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DILATED CARDIOMYOPATHY COMPLICATING LATE PREGNANCY: A CASE REPORT

Anaesthesiology

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ABSTRACT

Peripartum cardiomyopathy (PPCM) is a rare condition marked by severe heart dysfunction during late pregnancy or after childbirth. We present the case of a 29-year-old woman undergoing emergency cesarean section who developed sudden respiratory distress post-surgery. On table 2D echo revealed a severely reduced heart function (LVEF 25%), indicating dilated cardiomyopathy. Prompt intervention, including intubation, ventilator support, and medication, led to stabilization. Successful extubation followed, emphasizing the importance of immediate recognition and collaborative care in managing PPCM in obstetric settings.

KEYWORDS

Case Report, Emergency Cesarean Section, PPCM & Multidisciplinary Care

INTRODUCTION

Peripartum cardiomyopathy (PPCM) represents a relatively rare form of cardiomyopathy occurring in the later stages of pregnancy or shortly after childbirth, posing potential life-threatening risks due to significant left ventricular dysfunction and heart failure [1-3]. Reported incidences in the United States suggest a low rate of occurrence, estimated at approximately 1 case per 4,000 live births [4]. PPCM typically occurs after 30 years of age, showcasing diverse clinical paths from rapid heart failure to full ventricular recovery. Initial signs align with NYHA classes 3 or 4, depicting significant limitations or resting heart failure. Severe ventricular arrhythmias may occur [5]. Risk factors encompass multiparity, preeclampsia, and older maternal age. Emerging research links PPCM to imbalanced oxidative stress and a cardiotoxic prolactin subfragment [6]."

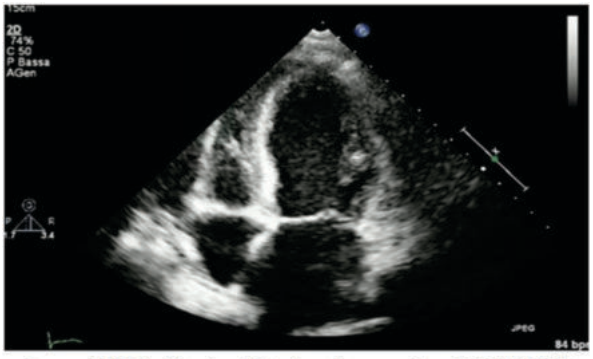

Image: 2D Echo Showing dilated cardiomyopathy with LVEF 25%

Figure 1 : https://doi.org/10.1093/ehjcr/ytab001

Case Study

A 29-year-old G2P1L1 female presented at 38 weeks of gestation for an emergency cesarean section without any reported complaints. she denied any symptoms of chest pain, palpitations, breathlessness, or cough. Routine preoperative investigations showed a hemoglobin level of 14.7 gm%, total leukocyte count of 17,320 cell/mm^3, and a platelet count of 2.38 x 10^3/µ. During her pregnancy, the patient diligently adhered to prescribed supplements of T. Iron folic acid (100/5mg) and T. calcium (500mg).

Under strict aseptic precautions, the patient received spinal anesthesia at the L3-L4 intervertebral space for the cesarean section. Intrathecal injection of 0.5% heavy bupivacaine H 2.2ml was administered, achieving adequate anesthesia with a maximum level up to T4. Intraoperatively, the patient's oxygen saturation ranged between 97-100%. A healthy baby was delivered with an APGAR score of 9, and the placenta was removed without complications.

During the skin closure phase, the patient's oxygen saturation dropped abruptly to 84% on room air, despite no apparent distress or complaints. Auscultation initially revealed clear lung sounds. Oxygen supplementation was promptly initiated, but saturation failed to improve. Subsequently, the patient developed mild coughing, tachypnea, and bilateral basal crepitations on lung auscultation.

An intraoperative 2D echocardiogram was performed, revealing a significantly reduced left ventricular ejection fraction (LVEF) of 25%, indicative of dilated cardiomyopathy. This cardiac condition was suspected to be the underlying cause of the patient's condition

In response to worsening respiratory distress and acute pulmonary edema secondary to congestive cardiac failure (CCF), we opted for elective intubation. A combination of medications including fentanyl, etomidate, and muscle relaxants facilitated intubation and subsequent ventilator support. Noradrenaline was initiated to support cardiac function, and diuretic therapy with furosemide was administered to address pulmonary edema.

Following stabilization and gradual improvement in cardiac function, the patient was successfully extubated the next day. She was transferred to the general ward for continued monitoring and management.

DISCUSSION:

Peripartum cardiomyopathy (PPCM) remains a rare but critical condition associated with significant morbidity and mortality in pregnant women or those who have recently given birth. The case of this 29-year-old woman undergoing emergency cesarean section highlights the challenging nature of diagnosing and managing PPCM in obstetric settings.The sudden onset of respiratory distress post-surgery in this patient, despite an uneventful preoperative period, underscores the need for vigilance and prompt intervention in such scenarios.

The precise cause of PPCM remains elusive, and while the exact etiology is yet to be fully elucidated, several factors have been proposed. These include familial predisposition, myocarditis, abnormal immune responses, and maladaptation to the stress of pregnancy. During pregnancy, the hyperdynamic circulation induces left ventricular remodeling and transient hypertrophy. This physiological adaptation may result in an exaggerated reduction in left ventricular systolic function. When coupled with the added stress from gestational hypertension, these factors could collectively contribute to the onset of heart failure in PPCM patients [7-10].

The initial phase of PPCM might present with nonspecific signs and symptoms that could easily be dismissed as common discomforts. These may include fatigue and dyspnea, which are often observed in

normal pregnancies or during the early peripartum period. Consequently, PPCM can be challenging to diagnose as its symptoms may mimic those commonly experienced during pregnancy, leading to cases going undetected [11].

The absence of prior cardiac symptoms or risk factors in the patient emphasizes the unpredictable nature of PPCM and the importance of considering it as a differential diagnosis in any peripartum woman presenting with acute cardiac or respiratory symptoms.The rapid reduction in the left ventricular ejection fraction (LVEF) to 25% observed during intraoperative echocardiography indicates the severity of cardiac dysfunction associated with PPCM. This decline in cardiac function likely contributed to the acute pulmonary edema and subsequent respiratory compromise seen in the patient.

The multidisciplinary approach employed in managing this case is noteworthy. Immediate recognition of the deteriorating clinical status prompted swift action, including intubation, ventilator support, administration of vasoactive agents, and diuretic therapy. Collaboration between obstetricians, anesthesiologists, cardiologists, and intensivists was crucial in stabilizing the patient's condition and facilitating successful extubation within a short timeframe.

Treatment recommendations for PPCM are typically guided by protocols outlined in the European Society of Cardiology's management guidelines for cardiovascular conditions during pregnancy and the peripartum period. Standard heart failure therapies during pregnancy may involve beta-blockers, vasodilators, and diuretics, with a cautious approach to diuretic use to minimize potential impacts on placental perfusion. Following delivery, optimization of therapy might involve the addition of ACE inhibitors, AT1 receptor antagonists, or aldosterone receptor blockers. In cases of hemodynamic instability, clinicians may resort to traditional inotropic agents such as dobutamine [12,13].Thromboembolism stands as the primary complication observed in PPCM cases. Patients with PPCM have been noted to experience a premature delivery rate of around 25%. Additionally, there is an elevated incidence of cesarean sections, reported to be as high as 40% in PPCM cases [14,15].

It's important to note that the precise etiology of PPCM remains unclear, although various hypotheses suggest hormonal, inflammatory, and genetic factors contributing to myocardial damage and dysfunction. The patient's diligent adherence to prescribed supplements during pregnancy might raise questions about the role of nutrition or potential metabolic factors in the development or progression of PPCM.

There were no indications of viral infection, autoimmune antibody positivity, abnormal levels of complement fractions in the blood, or nutritional disorders observed. The risk of experiencing PPCM in subsequent pregnancies remains notably elevated, particularly if there persists a persistent left ventricular dysfunction. Maternal mortality rates in PPCM cases have been documented to range 15% to 50%. Up to 25% of PPCM patients encounter preterm delivery, while among PPCM patients undergoing cesarean section due to obstetric reasons, intra-uterine fetal deaths have been reported in 40% of cases [16].

Yahagi et al. reported a PPCM case with atrial and ventricular tachycardia, leading to cardiac arrest, successfully treated with comprehensive organ support, including veno-arterial bypass [17].Kaufman et al. highlighted thromboembolic complications in PPCM within an obese, diabetic patient, advocating early prophylactic anticoagulation consideration [18].Chan &NganKee managed a PPCM case at 18 weeks gestation with systemic anticoagulation until an emergency cesarean section at 31 weeks due to fetal distress and maternal liver dysfunction [19].Shrestha B.R. et al. presented a PPCM case with an ejection fraction of 18%, managed through an emergency cesarean section using epidural anesthesia with Lignocaine 2% and Adrenaline, resulting in a successful outcome [20].

The successful outcome in this case, with the patient being extubated and transferred to the general ward for continued monitoring and management, highlights the significance of timely recognition, aggressive intervention, and collaborative care in improving the prognosis of PPCM cases.

CONCLUSIONS

The patient's clinical course was suggestive of peripartum cardiomyopathy, a rare condition characterized by heart failure in the peripartum period. In cases of unexpected desaturation during cesarean sections, considering peripartum cardiomyopathy as a potential cause is crucial. Anesthesiologists must maintain a vigilant approach in their assessments, as prompt recognition and appropriate intervention are paramount in handling such scenarios. Timely recognition and multidisciplinary management involving obstetric, anesthetic, and cardiac teams were instrumental in the patient's stabilization and subsequent recovery.

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