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Case Report
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Peripartum Cardiomyopathy with Complete Heart Block: A Rare Manifestation

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Abstract

Peripartum cardiomyopathy is an infrequent and potentially life threating condition characterized by development of systolic heart failure in the absence of any other cause of heart failure that happens towards the end of pregnancy or within five months following pregnancy. It requires urgent diagnosis and management to improve maternal outcomes.

Peripartum cardiomyopathy is associated with one in every 3,000 to 4,000 live births, affecting thousands of women in the US each year. Potential causes of this are pregnancies in older age, fertility-assisted treatment, multifetal pregnancies, better diagnostic tools, and better knowledge and awareness.

This case underscores the need for early diagnosis and teamwork among healthcare experts to enhance outcomes in similar cases, emphasizing the ongoing importance of research and awareness in maternal health.

Keywords: Peripartum; Cardiomyopathy; Heart Block; C-section

Introduction

Peripartum cardiomyopathy is an infrequent and potentially life threating condition characterized by development of systolic heart failure in the absence of any other cause of heart failure that happens towards the end of pregnancy or within five months following pregnancy [1]. It requires urgent diagnosis and management to improve maternal outcomes.

Peripartum cardiomyopathy is associated with one in every 3,000 to 4,000 live births, affecting thousands of women in the US each year [2]. Potential causes of this are pregnancies in older age, fertility-assisted treatment, multifetal pregnancies, better diagnostic tools, and better knowledge and awareness [3].

PPCM can present with various clinical features that are similar to heart failure caused by other causes. Complete Heart Block (CHB) is a severe conduction disorder within the cardiac electrical system, resulting in the dissociation of atrial and ventricular contractions. When CHB coincides with PPCM, it presents an exclusive and challenging clinical situation, which requires a delicate balance between the need of maternal recovery and safety of both mother and child [4]. Our case report aims to enlighten the rare occurrence of CHB in the setting of PPCM. We provide a thorough examination of recent clinical cases, emphasizing the patient's symptoms, how they were diagnosed, and treatment methods employed.

Additionally, this report highlights the critical role of a multidisciplinary approach, involving cardiologists, obstetricians, and neonatologists, in managing these complicated cases. By sharing our insights and experience, we aim to contribute to the evolving understanding of the diagnosis and treatment of PPCM complicated by complete heart block, ultimately enhancing patient care and outcomes.

Case Presentation

A 30-year-old female patient, with no prior co-morbid, G5 P2+2, at 38th week of pregnancy, was admitted to the Obstetric Department for elective C-Section. During admission, the patient developed shortness of breath (NYHA IV), Orthopnea, and dizziness. Her blood pressure recorded at that time was 70/50 mmHg and heart rate was 31 beats/min. Chest auscultation was significant for bilateral inspiratory crepitations from mid to lower zones. Cardiovascular Examination was

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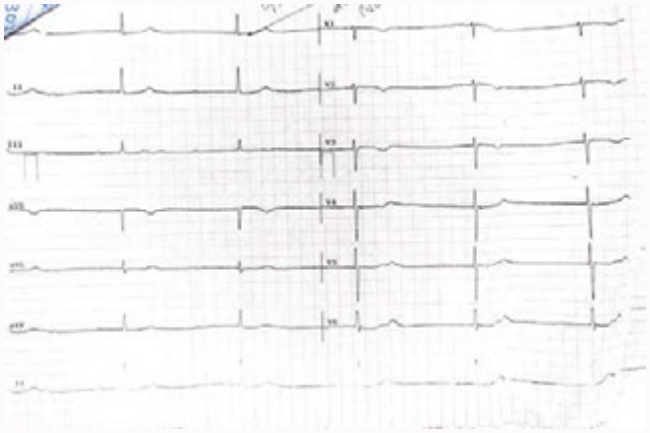

Figure 1: Complete Heart Block at the time of presentation.

significant for presence of third heart sound, raised jugular venous pressure, pan-systolic murmur at left 4th intercostal space increasing with inspiration. The electrocardiogram revealed complete heart block with ventricular rate 30/min (Narrow QRS complexes) and atrial rate of 100/min. Patient was shifted to the Cardiac Care Unit. Immediately, a temporary transvenous pacemaker was inserted *via* the right femoral vein. Her BP increased to 130/90 mmHg. She was given intravenous diuretics to relieve congestive symptoms. An immediate C-section was performed, and a healthy baby boy was delivered.

Her medical history included no previous cardiac disease and prior four uneventful pregnancies delivered *via* elective C-section. Two out of four children passed away due to sudden death within first two months of life. Transthoracic echocardiography revealed normal sized left and right ventricles with severe generalized left ventricular systolic dysfunction (LVEF 25%, end diastolic dimension of 49 mm). Bicuspid aortic valve with mild aortic stenosis and mild to moderate aortic regurgitation. Moderate mitral and tricuspid regurgitation. Pulmonary artery systolic pressure was 50 mmHg. Laboratory parameters were hemoglobin 13.4 g/dl, total leucocyte count 11.4 × 10^3/uL, platelet count 170 × 10^3/uL. High sensitivity troponin was <10 ng/L, Creatinine 0.45 mg/dl, Serum sodium 136 mmol/L, Potassium 4.7 mmol/L, Thyroid Stimulating Hormone (TSH) was 2.1, Liver function tests were within normal limits. Autoimmune profile was sent which was negative.

The patient was monitored in ICU setting for subsequent 72 h. Cardiac Electrophysiologist was taken on board. The patient did not revert back to sinus rhythm. A permanent pacemaker was implanted on the 4th day of admission. Heart failure treatment with b blockers, ACE inhibitors, spironolactone was initiated. Patient is now under follow up (Figure 1).

Discussion

Peripartum cardiomyopathy is a rare form of cardiomyopathy that occurs during the last month of pregnancy or in the post-partum period. As per the National Heart, Lung, and Blood Institute (NHLBI) diagnosis of PPCM was based on the following four criteria: Development of cardiac failure in the last month of pregnancy or within five months after delivery; absence of a demonstrable cause for cardiac failure; absence of demonstrable heart disease before the last month of pregnancy and documented systolic dysfunction [5]. Transthoracic echocardiography is the most widely used modality to assess ventricular dysfunction and chamber dilation. Risk factors for development of PPCM include African-American race, older age, pre-eclampsia, diabetes, fertility-assisted treatment, high parity and twin pregnancies [3]. Poor prognostic factors include high parity, twin gestation, age beyond 30 years, conduction defects on electrocardiography, and late onset of symptoms after delivery [6]. It has been observed that in 50% of the cases return to normal size and function of the left ventricle usually occurs within six months after delivery. In patients with LVEF greater than 30% the likelihood of normalization is higher [7].

In young female patients presenting with a new onset complete heart block, the differential diagnosis could include electrolyte imbalance, autoimmune diseases such as systemic lupus erythematosus or rheumatoid arthritis, drug overdose, Lyme disease, history of acute or chronic infectious or hypersensitivity myocarditis, infiltrative processes or hypothyroidism [8-10]. In our patient, after careful history, physical examination, laboratory and radiological investigations the other causes for complete heart block had been excluded.

As per the literature review, PPCM with complete heart block has only been reported once [11]. In our case however, complete heart block was irreversible and required permanent pacemaker implantation. Follow up echo after one week showed no improvement in left ventricular systolic functions. Unfavorable prognostic factors in this patient included high parity and LVEF less than 30%.

Conclusion

Our case highlights the rarity and complexity of PPCM with concomitant complete heart block, a condition scarcely reported in medical literature. The irreversible complete heart block in this case necessitated the implantation of a permanent pacemaker, and the patient's unfavorable prognostic factors, including high parity and reduced LVEF, emphasize the severity of this condition. This case underscores the need for early diagnosis and teamwork among healthcare experts to enhance outcomes in similar cases, emphasizing the ongoing importance of research and awareness in maternal health.

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