

Anesthetic Management of Hysterosalpingo-oophorectomy in a Case with Severe Idiopathic Dilated Cardiomyopathy

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ABSTRACT

Idiopathic dilated cardiomyopathy is a primary myocardial disease with unknown aetiology. This disease follows a prospective course that is characterized by ventricular dilation and impaired myocardial dilation. Congestive heart failure and malignant arrhythmias are the most widespread complications. The incidence of idiopathic dilated cardiomyopathy in the general population is 5-8/100.000. Because of the increased risks of perioperative complications, anesthetic management of this disease requires the application of a specific technique. This case report demonstrates the application of successful regional anesthetic management (thoracic epidural anesthesia) in a patient who had been diagnosed with severe idiopathic dilated cardiomyopathy.

Key words: idiopathic dilated cardiomyopathy, anesthetic management.

1. INTRODUCTION

Dilated cardiomyopathy (DCM) describes a group of myocardial diseases that have a progressive course characterized by ventricular dilation and systolic and diastolic dysfunction (1-7). DCM can be idiopathic, but infectious causes (viruses, bacteria, fungi, and parasites), toxins, excessive alcohol consumption, chemotherapeutic agents (doxorubicin), genetic mutations, and ischaemic heart disease might also play a part in the aetiology (1, 5, 7). The incidence of idiopathic DCM in the population is 5-8/100,000 (2, 5, 7). Complications that are most frequently seen include congestive heart failure and malignant arrhythmias (the most frequent cause of death) (5). The five-year survival rate after confirmation of the diagnosis is 25-40% (5). In this case report, we present a successful regional anesthetic management, thoracic epidural anesthesia (TEA), which was used for a patient who had serious idiopathic DCM and underwent laparotomy.

2. CASE PRESENTATION

A 41-year-old female patient who weighed 45 kg and measured 155 cm in height was scheduled for hysterosalpingo-oophorectomy because of myoma uteri. The patient had been diagnosed with idiopathic DCM two years earlier and with bronchial asthma. She was taking carvedilol, furosemide, spironolactone, digoxin, and a salbutamol inhaler. Physical examination revealed prolonged expirium and pretibial edema (+/+). The patient's exertional capacity (New York Heart Association Func-

tional Classification II) was also restricted (<2 MET). Although her laboratory values, including her bleeding profile, were within normal limits, the patient demonstrated a severely restricted pattern in respiratory function tests, with forced vital capacity (FVC): 33%; forced expiratory volume 1 (FEV1): 37%; and FEV1/FVC: 90%. An electrocardiogram showed left bundle block, and her heart rate was 110 bpm. Her echocardiography detected an ejection fraction (EF) of 25%, mild degrees of aortic, mitral, and tricuspid regurgitation, pulmonary hypertension (40 mm Hg), and left ventricular global hypokinesia. Bronchiectasis was also detected through computed tomography; the patient's posteroanterior pulmonary radiographs revealed cardiomegaly (Figures 1 and 2). The patient was categorized in ASA IV (American Society of Anesthesia). She was informed about all potential risks and provided her consent for all procedures.

When the patient was brought into the operating room, measurements were taken of her mean arterial pressure (MAP) (90 mm Hg), heart rate (HR) (100 bpm), respiratory rate (BR) (2-14 /min), and ambient oxygen saturation in the room air (SpO₂) (96 %). The patient underwent radial artery and central venous cannulation under local anesthesia to monitor arterial pressure and central venous pressure (CVP). Epidural anesthesia was planned for the patient, and Ringer's lactate solution (200 ml) was administered before the procedure to prevent sudden changes in her hemodynamic status. Then, while the patient was sitting upright, an 18G Tuohy needle (Portex) was insert-

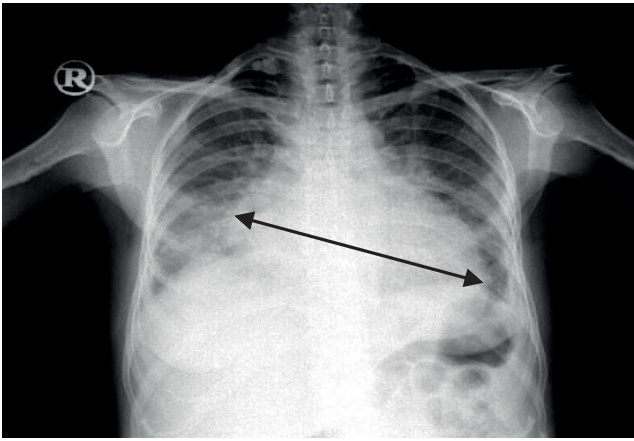


Figure 1. Chest radiography demonstrating cardiomegaly

ed at midline between the T11-12 intervertebral space, to determine epidural space with the “loss of resistance” technique, and the catheter was advanced for 5 cm into the thoracic region. The correct position of the catheter was verified through a test dose (3 ml; 2% lidocaine + 1:200 000 adrenaline) and a total of 15 ml of local anesthetic mixture (0.25% bupivacaine + 1% lidocaine) was delivered through the catheter in divided doses of 4-5 ml to attain a sensorial level of T5.

Before surgery, midazolam (1 mg) was administered for sedation and, during the surgery, O₂ (5L/min) was delivered by mask. During the 75-minute surgical procedure, MAP, CVP, SpO₂, HR, and BR were all maintained at levels of 20% of the preoperative values. The patient experienced one hypotensive attack (80/40) and responded to ephedrine (5 mg). During this episode, the patient’s CVP values were maintained at approximately 9-10 mm Hg, and she received Ringer’s lactate infusion (350 ml). For postoperative analgesia, patient-controlled analgesia (0.1% levobupivacaine + 2 mcg/ml fentanyl, bolus 5 ml, infusion 3 ml/h, and locked-in time of 45 min) was applied, and the patient was transferred to the intensive care unit for close follow-up. Since vital signs demonstrated a stable course, the patient was transferred to the surgical ward.

3. DISCUSSION

The most important problem in DCM is systolic dysfunction, and left cardiac failure are also common (1, 6). In addition to these, severe ventricular arrhythmias and embolisms may be seen (3, 5). The medical treatment that is planned is similar to cases of chronic heart failure. Lower EF (<0.25) increases the risks of hypokinetic left ventricular failure and mitral-tricuspid regurgitation and enhances the patient’s risk of postoperative cardiac complication (5).

During the preoperative period, echocardiography is required for the evaluation of ventricular and valvular functions (6). In patients with DCM, potassium and magnesium deficiencies can be seen secondary to the chronic use of diuretics. Since these electrolyte abnormalities can predispose patients to cardiac arrhythmias, they should be corrected during the preoperative period (6). Diuretic therapy can also cause dehydration. This can lead to serious hypotension during anesthetic applications, while

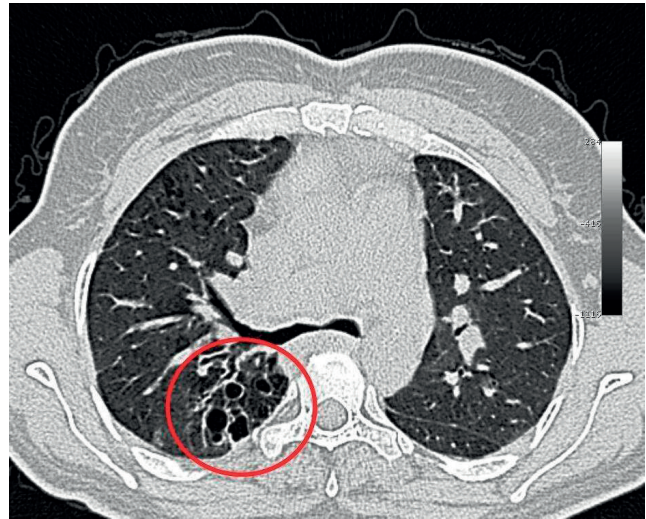


Figure 2. Computed tomography image of the area of bronchiectasis

a lack of attention to hydration can result in congestive heart failure (4). Therefore, patients need to receive optimal medical therapy during the preoperative period, and with adequate planning anesthetic management can be successfully achieved (7).

Our main targets in anesthetic management include avoiding or minimising potential myocardial depression induced by drugs, maintaining normovolemia, preventing increases in ventricular afterload, and avoiding tachycardia (4, 6).

It is also crucial to optimize preload (7). We applied central venous pressure (CVP) monitoring to achieve this. CVP monitoring provides information about preload of the right ventricle of the heart (6). Pulmonary catheterization can provide information about the filling pressures of the left ventricle of the heart (1, 3, 6). However, the absence of any marked impact that this monitoring can have on mortality and morbidity, together with its risk of serious complications, has limited the use of this procedure (6). Transesophageal echocardiography (TEE) is a useful technique for monitoring dynamic changes in cardiac performance and evaluating volemic status, fluid replacement, and inotropic therapies (6, 8). However, the inability to use TEE in patients who are awake restricts its use in regional anesthesia.

Application of general anesthesia in idiopathic DCM patients significantly increases the risk of heart failure, myocardial ischemia and arrhythmia (7). However, regional anesthesia decreases the frequency of deep vein thrombosis, damage to the central nervous system, and postoperative respiratory complications and also facilitates early mobilization with improved postoperative analgesia (4). In addition, a patient who is conscious can alert us to sudden changes in cerebral functions or new-onset angina pectoris (4). Many authors have argued that TEA can be recommended for patients who have restricted cardiac reserves and are to undergo abdominal surgery (9, 10). TEA has beneficial effects on cardiac functions because it decreases preload and afterload (11). Because the development of a sympathetic block is slower with TEA than with the spinal anesthesia, the probability of developing

severe hypotension and myocardial ischemia is reduced (6).

In patients who have DCM, it is important to maintain sinus rhythms during anesthetic management (6). It is also necessary to be prepared for the development of arrhythmias. Therefore, anti-arrhythmic medications should be available, and lidocaine, amiodarone, and a defibrillator should all be on hand in the operating room (4, 12). In addition, patients should be monitored very closely for hypotension, and a drop of more than 20% from the baseline value should not be allowed. A positive inotropic agent should be available as well, in case it is needed (1, 6).

Improved management of postoperative analgesia is also required to prevent increases in heart rate and vascular resistance (6). Since close monitoring of fluid replacement is essential, patients should continue to be followed in the intensive care unit during the postoperative period (6).

In conclusion, TEA can be safely and effectively applied in idiopathic DCM patients with appropriate preoperative preparation, closer hemodynamic monitoring, and meticulous titration of local anesthetic agents.

CONFLICT OF INTEREST: NONE DECLARED

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