

Anesthetic Management of a Patient with Severe Systolic Dysfunction Posted for Proximal Femur Fracture Fixation- A Case Report

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Abstract:- Proximal femur fractures are amongst the most common fractures in elderly people. As elderly patients present with multiple comorbidities including cardiac dysfunction, the anesthesia management in such cases can be quite challenging. We present a case report describing the successful anesthetic management of an elderly patient with severe systolic dysfunction posted for proximal fracture femur fixation. The importance of alternative anesthetic options to Sub-Arachnoid Block, especially Regional Anesthetic techniques, in elderly patients with left ventricular dysfunction, is emphasized.

I. INTRODUCTION

Elderly patients often present with injuries requiring surgery. Proximal femur fractures, most commonly seen in the elderly, are associated with a risk of cardiovascular, pulmonary, thrombotic, infectious and bleeding complications.[1] Mortality in the perioperative period is increased in these patients with added comorbidities, like congestive heart failure(CHF)[2]

There is a paucity of evidence on the safety of a certain anesthetic technique for patients with CHF. Here, we planned anaesthetic management of the patient with an aim to maintain sufficient analgesia and hemodynamic stability in the intra operative and immediate post operative period.

II. CASE REPORT

An 80 year old male was admitted to the hospital for fixation of proximal fracture femur. On admission, the patient was found to be in hypotension and was started on infusion of Inj. Noradrenaline after being shifted to the Intensive Care Unit. He had a history of hypertension and coronary artery disease (triple vessel disease), taking Tab. Aspirin 150 mg and Tab. Ivabradine 5 mg for the last 10 years. The patient had a heart rate of 96/min, blood pressure (BP) 100/60 mm Hg on vasopressor support and SpO₂ 96% at room air. He appeared pale; JVP was elevated and had bilateral basal crepitations on auscultation. All routine investigations were within normal limits, except for Hb of 7.6 g/dl. Global T wave inversions, ST depression and q waves were noted on ECG. 2d Echo showed a severely impaired left ventricular systolic function with ejection fraction of 20%, global hypokinesia, degenerative valvular heart disease (Mitral and Tricuspid regurgitation) with Type II Diastolic dysfunction. Considering the severe cardiac dysfunction and emergency nature of surgery, the patient was accepted as ASA Grade III

(E). The plan of anesthesia was decided as General anesthesia supplemented by Fascia Iliaca Compartment nerve block.

On the operating room table, all monitors were attached. Preoperatively, patient had heart rate of 98/min, blood pressure (BP) 112/60 mm Hg with Noradrenaline infusion at 6cc/hr and SpO₂ 97% at room air. Under all aseptic precautions, patient was given USG guided right Fascia Iliaca Compartment Block with 20 mL 0.25 % Ropivacaine + 4 mg Dexamethasone for achieving adequate analgesia. The patient received IV Midazolam 1mg and IV Fentanyl 40 mcg as premedication. Anesthesia was induced with IV Etomidate (0.2 mg/kg) and IV Scoline 70 mg, and airway was secured with LMA Supreme no.3. Anesthesia was maintained on Sevoflurane (1.5%) and intermittent doses of Inj. Atracurium. Intraoperative blood loss was 250 ml which was replaced with single PCV transfusion. Throughout surgery, the patient had heart rate of 96-98/min and systolic blood pressure of 102-104 mm Hg with Noradrenaline infusion at 4cc/hr. LMA supreme was removed successfully on table and patient was shifted to ICU for post operative monitoring on vasopressor and oxygen support. With the help of the Fascia iliaca blockade, patient was absolutely pain-free in the immediate post operative period. Vasopressors were stopped after gradual tapering and patient was shifted to ward on 3rd post operative day. He was discharged after 10 days of postoperative stay.

III. DISCUSSION:

Proximal femur fractures are associated with intense pain, which is more critical in elderly patients with added cardiovascular instability. These frail patients with multiple comorbidities get stripped of their already impaired self-sustainability.

Systolic dysfunction is common in elderly patients with hypertension and coronary artery disease[3] According to the American College of Cardiology classification, an ejection fraction $\leq 30\%$ is considered severe systolic dysfunction.[4] These patients have limited cardiac and pulmonary reserve.[3] Perioperative goals in the management of these patients include maintaining forward flow, promoting inotropy without inducing or exacerbating ischemia, and returning patients to their preoperative level of function after surgery.[5]

Neuraxial blockade is the most preferred anaesthesia for lower limb orthopaedic surgeries. Spinal anesthesia is

expected to produce profound vasodilatation and consequent severe hypotension. In a frail patient like ours, with poor LV systolic function, sudden reduction in peripheral vascular resistance may precipitate a drop in myocardial perfusion and cardiac output, leading to profound hypotension.[6] In addition, elderly patients with cardiac dysfunction are more susceptible to hypotension associated with spinal and epidural analgesia. A localized technique that minimizes vasodilation may be preferable to central neuraxial techniques.[6]

Virtually all anesthetic agents are intrinsic myocardial depressants. The vasodilatory effects of the volatile agents can result in serious hypotension when combined with negative inotropy. Patients with pre-existing cardiac disease will not tolerate wide swings of hemodynamic variables.[7] Direct laryngoscopy and tracheal intubation results in stimulation of the sympathetic nervous system, which may, in turn lead to increased heart rate, elevated systolic blood pressure and cardiac arrhythmias.[8]

Regional anesthesia can potentially offset some of the surgical stress response and should be considered as part of a multimodal and, where possible, the primary approach to anaesthesia and analgesia in the elderly patient.[9] Peripheral nerve blocks combined with general anesthesia provides not only better postoperative analgesia, but may also result in better intraoperative hemodynamic control than general anesthesia alone.[10] Their advantages include reduction in opioid consumption, intraoperative inhalational agents and decreased stress responses. Skilfully performed major peripheral blocks can be life-saving in patients with severe cardiovascular disease.[6]

Regional blocks like the fascia iliaca compartment block are now considered attractive alternatives for efficacious pain control in this cohort of patients.[11] The fascia iliaca compartment block (FICB) has been reported to effectively block the femoral, the obturator nerve, and the lateral cutaneous nerves and, therefore, has advantages in the management of the pain arising from a proximal femoral fracture.[11]



Fig 1: Fascia Iliaca Compartment Block.

The anaesthetic goals in this case were to provide intraoperative cardiovascular stability and post operative analgesia to an elderly, hemodynamically unstable patient in the safest possible way.

IV. CONCLUSION

Meticulous anesthetic management in the form of providing effective intra- and post- operative analgesia and hemodynamic stability with minimal anesthetic drug requirement, by adding Fascia Iliaca Compartment Block to General Anesthesia plays an important role in improving the outcome in an elderly patient with severe left ventricular systolic dysfunction posted for fixation of proximal femur fracture.

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