



Anaesthetic Management of a case of severe Dilated Cardiomyopathy with Splenic Abscess for Splenectomy: Case Report

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Abstract: Dilated cardiomyopathy (DCM) is characterized by dilatation and impaired systolic function of one or both ventricles. Malignant arrhythmias are the most common cause of death in DCM. Around 50% of cases of non-ischemic dilated cardiomyopathy are idiopathic. Anaesthetic management of these patients is quite challenging. The anaesthesiologist must have the knowledge of its pathophysiology, clinical features, diagnostic evaluations and the treatment modalities. This is a report of successful anaesthetic management of a patient with severe DCM just recovered from cardiac failure with septic foci undergoing splenectomy under general anaesthesia

Keywords: cardiomyopathy, splenectomy, general anaesthesia

Introduction: Dilated cardiomyopathy is characterised by left ventricular or biventricular dilatation and impaired ventricular contractility. The commonest aetiology is idiopathic or viral infections in children and alcohol abuse in adults. Each year, this disorder affects approximately five to eight people per 100,000.¹ It most commonly affects males than females. Natural history of DCM is not well established. Many patients have minimal or no symptoms.² The most common complication of dilated cardiomyopathy is progressive congestive cardiac failure. Prognosis of DCM patient is poor with only 25% to 40% of patients surviving 5 years after the definitive diagnosis. The management of a patient with DCM undergoing non-cardiac surgery is always a challenge to the anaesthesiologist as DCM is most commonly complicated by progressive congestive heart failure (CHF) and malignant arrhythmias (the most common cause of death in DCM).¹ This is a report of successful anaesthetic management of a patient with severe DCM who had just been weaned off Inj dobutamine for cardiac failure and was threatening to go into sepsis, undergoing a splenectomy under general anaesthesia. It also discusses other options of anaesthesia in these patients.



Case Report: A 65 yrs female, weighing 70 kg, was admitted in the ICU with the diagnosis of Left ventricular failure. She was a known case of dilated cardiomyopathy (DCM) with normal coronaries for the last 5 yrs and had presented with breathlessness (NYHA Class III), ankle oedema and palpitations. Several times in the past also she had been admitted for cardiac failure. Her 2D echo revealed ventricular ejection fraction (LVEF) of 25%, severe global hypokinesia and severe mitral regurgitation (MR) with moderate pulmonary hypertension. She was put on CPAP, and inj dobutamine 12mcg/kg/min was started. Being Diabetic her blood sugar was controlled by Inj insulin on hgt scale. She responded to treatment and her cardiac condition improved in a week but complained of severe pain in left hypochondriac region and repeated vomiting. USG showed a splenic abscess. A pigtail catheter was placed to drain her splenic abscess but due to repeated blockage decision was taken to undertake splenectomy. She was having dyspnoea (NYHA functional class II) but no complain of nocturnal dyspnoea, orthopnea or palpitation. On physical examination there were no suggestive signs of heart failure like raised JVP, ankle oedema or hepatomegaly. Her blood pressure was 130/78mmhg and heart rate was 68 beats /minute. There were no signs of pulmonary congestion on chest radiograph, only cardiomegaly was present. Her Left hand and arm showed burn contracture and a subclavian central venous catheter had been inserted by the ICU registrar. Her ECG showed LBBB and poor progression of R wave in leads V1-V5. Her haemoglobin was 10gm/dl. Her kidney functions were normal but LFT were deranged. Serum sodium was 135mEq/l, serum potassium was 3.5mEq/l. She was tapered of inj dobutamine two days prior to surgery and was on Tab digoxin 0.25mg OD, Tab. Lasix 20mg BD and Tab enalapril 2.5mg. Tab. Aspirin which was started when she was in failure was stopped two days prior, when it was decided to take her up for surgery. Her absolute platelet counts and peripheral smear for platelets were normal.

A high-risk consent was obtained based on the patient's critical cardiac condition, open rather than laparoscopic splenectomy was preferred. Since the patient was uncooperative general anaesthesia was planned for her. No premedication was advised.

Upon arrival into the operating theatre, the patient's blood pressure was 110/70 mmHg, heart rate (HR) was 66/min and oxygen saturation (SaO₂) was 97% on oxygen face mask 5L/ min. Monitoring of non invasive arterial blood pressure, central venous pressure, ECG and oxygen saturation was instituted prior to the induction of GA. Anaesthesia was induced slowly with iv fentanyl 100 ug, iv Ketamine 25mg mg, iv propofol 30mg and IV atracurium 30mg. The patient was intubated with cuffed endotracheal tube (7.5 mm ID). Anaesthesia was maintained with O₂/N₂O in isoflurane (MAC of 1-1.5 %) and intermittent atracurium. The surgery was completed in 45minutes. Intra-operative course was uneventful and systolic blood pressure varied between 90-110 mmHg and diastolic blood pressure between 60-88 mmHg. She was given 5mg bolus of Inj Mephentermine once. Her heart rate varied between 80-95 beats/minute. Her central venous pressure varied between 8-10 cmH₂O. She received 200ml of colloid and 400ml blood, urine output was 100ml. Blood loss was 500ml. Inj Dobutamine was started at 5mcg/kg/min as her BP during the end of surgery was 90/60 mm Hg. She was shifted to ICU, paralysed, and extubated later in the evening uneventfully. Inj Dobutamine was weaned off 2 days later.



Discussion: Idiopathic dilated cardiomyopathy is a unique subset of primary myocardial disease of unknown cause characterized by left ventricular or biventricular dilatation and impaired myocardial contractility. The most common initial manifestation as seen in this patient is heart failure, which occurs in 75 to 85 percent of patients. Symptoms of left sided heart failure predominate.³ The true natural history of the disease onset is difficult to determine, since asymptomatic cardiomegaly may be present for months or years. The key hemodynamic features of the DCM are elevated filling pressures, failure of myocardial contractile strength, and a marked inverse relationship between afterload and stroke volume.⁴ Apart from CHF, dysrhythmias and embolism (systemic or pulmonary) are also common features of DCM patients.⁵

The predictors of poor prognosis⁴ are an ejection fraction of less than 0.25 (as seen on Echo, during the acute presentation of heart failure), left ventricular end diastolic dilatation, a hypo kinetic left ventricle, and the presence of mitral & tricuspid regurgitation. It is difficult to decide the optimal time for surgery but medical control of heart failure for >1 week is desirable. In our case the since the WBC counts were increasing and splenic abscess was causing pain, discomfort to the patient hence the surgery was taken up as an emergency procedure just 2 days after Inj dobutamine was stopped.

Preoperatively any arrhythmia should be appropriately treated, particularly atrial fibrillation (AF) where rate, rhythm control, or preferably both are important. The correction of any significant electrolyte abnormalities should be made. This is especially important in relation to potassium and magnesium ions, both of which are likely to be depleted in patients receiving chronic diuretic therapy, and derangement may pre-dispose to cardiac arrhythmias.

The goals of anaesthetic management are⁵:

- Myocardial depression should be avoided
- Normovolemia should be maintained
- Avoid overdose of drugs during induction as the circulation time is slow.
- Ventricular afterload is avoided
- Avoid sudden hypotension when regional anaesthesia is the choice.

In this case, slow induction with inj Fentanyl and small doses of Ketamine and propofol provided good cardiovascular stability and we did not observe any rise in BP or HR. Inj atracurium was used as muscle relaxant, as her LFT were deranged. Several authors have recommended treating blood pressure if it decreases more than 25-30% below baseline. The acceptable limit of decrease in the blood pressure and heart rate for a patient depends upon the patients underlying medical condition.⁶

It is recommended that fluid therapy and pharmacological management be guided by the use of pulmonary artery catheterization and the determination of cardiac filling pressures⁶ but this was not available in our hospital we relied on Central venous pressure.



Regional anaesthesia may be an alternative to general anaesthesia in selected patients with DCM. Epidural anaesthesia produces changes in the preload and afterload that mimic pharmacological goals in the treatment of this disease.⁵ Yamaguchi et al⁷ reported a case of total proctectomy under continuous epidural anaesthesia and total intravenous venous anaesthesia (TIVA) using ketamine and propofol in a patient of DCM. Cases of Fracture neck femur done under plain epidural have been reported.⁸ Since our patient was not cooperative and we would have required higher thoracic segmental block we decided to go for general anaesthesia.

In conclusion, the important factors for the good outcome of these high-risk patients are - a thorough preoperative assessment, optimized cardiac status, formulating the anaesthetic plans, postoperative monitoring and prompt diagnosis & management of the complications.

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