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Nasotracheal Intubation under Videolaryngoscopy in Mandibular Abscess with Trismus

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Abstract

Management of a difficult airway is a challenge for every anesthesiologist. Mandibular stiffness, trismus, and facial structural deformities often limit the available airway management options. With a variety of techniques that have been developed today, the management of difficult airways is more optimal than conventional management. One technique that can be used is video laryngoscopy. The authors report a case of nasotracheal intubation by video laryngoscopy in a mandibular abscess patient with trismus. The purpose of this case report is to demonstrate the effectiveness of the video laryngoscopy technique to assist nasotracheal intubation and to add insight for nasotracheal intubation technique in difficult airway conditions, especially trismus. Female, 60-year-old, come with a left mandibular abscess with complicated trismus who was planned for incision and drainage of the abscess. Nasotracheal intubation was performed under video laryngoscopy and during the surgical procedure the patient's vital signs were stable. This case report concludes that video laryngoscopy can be an alternative to conventional techniques and awake fiberoptic intubation in the case of nasotracheal intubation.

Keywords: *nasotracheal intubation, video laryngoscopy, trismus*

Case Report

Intubasi Nasotrakeal dengan Videolaringoskopi pada Pasien Abses Mandibula dengan Trismus

Abstrak

Tatalaksana difficult airway merupakan tantangan bagi setiap dokter anestesi. Kekakuan mandibular, trismus, dan deformitas pada struktur wajah seringkali membatasi pilihan tatalaksana jalan napas yang dapat digunakan. Dengan berbagai macam teknik yang sudah dikembangkan saat ini, penatalaksanaan difficult airway menjadi lebih optimal dibandingkan dengan tatalaksana yang konvensional. Salah satu teknik yang dapat digunakan adalah videolaringoskopi. Penulis melaporkan kasus intubasi nasotrakeal dengan videolaringoskopi pada pasien abses mandibula dengan trismus. Tujuan penulisan laporan kasus ini adalah untuk menunjukkan efektifitas dari teknik videolaringoskopi dalam membantu intubasi nasotrakeal dan menambah wawasan mengenai teknik intubasi nasotrakeal pada kondisi difficult airway khususnya trismus. Pasien perempuan, usia 60 tahun, datang dengan abses mandibula sinistra dengan penyulit trismus yang direncanakan untuk insisi dan drainase abses. Intubasi nasotrakeal dilakukan dengan bantuan videolaringoskopi dan selama operasi berlangsung tanda vital pasien dalam keadaan stabil. Laporan kasus ini menyimpulkan bahwa pada kasus intubasi nasotrakeal, videolaringoskopi dapat menjadi alternatif dari teknik konvensional dan *awake fiberoptic intubation*.

Kata Kunci: Intubasi nasotrakeal, videolaringoskopi, trismus

INTRODUCTION

Management of difficult airway is a challenge for every anesthesiologist. Mandibular rigidity, trismus, and facial structural deformities often limit the available airway management options. With a variety of techniques that have been developed at this time, the management of difficult airways is more optimal than conventional management. One technique that can be used is videolaryngoscopy. This article reports a case of nasotracheal intubation by videolaryngoscopy in a mandibular abscess patient with trismus. The purpose of this case report is to demonstrate the effectiveness of the videolaryngoscopy technique in assisting nasotracheal intubation and to add insight into the nasotracheal intubation technique in difficult airway conditions, especially trismus.

CASE PRESENTATION

A 60 years-old female patient, body weight 60 kg with a left mandibular abscess. she was planned for incision and drainage of the abscess. The patient complained of swelling in the left lower jaw, since 1 week before admission to the hospital, it was painful, and the mass was getting bigger. When admitted to the hospital, the patient had difficulty opening his mouth (10mm incisor distance) which can be seen in Figure 1. The patient previously had a history of uncontrolled hypertension, Hypertensive Heart Disease (HHD), and hypokalemic electrolyte disturbances. The patient had no history of allergies and previous history of asthma.

Figure 1. Mandibular Abscess and Trismus

Vital signs before anesthesia: Blood pressure160/80, HR 90x/m, RR 18x/m, temperature 37°C. The patient was induced without using muscle relaxants so that when intubating the patient's breath remained spontaneous, nasotracheal intubation was performed with CMAC videolaryngoscopy, the intubation process can be seen in Figure 2. Prior to induction, the patient was given premedication including ondansetron 8 mg IV, dexamethasone 10 mg IV and diphenhydramine 10 mg IV. The analgesic fentanyl 100 mcg IV was administered and then the patient was induced with propofol 100 mg. After complete induction, anesthesia was deepened using sevoflurane 1.5 MAC (3 vol%) with a fresh gas flow of O_2 7 lpm. Then performed nasotracheal intubation with non-apnea sleep technique in patients with CMAC videolaryngoscopy using a non-kinking endotracheal tube (ETT) size 6.5. After successful intubation, the muscle relaxant atracurium 30 mg IV was given. Maintenance was administered under inhalation anesthesia using sevoflurane 2 vol% and 50% N2O (1.5 MAC) with a fresh gas flow of 4 lpm (FiO_2 50%). During anesthesia, the patient's condition and vital signs are stable. The

abscess drainage incision process can be seen in Figure 3. The patient was given a reversal of the muscle relaxant neostigmine 2 mg and anti-muscarinic sulfas atropine 1 mg. Extubation is performed while patient awake to maintain the she's airway reflex.

Figure 2. Nasotracheal Intubation Process under Videolaryngoscopy

Figure 3. Drainage of Abscess Process

DISCUSSION

A difficult airway is defined as a condition in which a trained health worker has difficulty intubating and venting. This condition is crucial, because failure of airway management in these patients will significantly increase patient morbidity and mortality (Reichman, 2019). Challenges in surgery of the airway area and the management of difficult airways is the anesthesia. Mandibular stiffness, trismus, and facial structure deformities often limit the available airway management options (Gupta and Gupta, 2018). In this case, the patient had trismus problems due to her mandibular abscess (Cho *et al,* 2016). Trismus is commonly referred to as the "locking jaw" and is generally caused by a sustained tetanic spasm of the muscles of mastication. Infection of the patient's left mandible near the Temporomandibular joint Syndrome (TMJ) causes inflammation. The inflammation causes pain, especially when opening the mouth and stiffness of the jaw muscles (Obradovic, 2021; Santiago-Rosado and Lewison, 2021). Normal adults are generally able to open their mouths as wide as 40-60mm, under 40mm it can be said to be trismus, while our patients can only open their mouths as wide as 10mm (Dhanrajani and Jonaidel, 2002). Nasotracheal intubation is considered to have an advantage when applied to these patients. In addition, nasotracheal intubation will benefit the surgical operator, because the field of surgery becomes wider (Reichman, 2019). Direct laryngoscopy can be used to facilitate nasotracheal intubation with a record of normal mouth opening. If the patient has trismus, the use

of direct laryngoscopy is not recommended because it will complicate the installation of the ETT. Generally, awake fiberoptic intubation can be performed, but videolaryngoscopy can also be an alternative that can be used. In difficult airway scenarios performed using a medium fidelity human stimulator, videolaryngoscopy can increase the exposure of the glottis when compared to direct laryngoscopy. (97% Cormack Lehane Grade I or II vs. 51%, P < 0.01) (Kulkarni *et al,* 2015). Videolaryngoscopy has revolutionized the management of difficult airways, optimal indirect visualization is very helpful in dealing with difficult intubation cases (Chemsian *et al,* 2014). Although visualization of the glottis becomes clearer, sometimes we still need magic, external laryngeal manipulation, and an Eschmann stylet to guide the ETT into the trachea (Gupta *et al,* 2017).

In the development of video-laryngoscope, it provides a new paradigm in airway management. In 1998, Weiss modified the Macintosh laryngoscope using a cable. John Pacey, tried to add a video chip to a curved-non-machintos blade laryngoscope (Pieters *et al,* 2015). There are various types of video-laryngoscope tools, ranging from CMAC, Glidescope, McGrath, Truview etc. In this study, nasotracheal intubation was performed with CMAC videolaryngoscopy, according to a study conducted in the emergency department in Arizona, intubation success showed not much different of using of CMAC compared with a glidescope (Mosier *et al,* 2013). When compared to Truview, CMAC has better glottic visualization and can speed up the intubation process (Vimal and Sivanolli, 2018).

According to a case study in Japan, nasotracheal intubation using a video-laryngoscope (especially a McGrath X blade) is more effective than a regular laryngoscope because it does not require a wide mouth opening. A case report describes videolaryngoscopy (McGrath type) effective in treating a difficult airway, in this case presented a 43-year-old man with trismus who was to undergo removal of an infected plate and screw. The patient refused awake fiberoptic intubation, so that orotracheal intubation was performed with a videolaryngoscopy (Graterol and Quader, 2009). Compared with direct laryngoscopy, Glidescope videolaryngoscopy ease nasotracheal intubation because faster intubation time and reduces the difficulty of nasotracheal intubation (Tseng *et al,* 2017). From the three case studies above, it can be concluded that the videolaryngoscopy is effective in assisting intubation management in patients with difficult airways, especially in patients with trismus.

During intubation, the patient's breathing remained spontaneous. This is intended to maintain airway reflexes and prevent aspiration. A study in India showed that intubation in the management of difficult airways with spontaneous respiration is safer than aspiration, which can increase the risk of mortality and morbidity (Raval and Rashiduddin, 2009).

A case report on anesthetic management in a child with a large rhabdoid tumor in the neck explained that in order to maintain a secure difficult airway intubation due to a mass in the neck, they intubated while the patient was breathing spontaneously. It is also intended to maintain the muscles function in the airway so that the patient's airway does not collapse by mass of tumor (Stevic *et al,* 2016).

In the treatment of intubation with a difficult airway such as Ludwig's angina patients, the use of muscle relaxants results in loss of spontaneous breathing and loss of pharyngeal and glossal muscle tone which rapidly causes obstruction. This can result in failed intubation and inability to oxygenate with facemask ventilation (Saha and Chong, 2020), therefore spontaneous breathing intubation is recommended.

CONCLUSION

Videolaryngoscopy is a technique that can assist in the management of difficult airways. In the case of nasotracheal intubation, videolaryngoscopy can also be an alternative to conventional techniques and awake fiberoptic intubation.

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