Section: Anaesthesiology

Original Research Article

ANAESTHETIC MANAGEMENT OF A PATIENT WITH RHEUMATIC HEART DISEASE POSTED FOR BIPOLAR HEMIARTHROPLASTY

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ABSTRACT

Background: Anaesthetic management of geriatric patients posted for fracture neck femur having underlying valvular heart disease pose a great challenge to the anaesthesiologist.

Case Report: A 76 year old female, known case of rheumatic heart disease with mitrl stenosis, had Right sided neck of femur fracture and was posted for bipolar Hemiarthroplasty. The plan of anaesthesia was General Anaesthesia (GA) with Suprainguinal Fascia Iliaca (SIFI) Block. The combination of GA with SIFI block provided effective pain control, reducing the need for opioids. This approach contributed to an early recovery, emphasizing the importance of tailored anaesthesia strategies for valvular heart disease patients undergoing non-cardiac surgeries.

Conclusion: General Anaesthesia along with regional anaesthesia provides superior control over patient's hemodynamic than Spinal Anaesthesia alone & this method would be the appropriate choice of anaesthesia for patients with valvular heart disease.

INTRODUCTION

Elderly patients often suffer from injuries requiring surgery. Anaesthetic management of elderly patients with Rheumatic Heart Disease with Mitral Stenosis undergoing non cardaic surgery is a challenging task. Rheumatic Heart Disease is most commonly associated with Mitral Stenosis (MS). MS is characterised by mechanical obstruction to left ventricular filling due to progressive decrease in the size of mitral valve orifice. Valvular heart disease presents as mixed spectrum lesions, and thus we need to understand the effects of various anaesthetic techniques on hemodynamic parameters.[1]

Here we report a case of fracture neck of femur having RHD with MS posted for Bipolar hemiarthroplasty where we have planned the anaesthetic management of the patient with the aim to maintain sufficient analgesia and hemodynamic stability in the intra operative period.

CASE REPORT

A 76 year old patient with right sided neck of femur fracture was posted for bipolar hemiarthroplasty. Patient is a known case of Rheumatic Heart Disease with Mitral Stenosis. Patient was on medication T. Metoprolol 12.5 mg, T. Aspirin 75mg + Atrovastatin 10mg, T. torsemide 10mg. On examination of vital parameters, patient had a pulse rate of 82 beats per minute, blood pressure of 160/80 mmHg, oxygen saturation of 97% on room air. Airway examination was normal with mallampatti score of 2. All routine laboratory investigations were witin normal limits. ECG was also within normal limits, 2DECHO showed EF= 55%, LA dilated, mild MR, mild Pulmonary Hypertension, PASP= 35mmHg, MVA= 1.6 sq.cm. CVS examination revealed loud S1, S2 normal, and a Diastolic Murmur present in mitral area. The patient was accepted under ASA grade III.

Plan of Anaesthesia and Intra-op management: Pre operatively, the patient had a baseline blood

pressure of 130/80mmHg, and heart rate was 64 bpm. After arrival in the operating room, patient was positioned supine followed by standard monitoring with electrocardiography, pulse oximetry and non invasive blood pressure. Supplemental oxygen was administered by face mask at a flow of 3L/min. The plan of anaesthesia was decided as USG guided right sided Suprainguinal Fascia Iliaca Block + General Anaesthesia. For General Anesthesia, the patient was premedicated with Inj. Midazolam 1mg i.v. and Inj. Fentanyl 100 mcg i.v. Induction of general anaesthesia was done with Inj. Etomidate 20mg i.v. and Inj. Vecuronium 6mg i.v. and the patient was intubated using ET tube no. 7.0. Under all aseptic precautions, the thigh to be blocked was scanned using a high frequency (9-13 MHz) linear array transducer. The Anterior Superior Iliac Spine (ASIS) was palpated and the ultrasound probe was placed slightly inferior and medial to the ASIS. The Iliacus muscle was identified superficial to the Ilium, and the hyperechoic Fascia Iliaca was identified on the superficial border of the muscle. The tapered confluence of the internl oblique (cephalad) and the sartorius (caudad) and the inguinal ligament (bow tie or horizontal hourglass) was identifed. With the probe in its positon, small manoevres were performed to optimize the visulization of fascia iliaca.[2] The deep circumflex iliac artery was identified between the internal oblique nd fascia iliaca. Right sided Suprainguinal Fascia Iliaca Block was given using 20 ml of 0.25% inj. Ropivacaine with 100 mm stimuplex needle after confirmation of negative aspiration of blood. Intra operatively, 2 cystalloids were admininstered. Towards the end of the surgery after estimating total blood loss, 1 pint blood (PCV) was also given. At the end of the surgery, the patient was reversed using Inj. Sugamadex 100 mg iv. Patient was extubated on table and shifted to ICU for further hemodynamic monitoring and observation. All vital parameters were stable during the surgery with BP being in the range of 130/70 to 140/80 mmHg and pulse being in the range of 62 to 68 beats/min. Towards the end of the surgery, inj. Paracetamol 1gm i.v was given.

DISCUSSION

Classification of valvular heart diseases is based upon the etiology:

1. Congenital valvular heart (stenisis, malposition, atresia, abnormalities of valve structure- bicuspid valves).
2. Acquired heart valve disease.
3. Rheumatic heart disease.
4. Endocarditis (regurgittion more common).
5. Senile calcific AS.
6. Myxomatus mitral valve prolapse leading to regugitation.[3]

The patient presented here was a known case of Rheumatic heart disease with mitral Stenosis. Mitral stenosis is characterized by obstruction to left ventricular filling due to decreased size of mitral valve orifice. With mild stenosis, left ventricular filling and stroke volume are maintained by increase in left atrial pressure. As the obstruction progresses, pulmonary venous and arterial pressures are increased. This leads to compensatory right ventricular (RV) hypertrophy, RV dilatation and failure. With mitral stenosis, there is evidence of left ventricle dysfunction.[1]

In a geriatric patient with RHD + MS undergoing non cardiac surgery, hemodynamic stability is of utmost importance. Anaesthetic management should focus on control of heart rate, ventricular preload, diminished RV and LV contractile functions and co-existing pulmonary hypertension.[1] A slower heart rate is needed to transfer enough blood from LA to LV. Any fast atrial rate or arrythmias such as atrial fibrillation diminishes left ventricular filling and cardiac output.[3] Fluids should be cautiously administered, as over transfusion will cause pulmonary edema. All measures to avoid increases in pulmonary arterial pressures (eg., avoid hypoxia, hypercarbia, acidosis, lung hyperexpansion and nitrous oxide) should be done.[3] Hypotension reduces coronary blood flow resulting in myocardial ischemia and further deterioraton in left ventricular function and cardiac output. Drugs causing depression of myocardial contractility should be avoided in patients with stenotic valvular diseases.

Neuraxial anaesthesia causes sympathetic blockade leading to profound hypotension resulting in reflex tachycardia. This will lead to poor myocardial perfusion and worsening cardiac function.[4] Hence, in patients with valvular heart diseases, general anaesthesia is preferred over neuraxial anaesthesia, to avoid sudden sympathetic blockade. This makes the patient bear a wide range of shortcomings like sympathetic stimulation during endotracheal intubation, polypharmacy, delayed recovery, ICU admission and prolonged hospital stay.[5]

While deciding plan of anaesthesia, local infiltrative anaesthesia or regional nerve blocks are suitable anaesthetic techniques. Suprainguinal Fascia Iliaca block under ultrasound guidance provides for optimal perioperative pain management in hip surgeries and improves long term quality of life. SIFI block under usg guidance will block both the femoral nerve and lateral femoral nerve completely. This technique by the supra-inguinal approach resulted in complete block of the femoral and the fascia iliaca nerves. GA with SIFI block provides a greater degree of hemodynamic stability than neuraxial anaesthesia. Regional anaesthesia reduces intra-op requirement of opioid analgesics.[2]

Ultrasonographic guided nerve blocks are more beneficial as they visually identify the nerves to be blocked. This technique gives more accuracy, drug requirement for the block is reduced and these blocks also provide postoperative analgesia.[6]

CONCLUSION

General Anaesthesia along with Regional Anaesthesia in the form of Suprainguinal Fascia Iliaca Block provide superior control over patient's hemodynamics as compared to Spinal Anaesthesia alone and this method would be the appropriate choice of anaesthesia for patients with valvular heart disease undergoing non cardiac surgery such as Bipolar Hemiarthroplasty of Hip.

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