

Anesthetic Management of Peripartum Cardiomyopathy in a Patient Undergoing Cesarean Section: A Case Report

Manejo anestésico de la miocardiopatía periparto en una paciente sometida a cesárea: Reporte de caso

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Abstract

Peripartum cardiomyopathy (PPCM) is a rare condition characterized by left ventricular dysfunction and heart failure symptoms that manifest during the peripartum period in previously healthy women. The anesthetic management of an obstetric patient with concurrent cardiovascular pathology presents a significant challenge for the anesthesiologist. The objective is to report a case of anesthetic management of peripartum cardiomyopathy in a patient undergoing cesarean section in a hospital with limited hemodynamic resources. We report the case of a 23-year-old gravida 3, para 2, abortus 1 (G3P2A1) patient with a left ventricular ejection fraction (LVEF) of 19% and New York Heart Association (NYHA) functional class IV, who presented with fever, cough, tachycardia, and tachypnea and was diagnosed with PPCM. After clinical deterioration, a cesarean section under general anesthesia was indicated, resulting in the birth of a neonate with Apgar scores of 8 and 9 and a favorable maternal outcome. This report highlights the importance of a multidisciplinary and individualized approach for patients with PPCM.

Keywords: Anesthesia; Peripartum Cardiomyopathy; Cesarean Section; Heart Failure; Angola (Source: MeSH, NLM).

Resumen

La miocardiopatía periparto (MCP) es una entidad poco frecuente caracterizada por disfunción ventricular izquierda y síntomas de insuficiencia cardíaca que se manifiestan durante el período periparto en mujeres previamente sanas. El manejo anestésico de una paciente obstétrica con enfermedad cardiovascular concomitante representa un desafío significativo para el anestesiólogo. El objetivo es reportar un caso de manejo anestésico de miocardiopatía periparto en una paciente sometida a cesárea en un hospital con recursos hemodinámicos limitados. Se presenta el caso de una paciente de 23 años, gestante 3, con 2 partos y 1 aborto (G3P2A1), con una fracción de eyección ventricular izquierda (FEVI) del 19% y clase funcional IV de la New York Heart Association (NYHA), quien presentó fiebre, tos, taquicardia y taquipnea, siendo diagnosticada con miocardiopatía periparto. Ante el deterioro clínico, se indicó cesárea bajo anestesia general, obteniéndose un recién nacido con puntuaciones de Apgar de 8 y 9 y una evolución materna favorable. Este reporte destaca la importancia de un enfoque multidisciplinario e individualizado en pacientes con miocardiopatía periparto.

Palabras clave: Anestesia; Cardiopatía Periparto; Cesárea; Insuficiencia Cardíaca (Fuente: DeCS, BIREME).



Introduction

Peripartum cardiomyopathy (PPCM) is an idiopathic cardiomyopathy presenting as secondary heart failure due to left ventricular systolic dysfunction occurring at the end of pregnancy or in the months following delivery, when no other cause of heart failure is found [1][2]. Early descriptions date back to 1850, when Ritchie published a case of early postpartum death due to myocardial failure of unknown origin; however, it was only in 1937 that PPCM was recognized as a distinct clinical entity [3].

The diagnosis of PPCM requires echocardiographic evidence of left ventricular dysfunction with LVEF <45% and often (but not always) left ventricular dilation; onset during the peripartum period or early postpartum; and absence of an alternative explanation [4], associated with symptoms such as dyspnea, chest discomfort, and lower limb edema [5].

This article describes the case of a 35-week pregnant patient diagnosed with severe PPCM who underwent a cesarean section under general anesthesia, and discusses the main anesthetic management aspects in light of the current literature.

Case report

Clinical presentation and diagnosis

A 23-year-old Black Angolan woman, gravida 3, para 1, abortus 1 (G3P1A1), at 35 weeks' gestation, weighing 50 kg, with inadequate prenatal follow-up (only one visit). She had no known personal medical history, but her brother had pulmonary tuberculosis more than one year prior. Fifteen days before admission, she developed intermittent nocturnal fever, night sweats, dry cough, and progressive dyspnea. On admission, she was alert and oriented, without meningeal signs. Her nutritional status was poor; mucous membranes were pink and moist; subcutaneous fat was decreased; there was no lower limb edema. Vital signs showed tachycardia (heart rate

122 bpm) and tachypnea (respiratory rate 48 breaths/min) with intercostal retractions, nasal flaring, and diffuse crackles on pulmonary auscultation. Her gravid abdomen measured 33 cm in uterine height, fetal heart rate was 152 bpm, and fetal presentation was cephalic.

The initial diagnostic hypothesis was term pregnancy with associated bronchopneumonia of probable tuberculous etiology and acute respiratory failure. Cardiology evaluation and complementary tests were ordered, including ECG (complete left bundle branch block) and transthoracic echocardiography (Table 1) (Figure 1).

Medical treatment

Medical treatment was started with digoxin 0.125 mg/day, furosemide 20 mg every 12 hours, and fluid restriction (500 mL/day). Laboratory tests results are shown in the Table 2.

After five days of hospitalization, her clinical condition worsened with orthopnea and aggravated dyspnea, requiring oxygen therapy. Delivery was indicated by the medical team.

Intraoperative management

Upon arrival in the operating room, the patient was in acute pulmonary edema (SpO₂ 87% on a non-rebreather mask), heart rate 125 bpm, and blood pressure 112/73 mmHg. She received furosemide 50 mg, digoxin 125 µg, metoclopramide 20 mg, and omeprazole 40 mg. An infusion of dobutamine (5 µg/kg/min) and nitroglycerin (0.5 µg/kg/min) was initiated.

General anesthesia with orotracheal intubation was chosen, with induction using etomidate (20 mg), fentanyl (total of 150 µg), and neuromuscular blockade with atracurium. The patient was intubated and maintained on mechanical ventilation. Intraoperatively, she remained hemodynamically stable, without the need for vasopressors or fluid boluses. A single live female neonate was delivered without complications, with Apgar scores of 8 and 9 at 1 and 5 minutes, respectively, and

Table 1. Measurements Obtained on Transthoracic Echocardiography.

Structures	Dimensions (mm)	Reference Values – Men (mm)	Reference Values – Women (mm)
Aortic Sinuses	23	31–37	27–35
Left Atrium (LA)	43	30–40	27–38
Right Ventricle (RV)	22	20–28	20–28
Intraventricular Septum (IVS)	9	6–10	6–9
Rear Wall of the Left Ventricle (RWLV)	9	6–10	6–9
Left Ventricular Diastolic Diameter (LVDD)	79	42–59	39–53
Left Ventricular Systolic Diameter (LVSD)	72	22–31	24–32
Left Ventricular Ejection Fraction (%)	19	≥ 55%	≥ 55%
Left Ventricular Shortening Fraction (%)	9	27–45	25–43

Source: Cardiology Department, Benguela General Hospital.

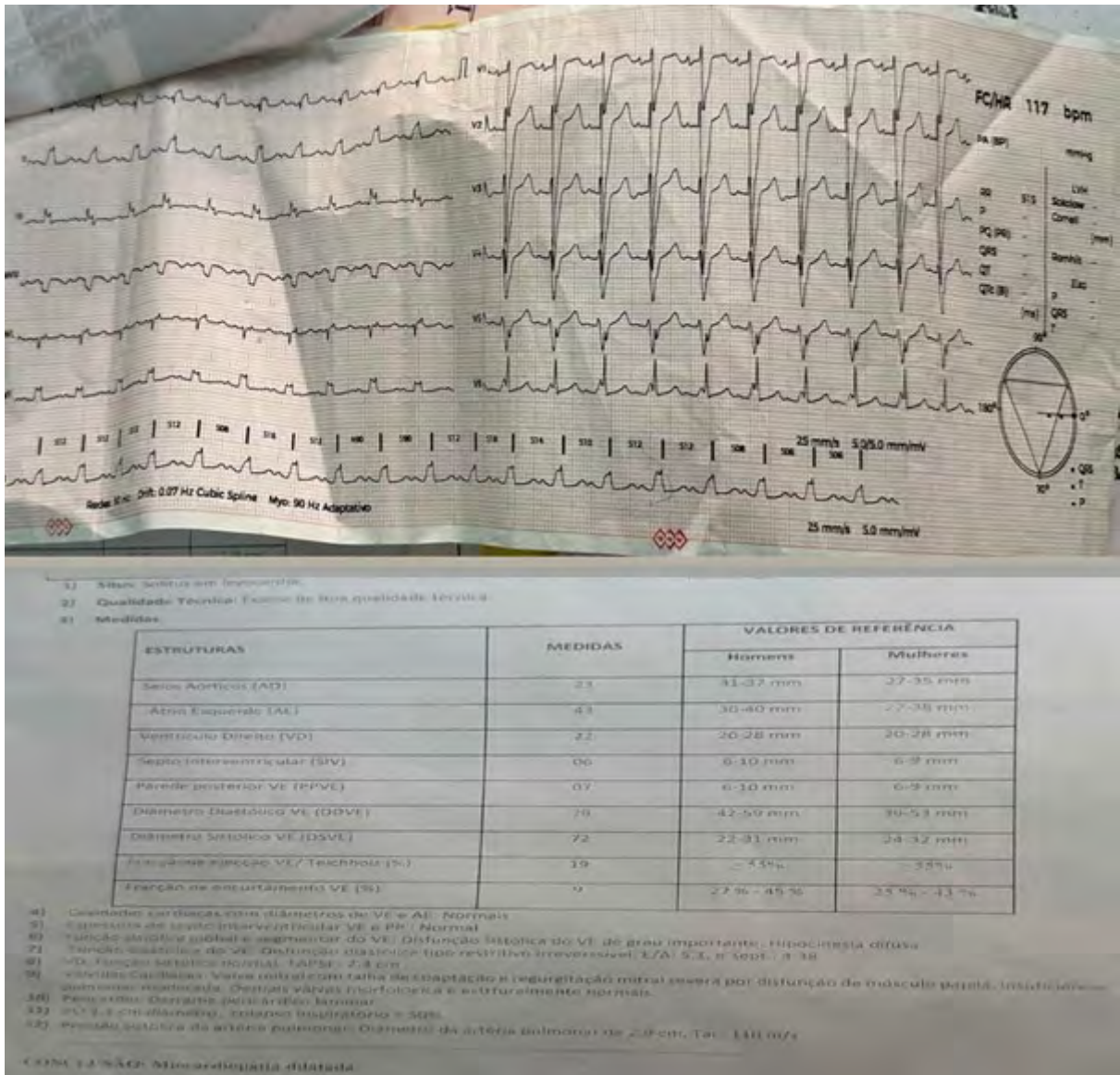


Figure 1. Electrocardiography and Transthoracic Echocardiography.
Source: Cardiology Department, Benguela General Hospital.

weight appropriate for gestational age. The neonate was transferred to the neonatal intensive care unit for close monitoring.

Postoperative evolution

The surgical procedure lasted 20 minutes, concluding without major complications. No reversal agents were required, and at the end of surgery her vital signs were: blood pressure 129/79 mmHg, heart rate 123 bpm, respiratory rate 12 breaths/min, SpO₂ 100% on mechanical ventilation set to tidal volume 6 mL/kg, respiratory rate 12 breaths/min, PEEP 8 cmH₂O, and I:E ratio 1:2. She was admitted to the intensive care unit for postoperative management, progressed satisfactorily, and was then transferred to the cardiology ward for continued hospitalization.

Discussion

Peripartum cardiomyopathy (PPCM) is a rare but potentially fatal condition characterized by left ventricular systolic dysfunction, typically with LVEF <45%, and may present with ventricular dilation. It usually manifests in late pregnancy or early postpartum, without alternative causes of heart failure, as defined by the 2022 AHA/ACC/HFSA guidelines [6].

Anesthetic management of patients with PPCM is challenging due to high morbidity and mortality risks associated with hemodynamic decompensation, arrhythmias, and thromboembolic events [7]. Vaginal delivery is preferred in most cases, except in scenarios of severe cardiac decompensation (LVEF <30%, NYHA

Table 2. Available Laboratory Tests.

Parameter	Valor
White blood cells	9.0 10 ³ /μL
Red blood cells	3.83 10 ⁶ /μL
Haemoglobin	9.0 g/dL
Haematocrit	30.3 %
MCV	79.1 fL
MCH	23.5 pg
MCHC	29.7 g/dL
Platelets	367000
LYM%	18.6 %
MXD%	8.6 %
NEUT%	72.8 %
LYM#	1.7 10 ³ /μL
MXD#	0.8 10 ³ /μL
NEUT#	6.5 10 ³ /μL
RDW-SD	43.9 fL
RDW-CV	13.1 %
AST	29.7 U/L
Creatinine	2.03 mg/dL
ALT	23.0 U/L
Urea	27.5 mg/dL

Source: Central Laboratory, Benguela General Hospital.

functional class III–IV), significant left ventricular outflow tract obstruction, or ongoing oral anticoagulation [8].

In this case, the patient was NYHA class IV with signs of acute pulmonary edema and hypoxemia, prompting the indication for a cesarean section under general anesthesia with orotracheal intubation. The decision considered the urgency of her clinical status and the safety of the medical team, opting for agents with favorable hemodynamic profiles (etomidate and fentanyl), in addition to inotropic and vasodilator support.

Key principles in anesthetic management for PPCM include prevention of myocardial depression, maintenance of adequate preload, strict afterload control, avoidance of tachycardia and abrupt hypotension, and careful titration of anesthetic agents [7]. In the present case, intraoperative management was successful, with effective hemodynamic control and no requirement to adjust vasoactive drug doses, owing to stable blood pressure throughout the procedure.

Although regional anesthesia can be considered in some stable PPCM patients, general anesthesia is recommended in emergency settings or hemodynamic instability, as illustrated here. The literature supports that the choice of technique should take into account team experience, maternal hemodynamic condition, and airway management needs [9].

Despite the favorable outcome, this case has certain limitations worth highlighting. The lack of invasive hemodynamic monitoring, such as arterial line or cardiac output assessment, limited precise evaluation of circulatory status during the intraoperative period. Additionally, management occurred in a resource-limited setting, hindering access to advanced imaging modalities and therapeutic strategies like mechanical circulatory support. These factors underscore the importance of team preparedness, judicious use of available resources, and individualized care even in adverse environments.

The success of this case underscores the importance of a multidisciplinary approach involving obstetricians, cardiologists, and anesthesiologists experienced in managing PPCM patients. Furthermore, it emphasizes the need for individualized therapeutic strategies based on clinical severity and adherence to current guidelines to ensure the best maternal and neonatal outcomes.

Conclusion

This report highlights the challenges of anesthetic management in patients with severe peripartum cardiomyopathy, especially in emergency contexts. General anesthesia, aligned with the clinical scenario and available resources, ensured intraoperative hemodynamic stability and contributed to favorable maternal and neonatal outcomes. Early diagnosis, multidisciplinary support, and individualized care strategies remain the cornerstones for successful management in these complex cases.

Additional information

Author Contributions (CRediT Taxonomy): BTSRQ and JBP developed the study concept and conducted the research. FAQ wrote the original draft. BTSRQ, JBP and FAQ carried out the formal analysis, reviewed and edited the article.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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Data availability

Not applicable.

Declaration of use of artificial intelligence (AI) tools

The authors declare that the AI tool was used during the literature review stage for the purpose of supporting, rather than replacing, the authors' scientific judgement. All content was reviewed, verified, and validated by the authors, who take full responsibility for the accuracy,

integrity, and originality of the manuscript. No sensitive or confidential data were entered into the AI tools.

The editorial process, including peer review, complied with the journal's policy on the responsible use of AI tools.

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