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Case report

# Peripartum cardiomyopathy management: insights from a Latin American case report

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## ABSTRACT

Peripartum cardiomyopathy (PPCM) is a potentially life-threatening condition that can occur during the late pregnancy or puerperium. A 31-year-old woman with a recent twin pregnancy presented with heart failure symptoms nine days postpartum. On admission, she had volume overload and hemodynamic compromise, which was rapidly reversed with inotropic levosimendan support. Echocardiography revealed a left ventricular ejection fraction (LVEF) of 20% with global hypokinesia. Once stabilized, she was discharged on heart failure medication, bromocriptine, and warfarin. Cardiac magnetic resonance imaging at five weeks demonstrated a preserved LVEF of 57% and no evidence of myocardial scarring or edema. During the 4-year follow-up, the patient remained stable with no new pregnancies. This case highlights the importance of considering PPCM in the differential diagnosis of heart failure in the peripartum period after excluding other etiologies. It also describes the successful use of bromocriptine in facilitating recovery of systolic function without long-term complications.

**Keywords:** Cardiomyopathies; Heart Failure; Latin America (Source: MeSH-NLM).

## RESUMEN

### Manejo de la miocardiopatía periparto: perspectivas desde un caso clínico latinoamericano

La miocardiopatía del periparto (MCPP) es una condición potencialmente mortal que puede ocurrir durante el final del embarazo o el puerperio. Una mujer de 31 años con embarazo gemelar reciente presentó síntomas de insuficiencia cardíaca nueve días después del parto. Al ingreso, mostraba sobrecarga de volumen y compromiso hemodinámico, que se revirtió rápidamente con soporte inotrópico de levosimendán. La ecocardiografía reveló una fracción de eyección del ventrículo izquierdo (FEVI) del 20% con hipocinesia global. Una vez estabilizada, fue dada de alta con medicación para insuficiencia cardíaca, bromocriptina y warfarina. La resonancia magnética cardíaca a las cinco semanas demostró una FEVI preservada del 57% y sin evidencia de cicatrización o edema miocárdico. Durante el seguimiento de 4 años, la paciente permaneció estable sin nuevos embarazos. Este caso resalta la importancia de considerar la MCPP en el diagnóstico diferencial de la insuficiencia cardíaca en el período periparto, después de excluir otras etiologías. También describe el uso exitoso de la bromocriptina para facilitar la recuperación de la función sistólica sin complicaciones a largo plazo.

**Palabras clave:** Cardiomiopatías; Insuficiencia Cardíaca; Latinoamérica (Fuente: DeCS-BIREME).

## Introduction

Peripartum cardiomyopathy (PPCM) is an increasingly recognized pathology, that may cause severe complications in morbidity and mortality among pregnancy and peripartum.[1] Diagnosis can be challenging because of subtle signs that can evolve to cardiogenic shock.[2] It is essential that the therapeutic approach be promptly started and tailored to the individual patient, considering ethnicity and available resources.

## Case report

A 31-year-old Latin woman with a medical history of recent twin pregnancy achieved through in vitro fertilization, hypothyroidism, chronic venous insufficiency, and family history of non-ischemic dilated cardiomyopathy presented to the emergency department on the ninth day postpartum. She complained of dyspnea on exertion, orthopnea, and lower limb edema for three days prior to admission. Physical examination revealed a blood pressure of 100/70 mmHg, a respiratory rate of 23 breaths/min, a regular heart rate of 110 beats/min, and oxygen saturation of 96% (room air). Cardiac auscultation was unremarkable except for S3, while lung examination revealed diminished breath sounds at the bases and crackles.

Laboratory tests showed mild anemia, normal coagulation parameters, normal kidney function, significantly elevated brain natriuretic peptide levels of 10,200 pg/mL, and a slightly elevated troponin I level of 0.05 ug/L (normal range: 0-0.03 ug/L). The chest X-ray demonstrated cardiomegaly, vascular congestion, interstitial edema and bilateral pleural effusion **(Figure 1)**. The electrocardiogram (ECG) showed sinus tachycardia and left atrial dilatation without any other significant findings **(Figure 2)**.

Given the clinical presentation and recent pregnancy, a diagnosis of probable PPCM was made. The echocardiogram on admission confirmed severely reduced left ventricular ejection fraction (LVEF) of 20% with global hypokinesia, mild secondary mitral regurgitation, mild left atrial dilation, and laminar pericardial effusion. **(Video 1)** Other cardiac structures appeared normal. Additional investigations, including autoimmune, infectious, and

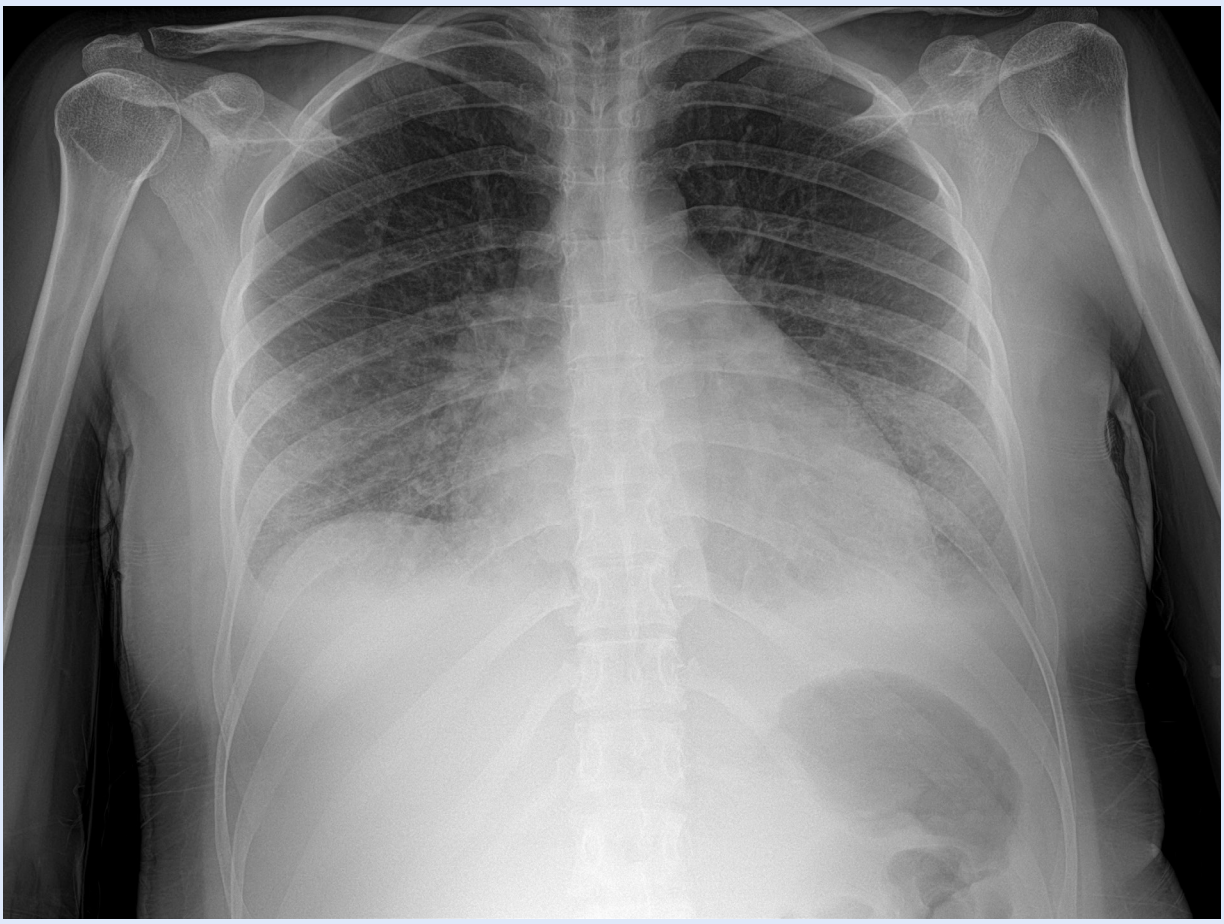

**Figure 1.** Chest X-ray upon emergency admission. Chest X-ray, anteroposterior view showing cardiomegaly, increased pulmonary vasculature, interstitial edema and bilateral pleural effusion.


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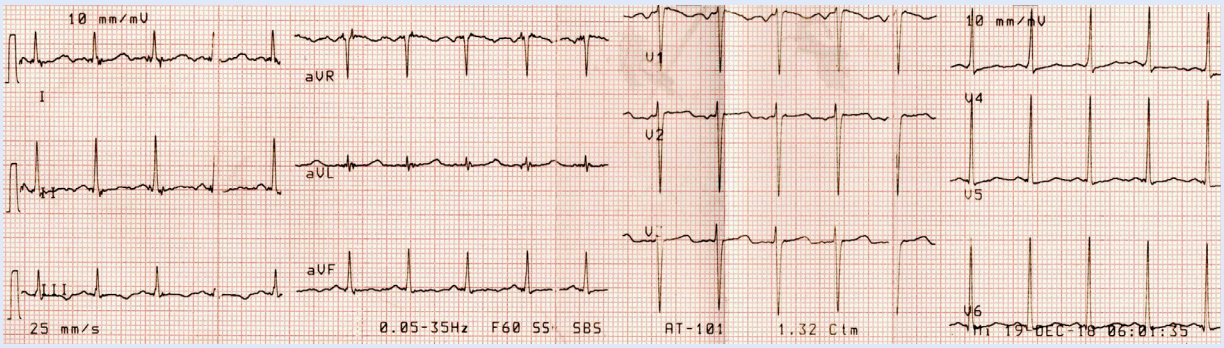


**Figure 2.** Electrocardiogram upon emergency admission. A 12-lead electrocardiogram showing sinus tachycardia and left atrial enlargement.

metabolic studies. were unremarkable. Genetic testing could not be performed due to institutional unavailability.

The patient was admitted to the cardiac intensive care unit due to hemodynamic compromise, exhibiting a blood pressure of 90/60 mmHg, a heart rate of 150 beats per minute, and a lactate level of 2.5 mmol/L. Norepinephrine and levosimendan were administered intravenously for 48 hours to support the patient's hemodynamics. Invasive ventilatory support was not required during this period. She showed clinical improvement and, on the 14th day of hospitalization, was discharged on a medication regimen comprising bromocriptine (2.5 mg twice daily for 2 weeks, then 2.5 mg once daily per 6 weeks), warfarin (5 mg once daily per 6 weeks), bisoprolol (1.25 mg once daily), spironolactone (25 mg once daily), and captopril (6.25 mg twice daily).

A cardiovascular magnetic resonance (CMR) study was performed five weeks later (due to the immediate unavailability of the scan at our facility). The CMR revealed a preserved LVEF of 57%, no evidence of myocardial scarring or edema **(Figure 3)**, and normal LV chamber dimensions **(Video 2)**. A follow-up echocardiogram three months after discharge revealed an improved LVEF of 60%.

The long-term management consisted in medical therapy with spironolactone 25 mg once daily, bisoprolol 2.5 mg daily, and enalapril 5 mg daily (initially started on captopril but later transitioned to enalapril) that were prescribed during the first year after LV recovery. From the second year onwards, only beta-blocker therapy (bisoprolol 2.5 mg daily) was continued for an additional year, while spironolactone and enalapril were discontinued without down-titration. Echocardiographic monitoring, performed quarterly in the first year and annually thereafter, showed sustained normal LV systolic function. Additionally, contraceptive counseling was provided to prevent future pregnancies, as the patient refused to use contraceptives. Remarkably, during the follow-up period, the patient remained pregnancy-free for the past four years since hospital discharge and did not necessitate any readmissions related to heart failure.

## Discussion

PPCM is a rare yet potentially devastating condition that manifests towards the end of pregnancy or in the months following childbirth, miscarriage, or spontaneous abortion-primarily within the first month after delivery, though it can occur up to 5 months postpartum. It is characterized by heart failure resulting from ventricular dysfunction, accompanied by a reduced ejection fraction below 45% (sometimes ranging from 45% to 50%), with or without ventricular dilation. There is no evidence of other potential etiologies for heart failure in these cases. Notably, PPCM shows higher recovery rates than other reduced LVEF heart failures, typically within 6 months.[1-3]

In the context of a pregnant or puerperal patient presenting with heart failure symptoms, several differential diagnoses need to be considered. The absence of a recent viral infection, the lack of specific findings in the CMR, and the negative results in autoimmune, infectious, and metabolic studies ruled out myocarditis. Takotsubo syndrome is associated with acute chest pain and a highly stressful labor for the mother. Our patient had a programmed cesarean section because of a twin pregnancy. Her echocardiography did not reveal a typical pattern of wall motion abnormality, but global hypokinesia. Pulmonary thromboembolism or amniotic fluid embolism would have been suspected in the context of precordial pain and acute dyspnea, frequently associated with deep vein thrombosis or complicated labor; moreover, her echocardiogram was negative for right ventricular dysfunction or dilatation. Acute myocardial infarction may manifest with chest or epigastric pain during pregnancy or shortly after delivery. This condition is often associated with coronary spontaneous dissection, elevated troponin levels, ischemic changes of ECG, impaired myocardial motion, and the presence of an ischemic scar on CMR. The diagnosis of PPCM was made based on the exclusion of the previous diagnosis and confirmed with a CMR with no

evidence of late gadolinium enhancement, edema, scarring and a recovered ejection fraction.[1,2]

PPCM has been observed to be more prevalent in pregnant women at the extremes of maternal age.[4,5] Additionally, multiple gestational pregnancies resulting from assisted reproduction techniques are associated with an increased risk of PPCM.[4] The involvement of specific immune responses, possibly triggered by viral infections, has also been described.[1] Other risk factors include arterial hypertension, anemia, substances abuse, asthma, autoimmune diseases, obesity, prolonged tocolysis, and hypothyroidism.[4]

In pregnant women experiencing acute heart failure in the setting of PPCM, it is crucial to manage volume overload and provide necessary respiratory support, including intravenous diuretics and oxygen supplementation. Although current recommendations for acute heart failure in the setting of PPCM are based on clinical experience, we have recent data that provides guidance for cardiopulmonary instability.[6] In cases of cardiogenic shock or the need for inotropic support, beta-adrenergic receptor agonist drugs like dobutamine should be avoided due to their potential harmful effects on heart failure progression.[7] Instead, norepinephrine is indicated, and levosimendan may be used to rapidly improve hemodynamics and LVEF.[8]

Bromocriptine, a dopamine D2 agonist and prolactin production inhibitor, has shown promise in the treatment of PPCM. Its mechanism of action involves inhibiting the formation

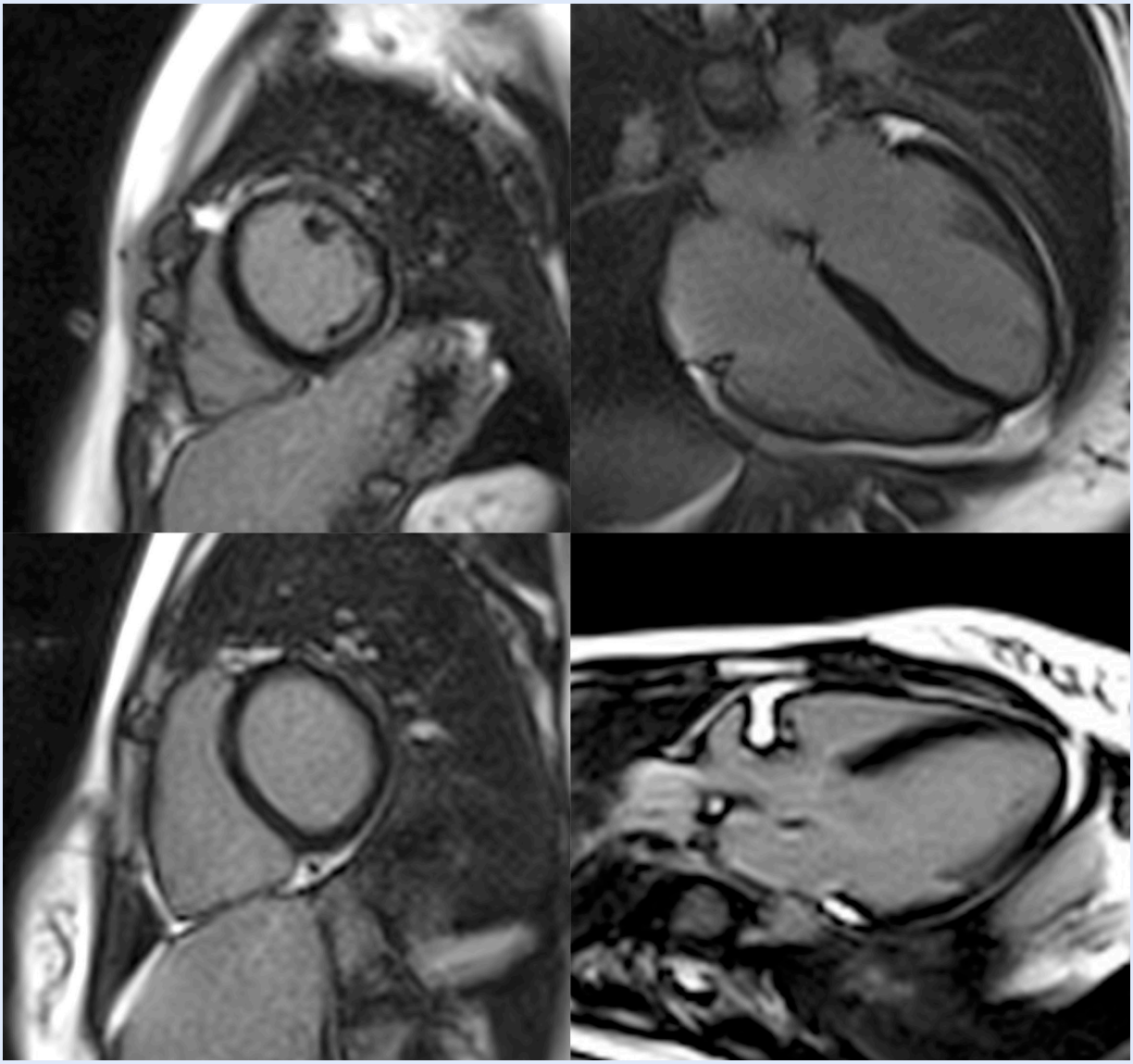

**Figure 3.** Cardiac MRI five weeks after admission. Late gadolinium enhancement images in short-axis, 4-chamber and 3-chamber views demonstrate no evidence of fibrosis.

of vasculotoxic and proapoptotic subfragments of prolactin, which may contribute to the development of PPCM.[1,2] Studies have demonstrated improvement in LVEF with bromocriptine therapy.[9-11] Therefore, the European guidelines suggest that bromocriptine could be considered as a treatment option for PPCM patients (class IIB recommendation).[12] It should be noted that the generalizability of study findings to the Latin American population is limited due to the predominantly black and white racial compositions of the study populations.[9,10,13] Although there is a single study including Hispanic patients, they represent only 1% of the total study population.[13]

Beyond heart failure medication and bromocriptine's positive impact on ejection fraction recovery, several sociodemographic, clinical, and imaging findings can predict recovery. Recent studies have explored quantitative tissue characteristics as predictive tools, including T1 and T2 mapping and extracellular volume (ECV), with an ECV cutoff of 32.5% showing promising results (area under curve 0.83, sensitivity 81.8%, specificity 90.0%). However, larger prospective studies are needed for broader population extrapolation [14]. Additionally, a prognostic model developed from European, Asian, and African registries predicts 6-month LV recovery using a simple integer score that includes baseline LVEF, baseline LV end-diastolic diameter, Human Development Index, symptom duration, QRS duration, and pre-eclampsia. While the model showed good calibration and discrimination (C-statistic 0.79, 95% CI 0.74-0.83), it lacks external validation and cannot predict LV recovery after subsequent pregnancies.[15] Despite using simplified integer scores rather than original coefficients, it remains practical and user-friendly. Our patient scored 8 points, suggesting an 83% predicted recovery probability, though ECV and mapping data were unavailable at our institution.

Given PPCM's higher risk of cardioembolic events, due to both pregnancy-related hypercoagulability in the early postpartum period and bromocriptine use (primarily at higher doses), anticoagulation with heparin should be used at minimum prophylactic doses.[12] However, therapeutic anticoagulation with heparin is indicated in acute PPCM patients with severely reduced LV systolic function (LVEF ≤35%).[16] Although our patient met both indications for anticoagulation, therapeutic warfarin was chosen instead (as PPCM occurred postpartum with no teratogenicity risk) and maintained throughout the bromocriptine treatment period. Anticoagulation was later discontinued based on follow-up echocardiogram findings.

A 6% co-occurrence with idiopathic dilated cardiomyopathy has been reported in PPCM, suggesting genetic links.[17] Truncating variants, found in 15% of cases, predominantly affect the TTN gene's A-band region—also implicated in idiopathic dilated cardiomyopathy. These TTN variants correlate with lower one-year LVEF, indicating poorer outcomes.[18] While pregnancy and delivery stress may unmask latent dilated cardiomyopathy, over 90% of individuals with TTN truncating variants never develop dilated cardiomyopathy or PPCM, suggesting the involvement of additional factors.[19]

Although our patient's family history of dilated cardiomyopathy warranted genetic testing, institutional unavailability prevented this evaluation—a widespread limitation in our healthcare system that merits addressing to improve comprehensive cardiovascular care.

The patient received counseling regarding the long-term prognosis of PPCM, particularly the risk of recurrence in subsequent pregnancies. Although the multidisciplinary team recommended the use of a contraceptive method, the patient opted not to receive any contraceptive method due to a personal preference. At follow-up, the patient had no pregnancies in the last four years since the discharge from the hospital. In general, international consensus recommends that all patients with PPCM receive contraceptive counseling as soon as the diagnosis is made.[2,20] Among the available methods, hormonal contraceptives with pro-thrombotic risk, such as estrogen-containing oral contraceptives, should be avoided. The most recommended methods are the progestogen-only implant and the progesterone-releasing intrauterine system, although more definitive methods, such as sterilization, may also be considered for either the woman or her partner.[20]

This case highlights the importance of considering PPCM in the differential diagnosis of heart failure in the peripartum period after excluding other etiologies. It also describes the successful use of bromocriptine in facilitating recovery of systolic function without long-term complications.

**Ethical considerations:** The article did not involve the participation of any human beings or animals. However, permission was requested from the ethics committee for the publication of the case, and it was granted.

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### Authors' contributions

**JTV:** conceptualization, investigation, writing - original draft, writing - review & editing. **GZC:** investigation, writing - original draft. **JSCH:** writing - original draft, writing - review & editing. **KAR:** investigation, writing - original draft. **CDA:** writing - original draft, writing - review & editing.

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