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Case Report

Above knee amputation in a geriatric patient with severe ICMP and DM2: A case report

Kush Sharma¹, Aparna Singh^{1,*}, Lalit Gupta¹

¹Dept. of Anaesthesia and Critical Care, MAMC and Lok Nayak, Hospital, New Delhi, India



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ABSTRACT

Geriatric patients with cardiac dysfunction are always a nightmare for anaesthetist in terms of successful intraoperative and postoperative management. We are presenting a case of 68-year-old male patient admitted in surgical emergency with rapidly progressive wet gangrene of right leg. He was a diagnosed case of severe Ischemic cardiomyopathy (ICMP) and Diabetes mellitus type 2 (DM-2) since last 10 years on medications. However, he was non-compliant with medications and had developed severe limitation in the functional status with metabolic equivalents <4 (METs<4) and complaints of chest pain even on minimal exertion. In view of the rapidly progressive wet gangrene and risk of sepsis leading to high possibility of morbidity and mortality, an urgent above knee amputation was planned. However due to the risks associated with general anaesthesia and central neuraxial blockade, an safe anesthesia plan was formulated and implemented utilising only the lower limb blocks to achieve a safe conduct of anaesthesia.

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1. Introduction

Ischemic cardiomyopathy results from a sustained imbalance between the oxygen delivery and demand of the heart that progressively leads to myocyte loss with myocardial scarring and ventricular failure. It can result from focal narrowing or occlusion of the main coronary arteries by atherosclerosis, spasm of the coronary circulation or alterations in the capillary network. Loss of the myocardium due to the ischemia places a demand on the surviving tissue to sustain the pumping action of the heart.¹ Thus, the pumping action of the heart is reduced in direct proportion to the myocardium that is lost, thereby decreasing the ejection fraction. This presents extreme challenges to the anaesthesiologists to maintain a fine balance between myocardial oxygen demand and supply under stress of anaesthesia. Central neuraxial blocks and

General anaesthesia have proven to be risky in such a patient as both may jeopardise the delicate balance of myocardial oxygen demand and supply in such patients.

We present a case report, which highlights these difficulties while being compounded with additional problems of a geriatric patient with uncontrolled diabetes and progressive sepsis.

2. Case Report

A 68-year-old elderly male patient, known case of severe ischemic cardiomyopathy and DM-2, presented to us with rapidly progressive wet gangrene of the right leg. The patient was non-compliant with medications and had poor functional status with METs<4. He had complaints of chest pain even on minimal exertion.

On examination, the patient was conscious and oriented, afebrile to touch with pulse rate of 68bpm and BP of 128/80 mmHg. Airway examination revealed adequate mouth opening (Mallampatti grade-I) with normal neck mobility

* Corresponding author.

E-mail address: qsh.sharma@gmail.com (A. Singh).

and normal dentition. Spine examination was also normal. Clinical examination of Cardiovascular and Respiratory systems was unremarkable. The TLC was 16460/mm³. RBS was 201 on insulin therapy. HbA1c was 12. Liver function, kidney function, serum electrolytes, coagulation profile were within normal limits. ECG showed a normal sinus rhythm with LAD. 2D ECHO revealed an ejection fraction of 20% with left ventricular hypokinesia. Above knee amputation in our patient was labelled as high-risk procedure with an elevated risk of adverse perioperative cardiac outcome.

2.1. Anaesthetic management

The patient was accepted as ASA III and high-risk consent was taken. He was optimised in the preoperative room, shifted to operation theatre (OT) and standard ASA monitors were attached. Under the guidance of senior anaesthesiologists, a safe and effective plan was formulated which circumvented the risks of General Anaesthesia and Central neuraxial block in our patient. It was decided to get the amputation done under peripheral nerve blockade.

All standard ASA monitors were attached and OT temperature was adjusted to avoid intraoperative hypothermia along with warm IV fluids and forced air-warmers. In the absence of USG guidance, peripheral nerve stimulator was used. Under all aseptic precautions, the patient was placed in lateral position and Parasacral block was given successfully with 10 ml of Lignocaine with adrenaline and 15 ml of 0.5 percent Bupivaine. After making the patient supine, femoral nerve block (perivascular three-in-one block) was given and 10 ml of Lignocaine with adrenaline and 15 ml of 0.5 percent bupivacaine was administered. Vitals were monitored continuously to look for any signs of local anaesthetics toxicity and tourniquet was applied in the mid-thigh. Care was taken during tourniquet inflation and deflation to avoid haemodynamic effects.

Multimodal analgesia was given using injection diclofenac (in IV drip) and paracetamol (1 gm IV) alternatively. No sedation was given intraoperatively. Effect of blocks was adequate and amputation finished without any adverse event intraoperatively. The patient remained hemodynamically stable throughout the procedure and surgery was completed uneventfully. Duration of surgery was 90 minutes and total intravenous fluid given intraoperatively was approximately 750 ml. The Post procedure vitals were also stable with adequate analgesia being achieved (VAs <2). Postoperatively, SpO₂, non-invasive blood pressure and ECG monitoring with oxygen supplementation by venturi mask continued in the recovery room.

3. Discussion

Patients with Ischemic Cardiomyopathy pose significant challenges to us Anaesthesiologists due to high risk of

cardiac morbidity and mortality. Due to the fine balance that needs to be maintained between myocardial oxygen supply and demand, choosing the ideal method for providing anaesthesia to such patients is difficult.^{2,3} The overall aims of anaesthesia are to avoid tachycardia and avoid/minimize the effects of negative inotropic agents, in particular anaesthetic drugs while maintaining preload and afterload in such patients. General Anaesthesia was not ideal for our patient due to the poor functional status of the patient. Central neuraxial blocks in such patients can also prove catastrophic due to the risk of peripheral vasodilation induced hypotension resulting in decreased cardiac output. This could lead to an increase in heart rate to maintain cardiac output thus theoretically increasing myocardial oxygen demand.^{4,5} Thus it was decided to perform the above knee amputation under peripheral nerve blocks.

Above knee amputation requires adequate anaesthesia of complete lower extremity due to use of tourniquet in order to minimise blood loss and subsequent problems. Hence, a combination of Parasacral block with femoral nerve block (perivascular three-in-one block) was used for adequate intraoperative anaesthesia and analgesia. Parasacral nerve block completely anaesthetizes the sacral plexus including the sciatic nerve. Perivascular three in one block anaesthetizes the femoral, obturator as well as the lateral cutaneous nerve of thigh thus avoiding risk of tourniquet pain.^{6,7} Intraoperatively adequate multimodal analgesia was given and all measures were taken to avoid hypothermia since pain and shivering can increase oxygen demand and lead to myocardial ischemia.

4. Conclusion

Every geriatric patient with myocardial dysfunction is an anaesthetist's challenge. The most important factors for management of these high-risk patients include a thorough preoperative assessment, optimizing the cardiac status, proper anaesthetic plans, intraoperative and postoperative monitoring and prompt diagnosis and management of complications.

5. Source of Funding

None

6. Conflict of Interest

The authors declared no conflicts of interest.

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Author biography

Kush Sharma, Senior Resident

Aparna Singh, Senior Resident

Lalit Gupta, Associate Professor

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