

# Regional Anaesthesia for Caesarean Delivery in Peripartum Cardiomyopathy with Severe Left Ventricular Dysfunction: A Case Report

Dr. Suddapalli Shaik Mohammad Abubakar<sup>1</sup>, Dr. Ganesan D<sup>2</sup>, Dr. Allaboyina Ragini<sup>3</sup>, Dr. Vineethan Vivekanandan<sup>4</sup>, Dr. Neenu B S<sup>5</sup>, Dr. Thoufic Abdullah R<sup>6</sup>

<sup>1</sup>Postgraduate Resident, Department of Anesthesia and Critical Care, Government Medical College, Srinagar  
Email: [abubakar82590@gmail.com](mailto:abubakar82590@gmail.com)

<sup>2</sup>Postgraduate Resident, Department of Anesthesia, Government Medical College, Srinagar  
Email: [ganesand26297@gmail.com](mailto:ganesand26297@gmail.com)

<sup>3</sup>Postgraduate Resident, Government Medical College, Srinagar  
Email: [raginiyadav004@gmail.com](mailto:raginiyadav004@gmail.com)

<sup>4</sup>Postgraduate Resident, Department of Anesthesia, Government Medical College, Srinagar  
Email: [vineethanraahul@gmail.com](mailto:vineethanraahul@gmail.com)

<sup>5</sup>Postgraduate Resident, Department of Anaesthesiology, Government Medical College, Srinagar  
Email: [neenusuresh11@gmail.com](mailto:neenusuresh11@gmail.com)

<sup>6</sup>Postgraduate Resident, Department of Anesthesiology, Critical Care Medicine & Pain Medicine, Government Medical College, Srinagar  
Email: [thouficdoctor@gmail.com](mailto:thouficdoctor@gmail.com)

Received: 25th Aug, 2026 | Revised: 1st Sep, 2026 | Accepted: 5th Sep, 2026 | Available Online: 15th Sep, 2026

## ABSTRACT

**Background:** Peripartum cardiomyopathy is an uncommon, potentially fatal form of heart failure that develops in late pregnancy or the early postpartum period without an identifiable cause. Anaesthetic management for caesarean delivery in affected women is contentious, since general anaesthesia carries risks of myocardial depression and haemodynamic surges, whereas regional techniques must be carefully titrated to avoid abrupt sympathetic blockade in a heart with limited reserve.

**Case presentation:** A 32-year-old woman, gravida 3 para 2 live 2, presented at 37 weeks of gestation with progressive dyspnoea, orthopnoea and peripheral oedema. Echocardiography revealed a dilated left ventricle with an ejection fraction of 32 to 35 percent, confirming peripartum cardiomyopathy. After haemodynamic optimisation, she underwent caesarean section under combined spinal-epidural anaesthesia and remained haemodynamically stable throughout surgery and recovery.

**Conclusion:** Judiciously titrated regional anaesthesia, supported by multidisciplinary planning, is a safe and effective strategy for caesarean delivery in peripartum cardiomyopathy and should be favoured over general anaesthesia whenever feasible.

**Keywords:** *Peripartum cardiomyopathy; Combined spinal-epidural anaesthesia; Caesarean section; Heart failure; Regional anaesthesia*

**How to cite this article:** Suddapalli Shaik Mohammad Abubakar<sup>1</sup> Dr. Ganesan D<sup>2</sup> Dr. Allaboyina Ragini<sup>3</sup> Dr. Vineethan Vivekanandan<sup>4</sup> Dr. Neenu B S<sup>5</sup> Dr. Thoufic Abdullah R<sup>6</sup>. Regional Anaesthesia for Caesarean Delivery in Peripartum Cardiomyopathy with Severe Left Ventricular Dysfunction: A Case Report. Int J Drug Deliv Technol. 2026;16(83s):470-473. DOI: 10.25258/ijddt.16.83s.52.

## INTRODUCTION

Peripartum cardiomyopathy is a rare, idiopathic form of dilated cardiomyopathy that presents with new-onset left ventricular systolic dysfunction toward the end of pregnancy or within the first months after delivery, in a woman without previously recognised heart disease and without another identifiable cause of heart failure [1,2]. Although uncommon, its clinical burden is disproportionate to its incidence. Peripartum cardiomyopathy remains among the leading causes of pregnancy-associated cardiac mortality worldwide, with case fatality rates ranging from a few percent in

high-resource settings to considerably higher figures in under-resourced regions [1,3].

The diagnosis rests on a combination of clinical and echocardiographic criteria. The original National Heart, Lung, and Blood Institute definition required onset of heart failure in the last month of pregnancy or within five months of delivery, absence of a determinable cause, absence of recognisable heart disease before the last month of pregnancy, and echocardiographic evidence of left ventricular dysfunction, typically an ejection fraction below 45 percent or fractional shortening below 30 percent with

an end-diastolic dimension exceeding 2.7 cm per square metre [4]. Subsequent position statements from the Heart Failure Association of the European Society of Cardiology have broadened the temporal window to include the final trimester and up to six months postpartum, while retaining the requirement for exclusion of alternative aetiologies [5].

The pathophysiology of peripartum cardiomyopathy is incompletely understood but converges on an anti-angiogenic, pro-apoptotic state driven by a cleaved 16 kDa prolactin fragment, oxidative stress and impaired vascular endothelial growth factor signalling, an axis that is amplified by pre-eclampsia and other angiogenic-imbalance disorders of pregnancy [6]. Recognised risk factors include multiparity, advanced maternal age, multifetal gestation, African ancestry, and hypertensive disorders of pregnancy, the last of which was present in the patient described in this report [1,3].

Beyond the diagnostic and therapeutic complexity of the disease itself, delivery poses a distinct challenge, because the anaesthetic technique chosen for caesarean section directly influences ventricular loading conditions in a heart with minimal contractile reserve. This report describes a case of peripartum cardiomyopathy with markedly reduced ejection fraction managed successfully with combined spinal-epidural anaesthesia for caesarean delivery, and discusses the physiological rationale underlying the preference for regional over general anaesthesia in this population, incorporating recent literature to critically evaluate the evidence base.

### CASE PRESENTATION

A 32-year-old woman, gravida 3 para 2 live 2 (G3P2L2), presented at 37 weeks of gestation with a six-day history of progressively worsening breathlessness, paroxysmal nocturnal dyspnoea, orthopnoea and bilateral pedal oedema. Her two previous pregnancies had been uneventful and had culminated in unassisted vaginal deliveries. She had a documented history of gestational hypertension under treatment in the index pregnancy but no prior cardiac illness, no known structural heart disease, and no family history of cardiomyopathy or sudden cardiac death. She denied tobacco, alcohol or illicit substance use.

On examination she was conscious, oriented and afebrile, with a pulse rate of 82 beats per minute, blood pressure of 140/90 mmHg, respiratory rate of 16 breaths per minute, and peripheral oxygen saturation of 93 percent on room air. Jugular venous pressure was not elevated. Bibasal coarse crackles were audible on chest auscultation, and a pansystolic murmur was noted on cardiac examination. Arterial blood gas analysis revealed a respiratory alkalosis with mild hypoxaemia. The electrocardiogram showed sinus

tachycardia, and chest radiography demonstrated cardiomegaly.

Laboratory investigations showed a haemoglobin of 9.4 g/dl, a platelet count of 1.2 lakh per microlitre, random blood glucose of 92 mg/dl, and renal function, liver function and serum electrolyte panels within normal limits.

Transthoracic echocardiography confirmed the diagnosis of peripartum cardiomyopathy: left ventricular ejection fraction of 32 to 35 percent, mild global hypokinesia, mild left ventricular systolic dysfunction, mild-to-moderate mitral regurgitation, pulmonary arterial hypertension, and a dilated left ventricle with an end-diastolic diameter of 81 mm, without aortic stenosis or regurgitation. These findings satisfied both the traditional clinical criteria and the echocardiographic criteria for the diagnosis.

The patient was started on a labetalol infusion for blood pressure control and oral furosemide 20 mg twice daily for decongestion. Following a period of haemodynamic optimisation and multidisciplinary discussion involving anaesthesiology, cardiology and obstetrics, she was posted for lower segment caesarean section. Anaesthesia was provided using a combined spinal-epidural technique. Intraoperatively, the patient remained haemodynamically stable throughout the procedure, and a live baby was delivered. She was subsequently transferred to the intensive care unit for continuous haemodynamic monitoring, remained stable over the following 24 hours, and was then shifted back to the postnatal ward in stable condition.

### DISCUSSION

The management of peripartum cardiomyopathy presenting near term for caesarean delivery sits at the intersection of obstetric urgency, cardiac physiological fragility and anaesthetic risk stratification, and this case illustrates several points of broader clinical relevance.

First, diagnostic vigilance is paramount because the presenting symptoms of peripartum cardiomyopathy, namely dyspnoea, fatigue and dependent oedema, overlap substantially with the physiological changes of normal late pregnancy, which routinely delays recognition [2,3]. In this patient, the combination of orthopnoea, paroxysmal nocturnal dyspnoea, bibasal crackles, hypoxaemia and radiographic cardiomegaly should prompt early echocardiographic evaluation rather than attribution to simple pregnancy-related breathlessness. The presence of gestational hypertension is noteworthy, since hypertensive disorders of pregnancy, particularly pre-eclampsia, are established risk factors for peripartum cardiomyopathy and are thought to share an overlapping angiogenic-imbalance pathophysiology [1,6].

Second, the anaesthetic decision for caesarean delivery in peripartum cardiomyopathy remains an area of ongoing debate, without a single technique proven superior in controlled trials, given the rarity of the condition and the impracticality of randomised comparison [7]. General anaesthesia exposes the parturient to the haemodynamic surge of laryngoscopy and intubation, the direct negative inotropic effects of volatile agents, and depression of neonatal respiratory drive, all of which are poorly tolerated by a ventricle already operating close to the limit of its contractile reserve [7,8]. Regional anaesthesia, by contrast, produces controlled peripheral vasodilatation that reduces both preload and afterload, avoids airway instrumentation, allows the mother to remain awake for early bonding, and permits titration of block height and speed of onset, particularly with epidural or combined spinal-epidural approaches [7].

The principal hazard of neuraxial anaesthesia in this setting is not the technique itself but the speed and magnitude of the sympathetic blockade it produces. A single-shot spinal anaesthetic can cause an abrupt fall in systemic vascular resistance that a hypokinetic, dilated ventricle cannot immediately compensate for through increased stroke volume, risking profound hypotension and cardiovascular decompensation [8,9]. This concern has led to a preference in the literature for techniques that allow incremental titration, namely continuous epidural anaesthesia, low-dose sequential combined spinal-epidural anaesthesia, or combined spinal-epidural anaesthesia supplemented by epidural volume extension, in which a reduced intrathecal dose of local anaesthetic is followed by an epidural bolus of saline or dilute local anaesthetic to extend the block gradually while limiting the sympathectomy associated with a full-dose spinal injection [9,10]. Case reports and small case series employing combined spinal-epidural or epidural volume extension techniques in peripartum cardiomyopathy and other forms of severe ventricular dysfunction have consistently described stable intraoperative haemodynamics and favourable maternal and neonatal outcomes [8,9,10,11], a pattern corroborated by the present case, in which combined spinal-epidural anaesthesia achieved adequate surgical anaesthesia without haemodynamic compromise.

Third, the 2018 European Society of Cardiology guidelines on cardiovascular disease in pregnancy recommend that delivery planning in women with cardiomyopathy be undertaken by a dedicated pregnancy heart team, with vaginal delivery preferred in haemodynamically stable patients and caesarean delivery reserved for obstetric indications or haemodynamic instability [12,13]. In the present case, caesarean delivery under regional anaesthesia represented a pragmatic strategy, allowing controlled,

monitored delivery in a patient with significant ventricular dysfunction while avoiding the additional physiological stress of prolonged labour.

Fourth, disease-modifying pharmacotherapy for peripartum cardiomyopathy continues to evolve. Bromocriptine, a dopamine D2 receptor agonist that suppresses the pro-apoptotic 16 kDa prolactin fragment implicated in disease pathogenesis, showed promise in an earlier multicentre randomised trial and, more recently, in a large European registry analysis in which bromocriptine-treated patients had a lower composite rate of death, readmission or persistent severe left ventricular dysfunction at six months compared with standard care alone [14,15]. A 2025 meta-analysis with trial sequential analysis similarly found that adjunctive bromocriptine improved left ventricular ejection fraction and remodelling, although the authors cautioned that the evidence remains suggestive rather than conclusive pending adequately powered randomised confirmation [16]. The patient in this report was managed with guideline-directed heart failure therapy comprising a beta-blocker and a loop diuretic; bromocriptine was not administered, consistent with the continuing lack of consensus regarding its routine use, particularly in mothers intending to breastfeed [12,15].

Finally, this case reinforces the importance of a structured, multidisciplinary approach spanning antenatal recognition, pharmacological optimisation, anaesthetic technique selection and postoperative critical care monitoring. Early involvement of cardiology and anaesthesiology, together with individualised choice of a titratable regional technique, appears central to achieving the favourable maternal and fetal outcomes increasingly reported in the contemporary literature on peripartum cardiomyopathy [1,17].

## CONCLUSION

Peripartum cardiomyopathy presenting near term for caesarean delivery demands early recognition, given its symptomatic overlap with normal pregnancy, and a carefully individualised anaesthetic plan. In this patient with an ejection fraction of 32 to 35 percent, combined spinal-epidural anaesthesia provided stable intraoperative haemodynamics and a favourable maternal and neonatal outcome, supporting a growing body of evidence that judiciously titrated regional anaesthesia is preferable to general anaesthesia in this population. Multidisciplinary planning involving obstetrics, cardiology and anaesthesiology, together with haemodynamic optimisation before delivery and close postoperative monitoring, remains the cornerstone of safe management. Wider adoption of titratable neuraxial techniques, alongside continued evaluation of disease-modifying therapies such as bromocriptine, should be prioritised to further improve

outcomes in this rare but high-stakes obstetric emergency.

## REFERENCES

1. Sigauke FR, Ntsinjana H, Tsabedze N. Peripartum cardiomyopathy: a comprehensive and contemporary review. *Heart Fail Rev*. 2024;29(6):1261-1278.
2. Koziol KJ, Aronow WS, Giuliani E, Nunziata A. Peripartum cardiomyopathy: current understanding of pathophysiology, diagnostic workup, management, and outcomes. *Curr Probl Cardiol*. 2023;48(8):101716.
3. Carlson S, Schultz J, Ramu B, Davis MB. Peripartum cardiomyopathy: risks, diagnosis and management. *J Multidiscip Healthc*. 2023;16:1249-1258.
4. Pearson GD, Veille JC, Rahimtoola S, Hsia J, Oakley CM, Hosenpud JD, et al. Peripartum cardiomyopathy: National Heart, Lung, and Blood Institute and Office of Rare Diseases (National Institutes of Health) workshop recommendations and review. *JAMA*. 2000;283(9):1183-1188.
5. Bauersachs J, König T, van der Meer P, Petrie MC, Hilfiker-Kleiner D, Mbakwem A, et al. Pathophysiology, diagnosis and management of peripartum cardiomyopathy: a position statement from the Heart Failure Association of the European Society of Cardiology Study Group on peripartum cardiomyopathy. *Eur J Heart Fail*. 2019;21(7):827-843.
6. Sliwa K, Bauersachs J, Arany Z, Spracklen TF, Hilfiker-Kleiner D. Peripartum cardiomyopathy: from genetics to management. *Eur Heart J*. 2021;42(32):3094-3102.
7. Nayak A, Ninave S, Tayade S, Tayade H. Anesthetic management in peripartum cardiomyopathy: a contemporary review. *Cureus*. 2022;14(12):e33159.
8. Shnaider R, Ezri T, Szmuk P, Larson S, Warters RD, Katz J. Combined spinal-epidural anesthesia for cesarean section in a patient with peripartum dilated cardiomyopathy. *Can J Anaesth*. 2001;48(7):681-683.
9. Tiwari AK, Agrawal J, Tayal S, Chadha M, Singla A, Valson G, et al. Anesthetic management of peripartum cardiomyopathy using "epidural volume extension" technique: a case series. *Ann Card Anaesth*. 2012;15(1):44-46.
10. Kawamoto Y, Nishihara T, Aono J, Nandate H, Hamada T, Yasuoka T, et al. Perioperative management of emergent cesarean section in a patient with peripartum cardiomyopathy and orthopnea: a case report. *J Int Med Res*. 2021;49(12):3000605211063077.
11. Almeida CR, Vieira LS, Cunha P, Gomes A. Low-dose spinal block combined with epidural volume extension in a high-risk cardiac patient: a case-based systematic literature review. *Saudi J Anaesth*. 2022;16(4):383-389.
12. Regitz-Zagrosek V, Roos-Hesselink JW, Bauersachs J, Blomstrom-Lundqvist C, Cifkova R, De Bonis M, et al. 2018 ESC Guidelines for the management of cardiovascular diseases during pregnancy. *Eur Heart J*. 2018;39(34):3165-3241.
13. Lang IM. What is new in the 2018 ESC guidelines for the management of cardiovascular diseases during pregnancy? *Wien Klin Wochenschr*. 2019;131(23-24):624-628.
14. Haghighia A, Podewski E, Berliner D, Sonnenschein K, Fischer D, Angermann CE, et al. Bromocriptine for the treatment of peripartum cardiomyopathy: a multicentre randomized study. *Eur Heart J*. 2017;38(35):2671-2679.
15. van der Meer P, van Essen BJ, Viljoen C, Böhm M, Jackson A, Hilfiker-Kleiner D, et al. Bromocriptine treatment and outcomes in peripartum cardiomyopathy: the EORP PPCM registry. *Eur Heart J*. 2025;46(11):1017-1027.
16. Adamu UG, Mojela K, Karaye KM, Tsabedze N. Bromocriptine in peripartum cardiomyopathy: a meta-analysis with trial sequential analysis. *ESC Heart Fail*. 2025;12(6):4041-4054.
17. Davis MB, Arany Z, McNamara DM, Goland S, Elkayam U. Peripartum cardiomyopathy: JACC state-of-the-art review. *J Am Coll Cardiol*. 2020;75(2):207-221.