Axia SCIENTIFIC PUBLISHING

OPEN ACCESS JOURNALS

Axia Journal of Cardiology

Complete Heart Block: Don't Reflex to Pacemaker

Shawn Wang[1], Jasmine K. Dugal[2]*, Brianna Yee[2], Sahar Mahani[3], Ali Namazi[3]

[1]Kirk Kerkorian School of Medicine at the University of Nevada, Las Vegas

[2]University of Nevada, Las Vegas Internal Medicine Residency

[3]University of Nevada, Las Vegas Cardiovascular Department

Research Article

Received: 17 May, 2025

Accepted: 26 May, 2025

Published: 31 May, 2025

***Corresponding author:** Jasmine K. Dugal, DO, MPH, University of Nevada, Las Vegas Internal Medicine Residency, 1701 W. Charleston Blvd Suite 230, Las Vegas, USA. Phone No: (916) 202-3879, E-mail: jasmine.dugal@unlv.edu.

Citation: Jasmine K. Dugal, DO, MPH Complete Heart Block: Don't Reflex to Pacemaker, Axia Journal of Cardiology(AJC). 2025;1(1):1001.

Abstract

Pregnancy is known to be the cause of many physiologic changes, including changes to blood flow, cardiac output, and atrial shape and size. It is theorized that the pregnancy-associated changes to cardiac structures can lead to atrial stretching and, in turn, lead to conduction issues such as heart block. While the complication is rare, this predisposition to conduction abnormalities should be considered as a possible complication associated with pregnancy. Complete Heart Block (CHB) is a serious conduction abnormality that often necessitates Permanent Pacemaker (PPM) implantation. However, the management of CHB in asymptomatic patients remains uncertain. We present a 29-year-old pregnant female at 23 weeks of gestation who developed CHB following a motor vehicle collision with no significant past medical history of arrhythmia or heart disease. Despite persistent bradycardia (HR 46-48 BPM), she remained asymptomatic without syncope or hemodynamic compromise. Given her stable condition, preserved ventricular escape rhythm, and the risks associated with PPM placement during pregnancy, shared decision with the patient led to deferring intervention. This case underscores the importance of individualized management in CHB, particularly in pregnant patients, and suggests that transient conduction abnormalities in the setting of pregnancy and trauma may not always necessitate immediate pacemaker implantation.

Keywords: Complete Heart Block (CHB), Pregnancy, Arrhythmias, Conduction Abnormalities

Introduction

Cardiac conduction disorders are the most common complication of pregnancy in women, with or without structural heart disease [1]. Specifically, childbearing women with congenital heart disease are at high risk for arrhythmias. Cardiovascular changes in pregnancy include increased cardiac output, blood volume, reduced vascular resistance, and blood pressure [1]. Additionally, cardiac output increases by nearly 50%, and heart rate increases by 10 to 20 Beats Per Minute (BPM) [1]. Experts believe this is because the atrial stretch experienced during pregnancy may provoke conduction issues, however, there is no clear association between pregnancy and complete heart block [1,2]. Pregnant women who develop symptomatic bradycardia, such as syncope or presyncope, typically need permanent pacemaker placement [2,4].

Methods

We describe a 29 y/o pregnant female G2P1001 at 23w5d with no past medical history, who presented after a Motor Vehicle Collision (MVC) wherein she was a restrained driver. The front of the vehicle was struck by another car and spun 90 degrees, with no direct trauma to the body and no complaints on admission aside from a mild headache. Initial vital signs were significant for bradycardia. Labs were essentially unremarkable. EKG performed on admission was notable for CHB (Figure 1A).

Due to the contradicting clinical picture of a malignant arrhythmia necessitating intervention, contrasted by her lack of symptoms, we investigated a true need for pacemaker placement, as her pregnancy implied increased risk. A follow-up EKG (Figure 1B) was performed after patient ambulation, which showed no improvement in heart rate and persistent CHB. However, the patient remained asymptomatic without any concerns for syncope or increased fatal outcomes. Through shared decision-making, the patient deferred PPM placement with cardiology follow-up in the clinic during this admission. She was discharged the following day.

Results

This case highlights an association between pregnancy-related physiological cardiac changes in the setting of blunt force cardiac trauma, leading to complete heart block. In this patient, we hypothesize that the physiological change from pregnancy, particularly atrial stretching, may predispose our patient to conduction abnormalities. A "second hit" by the blunt force of cardiac trauma from the MVC likely triggered the CHB [3]. Even in the absence of direct chest trauma, the mechanical stresses of an MVC can have significant cardiac repercussions, which can be particularly prevalent in vulnerable populations such as pregnant women. Although CHB typically necessitates permanent pacemaker (PPM) implantation, our patient presented with CHB as an incidental finding [4]. Notably, her ventricular rhythm remains intact and is likely a reliable intrinsic rhythm, which is supported by her narrow QRS complex [5]. Given that our patient did not experience any symptoms, even after exertion, her case was deemed to be safe for deferral of the pacemaker. Her pregnancy adds additional risk to the procedure, and with the temporary physiologic changes of pregnancy, she has a hopeful prognosis for the resolution of her conduction abnormality. Thus, a PPM placement in her clinical situation may have produced more risk than benefit.

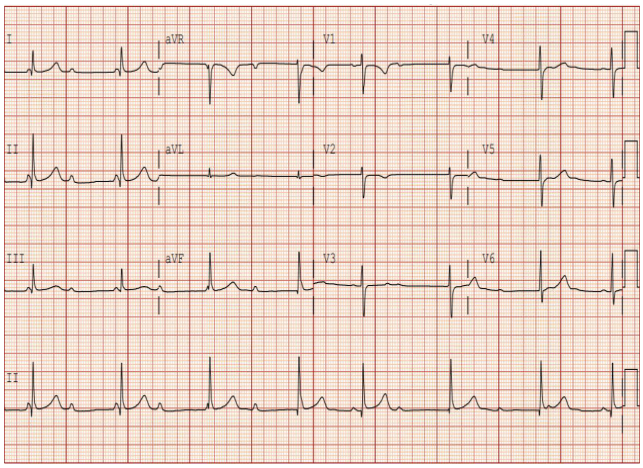

Figure 1A: The first EKG performed was significant for CHB, HR 48 BPM.

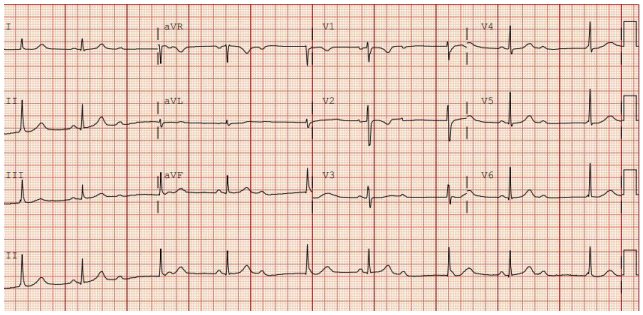

Figure 1B: Persistent CHB post-ambulation, HR 53 BPM.

Conclusion

We highlight this rare case of CHB where a PPM is not indicated. Clinicians need to be aware of similar scenarios, which not only can explain a possible mechanism for new-onset CHB in a young patient but also may avoid an unnecessary intervention on asymptomatic patients with incidental findings of CHB.

References

1. Naeini SP, Sorurbakhsh NZ, Razavi M. Cardiac arrhythmias during pregnancy. Tex Heart Inst J. 2021;48(4): e217548.

2. Adamson DL, Nelson-Piercy C. Managing palpitations and arrhythmias during pregnancy. Heart. 2007;93(12):1630-1636.

3. Singh S, Heard M, Pester JM, et al. Blunt cardiac injury. In: StatPearls [Internet]. Treasure Island (FL): StatPearls

4. Dalia T, Amr BS. Pacemaker indications. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan.

5. Hafeez Y, Grossman SA. Junctional rhythm. [Updated 2023 Feb 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan.

Citation: Jasmine K. Dugal, DO, MPH Complete Heart Block: Don't Reflex to Pacemaker, Axia Journal of Cardiology(AJC). 2025;1(1):1001