



Egyptian Society of Anesthesiologists
Egyptian Journal of Anaesthesia

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Case report

Combined spinal fentanyl with graded epidural anaesthesia for caesarean section in case of peripartum cardiomyopathy: A case report



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Received 31 August 2012; accepted 20 April 2013

Available online 21 May 2013

KEYWORDS

Peripartum cardiomyopathy;
Anaesthetic management;
Combined spinal opioid with
epidural anaesthesia

Abstract Perioperative management of peripartum cardiomyopathy patients posted for emergency caesarean section is a unique challenge to the anaesthesiologist. We are hereby reporting a case of peripartum cardiomyopathy posted for emergency caesarean section. A 23 year old lady with a 35 weeks pregnancy was admitted in our hospital with increasing breathlessness. Subsequently, she was diagnosed as a case of peripartum cardiomyopathy. She was posted for an urgent LUCS. After a rapid initial stabilization, she received combined spinal fentanyl with titrated epidural bupivacaine to achieve surgical anaesthesia. Apart from routine ASA monitors, CVP and IBP were monitored during the surgery. Hemodynamic perturbations were insignificant during surgery, and the postoperative period was uneventful. Key Messages: Combined spinal opioid with carefully titrated epidural anaesthesia is a safe and effective technique for anaesthetic management of peripartum cardiomyopathy posted for LUCS.

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1. Introduction

Peripartum cardiomyopathy (PPCM) is a primary myocardial disease without any demonstrable cause and having onset during the last month of pregnancy or in the first 5 months after delivery [1]. Though PPCM is a rare entity (incidence 1/3500 live births) but it has a very high mortality rate [2].

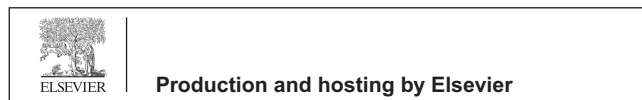
Anaesthetic management of a case of PPCM is often challenging, consisting of optimization of preload, afterload and myocardial contractility. General anaesthesia [3], low dose spinal anaesthesia [4], epidural anaesthesia [5] and combined spinal-epidural anaesthesia [6] – all have been reported as a successful anaesthetic technique in PPCM cases posted for caesarean section.

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Peer review under responsibility of Egyptian Society of Anesthesiologists.



2. Case history

A 23 year old primigravida was admitted with complains of increasing shortness of breath and swelling of the legs for last 10 days. On obstetric examination, she had a singleton pregnancy of 35 weeks with a large uterine fibroid.

She had undergone regular antenatal checkups during the first and second trimesters with no previous history of any other significant medical or surgical illness. On examination, she had tachycardia (PR 124/min, regular), mild pallor, bipedal pitting oedema, BP 100/70 mmHg, dyspnoea of grade IV, bilateral basal crepitations and systolic murmur at mitral area with grade IV/VI intensity. Twelve lead ECG revealed nothing other than sinus tachycardia and echocardiography showed severe global hypokinesia, LVEF 23%, dilated LA and LV chamber, severe MR and grade II TR. Laboratory investigations revealed nothing other than anaemia (Hb 9.2 gm%). She was then managed medically with oral frusemide, beta blockers, nasal oxygen at 2 L/min and subcutaneous enoxaparin 40 mg SC OD.

Obstetrician planned an elective caesarean section for the presence of cervical fibroid after 37 completed weeks. On the day before scheduled elective LUCS, she had increasing dyspnoea and cough which was poorly responsive to conventional medical management. Though the foetus was not at jeopardy at that moment, an urgent LUCS was planned by the obstetrician.

A rapid preoperative optimization was initiated; a tri-lumen CVP catheter was in the right IJV and an arterial line was inserted in the left radial artery. Infusion dobutamine was started @ 5 mcg/kg/min. We found that she received last dose of enoxaparin 9 h before; so we planned the LUCS 3 h later for safe administration of Neuraxial blockade.

Routine ASA monitors, for example SpO₂, ECG, temperature along with IBP and CVP, were used throughout the surgery. After transferring her to the OR, IBP was 130/90 mmHg, PR = 115/min, CVP was 20 mmHg and SpO₂ was 95%.

A combined spinal opioid with lumbar epidural anaesthesia was planned. She was initially kept on 30° head-up position to relieve dyspnoea. FHR was continuously monitored by the obstetric team to ensure foetal well being. After improving dyspnoea, CSEA was administered in sitting posture with mid-line approach. A 20G epidural catheter was introduced through an 18G Tuhoy type epidural needle in L2–L3 intervertebral space by loss of resistance to saline technique. Then 25 mcg fentanyl was introduced intrathecally in the L3–L4 interspace by a 27G Quincke's spinal needle. Intravascular/intrathecal placement of the catheter was excluded by 3 ml 2% lignocaine with 1:200000 adrenaline test dose; then a bolus of 4 ml 0.5% preservative free bupivacaine was administered by epidural route. Height of block was repeatedly monitored by sensation to cold. Repeat boluses of 3 ml 0.5% bupivacaine were administered to achieve a sensory block level of T6; a total dose of 13 ml 0.5% bupivacaine was used.

After achieving a sensory block height of T6, surgery was started, after the baby delivery, 5U injection oxytocin was given slowly by IV route to facilitate uterine contraction; it causes fall of MAP from 78 mm Hg to 52 mmHg which was promptly treated by intravenous bolus of 6 mg mephentermine. There was no other intraoperative hemodynamic insta-

bility, HR maintained at 80–110/min and MAP was maintained at 52–86 mmHg.

Postoperatively, she was shifted to intensive care unit; analgesia was maintained by 0.0625% bupivacaine along with 2 mcg/ml fentanyl at the rate of 5 ml/h. Dobutamine infusion was gradually terminated over a period of 12 h in the ICU. We removed the epidural catheter on postoperative day 2 after an interval of 12 h following last dose of enoxaparin. She was discharged from the ICU after 48 h and from the hospital with a substantial improvement in systolic function (LVEF 31%).

3. Discussion

PPCM is a rare, but a potentially life threatening disease. The prognosis is related to the recovery of ventricular function. The mortality rate of peripartum cardiomyopathy is 30–60% and may be caused by severe pulmonary congestion and/or thrombo-embolic events. The aetiology is yet to be defined; viral, autoimmune and idiopathic all have been considered [7].

Previously, it was diagnosed by clinical criteria of Demakis 1; nowadays, echocardiographic criteria are also used, which includes an ejection fraction of less than 45%, left ventricular end diastolic dimension greater than 2.7 cm/m² and fractional shortening of < 30% [8].

The patients typically present with features of systolic heart failure including increasing dyspnoea, effort intolerance, cough, paroxysmal nocturnal dyspnoea, peripheral oedema, etc.

Medical therapy for PPCM follows the routine principles of management of heart failure and is aimed at reduction of preload, afterload and increase in cardiac contractility through judicious use of bed rest, salt restriction, diuresis, digitalization, vasodilators, β -blockers and anticoagulants. [6] Caesarean section may be considered to avoid the stress of normal vaginal delivery [8].

Anaesthetic management of these patients is of special significance. Though various modalities of anaesthetic technique have been used successfully, the basic goals of anaesthetic technique remain same [8].

1. Avoidance of myocardial depression and maintaining stable hemodynamics.
2. Maternal and foetal safety.
3. Maintaining normovolemia and preventing increase in the ventricular afterload.
4. Maintaining uteroplacental adequacy.

General anaesthesia has the advantages of rapid airway control and may be considered in cases where urgent caesarean section is required and in cases where regional anaesthesia is contraindicated. However, it has also some disadvantages like drug induced myocardial depression, sympathetic stimulation of laryngoscopy and intubation, added risk of thromboembolism and even cardiac arrest [9], etc. Regional anaesthesia in the form of either epidural or spinal subarachnoid block may be beneficial as they are associated with vasodilatation and after load reduction [10]. But spinal anaesthesia may be associated with a rapid blood pressure fall, which may be disastrous in a patient whose systolic cardiac function is already at jeopardy. But an epidural anaesthesia with a catheter has many advantages: the height of the block can be slowly

titrated, and the catheter can be used for postoperative analgesia also. However, a combined spinal-epidural technique may be preferable than a continuous epidural technique as the former is associated with lower failure rate, better pain scores and patient satisfaction [11]. An intrathecally administered opioid provides a rapid onset of analgesia without significant hemodynamic perturbation [12]. In this case, we used a spinal subarachnoid opioid to reduce the requirement of epidural bupivacaine and better pain scores and patient comfort. There was no clinically significant hemodynamic alteration except one episode as previously mentioned, which was promptly managed.

Though central neuraxial blockade is contraindicated in anticoagulated patients, we managed the coagulation jeopardy by allowing proper timing before Neuraxial blockade and standard practice guideline was followed [13].

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