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Epidural Anaesthesia and Analgesia for Hip Fracture Surgery in a Patient with Ischemic Heart Disease and Reduced Left Ventricular Ejection Fraction: A Case Report

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Abstract

Background

Patients with ischemic heart disease (IHD) undergoing non-cardiac surgery are at increased risk of perioperative cardiovascular complications. Hip fracture surgery in patients with impaired left ventricular systolic function presents additional challenges because both anaesthesia-induced haemodynamic changes and perioperative stress may adversely affect myocardial oxygen balance. Careful preoperative assessment, optimization, vigilant monitoring, and an individualized anaesthetic technique are therefore essential.

Case Presentation

A 55-year-old woman with a history of ischemic heart disease, previous coronary angioplasty, hypertension, and left ventricular ejection fraction of 45% presented with fracture neck of femur and was scheduled for hemiarthroplasty. She was receiving metoprolol, nitroglycerin, aspirin, and clopidogrel. Clopidogrel had been discontinued 7 days before surgery, while aspirin was continued. Preoperative evaluation revealed anterolateral ischemic changes on electrocardiography and severe hypokinesia of the septal and anterior walls with reduced left ventricular systolic function. After cardiology consultation and optimization, epidural anaesthesia was selected. Following negative aspiration for blood and cerebrospinal fluid, a test dose of 3 mL of 2% lignocaine with adrenaline was administered. Epidural anaesthesia was subsequently established incrementally using ropivacaine, and fentanyl, achieving a T12 sensory level. Haemodynamic parameters remained stable throughout the 120-minute procedure, without clinically significant hypotension, tachycardia, or evidence of perioperative myocardial ischemia. Postoperative epidural analgesia was continued for 48 hours with low-concentration bupivacaine.

Conclusion

This case demonstrates that carefully titrated epidural anaesthesia with postoperative epidural analgesia can be successfully used in selected patients with ischemic heart disease and reduced left ventricular systolic function undergoing hip fracture surgery. The technique requires meticulous patient selection, appropriate antiplatelet management, incremental administration of local

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anaesthetic, vigilant haemodynamic monitoring, and immediate availability of equipment and drugs for management of cardiovascular or airway complications.

Keywords: Ischemic heart disease; epidural anaesthesia; hip fracture; reduced ejection fraction; cardiac risk; regional anaesthesia; postoperative analgesia.

Introduction

Patients with ischemic heart disease (IHD) undergoing non-cardiac surgery are at increased risk of perioperative cardiovascular complications [1,2]. The risk is influenced by patient-related factors, including the severity and stability of coronary artery disease, previous myocardial infarction, left ventricular dysfunction, hypertension, diabetes mellitus, renal dysfunction, peripheral vascular disease, and advanced age, as well as by the type and urgency of surgery [4,9].

The principal anaesthetic goals in patients with IHD are maintenance of myocardial oxygen supply-demand balance, avoidance of significant tachycardia and hypotension, prevention of excessive sympathetic stimulation, maintenance of adequate coronary perfusion, and early recognition and treatment of myocardial ischemia [2,9].

Both general and regional anaesthesia can be used in patients with cardiac disease, depending on the clinical condition, surgical procedure, anticipated haemodynamic changes, and expertise available. General anaesthesia may be associated with haemodynamic fluctuations during induction and airway instrumentation. Regional techniques, when appropriately performed and carefully titrated, may avoid airway manipulation and attenuate the neuroendocrine and haemodynamic stress response associated with surgery [3,7].

However, neuraxial anaesthesia in patients receiving antiplatelet therapy requires careful consideration because of the potential risk of neuraxial haematoma. Appropriate discontinuation of P2Y12 inhibitors and assessment of the overall bleeding risk are essential before neuraxial procedures [9].

We report the successful perioperative management of a patient with ischemic heart disease, previous coronary angioplasty, and left ventricular ejection fraction of 45% who underwent hemiarthroplasty for fracture neck of femur under carefully titrated epidural anaesthesia followed by postoperative epidural analgesia.

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Case Presentation

A 55-year-old woman with a known history of ischemic heart disease and hypertension for approximately 3.5 years was diagnosed with fracture neck of the femur and scheduled for hemiarthroplasty.

She had undergone coronary angioplasty three years previously. Her regular medications included metoprolol 25 mg once daily, sustained-release nitroglycerin 2.6 mg twice daily, aspirin 75 mg once daily, and clopidogrel 75 mg once daily. Clopidogrel had been discontinued 7 days before surgery, while aspirin was continued.

Preoperative assessment was performed in detail. The patient was conscious, oriented, afebrile, and haemodynamically stable. Her pulse rate was 68 beats/min and blood pressure was 120/70 mmHg. Airway examination revealed adequate mouth opening, Mallampati grade II airway, normal neck movements, and no loose teeth. Examination of the spine was unremarkable.

Routine haematological investigations, renal and liver function tests, serum electrolytes, blood glucose, and coagulation parameters were within normal limits.

Chest radiography demonstrated cardiomegaly. Electrocardiography showed anterolateral ischemic changes. Echocardiography revealed hypokinesia of the interventricular septum and anterior wall with compromised left ventricular systolic function. The ejection fraction was 45%. Mild mitral and tricuspid regurgitation were also noted.

A cardiology consultation was obtained and the patient was considered to be at increased perioperative cardiac risk. After multidisciplinary discussion and optimization, the patient was accepted for surgery with appropriate precautions. She was classified as ASA physical status IV.

Anaesthetic Management

The anaesthetic plan was epidural anaesthesia with postoperative epidural analgesia.

Before commencement of anaesthesia, all necessary equipment for airway management and cardiovascular resuscitation was checked and kept immediately available. A difficult-airway cart containing appropriately sized Macintosh blades, cuffed endotracheal tubes, laryngeal mask airways, face masks, and stylet was kept ready. Drugs required for the management of hypotension, arrhythmias, myocardial ischemia, and cardiovascular compromise were prepared, and facilities for emergency defibrillation and advanced resuscitation were ensured.

The patient had received ranitidine 150 mg and alprazolam 0.5 mg on the day before surgery. Detailed counselling regarding the proposed anaesthetic technique was performed, and informed high risk consent was obtained.

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On the day of surgery, her regular beta-blocker and antihypertensive medications were continued. An 18-gauge intravenous cannula was secured in the right forearm, and intravenous crystalloid infusion was commenced.For monitoring including continuous electrocardiography, invasive blood pressure, and pulse oximetry was instituted. Baseline haemodynamic parameters were recorded.

Epidural anaesthesia was performed under strict aseptic precautions with the patient in the sitting position. Following local infiltration with 2% plain lignocaine, an 18-gauge Tuohy needle was introduced at the L2–L3 intervertebral space. The epidural space was identified using the loss-of-resistance technique.

An 18-gauge epidural catheter was advanced and secured at the skin after positioning the catheter with the intended cephalad distribution. After negative aspiration for blood and cerebrospinal fluid, a test dose of 3 mL of 2% lignocaine with adrenaline was administered to assess for inadvertent intrathecal or intravascular catheter placement. No evidence of intrathecal or intravascular injection was observed.

The epidural anaesthetic was then administered incrementally. A total of 5 mL of 0.5% ropivacaine, and fentanyl 50 µg were administered through the epidural catheter in divided doses with continuous haemodynamic monitoring. A sensory block extending to approximately T12 was achieved.

The surgical procedure lasted approximately 120 minutes. Epidural anaesthesia was supplemented with 4 mL of 0.5% plain ropivacaine after approximately 60 minutes to maintain adequate surgical anaesthesia.

Throughout the procedure, haemodynamic parameters remained stable. Systolic blood pressure was maintained between 110 and 130 mmHg, diastolic blood pressure between 70 and 80 mmHg, and heart rate between 60 and 80 beats/min. There were no clinically significant episodes of hypotension, tachycardia, arrhythmia, or apparent perioperative myocardial ischemia.

The total intraoperative crystalloid administration was 500 mL. Urine output was approximately 200 mL, and estimated blood loss was 100 mL.

Postoperative Management

Following surgery, the patient was transferred to the recovery area for continued monitoring. Oxygen was administered through a Venturi mask at 4 L/min. Continuous electrocardiographic monitoring, non-invasive blood pressure, and pulse oximetry were continued.

Postoperative epidural analgesia was provided using 4 mL of 0.25% plain ropivacaine per top-up dose, with a total of four top-up doses administered over the first 48 hours.

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The patient's postoperative course was haemodynamically stable, without clinically evident cardiac complications. The epidural catheter was subsequently removed, and systemic analgesia was commenced thereafter.

Discussion

Patients with IHD undergoing non-cardiac surgery require careful perioperative management because myocardial ischemia may result from an imbalance between myocardial oxygen supply and demand. Tachycardia, hypotension, hypertension, anaemia, hypoxemia, and excessive sympathetic stimulation may contribute to this imbalance [2,9].

In the present case, several factors increased the patient's perioperative cardiovascular risk, including established coronary artery disease, previous coronary angioplasty, reduced left ventricular ejection fraction of 45%, and the need for urgent hip fracture surgery [4,9].

The choice of anaesthetic technique in patients with significant cardiac disease should be individualized. General anaesthesia may result in haemodynamic fluctuations associated with induction, positive-pressure ventilation, and airway instrumentation. In contrast, a carefully titrated epidural technique can provide surgical anaesthesia while avoiding direct laryngoscopy and tracheal intubation and may attenuate the sympathetic and neuroendocrine response to surgery [3,7].

However, neuraxial anaesthesia is not without limitations in patients with cardiac disease. Excessive sympathetic blockade can result in vasodilatation, reduced venous return, and hypotension. In a patient with impaired left ventricular function, significant hypotension may compromise coronary perfusion and myocardial oxygen delivery. Therefore, incremental administration of local anaesthetic, avoidance of unnecessarily high block levels, and close haemodynamic monitoring are particularly important [2,3].

In the present patient, the epidural drug mixture was administered incrementally rather than as a single large bolus. A relatively low sensory level of T12 was sufficient for the surgical procedure, and haemodynamic stability was maintained throughout the operation. The patient did not require significant fluid loading, which was important given her reduced left ventricular systolic function.

Another important consideration was the patient's antiplatelet therapy. She had been receiving dual antiplatelet therapy following previous coronary angioplasty. Clopidogrel was discontinued 7 days before epidural catheter placement, while aspirin was continued. The decision to interrupt antiplatelet therapy should always balance the risk of neuraxial bleeding against the risk of coronary thrombosis and should be made in consultation with the relevant cardiology and anaesthesia teams [9].

Postoperative pain can itself produce sympathetic activation, tachycardia, hypertension, and increased myocardial oxygen consumption. Effective analgesia may therefore be particularly

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valuable in patients with significant coronary disease. In this case, postoperative epidural analgesia using dilute ropivacaine provided continued analgesia while avoiding excessive systemic opioid administration [5,8].

Previous studies have suggested potential cardiovascular benefits from neuraxial and epidural analgesia in selected high-risk surgical populations [3,8], although the magnitude of these benefits varies between studies and cannot be extrapolated directly to an individual patient. Importantly, evidence from a single case cannot establish superiority of epidural anaesthesia over general anaesthesia or demonstrate a reduction in perioperative myocardial infarction.

The successful outcome in this patient was likely related to a combination of careful preoperative assessment, cardiology consultation, appropriate antiplatelet management, individualized anaesthetic planning, incremental epidural drug administration, close haemodynamic monitoring, and effective postoperative analgesia.

Conclusion

Carefully titrated epidural anaesthesia with postoperative epidural analgesia may be a useful anaesthetic option in selected patients with ischemic heart disease and reduced left ventricular systolic function undergoing hip fracture surgery.

Successful management requires meticulous preoperative cardiovascular assessment, appropriate management of antiplatelet therapy, incremental administration of local anaesthetic, avoidance of excessive sympathetic blockade and hypotension, continuous haemodynamic monitoring, and immediate availability of airway and cardiovascular resuscitation equipment.

This case highlights the feasibility of epidural anaesthesia as part of an individualized perioperative strategy in a high-risk cardiac patient. However, larger comparative studies are required to determine whether epidural anaesthesia provides superior cardiovascular outcomes compared with general anaesthesia in this population.

References

1. Hall MJ, Owings MF. 2000 National Hospital Discharge Survey. Advance Data from Vital and Health Statistics. Hyattsville, MD: National Center for Health Statistics; 2002.
2. Akhtar S, Hines RL, Marschall KE. Ischemic heart disease. In: Stoelting RK, Dierdorf SF, editors. *Anesthesia and Co-Existing Disease*. 5th ed. Philadelphia: Churchill Livingstone; 2008.
3. Yeager MP, Glass DD, Neff RK, Brinck-Johnsen T. Epidural anesthesia and analgesia in high-risk surgical patients. *Anesthesiology*. 1987;66:729–736.

ISSN: 0975-3583,0976-2833 VOL 17, ISSUE 11, 2026

4. Lee TH, Marcantonio ER, Mangione CM, et al. Derivation and prospective validation of a simple index for prediction of cardiac risk of major noncardiac surgery. *Circulation*. 1999;100:1043–1049.
5. Rosenquist RW, Rosenberg J. Postoperative epidural analgesia: what are the choices? *Anesthesiology*. 2003;98:1–2.
6. Yeager MP, Glass DD, Neff RK, Brinck-Johnsen T. Epidural anesthesia and analgesia in high-risk surgical patients. *Anesthesiology*. 1987;66:729–736.
7. Kehlet H. Modification of responses to surgery by neural blockade: clinical implications. In: Cousins MJ, Bridenbaugh PO, editors. *Neural Blockade in Clinical Anesthesia and Management of Pain*. Philadelphia: Lippincott.
8. Beattie WS, Badner NH, Choi P. Epidural analgesia reduces postoperative myocardial infarction: a meta-analysis. *Anesth Analg*. 2001;93:853–858.
9. Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery. *J Am Coll Cardiol*. 2014;64:e77–e137.