Case Report

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Anesthetic Management of Dilated Cardiomyopathy for Cesarean Section

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Abstract

Introduction:Dilated cardiomyopathy(DCM) is one of the most common types of non ischemic heart muscle disease among the adult population, and it is associated with a high perioperative mortality.

Case Report: A 33-year-old female, G2P1L1+1 at 37 weeks of gestation admitted electively for cesarean section who is a known case of DCM with an ejection fraction of 40%.

In the preoperative evaluation, patient has a history of shortness of breath on mild to moderate physical exercise, 12-lead electrocardiography (ECG) showed sinus rhythm with occasional premature ventricular complexes and other parameters are normal.

Echocardiogram (Echo) showed severely dilated left ventricle with moderately to severely reduced systolic function due to global hypokinesia and indeterminate filling pressures, and no thrombi were present. All monitoring parameters were connected and an awake arterial line was inserted first followed by epidural in the sitting position. Inj. bupivacaine 0.25% 20 mL + 40 µgn fentanyl was given into the epidural space. The depth of the epidural space was 9.5 cm, while the depth of the catheter was 5.5 cm. The epidural was uneventful, and we changed the patient position into a supine position. Intravenous fluids were maintained at 60–80 mL/h. Intra operative vitals are stable and baby was extracted and blood loss around 700ml.Patient shifted to ICU for close monitoring.

Conclusion: Dilated cardiomyopathy is associated with high mortality and persistewnt decrease in quality of mother. Careful selection of drugs and best anesthetic techniques is important for good maternal and fetal outcome.

Keywords: Dilated cardiomyopathy; Caesarean section.

Key Messages: Dialted cardiomyopathy is challenging task for an anesthesiologist and most of the patients who have DCM will be left undiagnosed peripartum period especially in the developing countries like India. Most of the patients who undergo cessarean section will be on emergency basis rather than elective. So, Anesthesiologist won't be having enough time in evaluating patients pre operatively. Any pre operative suspicion of DCM and intraoperative suspicion of persistent hypotension and tachycardia should be evaluated intraoperatively by bedside echocardiography. This bedside USG cardiac assesment should be used as an diagnostic tool by an anaesthesiologist in operation theatre helps in reduce the ICU stay of the patient and good prognosis.

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Introduction

Dilated cardiomyopathy (DCM) is one of the most common types of non ischemic heart muscle disease among the adult population, and it is associated with a high perioperative mortality.

Systolic function impairment and left ventricular or biventricular enlargements are the hallmark of DCM which have a significant impact on myocardial contractility.[1,2] Despite the high prevalence of DCM among adults, limited evidence has been published regarding the ideal anesthetic management in non cardiac surgery.[2] In this report, we describe successful management of a case of DCM that underwent cesarean section under neuraxial blockade (epidural anesthesia) with successful outcome.

Case Report

A 33 year old female, G2P1L1 at 37 weeks gestation admitted electively for cesarean section. She is a newly diagnosed Dilated cardiomyopathy (DCM) and completely asymptomatic.

In the preoperative evaluation, the patient was doing well, with no active complaint and good fetal movement with no history of vaginal leakage. She has a history of shortness of breath on moderate physical exercise, unable to climb a flight of stairs without becoming breathless. On examination, she was 165 cm tall and weighed 90.3 kg with body mass index of 33.2, her heart rate (HR) was 97/ min and blood pressure (BP) was 125/71 mmHg, and her SpO 2 was 99% while breathing room air. There were no features suggestive of congestive heart failure. Routine laboratory investigations were within normal limits with a hemoglobin level of 10.3g/dL. Chest X-ray show cardiomegaly. 12-lead electrocardiography (ECG) showed sinus (Fig. 1) rhythm with occasional premature ventricular complexes, otherwise normal ECG. Cardiology opinion was taken regarding ECG changes and Cardiomegaly on Chest X ray.

Echocardiogram (Echo) showed Global hypokinesia. of LV(total anterior and lateral walls are hypokinetic), Dilated LV with moderate eccentric MR, mild TR, mild PAH, thin IAS septum, Mild LV systolic dysfunction with preserved ejection fraction of 40%.Patient was diagnosed as Peripartum cardiomyopathy and advised Inj. Lasix 120mg stat, Tab. Spironolactone 25mg OD. Cardiologist suggested for elective LSCS after symptomatic improvement in cardiac congestion and Inj. Lasix 40mg to be given 1hr prior to the surgical procedure and the same has been same followed.

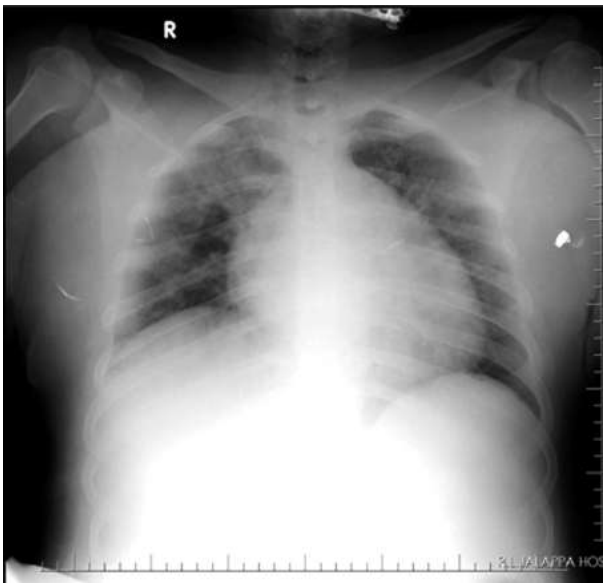

Fig. 1: X-ray showing Dilated Cardiomyopathy.

The last formal ultrasound (US) on 37 weeks 1 day showed an estimated fetal weight of 2.8 kg, cephalic with normal amniotic fluid, and normal Doppler. The epidural anesthesia technique was explained to the patient, and the consent was signed.

The plan was to admit her for cesarean section after cardiology clearance. The plan of anesthesia is to proceed with epidural anesthesia with a backup plan of general anesthesia.

Routine non invasive monitoring was established, including noninvasive blood pressure, hr, pulse oximetry (SpO 2), and ECG. Her SpO2 was 99% on face mask 5 L/min, and ECG results showed normal sinus rhythm. An awake arterial line was inserted first followed by epidural in the sitting position,. Two large intravenous accesses were inserted. The crash cart was brought in the operative room, and inotropes and vasopressors instead of mephentermine were kept ready to go The patient was very anxious; midazolam 1 mg was administered before epidural, and then 2mL of 2% lidocaine was used for local infiltration anesthesia at L3–4 space. The epidural space was located with an 18-G Tuohy needle at the first attempt. After confirming the space by loss of resistance, Test dose of 2%lidocaine with adrenaline 3ml given to confirm space followed by 0.5% Bupivicaine 6ml + 20mcg Fentanyl was given into the epidural space. The depth of the epidural space was 5cm, while epidural catheter was placed at 9cm. The epidural was uneventful, and we changed the patient position into a supine position.

Intravenous fluids were maintained at 60–80 mL/h. Intra operative BP was 110/70 mmHg. Successful neuraxial blockade level was achieved till T6 and surgeons were asked to proceed with LSCS and a baby girl was delivered. Uterotonic medications were administered, with estimated blood loss of around 700 mL. The surgery lasted for 45 min. The Apgar score for the newborn infant was 9 points. Surgical procedure was uneventful. The patient was admitted to the High dependency unit (HDU) for observation as she is in a high risk for having decompensated heart failure in post operative period. On cardiologist advice, post operatively Inj.Lasix 5mg/hr continuous infusion for 16hrs and later on switched to Inj. Lasix 40mg-20mg-20mg. She was stable in the HDU, and they transferred her back to the ward with a stable condition after 24 h. No perioperative or anesthetic complications occurred. The patient was discharged home 1 week later with cardiology reference.

Discussion

DCM is a diagnosis of exclusion and our case fulfilled all the diagnostic criteria. Treatment of DCM is similar to other types of congestive heart failure. The mainstay of therapy is a combination of diuretics, sodium restriction, anticoagulation and beta blockers. The cardiology consult did not include thromboprophylaxis in the treatment of this patient.[3]

The ultimate goal of Peripartum cardiomyopathy is to avoid changes in hemodynamics General anesthesia involves the use of cardio depressant drugs like thiopentone, narcotics and/or inhalational agents. The use of opioid based induction may necessitate post operative ventilation for both mother and new born. Performing a rapid sequence induction on a patient with compromised cardiac function can be extremely challenging. Thus, a carefully administered regional anesthetic is advantageous. In addition to avoiding the stress of laryngoscopy and intubation, the vasodilatation produced by regional anesthesia is beneficial with isolated left ventricular dysfunction. We chose epidural anesthesia as it permits gradual and controlled induction with minimal variation in hemodynamic parameters when accompanied by judicious administration of intravenous fluids and inotropes. 0.5% Bupivacaine was selected as it is long acting, gives surgical anesthesia of good quality with early recovery from motor blockade. Oxytocin after delivery was administered intravenously as a slow infusion to prevent sudden vasodilatation causing hypotension and tachycardia.

Post operative period is important in PPCM as reabsorption of third space fluid after 48 hours of LSCS may increase preload causing congestive cardiac failure.[6] Epidural top up of 0.125% of Bupivicaine 8ml 8th hrly was continued for post operative analgesia; to avoid post operative pain associated hemodynamic variations. To conclude, in developing nations, where not all parturients undergo regular antenatal checkups, high degree of clinical suspicion is important for early diagnosis and anesthetic management of PPCM thereby increasing chances of successful patient outcome. Titrated epidural anesthesia with judicious fluid and inotropic support is a prudent choice in such cases.

Conclusion

Dilated cardiomyopathy is a associated with high morbidity and mortality and can lead to maternal and fetal loss and persistent decrease in quality of life in mother. Early diagnosis, prompt monitoring and post operative follow up remains main stay of treatment. Principles of management is to prevent sudden hemodynamic changes and conscious administration of drugs which alter the hemodynamics gives good maternal and fetaloutcome.

Conflict of Interest: NIL

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