Our Anesthesia Experience for Lower Extremity Surgery in a Patient with Polymyositis

Polimiyozitli Bir Hastada Alt Ekstremite Cerrahisinde Anestezi Deneyimimiz

Bir Polimiyozit Hastasında Anestezi / Anesthesia in a Polymyositis Patient

Yeliz Kılıç, Tuğba Aşkın, Tülay Dal, Tünay Kandemir, İdil Kaya
Department of Anesthesiology and Reanimation, Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital, Ankara, Turkey

Özet

Polimiyozit ilerleyici kas güçsüzlüğü ile karakterize idiyopatik inflamatuvar miyopatilerin alt tiplerinden biridir. İnterstisyel akciğer hastalığı, toraks kaslarının zayıflığına bağlı pulmoner disfonksiyon, aritmi, dilate kardiyomiyopati ve düşük ejeksiyon fraksiyonu gibi çeşitli pulmoner ve kardiyak bulgular bu hastalığa eşlik edebilir. Polimiyozit hastalarının anestezi yönetiminde, aspirasyon pnömonisi, interstisyel akciğer hastalığı, kardiyak ritim bozuklukları, miyokardit ve kalp yetmezliği gibi eşlik eden sistemik bulguların varlığı ile kas gevşetici ajanların kullanımının potansiyel riskleri başlıca kaygılardır. Bu nedenle, bu hastaların anestezi yönetimi daha fazla dikkat ve yakın monitorizasyon gerektirir. Kendi olgumuzda da olduğu gibi, kas gevşetici kullanımı olmaksızın laringeal maske uygulaması seçilmiş vakalarda güvenle tercih edilebilir.

Anahtar Kelimeler

Anestezi; Santral Kas Gevşeticiler; Polimiyozit

Abstract

Polymyositis is one of the subtypes of idiopathic inflammatory myopathies characterized by progressive muscle weakness. Several pulmonary and cardiac manifestations such as interstitial lung disease, pulmonary dysfunction due to weakness of thoracic muscles, arrhythmias, dilated cardiomyopathy, and low ejection fraction can be accompanied this disease. The major concerns in the anaesthetic management of the patients with PM are the presence of various systemic disorders such as aspiration pneumonia, interstitial lung disease, cardiac arrhythmia, myocarditis and heart failure, and the potential risks of the use of muscle relaxant agent. Therefore, the anaesthetic management of these patients requires more attention and close monitoring. As in our case, laryngeal mask airway placement without using any muscle relaxant can be safely preferred in selected cases.

Keywords

Anesthesia; Central Muscle Relaxants; Polymyositis

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Corresponding Author: Yeliz Kılıç, Department of Anesthesiology and Reanimation, Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital, 06200, Ankara, Turkey. GSM: +905053573180 F: +90 3123340352 E-Mail: yeliz_kilic3@hotmail.com

Introduction

Idiopathic inflammatory myopathies are a heterogeneous group of autoimmune connective tissue disorders characterized by progressive weakness in the proximal striated muscles. It consists of four major subtypes including polymyositis (PM), dermatomyositis, necrotizing myopathy and inclusion body myositis. Among those, PM usually presents with subacute/chronic and symmetric proximal limb weakness, with a prevalence of approximately 10 cases per 100.000 persons in the general population [1]. Several pulmonary, cardiac and systemic manifestations such as interstitial lung disease, pneumomediastinum, pulmonary dysfunction due to weakness of thoracic muscles, arrhythmias, dilated cardiomyopathy, low ejection fraction, fever, and arthralgia can be accompanied PM [2]. The major concerns in the anaesthetic management of the patients with PM are delayed recovery from muscle relaxation, aspiration pneumonia, arrhythmia and cardiac failure [2]. In this paper, we aimed to present our anaesthetic management, particularly the choice of anesthesia method and the use of anaesthetic drugs intraoperatively, in an adult patient who underwent an emergent orthopedic surgery of lower extremity.

Case Report

A 38-year-old man, 170 cm in height and 94 kg in weight, presented with open reduction and internal fixation for body fracture of his left tibia. He was diagnosed as PM six years ago, and was treated with prednisolone regularly since then. However, he did not receive any medication for the last six months due to the remission of the disease. On examination, he had mild muscle weakness mainly in the lower limbs, which had been stable for the last year. His cardiac and pulmonary examinations were unremarkable. Echocardiography showed normal cardiac functions with an ejection fraction of 62%. The patient was also consulted by a cardiologist, and no cardiac abnormality was detected. All routine laboratory tests were in normal limits, except elevated creatine kinase (CK 210 U/L, normal ranges: ≤ 145 U/L), aspartate aminotransferase (AST 109 U/L, normal ranges: ≤ 35 U/L) and alanine aminotransferase (ALT 168 U/L, normal ranges: ≤ 40 U/L). Non-specific infiltrations were detected on Chest X-ray. His blood pressure, heart rate, EtCO2, and oxygen saturation were 130/80 mmHg, 94/min, 40 mmHg, and 98% respectively. Airway as¬sessment was consistent with Mallampati class 2. Written informed consent form was obtained from the patient for publication of this case report.

In the operating room, monitoring included electrocardiography, noninvasive blood pressure and pulse oximetry. After premedication with midazolam (0.02 mg/kg IV), anesthesia was induced by fentanyl (1 µg/kg), lidocaine (0.5 mg/kg) and propofol (2 mg/kg) with 100% oxygen. Then, a 5 no laryngeal mask was placed to control airway. Anesthesia was maintained with sevoflurane 2% with nitrous oxide (50%) in oxygen (50%) at 6 l/min total gas flow. Before the surgical incision, tenoxicam (20 mg) and ranitidine (50 mg) were given to patient for preemptive analgesia. Prednisolone (1 mg/kg) was also administered. Propofol (0.5 mg/kg) was added two times during the operation. No centrally acting muscle relaxant was used for induction and maintenance anesthesia. The operation lasted 90 minutes without any complication, and finally the laryngeal mask was removed successfully. The patient was given tramadol (1 mg/kg) for postoperative pain control. The postoperative course was also uneventfully, and he was discharged on eleventh day.

Discussion

The anaesthetic management of the patients with PM poses a concern for anesthesiologists due to several reasons including delayed recovery from muscle relaxation, hyperkalemia, cardiac and pulmonary complications. However, there are only few reports on the issue, which were mostly reported as single cases [2-5].

It is well known that PM is a systemic disorder presenting with progressive loss of skeletal muscle function. Although neck, shoulder, and pelvic muscle weakness are mostly found in these patients, any striated muscle such as intercostal, diaphragmatic and pharyngeal muscles may also be affected [3]. It is fact that most anaesthetic agents routinely used in general practice have direct or indirect effects on muscles and nerves, therefore it is very important to have sufficient knowledge on the management of the patients with neuromuscular disease such as PM, to avoid potential pitfalls. In this regard, the appropriate use of muscle relaxants is of great importance for the successful anaesthetic management. Although shorter acting neuromuscular blocking drugs such as atracurium may be advised to use for muscle paralysis with slightly increased sensitivity, these patients are believed to be sensitive to nondepolarizing muscle relaxants, and the use of these neuromuscular blockers may cause prolonged muscle weakness and life-threatening cardiac dysrhythmias [6]. While some authors preferred no muscle relaxants for the anaesthetic management of their patients with PM, the others reported titrated small dose of muscle relaxant in conjunction with a close peripheral neuromuscular monitorization as a safe option for such patients where the use of neuromuscular blockers is unavoidable [2,4]. Additionally, the patients with PM generally use steroids as mainstay treatment, and steroid induced myopathy may lead to an increased sensitivity to neuromuscular blocking agents, with unpredictable responses. Immunosuppressants, such as azathioprine and methotrexate, are the second line agents in the treatment of PM, and the interaction between these drugs and non-depolarising muscle relaxants may cause resistance to neuromuscular blocking drugs. Succinylcholine, a depolarising muscle relaxant, is not also recommended because of its potential to malignant hyperthermia and hyperkalemia [7]. In addition, thoracic epidural anesthesia was recommended as a successful anaesthetic method for thoracic surgery [5]. Accordingly, in the present case, we performed laryngeal mask airway placement to avoid the potential risks of general anesthesia, and used no depolarizing or non-depolarizing muscle relaxant agent in both induction and maintenance of anesthesia.

Another important point in the evaluation of polymyositis patients is to determine their cardiopulmonary sufficiencies. Interstitial lung disease is the major pulmonary manifestation, and is usually associated with significant morbidity and mortality. In addition, cardiac involvement may be found in some patients with PM, as arrhythmia, myocarditis or heart failure. Therefore, a detailed preoperative evaluation of cardiopulmonary function should be required to prevent potential severe complications.

In conclusion, the anaesthetic management of patients with neuromuscular disease such as PM requires more clinical attention, particularly in terms of accompanying systemic manifestations and use of muscle relaxant drugs. For our opinion, laryngeal mask airway placement without using any muscle relaxant can be safely preferred in selected cases.

Competing Interests

The authors declare that they have no competing interests.

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