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REVIEW ARTICLE

A Technical Approach to Anesthesia in the Case of Tonsillectomy

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ABSTRACT

Background: Tonsillectomy is the most common surgical procedure performed by an ENT doctor (Throat Nose Ear) in children. This surgery can cause pain, bleeding and swelling in the injured throat. Patient may complain of pain, difficulty swallowing, eating, drinking disorders, nausea and vomiting and fall into a dehydrated state. This can reduce patient satisfaction.
Discussion: Postoperative pain management of tonsillectomy is a concern both by the ENT doctor and by the anesthesiologist. The high incidence of post-tonsillectomy pain or anxiety increases the risk of secondary post-tonsillectomy bleeding. It is necessary to know the mechanism of post operative pain and the negative impact of pain.
Conclusion: Doctors should give attention to reduce postoperative pain and choose a rational analgesic to overcome post operative tonsillectomy pain.

Keywords: Anesthesia; Post operative pain; Tonsillectomy

INTRODUCTION

Tonsillectomy is the most common surgical procedure performed by ENT (Ear, Nose and Throat) doctors on children. This operation can cause pain, bleeding and swelling in the injured throat. Patient may complain of difficulty swallowing, eating, drinking disorders, nausea and vomiting and fall into a dehydrated state. This can reduce patient satisfaction with tonsillectomy surgery. The results of a previous retrospective study found that the incidence of secondary bleeding after tonsillectomy reached 10.1%, this was mainly due to the release of mediators inflammation during pain[1].

Post-tonsillectomy pain management is a special concern both by ENT doctors and by anesthesiologists. The high incidence of post-tonsillectomy pain or anxiety increases the risk of secondary post-tonsillectomy bleeding. It is necessary to know the mechanism of postoperative pain and the negative impact of pain. Doctors should give attention to reduce postoperative pain and choose rational analgesics to deal with post-tonsillectomy pain[2].

DISCUSSION

Definition

Tonsillectomy is a bilateral tonsil excision procedure and includes one day care (one day surgical) services in many health facilities[2]. Tonsillectomy is an operation to remove all the palatine tonsil tissue[3]. Tonsillectomy is the first-line technique to remove the palatine tonsils and is the most common surgical procedure performed in children and relatively often in adults[3].

Indication

The indications for tonsillectomy in the past and present are not different, but there are differences in relative priority in determining the indications for tonsillectomy currently. In the past, tonsillectomy was indicated for the treatment of chronic and recurrent tonsillitis. Currently, the predominant indications are airway obstruction and tonsillar hypertrophy. For emergency situations such as airway obstruction, the indication for tonsillectomy is no longer debatable (absolute indication)[4]. However, the relative indications for tonsillectomy in non-emergency settings and the need for an age limit in this setting are still a matter of debate. A literature states that age does not determine whether a tonsillectomy can be performed[5].

Preoperative management

A complete physical examination and history taking is mandatory for all

patients undergoing tonsillectomy. On physical examination, if a heart murmur is found, it is best to trace the abnormality first. In children under the age of 3 years, the incidence of heart murmurs can be considered physiological, if the child's clinical condition is good. Special attention is also given to children with evidence of *obstructive sleep apnoea*[6].

Obstructive sleep apnoea. In children, adenotonsillar tissue enlargement is the most common cause of OSA. Signs and symptoms of OSA include chronic hypoxemia which can manifest as polycythaemia and right ventricular strain (the ECG shows large P waves in leads II and V1, large R gels in V1 and deep S gels in V6). Symptoms of OSA at night are, snoring, episodes of apnoea followed by snoring and restlessness. While the symptoms that appear during the day are headaches, feeling not enough rest at night and feeling excessive sleepiness during the day. Perioperative use of opioid drugs may worsen respiratory drive and exacerbate hypoxia[7].

At the pre-operative visit, consider pre-operative analgesia, as children with tonsillitis usually complain of sore throat and difficulty swallowing. Analgesia can be with Paracetamol 20 mg/kgBW p.o or ibuprofen 5 mg/kgBW orally[10].

There are no special investigations to be performed in patients undergoing tonsillectomy surgery. If there is no abnormality on the physical examination and history, then a long examination is not necessary[6].

Operative Durante Management

The problems faced by an anesthesiologist in tonsillectomy are, sharing an airway with the surgical operator, remote access and having to prevent aspiration of blood into the trachea. In children with a history of OSA, it is likely that airway obstruction will occur at the time of induction, so special attention is needed[8].

The use of Laryngeal Mask Airway (LMA) for tonsil surgery, research has begun to be carried out for its safety. The principle is the installation of a tool to deliver inhaled gas, secure the trachea so that it is not exposed to splashes from the tonsillectomy process, and does not interfere with the operator's access to the operating field. There are several advantages and disadvantages of using an LMA with an endotracheal tube[9].

The main disadvantage of using the LMA is that it cannot be a definitive airway like an endotracheal tube can. In a study conducted in England between 1996-1997 it was found that 16% of tonsillectomy anesthesia used the LMA as a breathing apparatus[7].

Induction of anesthesia can be done by intravenous or inhalation techniques, inhalation induction must be careful, especially in cases of adenoid hyperplasia. Intravenous induction anesthesia agents can use Propofol (1.5 – 2.5 mg/kgBW) or thiopental (2-7 mg/kgBW). Intra-operative opioid administration can use Morphine (0.1 mg/kg), Fentanyl (1-5 mcg/kgBW), or Pethidine (0.5-2 mg/kgBW) intramuscular[9].

Intubation can be performed with or without muscle relaxants. The use of muscle relaxants should consider the duration of the operation. We recommend using short duration muscle relaxants because the average duration of surgery is short. The use of an *endotracheal tube*, use a *reinforced tube* because some surgical techniques use Boyle-Davis Gag to improve operator access to the oral cavity. Boyle-Davis Gag in installation can cause displacement of the *endotracheal tube* or obstruction because the tube is pinched Gag due to improper installation. Prior to the start of surgery, the patient will be positioned by the operator in a neck extension position using a support at the base of the shoulder. Ensure that the position of the *endotracheal tube* does not shift during neck extension[8].

The use of the ETT was chosen over the use of the Laryngeal Mask Airway because the ETT can serve as the definitive airway in maintaining the airway and facilitating access to the operator[7].

The choice of intubation technique without muscle relaxant was chosen with the consideration that the duration of tonsillectomy surgery was relatively fast, then the unavailability of short duration muscle relaxants at the surgery site. So that pre-intubation anesthesia was infused with the anesthesia inhalation agent Sevoflurane and N2O, then pre-emptive analgesia was given Fentanyl 3 mcg/kgBW which is expected to provide sufficient analgesia for the orotracheal intubation. Intubation was chosen with the orotracheal technique not nasotracheal because in this patient there was an enlarged adenoid gland so that it was difficult to get access to the nasopharynx

due to narrowing caused by the pressure of the adenoid gland[11].

There are various surgical techniques performed by the operator, this surgical technique will have an impact on the sensation of pain from the patient himself. The guillotine technique has been abandoned by many ENT experts in performing tonsillectomy. The technique that is widely used is the dissection / snare technique. After dissection, then bleeding is controlled with sutures, electrocautery or point coagulation, the use of adrenaline gauze is often used to reduce bleeding. In general, surgical techniques are divided into 'hot' and 'cold' techniques[6].

Cold steel dissection, followed by sutures and gauze packs. Cold steel dissection, followed by bipolar diathermy for haemostasis. Hot dissection, using bipolar or monopolar diathermy (400 – 600 oC) for dissection and haemostasis. Coblation, using low temperature electro surgery (60 – 70 oC) for dissection and haemostasis[6].

The technique with cold dissection has the lowest incidence of postoperative bleeding than hot dissection. Excessive use of electrocautery provides a more postoperative pain sensation than without cautery. During surgery, bleeding was only controlled with gauze. The operator uses a cold dissection technique and then haemostasis using a gauze pack. Adrenaline gauze is used to treat residual bleeding that is not lumpy on the installation of the gauze pack. The length of operation was 45 minutes, and the duration of anesthesia was 75 minutes from induction to the patient's emergent phase. Fluid intake during anesthesia is Ringer's Lactate as much as 300 ml. duration of hemodynamic surgery patient HR 92 – 104 x/min with O2 saturation 98 – 99 %[6].

Fluid management during surgery. Installation of an intravenous line for the duration of surgery is mandatory. In tonsillectomy surgery, the mean blood loss is 5% of the estimated blood volume. In 5% of the population, blood loss can reach 10% of the estimated blood volume. Transfusion of blood components is almost unnecessary in the case of tonsillectomy. The use of glucose-saline fluids must be careful because it can cause hyponatremia. If the patient is kept normovolumic using a crystalloid solution, such as Hartmann's solution, it is necessary to bleed to approximately 50% of the EBV to achieve an Hb level below 7 g/dL[6].

Post Operative Management

Extubation management. After the operator doctor has completed the procedure, it is time for the extubation procedure. Prior to extubation, clean the laryngeal area using a negative-pressure suction unit with the direct laryngoscope technique. The laryngeal area should be visually assessed as free of secretions and blood. Suction cannula should not touch the tonsillar bed so as not to cause secondary injury. Extubation is performed when spontaneous breathing is adequate, and the oropharynx is clean[12].

Extubation was performed using the sleep extubation technique. Consideration is the sleep extubation technique to reduce the incidence of cough in patients who are at risk of damaging the sutures on the tonsillar bed so that the incidence of postoperative bleeding is expected to decrease. The incidence of laryngospasm and stridor after extubation has been reported in up to 20% of patients. Laryngospasm is an involuntary reflex of the laryngeal muscles caused by sensory stimulation of the superior laryngeal nerve. Stimulation may include secretions from the pharynx, blood from a tonsillar dissection, or an *endotracheal tube* that passes through the larynx during extubation[13].

The manoeuvre to avoid laryngospasm is to extubate the patient when the patient is deep asleep, or the patient is fully awake. If laryngospasm occurs, action can be taken, clearing the airway of secretions and blood, performing positive pressure ventilation with gentle pressure using 100% oxygen or giving intravenous lidocaine (1 – 1.5 mg/kgBW). If it doesn't work and hypoxia occurs, a small dose of propofol can be given to relax the laryngeal muscles. The occurrence of laryngospasm can cause pulmonary edema even in healthy people. This is because there is a large negative intrathoracic pressure when the patient tries to breathe during spasm. Post-intubation croup, caused by edema around the glottis, larynx, and trachea. This is caused by trauma during laryngoscopy and endotracheal intubation. Management of post-intubation croup with corticosteroids, dexamethasone 0.2 mg/kgBW. Bleeding after tonsillectomy, if it feels profuse bleeding and endangers the airway, the operator will reassess the bleeding point in the Tonsillar bed. Such patients need to be brought back to the operating room,

and their intubation should be managed using the Rapid–sequence induction algorithm with cricoid pressure. The dose of the induction drug should match the possibility of unmeasured hypovolumia. Because the amount of bleeding cannot be known[13].

Opioids as postoperative analgesics can be given if needed, according to the WHO step ladder chart for pain. The use of opioids should be in accordance with opioids given during surgery, to avoid adverse events from opioid administration. Administration of NSAIDs is recommended with Ibuprofen (10mg/kgBW) or with Paracetamol (10-20 mg/kgBW). The administration of ketorolac, in several studies, has shown an increase in the incidence of postoperative bleeding. It is best to give paracetamol in combination with morphine, because paracetamol has a morphine sparing effect, thus increasing the analgesic potency[9].

CONCLUSION

Peritonsillar block can be a method that can be used to reduce pain after tonsillectomy surgery. Peritonsillar block can be performed after intubation (before incision) or before extubation (after the procedure is complete).

Induction of anesthesia can be done by intravenous or inhalation techniques, inhalation induction must be careful, especially in cases of adenoid hyperplasia. Intravenous induction anesthesia agents can use Propofol (1.5 – 2.5 mg/kgBW) or thiopental (2-7 mg/kgBW). Intra-operative opioid administration can use Morphine (0.1 mg/kg), Fentanyl (1-5 mcg/kgBW), or Pethidine (0.5-2 mg/kgBW) intramuscular.

CONFLICT OF INTEREST

The Authors declare that have no conflict of interest.

REFERENCE

1. Patrick N, Robert G. Dasar-dasar ilmu THT. 2nd ed. Jakarta: EGC ; 2012.
2. Brahmi NH, Sutiyono D. Ketamin and peritonsiller infiltration as post operative tonsillectomi pain management in children. J Anestesiol Indones. 2015;VII(2):114–9.
3. Bohr C, Shermetaro C. Tonsillectomy and Adenoidectomy. Natl Libr Med . 2022.
4. Indra I. Pre-Anesthesia Assessment and Preparation. Budapest Int Res Exact Sci J [Internet]. 2020;2(2). Available from: www.bircu-journal.com/ index.php/birex

5. Ragan B. Chapter 67. Anesthesia for Otorhinolaryngologic (Ear, Nose, and Throat) Surgery Key Points. Anesthesiology. 2023.
6. Morgan Jr GE, Mikhail MS, Butterworth JF, Mackey C, Wasnick JD. Airway Management . In: Morgan & Mikhail's Clinical Anesthesiology. 5th ed. The Mc Graw Hill company ; 2013.
7. Bangera A. Anaesthesia for adenotonsillectomy: An update. Indian J Anaesth. 2017;61(2):103-9.
8. Joshi GP, Kehlet H, Beloeil H. Guidelines for perioperative pain management: need for re-evaluation. Br J Anaesth. 2017;119:720–2.
9. M KK. Effect of intravenous paracetamol for post-operative pain relief after tonsillectomy - A study of 70 cases. MedPulse Int J Anesthesiol [Internet]. 2020;14(1):18–21. Available from: https://medpulse.in/Anesthsiology/html_14_1_5.php
10. Choubsaz M, Mohsenin G, Ahmadi SJ, Sadeghi M. Comparison of the effects of adding of ketamine to preincisional bupivacaine injection on post operative pain relief after tonsillectomy in children. J Reports Pharm Sci . 2017;6(1):68–76.
11. Rusmarjono, Arsyad SE. Nyeri Tenggorok. In: Buku ajar ilmu kesehatan telinga hidung tenggirik kepala & leher. 7th ed. Jakarta ; 2016.
12. Suvarna, Deepa, Fernandes S. Anesthesia Management of Adenotonsillectomy. Otorhinolaryngol Clin An Int J. 2015;7(1):17–21.
13. Kitisin N, Chumpathong S, Raykateeraroj N, Praserdvigai P, Tareerath M. Factors Associated with Moderate to Severe Pain in Post-Anesthesia Care Unit after Tonsillectomy ; : A Retrospective Study. J Med Assoc Thai . 2021;104:438–44.