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Peripartum Cardiomyopathy in a Morbidly Obese Pregnant Woman: Case Report

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Abstract: Peripartum cardiomyopathy (PPCM) represents a rare etiology of heart failure manifesting in women during the late gestational period or early postpartum phase. Despite several proposed pathophysiological mechanisms, the precise etiology of PPCM remains elusive, with current evidence supporting a multifactorial origin. Multiple definitions have been established to characterize this distinct clinical entity.

Acute heart failure management in PPCM aligns with standard heart failure protocols, adjusted for pregnancy-specific risks. Early delivery is reserved for maternal or fetal compromise. Given the high recurrence risk, thorough contraceptive counseling is imperative. Prognosis is generally favorable, with >50% of patients achieving spontaneous LV function recovery within six months postpartum.

The management of peripartum cardiomyopathy presents significant anesthetic and obstetric challenges, particularly in complicated cases, highlighting the complexity of perioperative care in such critical conditions.

Keywords: *Peripartum Cardiomyopathy, Morbid Obesity, Chronic Hypertension, High-Risk Pregnancy, Anesthetic Management.*

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I. INTRODUCTION

Peripartum cardiomyopathy (PPCM) is a rare but life-threatening condition characterized by heart failure secondary to left ventricular systolic dysfunction (ejection fraction <45%) occurring in the last month of pregnancy or within five months postpartum.(1) PPCM prevalence varies globally and is likely underdiagnosed, ranging from 1 in 100 births (Nigeria, Haiti) to 1 in 20,000 (Japan).(2) The disease carries significant morbidity and mortality, particularly in high-risk populations such as women with preexisting hypertension or obesity.(3)

Managing PPCM in super-obese pregnant patients is challenging, especially for delivery and anesthesia. General anesthesia risks include difficult airway, hypoventilation, and cardiovascular stress.(4) Neuraxial anesthesia may worsen hemodynamics in severe cardiomyopathy by causing sympathetic blockade and reduced preload. Individualized multidisciplinary care is essential for mother and fetus.(5)

We report a case of a 32-year-old primigravida with morbid obesity and untreated hypertension who developed acute heart failure at 30 weeks' gestation. The case highlights challenges in respiratory support, delivery timing, and anesthesia management.

II. CAS REPORT

A 32-year-old primigravida. BMI: 55 kg/m². History of untreated chronic hypertension. No personal or family history of cardiovascular disease. At 30+5 weeks of an unmonitored pregnancy, she presented with one month of progressive dyspnea, orthopnea, and severe hypoxemia (SpO_2 88% on room air). She was tachypneic (30 breaths/min), hypertensive (167/89 mmHg), and had a heart rate of 120 bpm. Lung auscultation revealed bilateral crackles. Peripheral edema was present. Obstetric exam was normal.

Radiological evaluation revealed cardiomegaly and pulmonary edema on chest X-ray.

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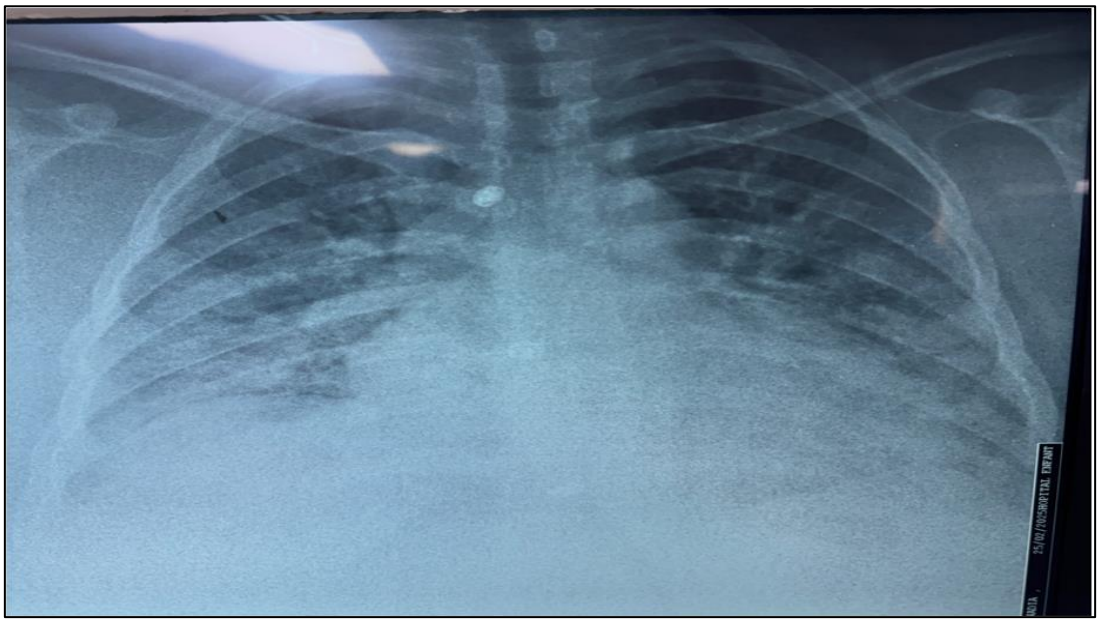

Fig 1 Chest X-Ray Showing Cardiomegaly and Bilateral Pulmonary Edema

➢ *Echocardiogram*

Left ventricular ejection fraction (LVEF) at 25%, global hypokinesis, and dilated cardiomyopathy predominantly affecting the left ventricle.

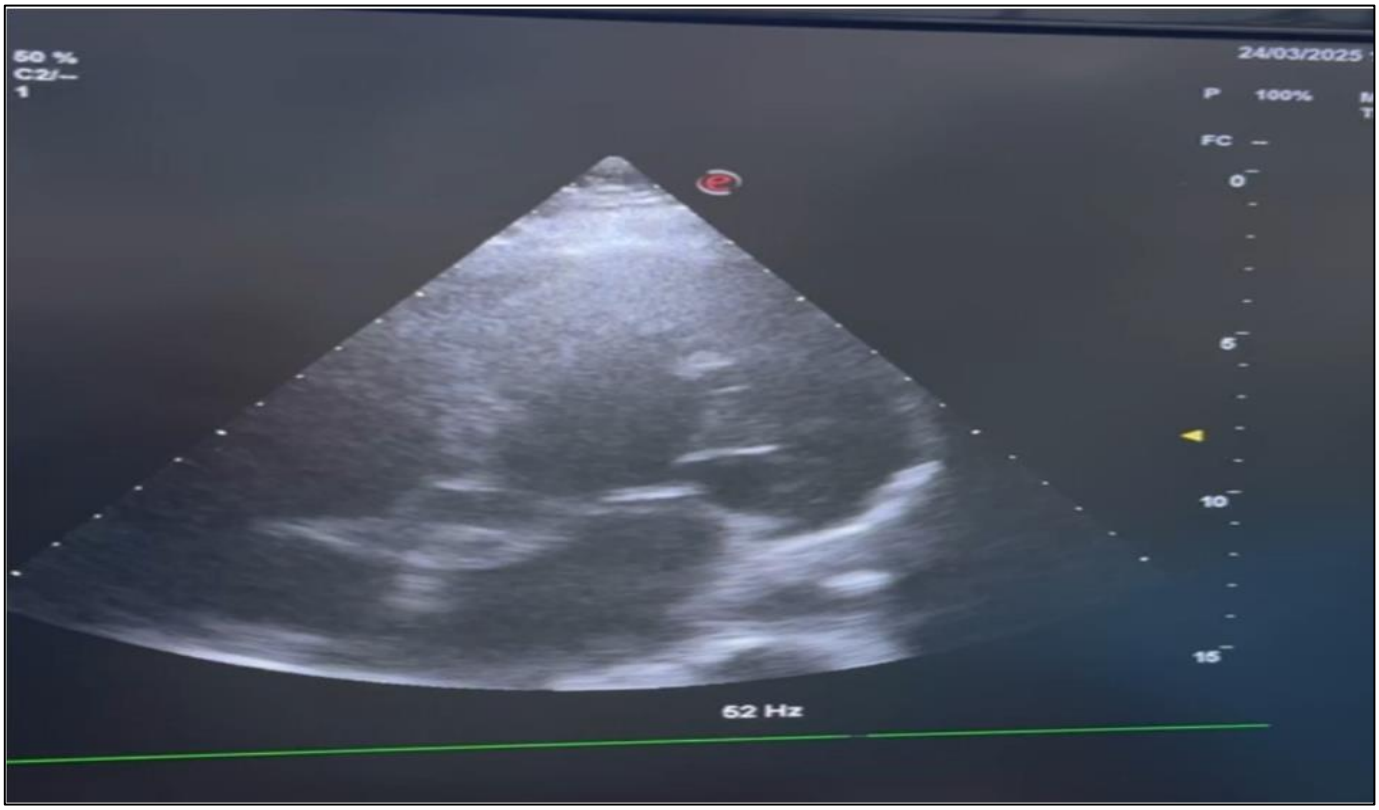

Fig 2 Echocardiogram Showing a Dilated Cardiomyopathy with Left Ventricular Enlargement

Laboratory tests showed an elevated BNP (2000 pg/mL) and a mild troponin increase (0.002 → 0.004 ng/mL), without proteinuria; the rest of the workup was normal. Obstetric ultrasound confirmed a single viable fetus, estimated at 2000 g.

The patient was admitted to the ICU for cardiac management with IV furosemide, nitroglycerin, nicardipine, metoprolol, and enoxaparin (8000 IU/24h). A single 12 mg dose of betamethasone was administered for fetal lung maturation.

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At 34 weeks, premature rupture of membranes occurred; antibiotics were started. A C-section at 34+5 weeks was performed due to high cardiovascular risk, under incremental epidural anesthesia following invasive hemodynamic monitoring. A female infant weighing 2900 g was delivered with Apgar scores of 9, 10, and 10.

Postpartum care included 48 hours of CPAP, transition to lisinopril, and resumption of enoxaparin 12 hours after epidural catheter removal. Uterine involution and wound healing were satisfactory. Oral contraception was initiated. At 3 months, echocardiography showed LVEF at 49% with residual hypokinesia. The overall outcome was favorable.

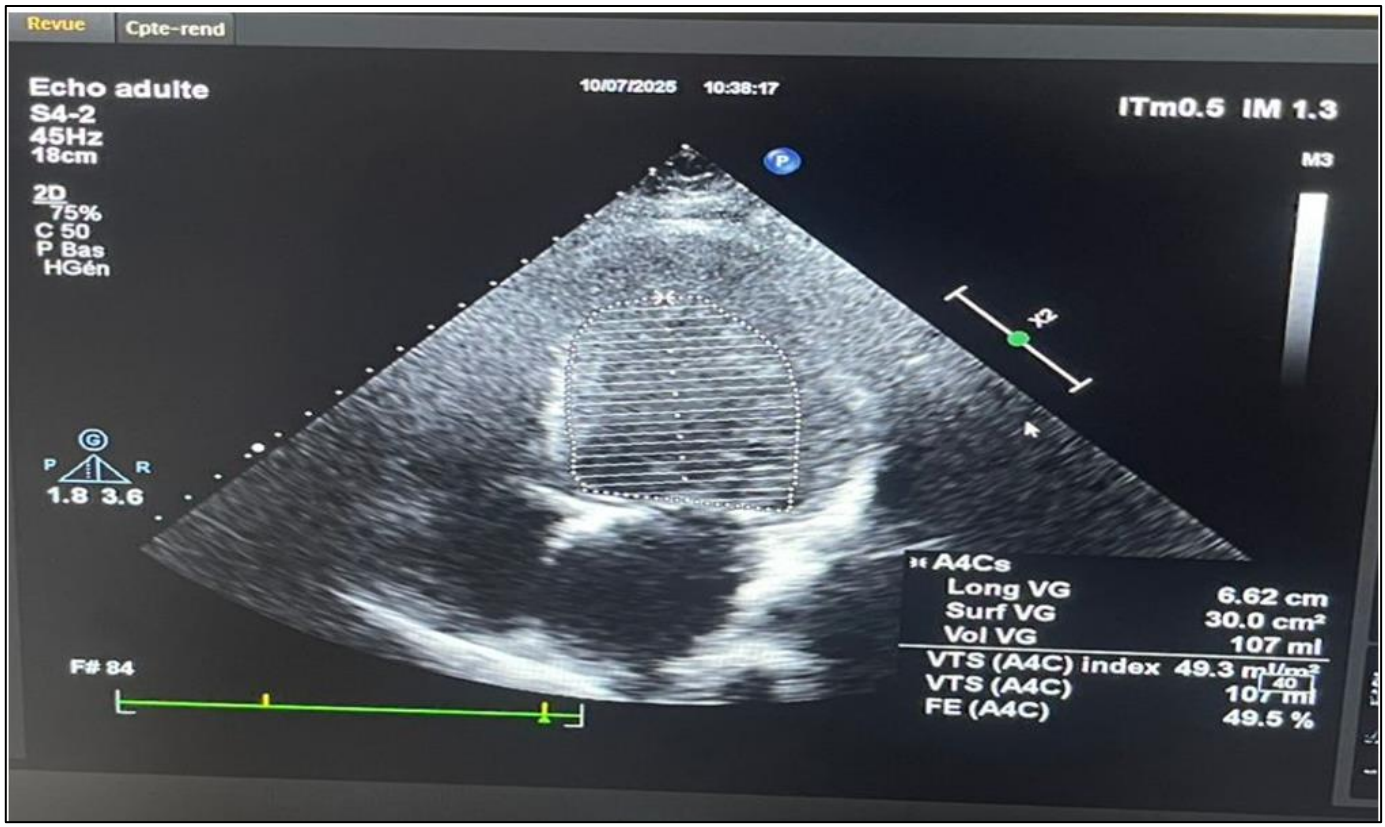

Fig 3 Echocardiogram Showing Improved Left Ventricular Ejection Fraction.

III. DISCUSSION

Peripartum cardiomyopathy (PPCM), or pregnancy-related heart failure, lacks a universally consistent definition. A broader classification includes early PPCM (1–9 months of pregnancy) and late PPCM (6–12 months postpartum), aiming to improve early detection and reduce maternal-fetal morbidity and mortality.(6) Peripartum cardiomyopathy (PPCM) is significantly more common in women of African ancestry. Major risk factors include preeclampsia, hypertension, multiple pregnancies and advanced maternal age (≥30 years, especially >40 years).(2, 7) Obesity (BMI ≥40 kg/m²), further complicates PPCM due to increased cardiovascular strain, metabolic dysregulation, and heightened perioperative risks.(8) PPCM is a rare condition with a poorly defined, multifactorial etiology. It typically occurs in late pregnancy or postpartum, suggesting a hormonal trigger. Vascular, immune, infectious, and hormonal factors may be involved. Current evidence supports a vascular origin linked to the hormonal changes of the peripartum period.(2, 9)

Peripartum cardiomyopathy (PPCM) presents with typical heart failure symptoms like dyspnea, fatigue, chest pain, and edema, along with signs such as tachycardia, third heart sound, murmurs, and pulmonary rales. Blood pressure may vary. Diagnosis is clinical and by exclusion, supported by ECG, NT-proBNP, and echocardiography (usually showing LVEF < 45%). No specific test confirms PPCM; additional labs and blood gases may assist if the patient is unstable.(10)

Optimal management of PPCM relies on a coordinated multidisciplinary team including obstetricians, cardiologists, anesthesiologists, intensivists, neonatologists, and nursing staff. Diagnosis may arise antepartum, intrapartum, or postpartum. A thorough diagnostic workup—including troponin, BNP, renal function tests, ECG, and echocardiography—is essential to exclude alternative causes such as myocardial infarction, aortic dissection, viral myocarditis, or renal artery stenosis.(5)

Hemodynamic management of PPCM during delivery is challenging due to venous compression, the need to maintain placental perfusion, and risk of hypovolemia. ACE inhibitors and ARBs are contraindicated because of fetal toxicity. Hydralazine, long-acting nitrates, and β1-selective beta-blockers are preferred. Diuretics should be used cautiously. Heparin is indicated when anticoagulation is

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required. Non-invasive ventilation and inotropic support are reserved for severe cases.(9, 11)

In stable heart failure cases, continuation of conventional heart failure treatment is possible, enabling pregnancy to reach term under close fetal monitoring for early detection and management of complications. Vaginal delivery is preferred unless obstetric indications require assisted vaginal delivery or cesarean section. Oxygen therapy should be administered based on the patient's clinical condition(2). The choice of anesthesia—regional versus general—depends on prior anticoagulant therapy and delivery urgency. Epidural anesthesia is preferred over spinal anesthesia due to its capacity for gradual hemodynamic modulation and superior analgesic and fatigue-reducing effects. In instances of severe cardiac decompensation, general anesthesia is indicated to optimize maternal and fetal outcomes.(5)

At 1 year, peripartum cardiomyopathy (PPCM) is associated with substantial morbidity and mortality, including 8% mortality, 6% thromboembolism, 2% stroke, and 14% rehospitalization rates. Left ventricular (LV) recovery varies regionally, with 46% of patients showing improvement at 6 months and approximately two-thirds by 1 year, accompanied by significant clinical improvement, as 67% of survivors achieve NYHA class I status.(12)

IV. CONCLUSION

Peripartum cardiomyopathy in super-obese women is a rare but serious condition that complicates obstetric and anesthetic management. This case highlights the importance of a multidisciplinary, individualized approach involving close cardiological and obstetric monitoring to optimize hemodynamic management, timing and mode of delivery, and anesthesia choice. Such a strategy is crucial to reduce maternal and fetal morbidity and mortality in this high-risk population.

- *Ethics Approval and Consent*

In line with the Declaration of Helsinki; no ethics approval required. Informed consent obtained.

- *Consent for Publication*

Written informed consent was obtained for publication of anonymized clinical and biological data.

- *Funding*

No funding was received for this study.

- *Competing Interests*

The authors declare no competing interests.

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