



UNILATERAL SPINAL ANAESTHESIA IN PATIENT WITH LOW EJECTION FRACTION

Anesthesiology

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ABSTRACT

It is challenging to administer anaesthesia in patients with pre-existing heart conditions. Now a days number of patients presenting for surgery with heart conditions are in rising trend and it may be due to increased life span and better anaesthetic techniques available and their increased safety. Ejection fraction (EF) is important in diagnosing and tracking the heart failure as it shows how well the heart is pumping out blood. Patients with EF < 30% (Low EF) are at risk of arrhythmias leading to sudden cardiac arrest and death. Goals for management of these patients include promoting adequate heart rate, maintaining adequate cardiac output, avoidance of arrhythmias. Care of these patients include proper identification of risk factors, pre-anaesthetic evaluation, vigilant monitoring of patient both intra operatively and post operatively and appropriate use of drugs. Here we present a case of 58 year old man with previous history of cardiac stenting, taking various cardiac drugs and having EF of 20%, who successfully underwent right sided inguinal hernia repair under unilateral spinal anaesthesia.

KEYWORDS

EF 20%, Ischaemic Heart Disease (IHD)/Ischaemic Cardiomyopathy (ICMP), Unilateral Spinal Anaesthesia, Hernia Surgery.

INTRODUCTION

Ejection fraction is important in diagnosing and tracking the heart failure as it shows how well the heart is pumping out blood. Patients with EF < 30% (Low EF) are at risk of arrhythmias leading to sudden cardiac arrest and death.¹ Objectives of anaesthetic management includes prevention of arrhythmias, avoidance of myocardial depression, adequate hydration, maintaining forward flow and timely discontinuing the cardiac drugs preoperatively.² Unilateral spinal anaesthesia is promising as it maintains the vitals near normal by localizing the anaesthetized area to surgical field.³ Unilateral spinal anaesthesia produces less haemodynamic changes therefore it is beneficial for patients at high risk such as IHD, pulmonary diseases.⁴ It has advantage over conventional spinal anaesthesia as it has lower incidence of hypotension and recovery is faster with this type of anaesthesia.⁵

CASES

A 58 year old man weighing 75 kg presented to us with surgical diagnosis of right sided inguinal hernia. He is farmer by occupation and continues to do moderate work daily and is a teetotaler. He has a medical history of IHD with angiography showed 80% blockage in LAD and underwent cardiac stenting with drug eluting stent 7 yrs ago. At present his physical examination revealed moderate built, pulse rate (PR) 84/min, regular, blood pressure recorded 140/90 mmHg, respiratory rate (RR) 15/min, oxygen saturation at room air was 97%, moderate exercise tolerance and history of dyspnoea grade II. Pedal oedema was absent and on chest X Ray examination lung fields were clear. On auscultation heart sounds (S1 & S2) were normal, PR 84/min. At present his ECG revealed sinus rhythm with strain pattern with HR 84/min with no pulse deficit, Anterior wall MI, inverted T waves (I, aVL, V5, V6). 2D Echo reveals dilated LV, LA with severe global hypokinesia of LV with thin akinetic LAD territory with LVEF 20%. Patient has been on Ecosprin, Telmisartan, Lasilactone since past 7 years.

His routine investigations were unremarkable. Cardiologist evaluated and opined this case with stable cardiac status and patient as moderate to high risk case for surgical intervention. High risk to life was explained and written consent was taken. Patient was accepted for

right sided inguinal hernia repair surgery under central neuraxial blockade. He was premedicated with Ranitidine 150 mg and Alprazolam 0.25 mg orally at night and 6 AM prior to surgery.

In the operation theatre an IV access was secured with 18G IV cannula. All routine monitors were attached with 12 lead ECG and spinal procedure was explained to patient. The surgery was planned under unilateral spinal anaesthesia. Right lateral decubitus position of patient was made. Under all aseptic precautions lower back was cleaned and draped, L3-L4 space was identified. 2 ml of 1% lignocaine was infiltrated in skin and subcutaneous tissues. Lumbar puncture done with 23G Quincke needle, free and clear flow of CSF was seen, unilateral spinal anaesthesia was achieved with 1.7 ml (8.5 mg) of 0.5% bupivacaine with dextrose (heavy) while the patient remained in the above position for next 10 minutes & after adequate level of anaesthesia was achieved i.e T8, patient was made supine and surgery was commenced. Patient was put on face mask with oxygen flow @ 2L/min which made oxygen saturation 100% during surgery. Intraoperatively continuous ECG, HR, NIBP, RR, Oxygen saturation monitoring was done. Surgical procedure lasted for 1hr and 25 minutes without any significant changes in HR, ECG, RR and blood pressure. Intraoperatively patient was comfortable and he did not require any sedation. Total fluid administered during surgery was approximately 1200 ml (fasting plus maintenance). Postoperatively patient was monitored in recovery room till full recovery from spinal anaesthesia and then patient was shifted to PACU. Post operatively analgesia was achieved with 1 gram Paracetamol infusion IV and Inj. tramadol 70 mg IV.

DISCUSSION

Normal EF ranges from 55% - 70% and EF 40% - 55% may indicate damage due to previous heart attack but does not indicate heart failure. EF < 40% shows evidence of heart failure and cardiomyopathy. Patients with EF < 35% are at risk of life threatening arrhythmias leading to sudden cardiac arrest and death. Preoperative heart failure is an important risk factor for postoperative complications.² IHD is most common cause of morbidity and mortality in cardiac patients perioperatively all over the world.⁶ It accounts for subsequent mortality of 10% – 25% worldwide.⁷ In moderate to severe heart

failure conventional spinal anaesthesia is less preferred.⁸ In patients for whom we have an option of using neuraxial anaesthesia, several factors such as type of surgery, duration of surgery, height of block, patient comorbidities and medical drugs are important in determining risk versus benefit. Hypotension and bradycardia must be prevented to avoid myocardial hypoperfusion. Antihypertensive acts on Renin angiotensin aldosterone system such as angiotensin converting enzyme inhibitors and angiotensin receptor blockers doses should be omitted in the morning of the day of surgery as spinal anaesthesia causes hypotension which is exacerbated by these drugs.⁹ In case of antiplatelet agents, some author suggests the indication for continuing therapy is to weigh the risk of stopping (increased cardiovascular risk) against those of continuing (increased risk of bleeding).¹⁰ Aspirin is usually continued unless there is specific risk of excessive bleeding with a procedure in patients with significant cardiovascular risk for e.g.: coronary stents or substantial cardiac history (H/O MI or stroke).¹¹ On the other hand Clopidogrel should be stopped 7 days before an operation, where there is potential for the patient to have an epidural or spinal anaesthesia due to risk of haematoma formation. Dual antiplatelet therapy is indicated following acute coronary syndrome or following PCI involving stent insertion. For bare stent minimum 3 months therapy is required and for drug eluting stents minimum 1 year therapy is needed.¹² Perioperative goals include adequate HR without inducing ischaemia, maintaining forward flow, avoidance of arrhythmias. Oxygen is delivered via face mask as patient is having cardiac condition with low ejection fraction (20%) otherwise oxygen supplementation may not be required as height of block is low and no sedation is required as patient is comfortable. Patient characteristics for which oxygen supplementation is required are extremes of age, excessive weight, high BMI, low Haemoglobin and increased height of block and cardiac dysfunction.¹³ Pain management is very important as pain is one of the main cause of tachycardia, anxiety and increased blood pressure which in turn causes coronary hypoperfusion. However unilateral spinal anaesthesia achieves adequate anaesthetic effect and thus avoids the need for general anaesthesia in patients with low ejection fraction but several case reports has been published having patients with low ejection fraction undergoing elective LSCS under general anaesthesia such as Zangrillo et al¹⁴ presented a case report on elective LSCS under general anaesthesia in patient with EF of 20% using invasive monitoring. Other case reports includes pirlet et al¹⁵ presented a case of elective LSCS under CSE in patients with EF of 13% using invasive monitoring and shreshtha et al¹⁶ reported a case of elective LSCS under epidural anaesthesia in patient with EF of 13% using non-invasive monitoring. Almost all authors used radial artery cannulation for invasive blood pressure monitoring in patients with low ejection fraction but in our case, patient had good exercise tolerance and case was done under unilateral spinal anaesthesia. Patient had stable vitals therefore need for invasive monitoring was not essential.

Conclusion

Patients with EF of 20% are considered to be at high risk for anaesthesia due to risk of sudden cardiac arrest and death. Goals of perioperative management in these patients includes maintenance of HR and BP within normal limits and avoidance of extremes, maintaining forward flow and avoidance of arrhythmias. Here we concluded that patients with moderate exercise tolerance even with low ejection fraction can be taken up for surgery under unilateral spinal anaesthesia without any invasive monitoring and with adequate post-operative pain relief. With proper pre-anaesthetic evaluation and anaesthetic plan he successfully underwent hernia repair under unilateral spinal anaesthesia.

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