Case Report

A rare case with double trouble: Peripartum cardiomyopathy and preeclampsia together with placental abruption resulting in both cardiac and kidney failure

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Abstract

Peripartum cardiomyopathy and hypertensive disorders of pregnancy are not very uncommon in routine practice, but when associated with abruptio placentae and significant hypotension, survival of both child and mother becomes challenging. We report a case of a 20-year-old primigravida who presented in the gynecology emergency unit of our hospital with an ejection fraction of < 20%, severe preeclampsia with abruptio placentae leading to fetal demise, and renal failure in the immediate postoperative period. Challenges faced during decision making regarding the mode of delivery and grave concerns during intraoperative and postoperative periods are discussed. In this case, prompt termination of pregnancy, various point-of-care sonographic measurements, and post-operative emergency dialysis played vital roles in the complete recovery of this patient with a failing heart and grossly jeopardized hemodynamics. Hence, multidisciplinary team-based management is crucial for managing such cases to prevent maternal mortality and morbidity.

Keywords: Acute kidney failure, peripartum cardiomyopathy, placental abruption, primigravida

Introduction

Peripartum cardiomyopathy (PPCM), though not very commonly encountered, is potentially fatal and needs prompt and multidisciplinary expert management for optimum feto-maternal outcome. While the global incidence of PPCM ranges between 1:100 and 1:1500, a pooled analysis published in 2021 reported an overall incidence of 1:1340 live births in the Indian population with maternal mortality of 11.7% and fetal mortality of 14.2%.[1] Here, we discuss the management of a very rare case of PPCM in a 20-year-old primigravida who came with concomitant presence of severe preeclampsia, placental abruption, heart failure, and developed acute kidney failure in the immediate postoperative period.

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Case Presentation

A 20-year-old unbooked primigravida presented to our gynecology emergency unit at 35 + 6 weeks of period of gestation (POG) with complaints of the absence of fetal movements and bleeding per vaginum for one day. She also complained of dyspnea on exertion, which developed four days back, for which she consulted a local practitioner and was referred to our tertiary care institution. On physical examination,

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moderate pallor was noted and gross edema in bilateral lower limbs and vulva was present [Figure 1a]. She was afebrile with sinus tachycardia with 114 beats/min, hypertensive with a blood pressure (BP) of 186/108 mm of Hg and a respiratory rate of 24 breaths/min. Her oxygen saturation was 98% on 5 L/min oxygen by facemask. Chest examination revealed basal crepitations. Abdominal examination revealed a 30–32-week size gravid uterus with increased tone and absence of fetal heart sound on auscultation. Vaginal examination revealed a soft, mid-positioned, and uneffaced cervix and the presenting part was high up with an absent amniotic membrane with dark altered blood draining through the cervical os. Electrocardiography (ECG) revealed sinus tachycardia and left ventricular strain pattern with diffuse presence of inverted asymmetric T wave. Echocardiography (ECHO) suggested a severely enlarged and hypokinetic heart with global hypokinesia, left ventricular systolic ejection fraction of less than 20% along with moderate mitral and tricuspidal regurgitation [Figure 1b]. The patient was diagnosed with a case of severe preeclampsia with major abruptio placentae with intrauterine fetal demise with heart failure with the possibility of PPCM.

Despite a dead fetus, the decision of cesarean section was taken to immediately evacuate the uterus. In the operating room, BP crashed to 90/60 mmHg and an ultrasound assessment of the chest revealed hypovolemia with an inferior vena cava diameter of 0.87 cm and the presence of Kerley B lines or "Rocket Sign" [Figure 1c] in the lungs. A balanced salt solution was then carefully given in view of an extremely low ejection fraction. Once BP reached 120/76 mm Hg with a pulse rate of 148 beats/min, rapid sequence induction and intubation were done using etomidate 0.3 mg/kg, fentanyl 2 μg/kg, and succinylcholine 1 mg/kg. During cesarean, a "Couvelaire uterus" signifying a massive abruptio placentae [Figure 1d] was seen. There was also a partial dehiscence of the lower uterine segment and the amniotic fluid that drained was scanty and tarry-colored.

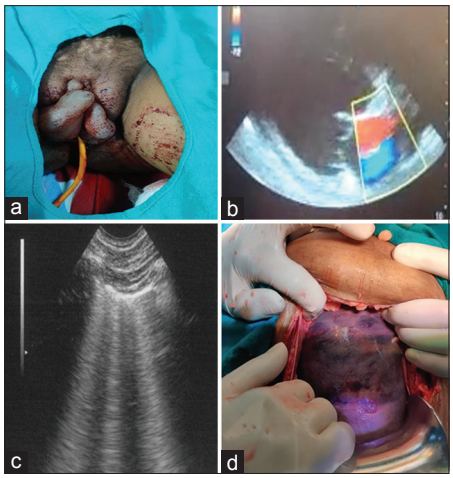

Figure 1: (a) Showing gross vulval edema, (b) ECHO showing mitral regurgitation of the patient at admission, (c) Chest ultrasound showing Kerley B lines or "Rocket Sign" indicating fluid overload, (d) The Couvelaire uterus seen while getting exteriorized at the time of cesarean section

The uterus was atonic and prophylactically, uterine artery ligation and hemostatic B Lynch suture were performed. Intraoperatively, hypertension observed after the removal of the fetus was managed with nitro-glycerine infusion and 40 mg intravenous furosemide while injectable metoprolol was administered to control the heart rate. The surgery lasted for about 50 min, and the estimated blood loss was around 300 ml. At the end of the surgery, the patient was awake and alert and so was extubated on the operating table itself.

Postoperatively, her cardiac condition was managed with intravenous furosemide 60 mg and tab metoprolol 25 mg. Oliguria and gradually deranging kidney functions with blood urea levels rising from 60.8 mg/dl to 138.4 mg/dl and serum creatinine increasing from 1.2 mg/dl to 2.6 mg/dl to 4.46 mg/dl in the next two days confirmed acute kidney injury (AKI). Kidney function tests began to improve on postoperative day 6 after three sessions of sustained low-efficiency dialysis (SLED). Gradually, her renal functions further improved and she was discharged on day 14 on oral ramipril and torsemide. At 5 months follow-up, she was symptomatically much better and her left ventricular ejection fraction (LVEF) improved to 45%.

Discussion

PPCM is diagnosed when heart failure develops in the last month of pregnancy or within five months postpartum in the absence of other possible causes of dilated cardiomyopathy (DCMP). As it mostly mimics the symptoms of a normal pregnancy, its diagnosis is frequently delayed or missed.[2] Primary care physicians with significant exposure to antenatal women should keep a high index of suspicion to rule out covert heart disease when signs and symptoms related to physiological changes of pregnancy appear exaggerated. PPCM can be a life-threatening condition, especially when complicated by some other comorbidity. There are some predictors of poor prognosis of PPCM, and many of these were present in our patient, like preeclampsia, LVEF < 25%, left ventricular end-diastolic dilatation, hypokinetic LV, and the presence of mitral or tricuspid regurgitation and tachyarrhythmia in the postoperative period.[3-6] It has been reported that the development of malignant arrhythmias is the most common cause of death in patients with PPCM.[7] The incidence of AKI in patients with severe preeclampsia is approximately 2%.[8] In patients with compromised cardiac functions as in PPCM, chances of renal failure increase due to reduced cardiac output as a result of depressed ejection fraction that leads to renal hypoperfusion. Injudicious fluid administration may also result in AKI secondary to cardiac dysfunction resulting from fluid overload that reduces cardiac output and causes decreased perfusion of kidneys. Management goals in our case included maintenance of normal to low heart rate to decrease oxygen demand, normovolemia, avoidance of drug-induced myocardial depression, prevention of increased ventricular afterload, and maintenance of adequate renal perfusion. Despite multi-organ dysfunction, in this case, prompt and multidisciplinary management helped in saving the young mother.

Take home message

- PPCM is a rare entity, but all physicians must be aware of this condition.
- Although diagnosis of PPCM is difficult, demanding a high index of suspicion by primary care physicians, such patients should be timely referred to tertiary care for prompt multidisciplinary management.
- LVEF before a subsequent pregnancy is the strongest predictor of outcome with the worst outcome in women whose LVEF failed to normalize (≥50%).[9]
- However, in women whose LVEF returns to ≥50% risk of relapse of PPCM persists, and hence women should avoid subsequent pregnancies.
- Point-of-care ultrasound may be used for hemodynamic assessment in critical care management.
- Early dialysis helps in reverting renal dysfunction.

Relevance of this article to the practice of primary care physicians

Being frontline care providers within the primary care team, primary care physicians should be trained and encouraged to perform comprehensive evaluations of all antenatal women to screen for any underlying systemic diseases and promptly refer high-risk cases to tertiary care centers for timely multidisciplinary management. Thus, morbidity and mortality of critical cases can be reduced.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent form. In the form, patient has given consent for her images and other clinical information to be reported in the journal. The patient understand that her name and initial will not be published and due efforts will be made to conceal her identity, anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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