronary angiography in the cardiac care unit, but it also shows normal coronaries and then cardiologist advised the patient for medical management (Figure 4,5,6,7). The atrioventricular dissociation aroused concerns about other uncommon and possibly treatable

inflammatory heart disorders, such as LYMES CARDITIS, in the absence of any symptoms of structural, coronary, or infiltrative heart disease. In a Schellong test, orthostatic hypotension was not observed.

But as she gave history of intermittent fever and joint pains in her past history for two months , infective work up was sent .

Cardiac Lymes disease By using an enzyme-linked immunosorbent assay with positive titre 33.2 of IgG antibodies against B. burgdorferi specific antigens, serological testing was performed to diagnose Lyme Borreliosis (Figure 3).

On day five, the transvenous pacemaker was removed once the patient had fully recovered from their symptoms and had an intrinsic sinus rate of 78 beats per minute, a normal P-R interval, and a sinus rhythm (figure 8) . After switching from IV ceftriaxone to oral doxycycline, the patient was sent home with no symptoms and no sinus pauses recorded on the cardiac loop recorder to finish the remaining antibiotics.

Signs of atrioventricular dissociation completely resolved with antibiotic treatment with a third-generation cephalosporin. The patient did not require permanent pacemaker implantation and had normal sinus rhythm after a follow-up as confirmed via implantable loop recorder.

III. DISCUSSION:

This case provides the first evidence that conductive tissue of the heart may be involved in spirochete infection which may lead to atrioventricular dissociation resulting in asystole with concomitant loss of consciousness . Although LC mostly presents with AVB, there are six case reports published that describe patients with sinus pauses associated with LC.[7–12] Mechanistic explanations of sinus node dysfunction in LC have not yet been provided. However, the observation that LC mainly manifests with conduction abnormalities had already led to the hypothesis that sinus pauses in LC may result rather from SA exit block than from disturbances of the intranodal electrical automaticity.[9]

Interestingly, cardiac MRI did not reveal any signs of wall oedema corresponding to myocardial inflammatory processes or pericarditisinduced irritation that has been reported in cases of LC with concomitant AVB.[13,14]

Evidence regarding the correct diagnosis and management of suspected LC is scarce and largely based on case reports. As proposed by Yeung and Baranchuk,[3] intravenous antibiotic treatment with 2 g ceftriaxone once daily for 10–14 days is considered first-line therapy, followed by oral antibiotics (doxycycline, amoxicillin, or cefuroxime) for a total antibiotic course of 14–21 days. Early permanent pacemaker implantation should be avoided as conduction disorders may resolve under antibiotic treatment. Although the SILC score was originally introduced for patients presenting with AVB and is not validated for sinus node dysfunction, it was useful to stratify the need for further diagnostic steps into this direction and therefore led to the following positive serological testing.

It has to be noted that other possible causes of sinus arrest such as vagal dysregulation or possibly extensive marijuana consumption cannot be completely ruled out in our patient. However, the complete regression of atrioventricular dissociation on surface ECG after antibiotic treatment with intravenous ceftriaxone strongly supports LC as the causal factor, and cannabis has been reported to enhance rather than suppress sinus automaticity and to facilitate cardiac conduction.15

IV. CONCLUSION:

Although Lymes disease is rare associated with AV dissociation, the possibility of LC particularly in younger patients presenting with loss of consciousness with atrioventricular dissociation and suspicion of LC as per the past clinical history should be considered. Antibiotic therapy can be an effective treatment and spare patients from potentially unnecessary pacemaker implantation. The identification of patients with LC is crucial but may be currently underappreciated and should therefore be subject of further investigations.

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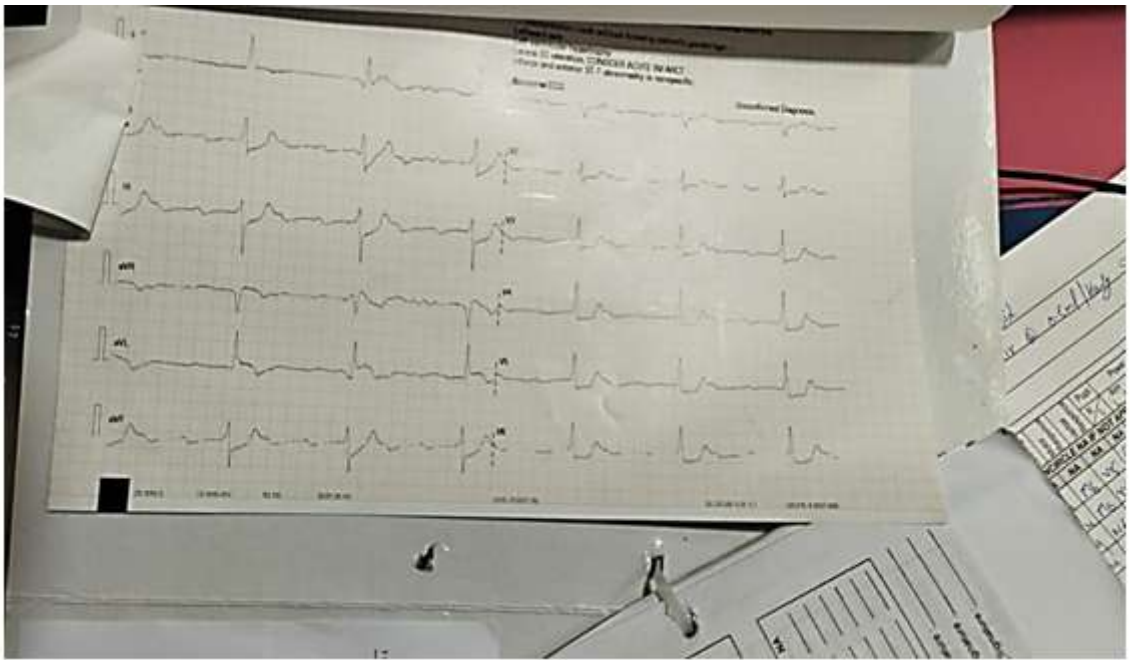

FIG.1: 12 –LEAD ELECTROCARDIOGRAM OF PATIENT ON ADMISSION SHOWING ATRIOVENTRICULAR DISSOCIATION.

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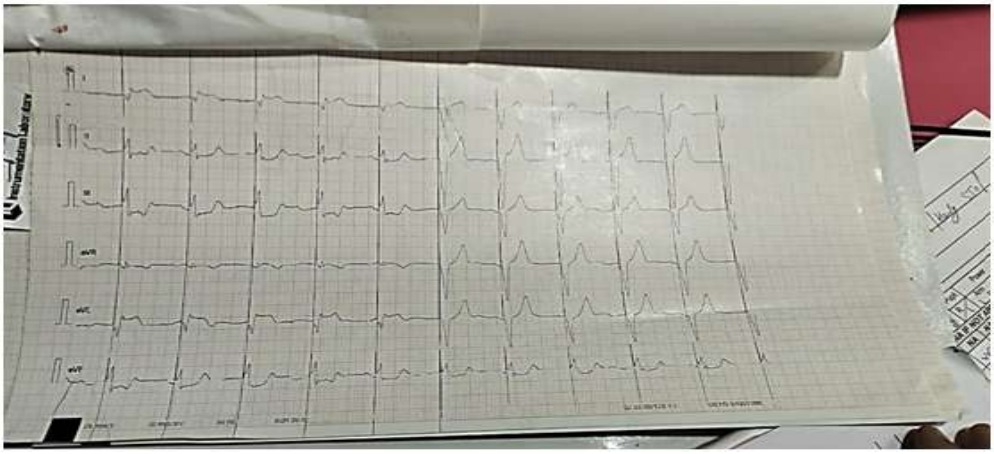

FIG.2: 12 – 12 LEAD ELECTROCARDIOGRAM AFTER POST TRANSVENOUS PACEMAKER PLACEMENT

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Super Speciality Care Beyond Compare

NAME	: SIMPLE KUMARI	Lab ID	: 44386/892623/114
AGE/GENDER	: 35y/Female	SAMPLE COLLECTED	: 02-Jan-23 05:12 pm
UHID/T/REF	: 011150/IPD/62071	RECEIVED TIME	: 02-Jan-23 05:13 pm
MOBILE	:	REPORTED TIME	: 02-Jan-23 05:19 pm
WARD	: ICU-2	EXAMINER DOCTOR	:
CORPORATE	:	REFFERRING DOCTOR	:

TEST REPORT STATUS - FINAL

# TEST DESCRIPTION	VALUE'S OBSERVED		Biological Reference Values
ELISA (ENZYME LINKED IMMUNOSORBENT ASSAY)			
Lyme (Borrelia Burgdorferi- IgG & IgM) LYME SEROLOGY			
Lyme-Borrelia Burgdorferi IgG (Serum,EIA)	POSITIVE(33.2)	aU/ml	Negative: < 10 Equivocal: 10-15 Positive: > 15
Medical Remarks: RECHECKED (CORRELATE CLINICALLY)			
Lyme-Borrelia Burgdorferi IgM (Serum,CLIA)	NEGATIVE(5.4)	aU/ml	Negative: < 18 Equivocal: 18-22 Positive: > 22

Interpretation:
Lyme disease is caused by a tick borne spirochete, Borrelia Burgdorferi.IgM antibodies may be detectable within 1-2 wks following the tick bite,but may be delayed for 3-6 wks,The IgM antibodies may be present for months. A negative result doesnot rule out the possibility of infection in a patient.Patient with clinical history / symptoms suggestive of Lyme disease may be retested in 2-4 wks.A positive result must be interpreted with caution.Cross reactivity has been seen h syphilis,relapsing fever Rocky mountain spotted fever,auto immune diseases,RA , SLE, CMV , EBV infection.The tinued presence or absence of antibodies cannot be used to determine sucess or failure of therapy.

Lab Technician

Dr Priyanka Panday
Consultant Pathologist

Results are to be correlated clinically.
End Of The Report

FIG.3: LABORATORY REPORTS SHOWING ELISA (ENZYME LINKED IMMUNOSORBENT ASSAY) WITH POSITIVE TITRE OF ANTIBODIES AGAINST B. BURGDORFERI SPECIFIC ANTIGENS

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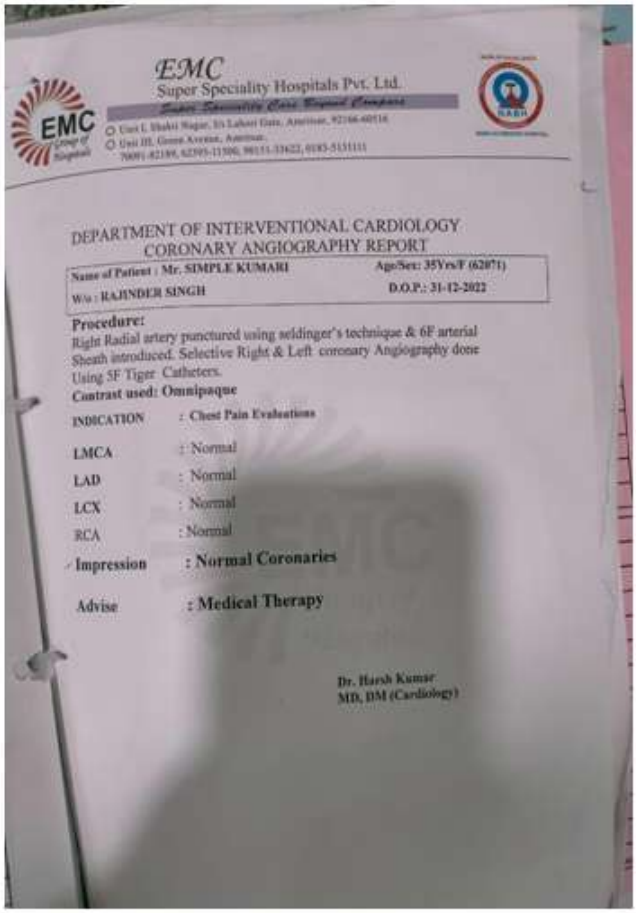


EMC
Super Speciality Hospitals Pvt. Ltd.

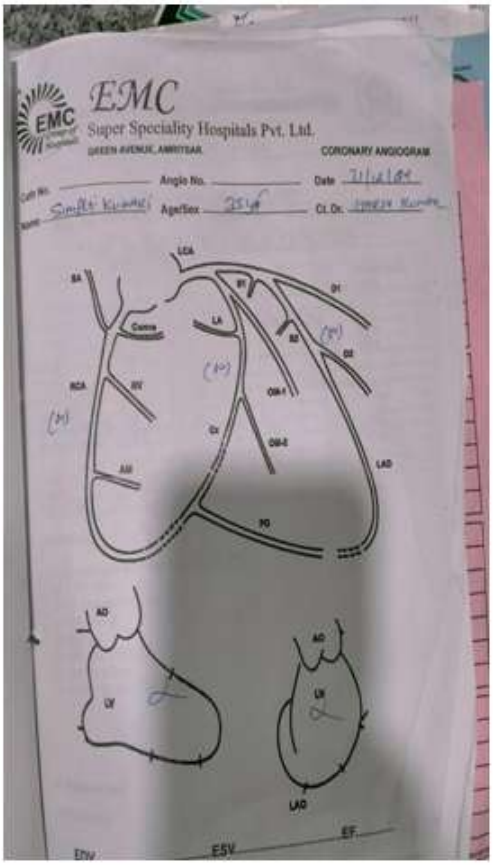
DEPARTMENT OF INTERVENTIONAL CARDIOLOGY
CORONARY ANGIOGRAPHY REPORT

Name of Patient : Mr. SIMPLE KUMARI — Age/Sex: 35Yrs/F (62871)
W/o : RAJINDER SINGH — D.O.P.: 31-12-2022

Procedure:
Right Radial artery punctured using seldinger's technique & 6F arterial Sheath introduced. Selective Right & Left coronary Angiography done Using 5F Tiger Catheters.
Contrast used: Omnipaque

INDICATION : Chest Pain Evaluations
LMCA : Normal
LAD : Normal
LCX : Normal
RCA : Normal
Impression : **Normal Coronaries**
Advise : **Medical Therapy**

Dr. Harsh Kumar
MD, DM (Cardiology)



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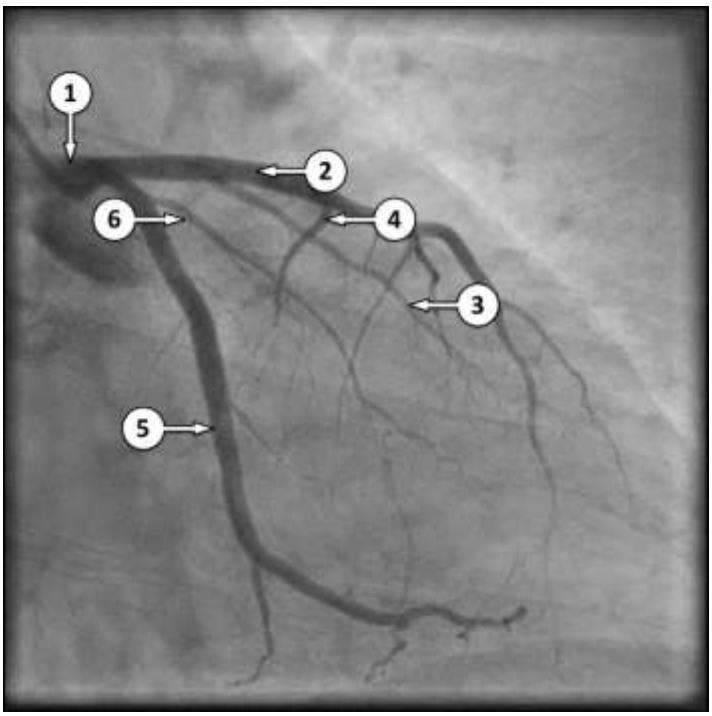
GREEN AVENUE, AMRITSAR
CORONARY ANGIOGRAM

Angio No. _____ Date 31/12/22
Age/Sex 25/F Ct. Dr. Dinesh Kumar

LCA, RA, RCA, Conus, LA, D1, D2, OM-1, OM-2, LAD, PD, AO, LV, LAD, ESV, EF

FIG. 4 & 5: CORONARY ANGIOGRAPHY REPORT SHOWING NORMAL CORONARIES



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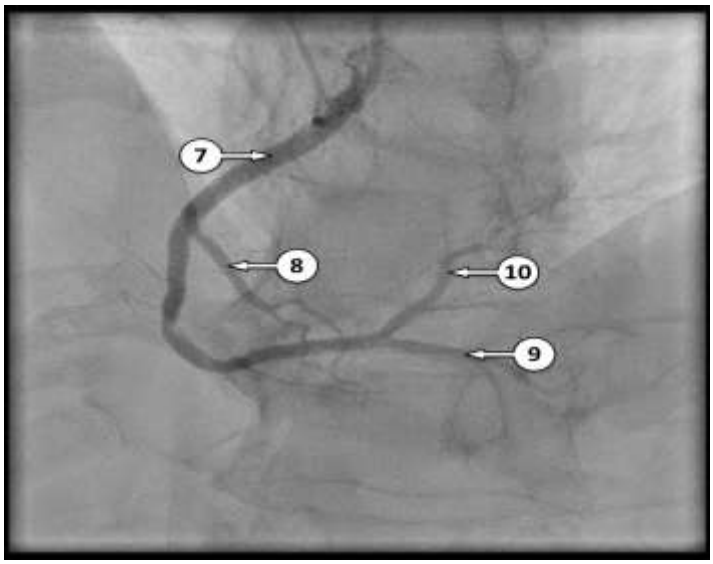

FIGURE 6 &7: CORONARY ANGIOGRAPHY SHOWING NORMAL CORONARIES

1. Left (main) coronary artery (LCA, LMCA)
2. Left anterior descending artery (LAD)
3. First diagonal artery (D1)
4. First septal artery (S1)
5. Circumflex artery (LCx, Cx)
6. First (obtuse) marginal (M1)
7. Right coronary artery (RCA)
8. First acute marginal artery (AM1)
9. Posterior descending artery (PDA)
10. Posterior left ventricular artery (PLV)

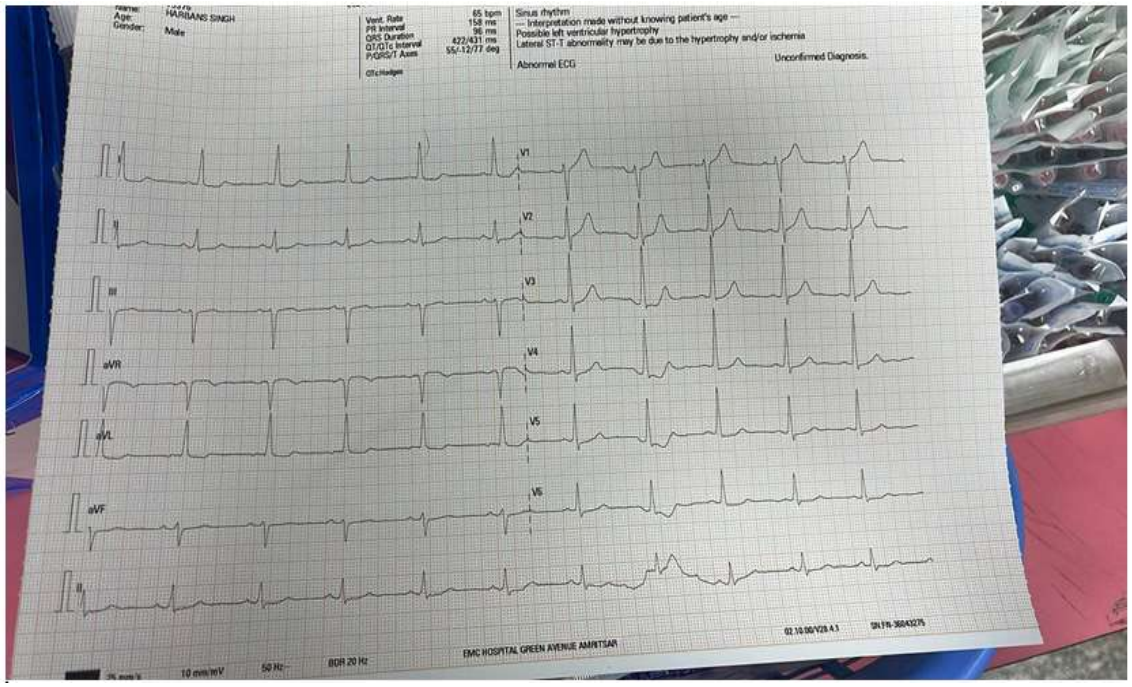

FIGURE 8: 12 LEAD ELECTROCARDIOGRAM OF PATIENT AFTER TREATMENT SHOWING INTRINSIC SINUS RATE OF 78 BEATS PER MINUTE, A NORMAL P-R INTERVAL, AND A SINUS RHYTHM