

General Anestesi Intubation Technique in Tonsillectomy Patients with Morbid Obese

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Abstract. Using the descriptive case method, this study examined general anesthesia intubation procedures in tonsillectomy patients who were severely obese. Obesity, which is a worldwide health problem, impacts anesthesia procedures, especially when intubating patients with large necks, such as the study participants. The modified RAMP technique decreased the risk of respiratory complications, improved visualization of the larynx, and established ideal positioning. Although there are some drawbacks, such as inadequate equipment, the study findings suggest that the RAMP position may make intubation easier in obese patients.

1 Introduction

Obesity has become an increasingly pressing global health problem, affecting individuals from various social and economic backgrounds in both developed and developing countries, including Indonesia. According to (1), obesity is not only a problem in countries with high income levels, but also penetrates into developing countries such as Indonesia. The World Health Organization (WHO) and various other international health agencies have officially classified obesity as a disease with serious health risks.

Globally, there are an estimated 650 million people who are obese (2). Excess body fat can lead to obesity, a condition that can have an impact on a person's physical and emotional well-being. According to Yanto, F., & Sudjana, IB.G, (2019), a person is considered obese when their fat tissue level reaches a certain limit that can interfere with various body functions. Obesity is often associated with increased inflammation in the body, which can lead to other medical conditions such as disorders of the respiratory tract and digestive system, as well as increase the risk of cancer (1).

Obesity also causes various medical complications, including during medical procedures such as anesthesia. Obese patients often face difficulties in tracheal intubation and laryngoscopy due to factors such as a large neck circumference, which increases the risk of respiratory complications during such procedures (1). In addition, hypoventilation syndrome of obesity (SHO), which occurs when patients experience hypoventilation during sleep, adds to the complexity of medical management in obese patients. This syndrome can trigger hypoxemia, acid-base disturbances, and even type II respiratory failure, which worsens the patient's condition (1).

With the increasing prevalence of obesity worldwide, including Indonesia, medical treatment of obese patients, especially in anesthesia procedures, requires special attention. One of the latest approaches widely used in intubation procedures in obese patients is the use of the Modified RAMP (Rapid Airway Management Positioner) technique. This technique

aims to create an optimal position that allows better visualization of the larynx and reduces the risk of respiratory complications during and after anesthesia procedures, especially in patients who have airway compromise. In this case using a pillow that has been modified from the Hasanin Pillow findings (3). This demonstrates the importance of patient position adjustment as part of an anesthesia management strategy in obese patients.

2 Method

The research methodology in this study is a descriptive case study form, which is used to track and analyse increasingly complex systems, contexts, and relationships. Case studies, according to Yin (2003), are techniques for researching phenomena that occur when there is a gap between the phenomenon and the current context, when there are multiple sources of evidence, or when the focus is on the lived experience of individuals (real-life context) (4). Using a limited number of events in the research design allows the case study to highlight the case analysis, in this case using the sample criteria of patients who underwent tonsillectomy with obesity of one person.

3 Case History

A male patient 24-year-old with a diagnosis of acute tonsillitis will undergo tonsillectomy. From anamnesis, the patient is conscious with complaints of pain when swallowing food and drinks, the pain is felt to arise with a pain scale of 5, and accompanied by edema in the left throat. The patient also complained of difficulty breathing or shortness of breath. Previous medical history, the patient had undergone abscess surgery four years ago using regional anesthesia technique. The patient also consumes cigarettes but not actively.

The physical examination revealed a body weight of 89 kg, height 160cm, body mass index (BMI) 35, temperature 36.0°C with problems in respiratory rate 18x/min, SPO₂, 95-98% without oxygen therapy. Lung examination revealed additional gurgling sounds. On LEMON examination the patient had whiskers and a short neck, the distance between Osmental to hyoid 2 and Thyroid to hyoid 2, with a malampati score 3 classification where the palate molle and uvula base were visible, there was inflammation of the palatine tonsils (faucial tonsils), but there was no limitation of neck movement.

The supporting laboratory examination showed leukocytes ($21.42 \times 10^3/\mu\text{L}$), Erythrocytes ($6.63 \times 10^3/\mu\text{L}$), Hematocrit (52.8%), Platelets ($347 \times 10^3/\mu\text{L}$), MCV (79.6 fL), MCH (26.2 pg) and MCHC (32.9 g/dL) which can be seen in Table 1. The patient's preop examination fell into the ASA 3 American Society of Anesthesiologists physical status classification with the patient having morbid obesity.

Pre-anesthesia preparation with a letter of consent for surgery and anesthesia, fasting, STATICS, infusion anesthetic drugs and emergency drugs. The patient used general anesthesia using et_t (nasal) no.7.0. The duration of surgery was about 50 minutes with the patient's vital signs blood pressure 150/112mmHg, respiratory rate 16x/minute, and SPO₂ 92-95%. Post-operatively given analgesic therapy Paracetamol 650 mg and ketorolack 30mg every 8 hours intravenously, the patient was admitted to the inpatient room.

Table 1 :Laboratory Test result

Inspection	Results
Leukosit	21.42 10 ³ /uL
Eritrosit	6.63 10 ³ /uL
Hematokrit	52.8 %
Trombosit	34710 ³ /uL
MCV	79.6 Fl
MCH	26.2 pg
MCHC	32.9 g/dL

4 Discussion

Physiologically, obesity is defined as a condition where there is an abnormal or excessive accumulation of fat in the body that has a negative effect on health. Obesity in children will have an effect on their health and productivity from a young age (5).

Interleukin 6 (IL-6) is a protein produced by body cells as part of the immune response to infection or tissue damage. It is also known to play a role in regulating the body's metabolism, especially in the inflammatory process associated with obesity. IL-6 is produced by fat cells or adipocytes in adipose tissue, where increased IL-6 production in adipose tissue is comparable to normal levels (6).The result is oxidative stress and a pro-inflammatory state in the human body. The upper respiratory tract and head to neck region contain increased adipose tissue, which functions as an endocrine organ and alters immunity. This can lead to various otorhinolaryngological conditions, including chronic rhinosinusitis, obstructive sleep apnoea, laryngopharyngeal reflux, tonsillitis and head and neck cancer (2).

Tonsillitis is a viral or bacterial infection of the tonsils that causes swelling, redness, tenderness, and white spots on the surface of the tonsils (7). Tonsillitis is also an inflammation of the palatine tonsils that can occur in all groups, especially in children. Inflammation of the tonsils and palate, which are part of *Waldeyer's ring*, is known as tonsillitis (8). If tonsillitis is not treated properly and completely it can result in chronic tonsillitis, which is more common than acute tonsillitis and can permanently damage the tonsil tissue (8). This will require surgery or tonsillectomy. More than 530,000 tonsillectomy (TE) procedures are performed each year on children under the age of 15 in the US, making it one of the most common surgical procedures. Before the 20th century, recurrent tonsillitis was the main reason for tonsillectomy; after the advent of antibiotics in the 20th century, obstructive sleep apnoea (OSA) and SDB are the main reasons for tonsillectomy today (9).

The patient in this case was diagnosed with acute tonsillitis so tonsillectomy will be performed. Tonsillectomy aims to clear the tonsil cavity and prevent serious damage to the surrounding tissues, including the uvula and pillar, tonsillectomy involves the removal of the palatine tonsils and all pathological tissues. According to the American Academy of Otolaryngology-Head & Neck Surgery (AAO-HNS), indications for tonsillectomy iclude (10). The American Academy of Otolaryngology-Head & Neck Surgery defines tonsillectomy as a surgical operation conducted with or without adenoidectomy that involves dissecting the peritonsillar gap between the tonsil capsule and the muscle wall in order to remove the tonsil in its entirety, including the capsule (11).

On physical examination, the weight was 89 kg, height 160cm, body mass index (BMI) 35, with ASA 3 *American Society of Anesthesiologists* physical status classification with the patient having morbid obesity. So patients with obesity are an interesting challenge for an anaesthesiologist. Complications that may arise in patients with obesity at the time of intubation will be more difficult, such as a large neck circumference, are more common in obese patients. A number of studies have shown that obese patients have more difficulty with tracheal intubation and laryngoscopy than lean patients (12).

The anaesthetic technique that can be used as an option for this tonsillectomy is general anaesthesia with endotracheal intubation, controlled ventilation and positioning during intubation. To spot possible problems, a rapid and thorough airway assessment should be performed (13).

In this case, the ramp posture during laryngoscopy works better than the sniffing position (14). The glottis can be positioned in a ramp for both obese and non-obese patients, which facilitates intubation and ventilation (15). The patient's body can be positioned in respect to the bed in such a way that the sternum and external meatus of the ear are in a horizontal line, or blankets and piles can be used to accomplish this position (16).

Reaching this position is very important, but this technique may cause problems if a person remains in it during operations or even during recovery. Moreover, using pre-made tools, such as the Oxford Head Elevating Laryngoscopy Pillow, Troop Elevation Pillow, and Rapid Airway Management Positioner (RAMP), is expensive, and creating positions reinforced with pillows and blankets takes time (17).

Therefore, it seems that the appropriate solution for intubation of severely obese patients or requesting intubation, Finding a straightforward substitute technique that may create circumstances comparable to the typical conditions recommended by the laryngoscopic view is crucial, particularly in emergency situations. Requirements for inclusion included being between the ages of 18 and 70, having a body mass index (BMI) of greater than 35 kg/m², and being a candidate for bariatric surgery (18).

In obese patients, the posterior-anterior chest diameter increases due to increased chest wall fat, particularly at the back. As a result, using the standard sniffing position with these patients is challenging. Because obese patients have a high chest-to-head ratio, the head is lower than the chest when they are supine (3).

This problem is resolved under both modified ramp and ramp conditions. The benefits of a ramp compared to sniffing were initially described by Collins et al. (19). Subsequent studies have shown that the ramp position is better for both non-obese patients and patients with a difficult airway. According to Lee et al.'s 2015 study of patients predicted to have a difficult airway, With the ramp position and solid clinical experience, achieving a proper laryngeal view and a successful endotracheal intubation was simple (20).

Hasani et al. In 2020 claims to have created a novel shoulder elevating void that positioned the patient's head as far as feasible, much like the case study used. They compared the ease of breathing and laryngoscopy in 60 obese patients who were scheduled for general anaesthesia. They came to the conclusion that their pillow made intubation and ventilation easier than the positioning ramp, can be seen in figure 1 and figure 2. However, compared to the case study taken, the requirement for oral airway insertion was identified as a slightly difficult ventilation procedure (3).



Fig. 2.Mdified Ramp Position

However, this study has several limitations. Firstly, the lack of adequate equipment, in this case performed on ett (nasal) intubated patients. Lastly, Another restriction is the inability to access TOF monitoring

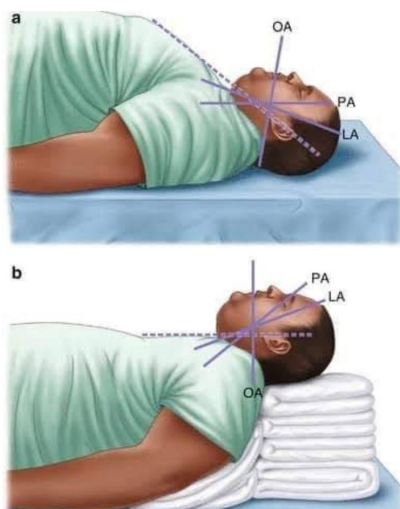


Fig. 3. Mdified Ramp Position

5 Conclusion

This case study concludes that obese patients undergoing tonsillectomy require special consideration in terms of anaesthetic management, particularly in terms of intubation techniques. Physical conditions such as a large neck and difficulty performing laryngoscopy may increase the risk of respiratory complications in obese individuals. By positioning the patient in the best position to improve visualisation of the larynx, a modified RAMP (Rapid Airway Management Positioner) technique may decrease the risk of complications. In this regard, it was shown that the ramp position is superior to the sniffing position to facilitate intubation for obese patients. However, anaesthesia management efficiency may be affected by access restrictions and monitoring equipment.

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