(International Print/Online Journal)

SJIF IMPACT FACTOR: 6.829
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 9, Issue 4, Page No: 114-117
July-August 2026

IJMSCR

Triple Challenge in Obstetric Anesthesia: Peripartum Cardiomyopathy, Nephrotic Syndrome, and Difficult Airway

***Corresponding Author:**
Dr. Jithisha S L
DNB Resident, Department of Anesthesia
Daya General Hospital Ltd, Viyyur, Thrissur

***Co-Author:**
Dr Rohini K P
Head of Department, Department of Anesthesia
Daya General Hospital Ltd, Viyyur, Thrissur

Dr Karthika
Senior Consultant, Department of Obstetrics and Gynecology
Daya General Hospital Ltd, Viyyur, Thrissur

Type of Publication: Original Case Report
Conflicts of Interest: Nil

Abstract

Peripartum cardiomyopathy (PPCM) is a rare but potentially life-threatening cause of heart failure occurring toward the end of pregnancy or in the months following delivery [1]. Nephrotic syndrome during pregnancy further complicates management due to fluid overload, hypoalbuminemia, thromboembolic risk and altered pharmacokinetics [2]. Difficult airway in obstetric patients adds another layer of anesthetic complexity. We report the perioperative management of a parturient with nephrotic syndrome who developed PPCM and presented with a difficult airway requiring caesarean delivery [3]. Multidisciplinary planning, meticulous hemodynamic monitoring, and airway preparedness contributed to a favourable maternal outcome.

Keywords: Peripartum cardiomyopathy, nephrotic syndrome, difficult airway, caesarean section, obstetric anesthesia

Introduction

Peripartum cardiomyopathy is characterized by the development of heart failure in the last month of pregnancy or 5 months after delivery, with absence of an identifiable cause of cardiac failure, absence of recognizable heart disease prior to last month of pregnancy and with reduced left ventricular systolic function. The coexistence of nephrotic syndrome may exacerbate fluid retention and cardiovascular compromise. Obstetric airway management is inherently challenging due to pregnancy-related airway edema, weight gain, and reduced functional residual capacity. We describe a unique case involving the coexistence of PPCM, nephrotic syndrome, and difficult airway, highlighting the anesthetic considerations and perioperative management.

Case Presentation

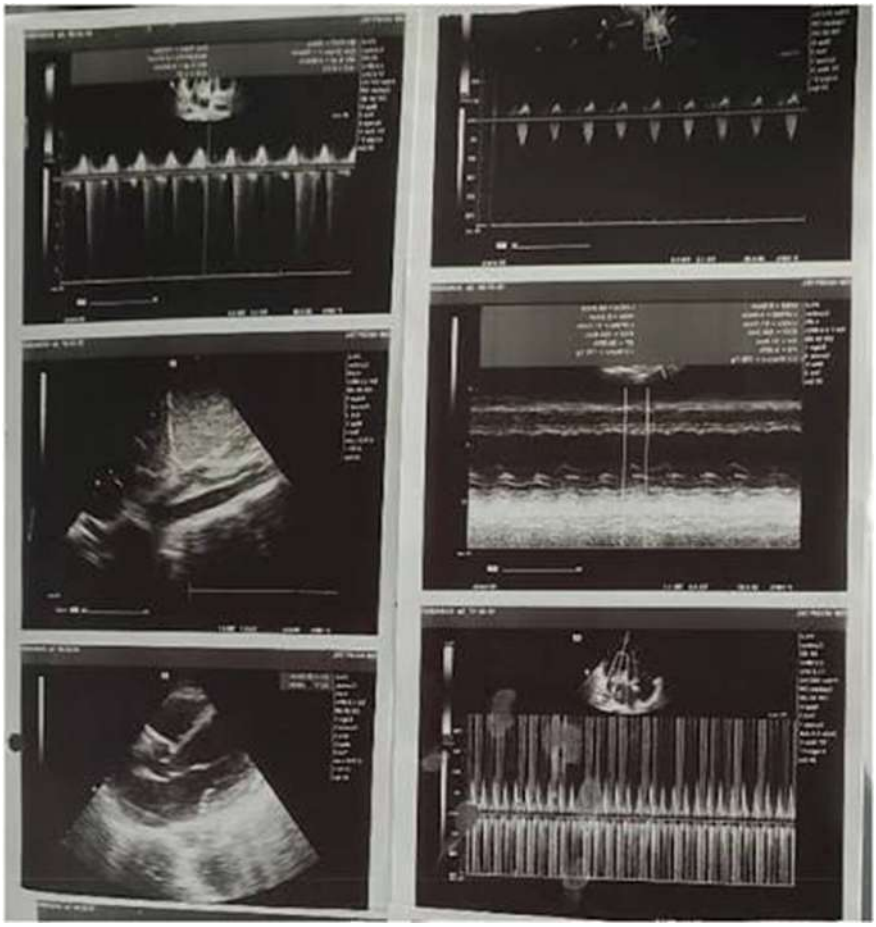
A 24-year-old primigravida at 34 weeks of gestation with a known history of gestational diabetes mellitus on OHA and adult onset nephrotic syndrome on steroids, presented with progressive dyspnea, orthopnea and lower limb edema. On examination, blood pressure was 120/70 mmHg, heart rate 130 beats/min, respiratory rate 20 breaths/min, and oxygen

saturation 95% on room air. The patient had a body weight of 77 kg as documented two days prior and was noted to have short stature. The patient was administered a complete course of antenatal corticosteroids (inj. betamethasone 12 mg intramuscularly, two doses 24 hours apart) before delivery to enhance fetal lung maturity due to the anticipated risk of preterm birth.

Laboratory investigations revealed:

1. Hemoglobin: 14 g/dL
2. Serum albumin: 3.4 g/dL
3. Urinary albumin: 2+
4. Complement 3: 178.2 mg/dL
5. Serum creatinine: 0.35mg/dL
6. Pre-operative GRBS: 99mg/dL

Echocardiography revealed global left ventricular hypokinesia with an ejection fraction of 40%, Mild MR consistent with peripartum cardiomyopathy.



Echocardiography: showing global hypokinesia

Airway assessment revealed Mallampati grade III, limited mouth opening, reduced thyromental distance, limited neck extension, crowded dentition and anticipated difficult mask ventilation and intubation. Given maternal cardiac status and obstetric indication for delivery, cesarean section was planned. A multidisciplinary team comprising obstetricians, cardiologists, anesthesiologists, critical care team and neonatologists formulated a management plan.

Preoperatively, a difficult airway cart was prepared with videolaryngoscope, fiberoptic bronchoscope, supraglottic airway devices, and emergency front-of-neck access equipment. Standard ASA monitors were established. In view of the patient's stable hemodynamic status, CVP monitoring was deferred, with the option to institute it if clinically indicated based on intraoperative or postoperative hemodynamic changes. Preoxygenation was performed with 100% oxygen for 5 minutes prior to induction of anesthesia.

Premedication included Inj Hydrocort 12.5mg IV along with standard aspiration prophylaxis and antiemetic agents before induction of anesthesia.

Volume 9, Issue 4; July-August 2026; Page No 114-117

Rapid sequence induction was performed using Inj Etomidate 0.2-0.3mg/kg IV followed by Inj Rocuronium 0.6mg/kg IV.

Considering the anticipated difficult airway and possible airway edema secondary to nephrotic syndrome, laryngoscopy was performed gently to minimize sympathetic stimulation. Endotracheal intubation was successfully performed using video laryngoscopy in a single attempt. Vasopressors such as phenylephrine (50–100 µg boluses) or norepinephrine infusion were kept ready to manage peri-intubation hypotension while maintaining coronary perfusion.

Anesthesia was maintained with a 50:50 mixture of oxygen and nitrous oxide until delivery of the baby. Following delivery, Isoflurane was introduced, and its concentration was titrated according to the patient's hemodynamic response and anesthetic requirements. Intraoperative neuromuscular blockade was maintained with Inj Rocuronium IV in incremental doses of 0.1–0.2 mg/kg, titrated according to surgical requirements. Fluid administration was restricted and guided by hemodynamic monitoring to avoid worsening heart failure and pulmonary edema. Lung-protective ventilation strategies were employed throughout the procedure.

Intraoperative hemodynamics remained stable. A live male infant was delivered, weighing 2.3kg, with Apgar scores of 9 and 10 at 1 and 5 minutes, respectively, and was handed over to the neonatology team in stable condition. At the end of surgery, neuromuscular blockade was reversed with Inj Sugammadex IV 2 mg/kg. The patient was extubated when fully awake after fulfilling standard extubation criteria and remained comfortable and hemodynamically stable.

Postoperatively, the patient was monitored in the intensive care unit. The critical care team performed bedside echocardiography and IVC assessment, along with lung ultrasonography, which demonstrated stable cardiac status and no evidence of pulmonary edema. Urine output was maintained intraoperatively and postoperatively at approximately 1 mL/kg/hour. Heart failure management included diuretics, afterload reduction, and guideline-directed medical therapy as appropriate. Maternal recovery was satisfactory, and follow-up echocardiography demonstrated improved dysfunction.

Discussion

The coexistence of PPCM and nephrotic syndrome poses significant challenges. Both conditions contribute to edema and volume overload, making fluid management difficult. Hypoalbuminemia associated with nephrotic syndrome may worsen pulmonary edema and alter drug distribution.

Airway management was complicated by pregnancy-related airway edema and generalized edema associated with nephrotic syndrome. Preparation for failed intubation and availability of advanced airway devices were critical components of management.

The anesthetic goals included:

1. Avoidance of myocardial depression.
2. Maintenance of stable preload and afterload.
3. Prevention of fluid overload.
4. Optimization of oxygenation.
5. Preparedness for difficult airway management.

In the present case, advanced airway planning played a pivotal role in successful management. Availability of a difficult airway cart, videolaryngoscope, supraglottic airway devices, and backup airway rescue techniques were crucial. Videolaryngoscopy has emerged as an important tool in anticipated difficult airway management because it improves glottic visualization, increases first-pass success rates, and reduces airway trauma compared with conventional direct laryngoscopy. Minimizing the number of intubation attempts is particularly important in patients with limited cardiopulmonary reserve.

Drug selection should focus on cardiovascular stability. Etomidate remains an attractive induction agent in patients with severe ventricular dysfunction because of its minimal effects on myocardial contractility and systemic vascular resistance. Although cisatracurium is generally associated with minimal hemodynamic effects, its use was considered less suitable in this case due to concern for tachycardia and its potential detrimental impact, and rocuronium was therefore chosen as the preferred agent for rapid sequence induction owing to its rapid onset and the availability of rapid, predictable reversal with sugammadex, facilitating early and safe extubation. Vasopressor support should be immediately available to treat hypotension while maintaining coronary and end-organ perfusion. Fluid therapy should be individualized and guided by invasive hemodynamic

Volume 9, Issue 4; July-August 2026; Page No 114-117

monitoring and clinical assessment rather than peripheral edema alone.

Conclusion

Peripartum cardiomyopathy in the presence of nephrotic syndrome and difficult airway represents a rare and challenging clinical scenario. The successful outcome in our patient can be attributed to meticulous preoperative evaluation, anticipation of difficult airway, careful selection of anesthetic agents, advanced airway equipment readiness, and vigilant hemodynamic monitoring. This case highlights the importance of a multidisciplinary approach involving anesthesiologists, critical care team, cardiologists, nephrologists, and obstetricians in managing complex patients with concurrent PPCM and nephrotic syndrome [4]. In conclusion, successful airway management requires thorough preparation, utilization of advanced airway devices, and a hemodynamically stable intubation strategy. Individualized anesthetic planning and close perioperative monitoring are essential to minimize morbidity and optimize outcomes in this high-risk patient population.

References

1. Arany, Z.; Elkayam, U. Peripartum Cardiomyopathy. Circulation 2016, 133 (14), 1397–1409. https://doi.org/10.1161/CIRCULATIONAHA.115.020491.
2. Nara, M.; Kaga, H.; Saito, M.; Abe, F.; Saito, A.; Imaizumi, C.; Komatsuda, A.; Wakui, H.; Takahashi, N. Successful Pregnancies in a Patient with Childhood-Onset Steroid-Dependent Nephrotic Syndrome during Rituximab Maintenance Therapy. Intern. Med. 2021, 60 (18), 2985–2989. https://doi.org/10.2169/internalmedicine.6633-20.
3. Davis, M. B.; Arany, Z.; McNamara, D. M.; Goland, S.; Elkayam, U. Peripartum Cardiomyopathy. Journal of the American College of Cardiology 2020, 75 (2), 207–221. https://doi.org/10.1016/j.jacc.2019.11.014.
4. Sigauke, F. R.; Ntsinjana, H.; Tsabedze, N. Peripartum Cardiomyopathy: A Comprehensive and Contemporary Review. Heart Fail Rev 2024, 29 (6), 1261–1278. https://doi.org/10.1007/s10741-024-10435-5.

Volume 9, Issue 4; July-August 2026; Page No 114-117