

# Anesthetic management of an elderly patient with kyphoscoliosis and dilated cardiomyopathy posted for abdominal hysterectomy and salpingo-oophorectomy

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## ABSTRACT

A 76-year-old kyphoscoliotic female patient presented with severe pain and sudden acute abdominal distension for 1-week and was diagnosed to have right-sided massive twisted ovarian cyst. The patient was a known case of hypertension, dilated cardiomyopathy with low 20% cardiac ejection fraction. Though very few incidences of multiple comorbid conditions existing together in a single elderly patient have been reported in the past, it is important to titrate the dosage, type of anesthetic agents and their routes of administration in high risk patients.

**Key words:** *Cardiomyopathy, epidural anesthesia, hypertension, low ejection fraction*

## INTRODUCTION

DCM (dilated cardio myopathy) is a primary myocardial disease characterized by LV or biventricular dilation, systolic dysfunction, and normal LV wall thickness. DCM is the most common type of cardiomyopathy, the third most common cause of heart failure. The presence of heart failure has been described as the single most important risk factor for predicting perioperative cardiac morbidity and mortality.<sup>[1]</sup> Because stroke volume is relatively fixed, it is important to maintain normal sinus rhythm and to avoid any significant decrease in the heart rate. Maintenance of venous return and intravascular fluid volume is also necessary to maintain an acceptable cardiac output. The presence of concomitant cardiac and respiratory changes caused by kyphoscoliosis makes anaesthetic management challenging. Here, we report a kyphoscoliotic elderly patient having DCM with low

EF posted for elective hysterectomy with salpingo-oophorectomy under epidural anesthesia.

## CASE REPORT

A 76-year-old female patient presented with a history of pain abdomen for the last 1-year with acute exacerbation for the last 1-week and was diagnosed to have right-sided massive adnexal mass. The right sided adnexal mass weighed 8.2 kg with dimensions 36.3 cm × 18.4 cm and left cyst 5.7 cm × 5.1 cm in size [Figures 1 and 2]. The patient was a diagnosed case of kyphoscoliosis, dilated cardiomyopathy with very low 20% ejection fraction, hypertension on treatment and symptoms of dyspnea at rest. She was taking tablet digoxin 0.25 mg O.D., tablet frusemide 40 mg O.D., tablet amiloride 40 mg O.D., and tablet losartan 25 mg O.D. On clinical examination, patient looked pale. Her preoperative investigations revealed anemia, hemoglobin reported was 9.5 g/dl. All routine preoperative investigation reports were normal. The random blood sugar on morning of surgery was 5.6 mmol/L, serum urea 1.1 mmol/L, serum creatinine 0.3 mmol/L and prothrombin time was test-13 s and control - 12 s with International Normalized Ratio ratio: 1.09. Her bleeding time was 1 min, 30 s and clotting time-4.1 min. Her packed cell volume was 43.8%, total lymphocyte count 6900/cumm and differential

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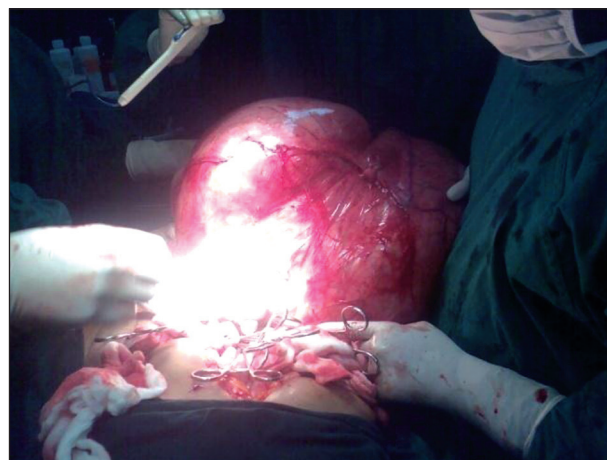
**Figure 1:** Right adnexal mass

leucocyte count reported-neutrophils 65%, lymphocytes 29%, eosinophils 3%, monocytes 2% and basophils 1%. Her serum electrolytes were found to be within normal range on the morning of surgery, serum sodium 142.2 mmol/L, serum potassium 4.5 mmol/L and serum chloride was 100.1 mmol/L.

Her electrocardiogram revealed T wave inversion in V1-V3 leads. Echocardiogram showed thickened aortic cusps, global hypokinesia, dilated left ventricle, no tricuspid regurgitation or mitral regurgitation, aortic regurgitation without any clots or effusion with left ventricular ejection fraction being 20%. The left ventricular dimensions were end-diastolic-5.1 cm and end-systolic-3.8 cm. The patient had no signs and symptoms suggestive of congestive cardiac failure. Her pulmonary function tests showed restrictive pathology. Her preoperative abdominal sonography revealed large cystic lesion in the right adnexa measuring 32.2 cm × 17.6 cm and left adnexa showed 5.3 cm × 4.8 cm sizes. The patient was accepted for surgery and anesthesia under American Society of Anesthesiologists grade IV E with high-risk consent. Her antihypertensives were continued on the day of surgery.

Preoperatively on the day of surgery her pulse rate recorded, varied between 102 and 109 beats/min, low volume, regular. Her blood pressure (BP) varied between 136 and 145 mmHg systolic to 78-86 mmHg diastolic in right upper arm, supine position. Besides the usual baseline monitoring of SpO<sub>2</sub>, capnography, noninvasive BP, pulse rate, esophageal temperature, and urine output, intraoperative invasive monitoring was started. Her right radial artery and right internal jugular vein were cannulated for continuous invasive BP and central venous pressure respectively.

Our choice of anesthesia in this patient was centrineural blockade under continuous epidural block. Under all



**Figure 2:** Left ovarian cyst

aseptic precautions an epidural space was identified in the lateral decubitus position with 18-gauge Tuohy's needle in T 10-11 intervertebral space, using loss of resistance technique.

Epidural catheter was inserted 4 cm cephalad and after negative aspiration for blood and cerebrospinal fluid, a test dose was given, followed by 10 ml of 0.5% hypobaric bupivacaine. Analgesia was achieved till T-7 dermatome.

Surgically a midline incision was given extending 4 cm above umbilicus and bilateral salpingo-oophorectomy with hysterectomy was done. Right twisted ovarian cyst sized 36.3 cm × 18.4 cm removed after aspirating hemorrhagic serous fluid, weighing 7.9 kg and left the cyst removed measured 5.7 cm × 5.1 cm size.

No intraoperative top up was required throughout the surgical procedure. Her intra operative parameters recorded showed little variation under epidural anesthesia. The systolic BP fell from 140 mmHg to 100 mmHg and diastolic BP fell from 100 mmHg to 70 mmHg intraoperatively. Her pulse rate remained between 95 and 105 beats/min throughout the procedure. At the end of surgery preservative free injection morphine, 5 mg was given for postoperative pain relief in epidural catheter. At night, the same dose of morphine was repeated in the epidural catheter.

The patient's intraoperative and postoperative course remained uneventful and she had a comfortable postoperative period for the first 24 h with a visual analog pain scale score of 1.

## DISCUSSION

In patients with cardiomyopathy, the usual causes of death are progressive heart failure, arrhythmias or

thromboembolism.<sup>[1]</sup> The outcome seems to be linked to heart size and continuing cardiomegaly. Published data indicate a 7-60% risk of death with subsequent, co-morbid conditions although the numbers of patients in these studies is small.<sup>[2]</sup> Perioperative cardiovascular collapse and death have been reported in elderly patients having cardiomyopathy with low ejection fraction and restrictive lung pathology during induction of anesthesia.<sup>[3,4]</sup> Therefore, the choice of anesthesia technique is difficult to decide.<sup>[3]</sup> More challenging is to perform induction on an elderly kyphoscoliotic patient with severely compromised cardiac and respiratory functions.<sup>[3,5]</sup> Kyphoscoliosis, a restrictive type of pathology is due to disruption of balance between structural and dynamic components of the spine.<sup>[6]</sup> The anesthetic management in these patients is challenging, since patients may be hemodynamically unstable with associated high morbidity and mortality.<sup>[7]</sup>

The goals of anesthetic management in patients with dilated cardiomyopathy and kyphoscoliosis include; avoidance of drug-induced myocardial depression, maintenance of normovolemia, and prevention of increased ventricular afterload.<sup>[8]</sup> As kyphoscoliosis poses hazard of pulmonary hypertension, these four factors need to be kept in mind. Pain, hypoxemia, hypercarbia, and acidosis are to be avoided as they tend to increase pulmonary vascular resistance. The need, to prevent myocardial depression in such cases, is warranted as it may further lower cardiac output.<sup>[9]</sup> Maintenance of optimum intravascular volume, thus preload, and systemic vascular resistance is mandatory.<sup>[10,11]</sup>

Epidural anesthesia produces changes in preload and afterload that mimic pharmacologic goals in the treatment of idiopathic dilated cardiomyopathy.<sup>[3,5]</sup> A controlled afterload reduction by regional anesthesia may be beneficial for patients with low cardiac output. However, clinical experience is limited and caution is indicated to avoid an abrupt onset of blockade of sympathetic nervous system.<sup>[7]</sup>

Regional anesthesia is a good alternative to general anesthesia in selected patients with idiopathic dilated cardiomyopathy and kyphoscoliosis for increasing the risk of subjecting the patient to ventilatory support for worsening cardiorespiratory failure in the postoperative period and facing the difficulty of tracheal extubation.<sup>[12]</sup>

## CONCLUSION

Epidural anesthesia can be safely given in cases of dilated cardiomyopathy with low ejection fraction and kyphoscoliosis in elderly patients.

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