

# Management of Intraoperative Asthma Attacks in Emergency Appendectomy Surgery

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**Abstract:** Introduction: Asthma is defined as a chronic inflammatory disease of the respiratory tract due to airway hyperresponsiveness with clinical manifestations such as: shortness of breath, chest pain and/or cough with typical physical examination found wheezing in the lungs. <sup>1</sup> Appendectomy is a surgical procedure performed to remove an infected appendix, which can cause pain. <sup>2</sup> In this case, we will discuss the management of asthma during emergency appendectomy surgery. Case: It has been reported that a 19-year-old female patient with a diagnosis of acute appendicitis with a physical status of the patient is ASA II E was planned to have an emergency appendectomy with a type of regional anesthesia and subarachnoid block technique + deep sedation. The patient was premedicated with paracetamol 1 g IV and dexamethasone 10 mg IV, then spinal anesthesia was performed with bupivacaine 20 mg and given midazolam sedation 2 mg IV, fentanyl 50 mcg IV and O<sub>2</sub> 2 lpm nasal cannula. In this case the patient brought the fenoterol inhaler reliever drug as the first line during an intraoperative asthma attack and was given aminophylline 5mg/kgbb IV when the complaint had not improved. Epinephrine 0.5 mg SC is given when other drugs fail to relieve symptoms during an attack. Discussion: Intraoperative asthma therapy is with beta agonist groups such as fenoterol inhalers which can relieve asthma at the start of an attack. Giving premedication such as benzodiazepines is important to make the patient calmer. Aminophylline is a xanthine class of drugs that causes bronchodilation due to inhibition of phosphodiesterase isoenzymes. Low-dose epinephrine is given if all other asthma medications don't work. <sup>3,5</sup> Conclusion: The choice of a regional anesthetic technique in asthma is the best option to avoid overresponsiveness to the airway. Emotional pressure, inadequate premedication and post-spinal pain can trigger intraoperative asthma. Beta agonist and methylxanthine drugs are often used as intraoperative asthma therapy. Key findings: Successful management of intraoperative was achieved using fenoterol, aminophylline, and epinephrine. <sup>4,6</sup>

**Keywords:** Asthma Management, Regional Anesthesia, Appendectomy, Intraoperative Asthma, Emergency Surgery

## 1. Introduction

Asthma is a lung disease with the following characteristics: 1) reversible airway obstruction, either spontaneously or with treatment; 2) airway inflammation; 3) increased airway response to various stimuli. The causes of asthma are divided into two, namely allergic (extrinsic) and non-allergic (intrinsic) asthma. Allergic asthma appears in childhood, and the mechanism of attack occurs through a type I allergic reaction to an allergen. Intrinsic asthma is triggered by non-allergenic factors such as viral respiratory infections, irritants, and exercise. Asthma is influenced by many factors, including gender, age, atopic status, heredity, and environmental factors. In Indonesia, the prevalence of asthma ranges from 5-7%.

In asthmatic patients who require general anesthesia and tracheal intubation should be considered the increased risk of bronchospasm during anesthesia. Bronchospasm during surgery is characterized by wheezing, decreased exhaled tidal volume, or a slow rise of the waves on the capnography. A decrease in the diameter of the airways caused by severe bronchoconstriction can affect the distribution of gas in the lungs. The most important thing in anesthetized patients is to increase the concentration of inspired oxygen gas to 100% in the event of bronchospasm. At the end of surgery the patient should be wheezing free. Nondepolarizing reverse muscle relaxants and anticholinesterase drugs will not cause bronchospasm when administered in the correct therapeutic dose. To reduce the risk of bronchospasm in anesthesia, namely by avoiding the endotracheal tube and the use of inhalation anesthetics.

Administration of a bronchodilator via a nebulator or facemask after surgery should be as soon as possible

## 2. Case

It has been reported that a 19-year-old female patient with a diagnosis of acute appendicitis with a physical status of the patient is ASA II E is planned to have an emergency appendectomy with a type of regional anesthesia and subarachnoid block technique + deep sedation. The patient was premedicated with paracetamol 1 g IV and dexamethasone 10 mg IV, then spinal anesthesia was performed with bupivacaine 20 mg and given midazolam sedation 2 mg IV, fentanyl 50 mcg IV and O<sub>2</sub>~2 lpm nasal cannula.

In the middle of the operation the patient complained of shortness of breath with SpO<sub>2</sub>: 84%, BP: 100/72, N: 101x/min, RR: 42x/minute there was wheezing in both lung fields. Given fenoterol inhaler 100 mcg/puff and O<sub>2</sub> with a mask of 15lpm. The patient said he was still short of breath and still had wheezing, BP: 110/73, N: 97x/minute, RR: 37x/minute, SpO<sub>2</sub>: 88% then given a bolus of aminophylline 240 mg IV for 20 minutes and maintenance aminophylline given at a dose of 0.5-1 mg/kg BW/hour

After being given aminophylline, the complaints did not improve RR: 36x/min, N: 97x/min, SpO<sub>2</sub>: 88%, wheezing (+/+) then given epinephrine 0.5mg by SC and finally the patient's complaints began to improve, the wheezing gradually disappeared and saturation up to 94%, RR: 23x/minute

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### 3. Discussion

In patients with asthma undergoing surgery, it is better to use regional anesthesia so that the breathing muscles are not disturbed. The drugs used in the treatment of asthma are sympathomimetic groups, leukotriene antagonists, steroids, anticholinergics and anti-immunoglobulin E (anti-IgE). Other drugs that are rarely used are mucolytic groups, xanthines, mast cell stabilizers and parasympatholytic groups.

In this case, the patient was anesthetized under regional anesthesia, namely the subarachnoid block technique to avoid exacerbations of the patient's asthma. Intraoperative asthma therapy is with a fast-acting beta agonist group where in this case the patient takes the fenoterol reliever drug as the first line during an attack and is given a xanthine group, namely aminophylline which helps cause bronchodilation. Low-dose epinephrine intramuscularly as a last resort if other drugs are unable to relieve symptoms during an attack. Epinephrine also functions as a bronchodilator because it works as a beta agonist through stimulation of adrenergic receptors. The patient has also been given IV dexamethasone premedication to prevent asthma attacks.

### 4. Conclusion

Selection of regional anesthesia techniques in asthma is the best choice. Emotional pressure, insufficient premedication and post-spinal pain can trigger asthma. Beta agonist and methylxanthine drugs are often used as intraoperative asthma therapy. This study is significant as it provides insights into the management of intraoperative asthma attacks, which can be a life threatening situation during emergency surgeries. It also highlights the importance of choosing the right anesthetic technique in patients with asthma.

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