

Anaesthetic Management of Ischemic Heart Disease with Ejection Fraction of 30 % Posted for Fracture Femur Surgery – A Case Report

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INTRODUCTION

The incidence of ischemic heart disease (IHD) is increasing and it is the leading cause of morbidity and mortality worldwide.¹ These patients have increased risk of myocardial ischemia, myocardial infarction (MI), conduction disturbances and cardiac arrest perioperatively. Preoperative cardiovascular assessment and prediction of short- and long-term risks affects the perioperative anaesthetic management and also surgical decision making. Risk factors include recent MI, congestive cardiac failure, peripheral vascular disease, angina pectoris, diabetes mellitus (DM), hypertension, renal dysfunction, age, obesity and sedentary lifestyle.²

The choice of anaesthesia is general anaesthesia so that myocardial oxygen supply can be kept greater than demand by preventing tachycardia and high blood pressures, which can lead to ischemia.³ Few studies have shown that Epidural anaesthesia can decrease cardiac morbidity and mortality in IHD patients. We report a successful anaesthetic management of IHD with ejection fraction of 30 % posted for fracture femur surgery under Combined Spinal Epidural (CSE) anaesthesia.

PRESENTATION OF CASE

A 60-year-old female with known history of DM since 15 years, asthmatic since 5 years and IHD 4 years back diagnosed to have intertrochanteric fracture femur was posted for proximal femur nail placement. Patient had history of angina 4 years back and was started on aspirin 75 mg once daily and atorvastatin 10 mg once daily, metformin 1 gm and glimepiride 1 gm once daily and fluticasone and budesonide inhaler. Among these, aspirin was continued and metformin was stopped and started on insulin 2 days before surgery. On examination, patient was moderately built, well nourished, pulse rate 75 bpm, blood pressure 110 / 68 mm Hg. Adequate mouth opening and normal neck movements, spine was normal.

Laboratory reports including complete hemogram, liver and renal function tests, serum electrolytes, blood sugar levels were normal. Chest radiography was normal. ECG showed LBBB pattern. Echo showed sclerotic aortic valve, left atrium and Left Ventricle dilated, Left Ventricle global hypokinesia, moderate Mitral Regurgitation, severe Left Ventricular systolic dysfunction and ejection fraction of 30 %. Cardiologist opined to take up for surgery under Class III cardiac risk.

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DISCUSSION OF MANAGEMENT

Preoperative counselling was done and informed written consent taken. On the day of surgery fasting blood sugar was 98 mg %. Intravenous line secured. Monitors including pulse oximetry (SpO₂), ECG and non-invasive blood pressure were connected. Inj. Ondansetron 4 mg was given and started on Ringer lactate fluid.

Patient in sitting position. Under aseptic precautions, Parts painted and draped. Skin infiltrated with 2 % plain lignocaine and 18G Tuohy needle introduced at L2 - L3 intervertebral space. Epidural space confirmed by loss of resistance technique; 20G epidural catheter was threaded up to T10 - T11 level and fixed to skin. 3 ml of 2 % lignocaine test dose was given after negative aspiration. Spinal anaesthesia was performed using 23 G spinal needle in L3 - L4 intervertebral space and clear free flow of CSF noted and Inj. Bupivacaine 0.5 % (H) 2 ml and Fentanyl 25 mcg injected into subarachnoid space. Adequate block was obtained till T 10 level. Inj. Midazolam 1 mg and Pentazocine 10 mg iv and Oxygen through face mask was given. We preferred combined spinal-epidural (CSE) technique as it permits advantage in early onset of effect as well as the flexibility of graded doses of local anaesthetics through epidural catheter and in maintaining hemodynamic stability. Duration of surgery was 120 min. Total intravenous fluid given intraoperatively was 700 ml of ringer lactate, urine output was 200 ml and estimated blood loss was around 100ml. Intraoperative systolic blood pressure was maintained between 90 – 110 mm Hg, diastolic blood pressure between 60 – 80 mm Hg and heart rate between 70 – 80 bpm. Inj. Ephedrine 12 mg was given intermittently.

Postoperatively SpO₂, non-invasive blood pressure and ECG with oxygen supplementation was done. For postoperative analgesia three epidural top up doses were given with 8 ml of 0.1 % Ropivacaine up to 24 hours after surgery. On second postoperative day patient had fall in blood pressure up to 85 / 45 mm Hg, so epidural top up was not given and foot end elevation with 250 ml of intravenous fluid bolus was given and blood pressure picked up to 100 / 50 mm Hg and oxygen was continued and started on Paracetamol 1 gm intravenous infusion twice daily. On Post - operative day 3 epidural catheters was removed. Day 4 onwards patient was very much comfortable and vitals stable.

DISCUSSION

In a patient with IHD, anaesthetic goals are to maintain stable hemodynamics, prevent MI by optimizing myocardial oxygen supply and reducing oxygen demand, monitoring for ischemia and to treat it, normothermia, prevent hypoxia and avoiding significant blood loss.³ Perioperative management differs based on the type of surgery whether its elective or emergency. Emergency surgeries can be proceeded with the medical management of cardiac issues. But for elective surgeries management varies depending on the clinical and surgical risk factors. In our case patient had history of MI

and known case of DM and asthmatic, intermediate risk surgery with cardiac risk of more than 5 %.⁴

Technique of anaesthesia - General or regional anaesthesia depends on the surgery and the patient requirements. Goal of GA in IHD is to avoid tachycardia and extremes of blood pressure both of which may cause myocardial oxygen supply demand mismatch leading to MI.³ GA is associated with hypotension due to intravenous induction agents, tachycardia and hypertension due to pressure response during direct laryngoscopy and intubation, enhanced stress response leading to perioperative hypercoagulable state and release of cytokines and neuroendocrine hormones leading to venous thrombosis and cardiac morbidity which can be prevented with EA.⁵ In these patients, spinal or epidural anaesthesia can be opted in intermediate and low risk surgeries involving extremities, perineum and lower abdomen. Regional techniques can cause hypotension which should be treated with adequate preload and vasopressors such as phenylephrine.⁶ Subarachnoid block alone is associated with inability to control the level of block which can result in significant hemodynamic imbalances including profound hypotension and and respiratory depression.⁷

A randomized controlled study in 2014 summarizes the outcomes of neuraxial analgesia with or without GA versus GA alone, which showed that use of neuraxial blockade alone reduces 0 - 30-day mortality and decreases the risk of pneumonia.⁸

Large doses of local anaesthetics (LAs) can cause myocardial toxicity and myocardial depression. Epidural LAs with opioids are better for postoperative analgesia. *Yeager et al.* concluded that epidural analgesia group patients had lesser incidence of postoperative myocardial morbidity compared with GA alone for high risk surgeries.⁹ *Beattie et al.* in meta - analysis on epidural analgesia concluded that reduction in cardiac events with postoperative epidural analgesia is important as it reduces post op MI also.¹⁰ *Rivers et al.* compared EA with GA for infrainguinal arterial reconstruction and concluded that both regional and GA techniques remain equally acceptable.¹¹

CONCLUSION

Incidence of IHD and also patients coming for noncardiac surgeries has been increasing. Thorough preoperative assessment, risk stratification, guidelines regarding use of medications, intraoperative monitoring, detecting MI, treating them, and postoperative care and pain management are all equally important.

This is a team work involving cardiologists, physicians and surgeons. Factors which alter myocardial oxygen supply demand ratio should be taken care of and be prepared with all the vasopressors and inotropes like norepinephrine and dobutamine and airway management equipment. EA can be used as an alternative to GA as they reduce preload and afterload, coagulation responses, coronary vasodilatation, postoperative analgesia and reduce harmful effects of GA such as hypotension due to induction agents, hypertension and tachycardia due to pressure response.

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