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Case Report

Anesthetic Challenges and Strategies in a Child with Kawasaki Syndrome Undergoing Surgical Intervention: A Case Report

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ABSTRACT

A 26-month-old male patient presented with swelling in the right hemi-scrotum, diagnosed as a hydrocele and a 44 x 14 mm hernia displacing the right testicle. He had been hospitalized 12 days earlier due to prolonged fever, leading to concerns about Kawasaki syndrome. Prior to surgery, a cardiovascular consultation was performed, revealing no complications. The patient received treatment with clindamycin, ASA, prednisolone, and intravenous immunoglobulin. Admitted to Beheshti Hospital for surgery, his vital signs were stable. Anesthesia considerations were complicated by Kawasaki syndrome, but after consultation, general anesthesia was administered using a Laryngeal Mask Airway. The surgical procedure lasted an hour and fifteen minutes, during which basic monitoring was conducted. Post-surgery, the patient was transferred to recovery and later admitted to the pediatric department for two days, ultimately being discharged without complications.

Introduction

Kawasaki disease is a type of acute vascular disease that mainly affects children under 5 years of age and can result in coronary artery complications. Due to the similarity of symptoms with other conditions such as multisystem inflammatory syndrome in children and inflammatory diseases caused by coronavirus, diagnosing it can be challenging. Tests such as eosinophilcount, microRNA panels, and elevated immune response markers are used to help diagnose the disease [1-2].

Case Report

A 26-month-old male patient presented with a complaint of swelling in the right hemi-scrotum. Diagnosis revealed multiple cystic structures and a 44 x 14 mm hernia, which displaced the right testicle to the medial side, indicating a hydrocele in the scrotum. The patient underwent right hernia and hydrocele repair surgery. He had been admitted to the hospital 12 days prior due to prolonged fever and increased tests ESR (Erythrocyte Sedimentation Tate), platelets and clinical symptoms, which raised suspicion for Kawasaki syndrome. Cardiovascular consultation was conducted before surgery, and no complications were observed. During this period, the patient was treated with the following drugs: clindamycin 120 mg four times a day, ASA 60 mg daily orally, prednisolone 5 mg daily for 3 days, then half of this amount for 3 days, and 25 mg of vial Intravenous Immunoglobulin (IVIG). Patient admitted to Beheshti Hospital, Hamedan for right hernia and hydrocele operation with vital signs as follows: SPO2=98%, PR=85/minute, RR=20/minute, T=36.5°C. Basic tests showed Hb=12.8, HCT=38.5%, MCV=76.84, MCHC=33.24, WBC=9400, platelet=338*10^3/µL,

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RBC=5.01. The weight of the patient was 16 kg and the height was 75 cm. During the initial stages of the procedure, there was a question about which anesthesia method to use due to the presence of Kawasaki syndrome? After consultation among anesthesiologists, it was decided to proceed with general anesthesia using a Laryngeal Mask Airway (LMA size 2). The anesthesia induction drugs used were thiopental 50 mg, sufentanil 10 micrograms, and lidocaine 10 mg. To maintain anesthesia, isoflurane inhaler with a minimum alveolar concentration of 1.1 was used along with N_2O at a rate of 3 liters per minute and O_2 at a rate of 3 liters per minute. Basic monitoring was performed during the operation, which lasted for an hour and fifteen minutes. After extubation and removal of the laryngeal mask, the patient was transferred to the recovery department. Subsequently, the patient was admitted to the pediatric department for 2 days and was discharged without any special complications.

Discussion

The purpose of this article is to describe the anesthesia management preoperative, perioperative and postoperative for patients with Kawasaki disease. It's crucial to have a deep understanding of the disease's symptoms and related complications to ensure proper anesthesia management. This knowledge will help healthcare providers choose the most suitable anesthesia method and take the required precautions. This disease is a self-limiting inflammatory condition affecting blood vessels. The exact cause is unknown. Clinical symptoms include fever, swelling of the hands and feet, Swollen neck lymph nodes, as well as vasculitis, which is characterized by redness and swelling of the lips (strawberry tongue and fissured lips) [3-4]. This most common symptom was also present in our case (Figure 1).

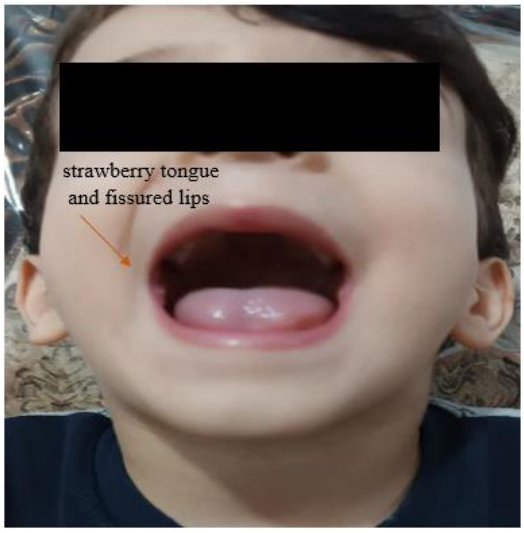

Figure 1- Picture of the patient's face and strawberry tongue and fissured lips sign

This disease in children can lead to acquired heart conditions, especially coronary artery disease, thrombo-embolic occlusions, myocardial dysfunction, and hypotension [2].

Our goal in presenting this article was to share our experiences in managing anesthesia for a patient with Kawasaki syndrome who was scheduled for surgery.

Preoperative consideration

In addition to performing routine evaluations before performing surgery in these patients, these points should be noted that common drugs used for this disease include ASA, IVIG, and in cases of symptom exacerbation, corticosteroids are used [1]. Patients who take exogenous steroids may need a supplemental dose of steroids because their adrenal glands may not respond properly to surgical stress [5]. Unfortunately, in our case, this issue was overlooked in the management of anesthesia. One of the most dangerous complications caused by this disease is the occurrence of aneurysm and dissection of the aorta, as well as coronary artery diseases. These conditions must be assessed by a cardiologist and ruled out using echocardiography and, if necessary, CT angiography [6]. In our case, these investigations were carried out as part of the pre-operative evaluation.

Perioperative consideration

Managing anesthesia for these patients can be challenging. Failure to use standard methods and monitoring can complicate conditions during and after surgery [6]. Choosing the type of anesthesia technique and its management, especially the use of general anesthesia, depends on the severity of the disease complications [7]. When patients receive neuraxial anesthesia, it's crucial to be aware that hypotension can be a serious complication. When using this anesthesia technique, it's vital to monitor the patient's blood pressure carefully to prevent any deterioration in their condition [8].

In this case, based on the patient's clinical conditions and pre-operative tests, the anesthesia team consulted with the surgeon in a multidisciplinary manner and ultimately decided to use LMA intubation as the anesthesia technique. It is important to note that one of the medications given to these patients is anticoagulants, which increases the risk of bleeding. Therefore, if general anesthesia is selected, oral intubation is more suitable than nasal intubation [7]. In our case, the intubation was performed orally. Patients with this disease are at risk of experiencing myocardial ischemia during surgery. It is very important to prevent myocardial supply and demand ischemia, which can be caused by factors such as increased heart rate, increased systolic blood pressure, and decreased diastolic blood pressure. The goal of intraoperative anesthesia management is to deal with these issues [7]. In our case, considering that the surgery was deemed a low-risk operation, the anesthesia team opted to monitor the patient's blood pressure non-invasively, checking it every 3 minutes. Also, anesthetics

were administered in a balanced to stabilize the hemodynamic status as much as possible. In these patients, the main concern during the surgery was the development of cardiac complication such as ischemia, arrhythmia, and myocardial infarction [9].

In our case, II lead monitoring was used for rapid detection of ischemia and arrhythmia. Non-invasive blood pressure monitoring was done at 3-minute intervals. In the past, it was recommended to use lead V5 and lead II to measure ECG in patients with ischemia and ST segment monitoring. However, new studies suggest that lead V3 is now the most widely used lead for detecting ischemia [10]. In patients at risk for ischemic events, it is recommended to display the maximum number of ECG leads (e.g., 3, 7, 12 [derived 12 lead]) during the perioperative period to enhance continuous and comprehensive assessment of ST segment and T-wave changes [5,9]. it should be noted that abnormalities of the ventricular wall observed by transesophageal echocardiography (TEE) can be the most sensitive indicator of myocardial ischemia. However, TEE monitoring is costly, invasive, and requires additional training [5]. In our case, considering the type of operation, it didn't seem logical to use this monitoring.

Postoperative consideration

The measures and monitoring required vary depending on the type of surgery, the anesthesia used, and the level of complications caused by Kawasaki disease [9]. In these patients, it is usually recommended to use antiplatelet drugs for a few months, such as 3-5 mg/kg of aspirin. However, it should be noted that aspirin should be used with caution due to allergic eruptions or liver dysfunction. This was also considered in our case [3].

Conclusion

Kawasaki syndrome is a self-limiting inflammatory condition that affects the blood vessels. The exact cause is unknown. The most important complication of this disease is its effect on the aorta artery, such as aneurysm and dissection, as well on the coronary artery. The most important measures in the preoperative assessment involve evaluating the cardiovascular system using echocardiography and angiography if necessary. During the perioperative period, cardiac monitoring is crucial to detect myocardial ischemia and heart attack. Additionally, in postoperative care, close attention should be given to the drugs used, including their actions and side effects.

Data availability

Echocardiography results, patient tests, patient medical treatment course are available upon request from the corresponding author.

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References

[1] Kuo HC. Diagnosis, Progress, and Treatment Update of Kawasaki Disease. Int J Mol Sci. 2023; 24(18). 13948.
[2] Rivas MN, Arditi M. Kawasaki disease and multisystem inflammatory syndrome in children: common inflammatory pathways of two distinct diseases. Rheum Dis Clin. 2023; 49(3):647-59.
[3] Seki M, Minami T. Kawasaki Disease: Pathology, Risks, and Management. Vasc Health Risk Manag. 2022; 18:407-16.
[4] Agarwal S, Agrawal DK. Kawasaki disease: etiopathogenesis and novel treatment strategies. Expert Rev Clin Immunol. 2017; 13(3):247-58.
[5] Pardo, M. (Ed.). Miller's Basics of anesthesia. Elsevier Health Sciences. 2023; 8.
[6] Kawasaki T, Sugita M, Kodera C, Hirata N. Anesthetic Management of a Cesarean Delivery in a Patient with MYH11 Mutation Who Underwent Aortic Replacement. Cureus. 2023; 15(11).
[7] Lee S, Guthrie DB, Epstein RH. Kawasaki Disease and General Anesthesia for Dental Treatment: A Case Report. Anesth Prog. 2021; 68(3):146-53.
[8] Inoue R, Mazda Y, Tanaka H, Tanaka K, Yoshimatsu J, Tamura K, et al. Management of pregnancy and delivery in women with Kawasaki disease and residual coronary artery lesion with detailed analysis of labor analgesia: combined experience of 13 cases in two institutions. JA Clin Rep. 2020; 6:1-8.
[9] To L, Krazit ST, Kaye AD. Perioperative considerations of Kawasaki disease. Ochsner J. 2013; 13(2):208-13.
[10] Elisha S, Heiner J, Nagelhout JJ (Eds.). Nurse Anesthesia. Elsevier. 2023; 7: 293-4 p.