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CASE REPORT

The Hip Fix with a Heart Twist: Anaesthetic Complexity in Hemiarthroplasty for Dilated Cardiomyopathy

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ABSTRACT

Anaesthetic management of a patient with Dilated Cardiomyopathy (DCM) or a non-cardiac surgery is always a challenge to the anaesthesiologist.[1] DCM results in deterioration of the function of myocardium caused by either LV or biventricular dilatation or due to an impaired systolic function of one or both ventricles with impaired contractility[2], thereby increasing the risk of perioperative cardiovascular complications. We present the successful anaesthetic management of hemiarthroplasty for a patient with severe DCM under Epidural anaesthesia.

This abstract outlines the anaesthetic considerations and approach in a patient with DCM undergoing hemiarthroplasty under epidural anaesthesia. The case emphasizes the importance of preoperative optimization, including assessment of cardiac function, fluid status, and electrolyte balance. Epidural anaesthesia is a viable option in these cases due to its advantage in minimizing systemic stress responses and providing effective postoperative pain relief. Special attention was given to the titration of the epidural local anaesthetic to avoid hypotension, which could otherwise exacerbate heart failure symptoms. Continuous monitoring of cardiac output and blood pressure, alongside careful fluid management, was essential to prevent exacerbation of DCM-related complications. Postoperatively, epidural analgesia facilitated controlled pain relief, reduced the need for systemic opioids, thus lowering the risk of respiratory depression and other cardiovascular events.

This report suggests that epidural anaesthesia, when carefully administered, can be a safe and effective anaesthetic technique in patients with DCM undergoing hemiarthroplasty, provided there is vigilant monitoring and individualized management of fluid balance, blood pressure, and cardiac function.

KEYWORDS

• Dilated cardiomyopathy • Hemiarthroplasty • Epidural anaesthesia

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INTRODUCTION

Hemiarthroplasty, commonly performed for hip fractures, requires careful anaesthetic management, especially in patients with underlying cardiovascular conditions. Dilated cardiomyopathy (DCM) is a condition characterized by the dilation and impaired contraction of the left ventricle, leading to systolic heart failure. The anaesthetic management of these patients is challenging due to the compromised cardiac function, which can increase the risks of perioperative complications such as arrhythmias, hemodynamic instability, and congestive heart failure.

This case report describes the successful anaesthetic management of a patient with DCM undergoing hemiarthroplasty, highlighting the use of epidural anaesthesia as a preferred technique. Epidural anaesthesia offers advantages in such cases by providing effective analgesia, stable hemodynamics, and reducing the need for systemic opioids, which can further compromise cardiovascular function. The aim of this report is to discuss the perioperative considerations, anaesthetic choices, and monitoring strategies in managing a patient with DCM undergoing major surgery.

CASE REPORT

A 76 yrs old female, a known case of dilated cardiomyopathy with fracture neck of femur was posted for hemiarthroplasty. On preoperative evaluation, she had given history of fall with history suggestive of dizziness, syncope or loss of consciousness. She had history of systemic hypertension for 10years and her drug history revealed that she was on Spironolactone, Carvedilol, Ramipril, Amiodarone, Torsemide, Ecospirin.

Pre operative finding included a regular PR of 68/min, a BP of 110/68mmHg and a RR 16/min. On auscultation, heart sounds were normal, without any appreciable murmurs. Chest was clear on auscultation, air entry bilaterally equal with no added or adventitious sounds.

INVESTIGATIONS

Hb 12.7gm%, TC 7480cells/mm3 , RBS 140mg/dL, Platelet count 1.2lakhs cells/mm3, Blood urea nitrogen 36mg/dL, S.Cr 1.0mg/dL, S.Na 138mEq/L, S.K 4.5mEq/L, Blood group A negative

ECG – LBBB, Atrial fibrillation (Figure 1)

CXR – cardiomegaly (Figure 2)

Echocardiography – Global hypokinesia, poor systolic function, mild MR, LV end diastolic dilatation. EF 22%

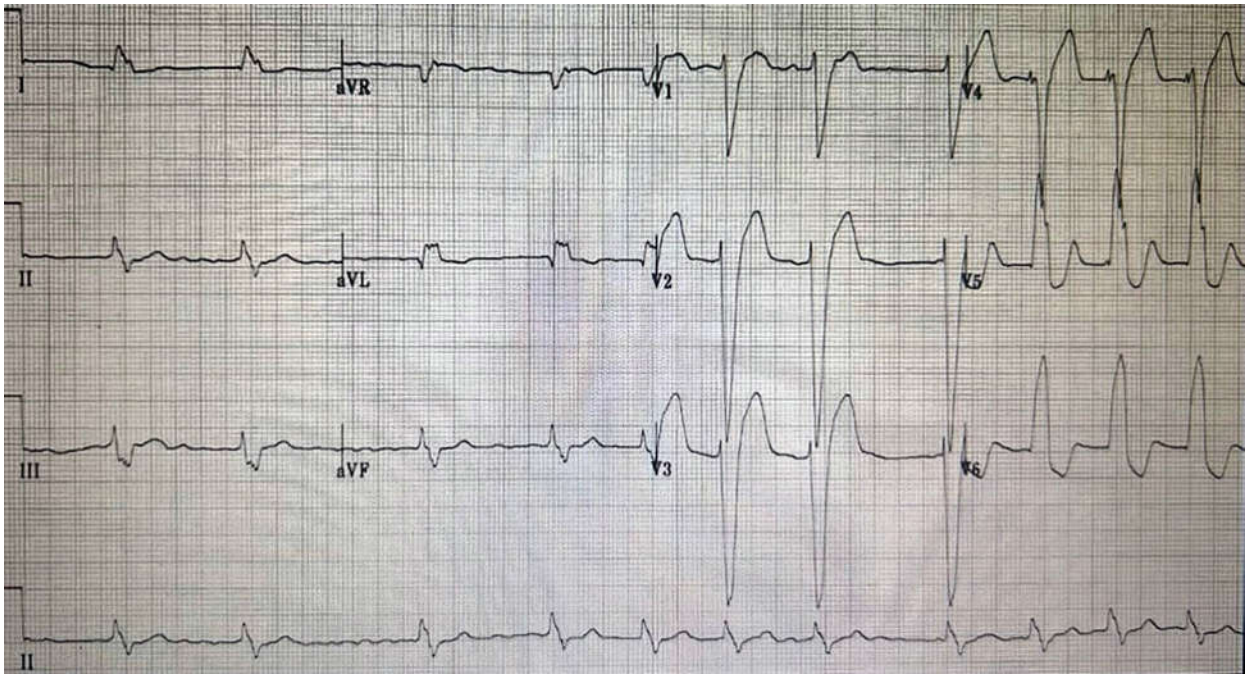

Figure 1: ECG showing LBBB

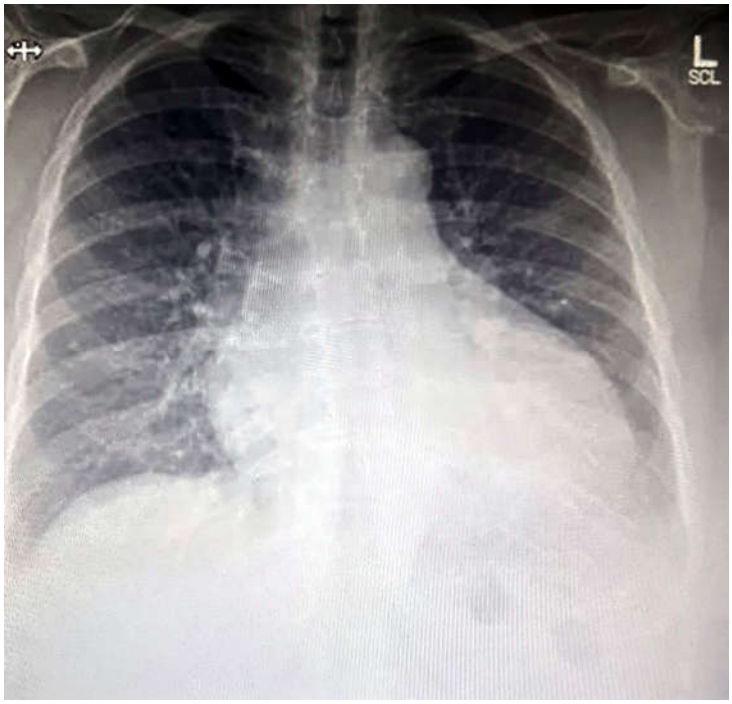

Figure 2: CXR showing cardiomegaly

ANAESTHETIC MANAGEMENT

A high risk informed consent was obtained. Epidural anaesthesia was planned and explained to the patient and bystanders.

On the day of surgery, baseline monitors (NIBP, CVP, Oxygen saturation (SpO_2) and ECG) were attached. IV access established with 16G iv cannula in left hand. IV fluid – RL started at 50ml/hr. Left radial artery was canulated under local anaesthesia and intra-arterial blood pressure was monitored. Under strict aseptic precautions, an 18G epidural catheter was inserted under local anaesthesia at L3-L4 interspace and 3ml of 2% plain lignocaine (without adrenaline) injected slowly followed by another 3ml of the same. A sensory level of T10 was attained. Systolic BP dropped to 60mmHg during positioning for surgery which was treated with 25mcg of phenylephrine. Systolic BP was maintained at around 90mmHg throughout the procedure. Intraoperative blood loss was approximately 150ml. Surgery lasted for 45min. Urine output adequate

POSTOPERATIVE CARE

Post operative epidural analgesia was continued with Levobupivacaine 0.0625% at a rate of 5ml/hr. Thromboprophylaxis was given with Enoxaparin 0.4ml OD. No significant haemodynamic instability, chest pain, sweating or dyspnoea were noted postoperatively. The epidural catheter was removed on the 5th postoperative day. The patient was discharged on 7th postoperative day and was advised regular follow up in OPD

DISCUSSION

Dilated cardiomyopathy (DCM) is primarily a disease characterized by the left ventricle (LV) or biventricular dilatation, systolic dysfunction, and normal LV wall thickness. DCM is defined by the presence of: (a) Fractional myocardial shortening less than 25% and/or left ventricular ejection fraction (LVEF) less than 40%; and (b) LV end diastolic diameter greater than 117% excluding any known cause of myocardial disease.[3] It is usually the end result of myocardial damage produced by a variety of toxic, metabolic or infectious agents.

DCM is the most common type of non-ischemic cardiomyopathy,[4] the third most common cause of heart failure, and the most common indication for cardiac transplantation. In severe DCM, the reduced ejection fraction (EF) and possible congestive heart failure (CHF) increase the risk of perioperative hypotension, arrhythmias, and fluid overload.

Preoperative optimization, including the use of inotropes, diuretics, and ACE inhibitors, may be necessary to improve cardiac output and reduce preload and afterload. Epidural anaesthesia is often used for its advantages in providing good analgesia, reducing the need for systemic opioids, and providing a smoother perioperative course.[5] However, the potential adverse cardiovascular effects, such as hypotension and bradycardia, need to be closely managed in patients with DCM. It can lead to sympathetic blockade and subsequent vasodilation, which may exacerbate the patient's already compromised cardiovascular status. Close monitoring of blood pressure and the use of vasopressors may be necessary to maintain adequate perfusion. Epidural anaesthesia can also cause vagal stimulation, leading to bradycardia, which may be problematic in a patient with severe DCM.

Patients with severe DCM are prone to fluid retention and pulmonary congestion, so fluid management should be carefully balanced.[6] Overloading the patient with fluids can exacerbate heart failure, while hypovolaemia can worsen tissue perfusion. A cautious, goal-directed fluid strategy using monitoring tools like central venous pressure (CVP) or pulmonary artery catheter (if available) is beneficial. Inotropic support may be required in some cases to support cardiac output during the perioperative period

Post operative close monitoring in an intensive care or high-dependency unit may be required, especially if the patient remains unstable postoperatively. Analgesia should be maintained with a balanced approach, combining epidural analgesia with systemic pain relief. Monitoring for signs of heart failure exacerbation, such as worsening dyspnoea, fluid retention, or altered mental status, should be done regularly.

CONCLUSION

For a patient with severe dilated cardiomyopathy undergoing hemiarthroplasty, epidural anaesthesia can be an appropriate choice, providing good analgesia with careful haemodynamic management especially in a centre with limited resources. The anaesthetist must be vigilant in maintaining cardiovascular stability, optimizing preload, afterload, and contractility, and avoiding complications such as hypotension, bradycardia, and arrhythmias. Fluid management and postoperative monitoring are crucial in reducing risks and ensuring a smooth recovery.

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Ethical Issues: None involved

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