

Successful Anaesthetic Management Of Patient With Severe Hocm For Redo Surgery For Malunited Distal Femur Fracture Fixation

Dr Ravi Narayanan

Senior Consultant and Chief Anaesthesiologist

NH Health city Orthopaedics Spine and Trauma Unit Bangalore

Abstract

Hypertrophic Cardiomyopathy Most Often Inherited As Autosomal Dominant Is Characterised By Asymmetrical Hypertrophy Of Interventricular Septum Leading On To Varying Degrees Of Lvt Obstruction. Clinical Features May Vary From Asymptomatic Presentation To Fatal Arrhythmias And Sudden Cardiac Death. Clinical Course Of Often Complicated Consequent To Stress Of Surgery And Anaesthesia We Hereby Discuss Successful Anaesthetic Management Of Patient With High Grade Of Lvt Obstruction Consequent To Hocm For Correction Of Malunited Distal Femur Fracture.

Keywords -Hypertrophic Obstructive Cardiomyopathy

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I. INTRODUCTION

Hypertrophic obstructive cardiomyopathy a critical condition of heart and most often inherited as autosomal dominant pattern. It is often characterised by asymmetrical hypertrophy of interventricular septum leading on to varying degree of fatal LV outflow tract obstruction

Sudden cardiac death, Fatal arrhythmias are some of troublesome features of HOCM.

We report here successful perioperative management of patient with severe HOCM associated with high grade LVOT obstruction for redo surgery for malunited distal femur fracture fixation.

II. CASE HISTORY AND PREOPERATIVE EVALUATION

49-Year-old female was admitted for Redo surgery to correct malunited left distal femur fracture fixation. Known case of Hypothyroidism on Thyroxine 150 ugin the past 5 years and known case of Diabetes mellitus since 10 years on Tab Metformin 500 mg three times daily. She was on antidepressant Tab Venlafaxine 150 mg HS and Tab Ativan 1 mg at night daily

Past surgical history revealed that she underwent femur nailing in October 2020 and surgery again in October 2021 for correction of deformity under Subarachnoid block. During procedure she developed hypotension, palpitation, breathlessness, and sweating. On evaluation she was found to have severe grade Hypertrophic cardiomyopathy. She was started on Tab Disopyramide 200 mg three times daily and Tab Metoprolol XL 50 mg OD.

Preoperative 2D Echo evaluation revealed Concentric hypertrophy of LVH, RWMA EF OF 35 TO 45 Percent with LVOT Gradient of 80mmHg. Cardiologist consultation also obtained prior to planned ortho procedure. Advised to undergo surgical procedure for excision of Hypertrophied IV Septum. Patient preferred to undergo orthopaedic procedure first as she was experiencing severe pain.

After admission Preoperative evaluation was done and on physical examination HR 50 beats /minute BP 160/80, Spo2 92% Room air. Her Metabolic equivalents was less than 4. Her airways assessment revealed MMC grade 2. During her Pre Anaesthetic check-up she had clearly refused for spinal or epidural and preferred GA. Blood investigations revealed HB 12G/DL, S Creatinine of 1.1 mg/dl Potassium of 4.5 meq/l.

III. ANAESTHETIC MANAGEMENT

After arrival in OR holding area, Routine monitors were applied including ECG, NIBP Pulse oximetry. 18G iv canula secured in Rt hand and IV RL infusion commenced at 100 ml/hr.

Left radial artery canulated with 20 G Arterial canula for continuous BP monitoring. It was also ensured that Phenylephrine infusion at dosing of 50ug/ml was kept ready to manage any inadvertent hypotension at induction or during intraoperative period. After recording of baseline values, slow induction done with 8 to 10mg of etomidate and Fentanyl 100ug. Vecuronium 6 mg given to facilitate Neuromuscular blockade. Xylo card 60mg given 90 seconds prior to endotracheal intubation to minimise pressor response to laryngoscopy and

intubation. Endotracheal intubation done with 7.5 mm cuffed ET tube and fixed at 20cm mark. Adequacy of B/L air entry checked and IPPV Commenced

Right sided Internal jugular vein cannulated with triple lumen CVP catheter and secured firmly with sterile adhesive dressing after ensuring adequate backflow of blood in three lumens

We performed Left sided USG guided Femoral Nerve block and Lateral cutaneous nerve of thigh block to ensure adequate analgesia in intraoperative a period and minimise anaesthetic requirement.

Foleys catheterisation done to monitor hourly urine output and to indirectly gauge cardiac output.

Total surgical duration was 3 hours. Intraoperative period she was stable with no major hemodynamic drifts. Blood loss was around 750 ml. She received 1.5 L Crystalloid and 1 unit PRBC Transfusion.

She was shifted to ICU for gradual weaning and extubation. This was done as she had severe grade HOCM and any sympathetic surges at time of extubation could lead on to aggravation of LVOT obstruction. Smooth extubation done under cover of NTG infusion after attainment of normothermia and correction of various biochemical and metabolic parameters. NTG Infusion was tapered and stopped subsequently.

IV. DISCUSSION

Advances in monitoring standards coupled with better understanding of pharmacokinetics of various anaesthetics have resulted in better outcomes in perioperative care for surgeries in elderly with significant comorbidities.

When considering various options for Anaesthetising Patient with multiple comorbidities, it becomes prudent on part of Physician to have vivid understanding of deranged physiology pertaining to individual systems along with overall damaging cascade effects it has on patient.

Management strategies¹ focussed on maintenance of sinus rhythm, maintenance of adequate preload afterload and most importantly minimise sympathetic surges

Diastolic dysfunction, subendocardial ischaemia Ventricular arrhythmias Atrial fibrillation are some of troublesome anticipated perioperative complications². Atrial fibrillation creates nidus for thromboembolism, also not to forget delayed diastolic filling and consequent reduced cardiac output. Preoperative use of B blockers³ ensured stable heart rate and minimised undue excess of myocardial oxygen consumption. At the same time diastolic filling time was also optimised ensuing adequate coronary perfusion.

Patient had traumatic history pertaining to previous surgery for fixation of femur fracture. She had episode of palpitation sweating and chest pain during her intraoperative period. She had to be stabilised in Coronary care unit for the same. Also, she gives significant history of back ache with pain radiating down legs. She did not give consent for subarachnoid block during present surgery. Hence, we decided to proceed with case under GA even though we felt Combined spinal epidural anaesthesia would have been better choice. We also performed Femoral nerve block⁴ along with blockade of lateral cutaneous nerve of thigh to provide adequate intraoperative analgesia and also to decrease intraoperative anaesthetic requirement.

During course of anaesthesia and surgery abundant instance of sympathetic stimulation is bound to happen due to variety of noxious stimuli. All these can worsen dynamic outflow obstruction and lead on to variety of cardiovascular complications. Hence Anaesthesia management⁵ has to be customised in such so as to minimise adverse events causing aggravation of LV outflow obstruction and at same ensuring appropriate fluid balance minimising hypotension and providing adequate analgesia.

Combined spinal epidural anaesthesia⁶ with low volume subarachnoid block ensures good operative conditions, avoids wide swings of blood pressure, and ensures stable hemodynamic intraoperatively and minimise perioperative stress Also helps to provide long lasting post operative analgesia and ensuring early rehabilitation

Patient was shifted to ICU for mechanical ventilation, gradual weaning and extubation. Sympathetic surge during extubation could cause hypertension and tachycardia aggravating LV Outflow tract obstruction. Nitroglycerin infusion was started to titrate BP and at the same time it was ensured that normothermia maintained, biochemical acid base and electrolyte derangements were corrected prior to Extubation.

It was also ensured that same standards of monitoring and care was continued into post operative period. Fluid management guided by Ultrasound assisted IVC diameter, base deficit, serum lactate and hourly urine output levels. IV fluid administration stopped on resumption of adequate oral intake

Post operative analgesia was managed with IV Fentanyl infusion at dose range of 0.5 to 1 µg/kg/hr in addition to IV Paracetamol 1g 8th hourly. All cardiac medications including b blockers, disopyramide were continued into post operative period. Patient was shifted to the ward subsequently for further management

Preoperative 2D Echo evaluation revealed Concentric hypertrophy of LVH, RWMA EF OF 35 TO 45 Percent with LVOT Gradient of 80mmHg. Excision of hypertrophied tissue IV septum⁷ would have been ideal choice prior to any elective surgery to minimise perioperative cardiovascular risks. Patient preferred to undergo orthopaedic procedure first she was experiencing significant pain. Cardiologist consultation also obtained prior

to planned ortho procedure. It was also ensured that patient received B blockers and antiarrhythmic drugs to minimise Sympathetic response and reduce burden of LV outflow tract obstruction

V. CONCLUSION

Sound knowledge of Pathophysiology of HOCM, Factors aggravating and relieving obstruction, skilled supervision, effective planning, and administration of anaesthesia judiciously coupled with effective management of patient in postoperative period will ensure smooth and successful outcome for HOCM patient posted for non-cardiac surgery.

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