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Hemodynamic Response and Patient Comfort in Conscious Intubation with Recurrent Laryngeal Nerve Block

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A B S T R A C T

Introduction: Anesthetic management of conscious intubation in difficult airway cases can be done with topical anesthetics, airway nerve blocks, or a combination of both. Inadequate quality of anesthesia can cause hemodynamic turmoil, pain, gag reflex, and patient discomfort. This study presents a case report on the use of recurrent laryngeal nerve blocks in patients who were consciously intubated. **Case presentation:** This man was premedicated in the reception room using 10 mg IV dexamethasone, 10 mg IV diphenhydramine, 2 drops of 0.05% oxymetazoline right nose, 4 ml of 4% lidocaine nebulization, 10% lidocaine spray on the uvula and 2 puffs of pharyngopalatine fauces. Once in the operating room, this man was given midazolam 1.5 mg IV, fentanyl 25 mcg IV, followed by ultrasound-guided recurrent laryngeal nerve block. The local anesthetic used was 2 ml of 2% lidocaine. After that, right intranasal conscious intubation was performed. During intubation, this man began to show discomfort in the form of frowning when the flexible scope (FIS) was in the larynx and briefly passed the vocal cords. In addition, a gag reflex and cough are seen when the FIS and airways pass over the larynx and vocal cords. Intubation is done in about 4 minutes with 1 attempt. C**onclusion:** Awake intubation can be performed with topical anesthesia, airway block, or a combination of the two. Awake intubation with a combination of laryngeal recurrent nerve blocks and topical anesthesia, in this case, was inadequate because there was coughing, gag reflex, and increased heart rate during intubation.

1. Introduction

Management of difficult airways is quite common in anesthesia, emergency, and intensive care patients, which are estimated to be around 20% of the general population.[1] Awake intubation is the gold standard recommended for the management of a predictable difficult airway, but it requires a technique that is quite challenging and can cause discomfort to the patient. Awake intubation is a medical procedure commonly used in modern medical practice to support or ensure the airway in patients requiring assisted mechanical ventilation. The process of conscious endotracheal tube or laryngeal tube into the patient's airway through the mouth or nose so that air can move in and out of the lungs more efficiently.[2]

Although conscious intubation can save lives and support important medical procedures, the process is not always pleasant for the patient. The conventional conscious intubation process can cause stress and discomfort to the patient, which can impact the hemodynamic response or changes in the patient's blood circulation. As technology advances and the desire to increase patient comfort during medical procedures, new techniques have been developed to reduce the discomfort and unwanted hemodynamic

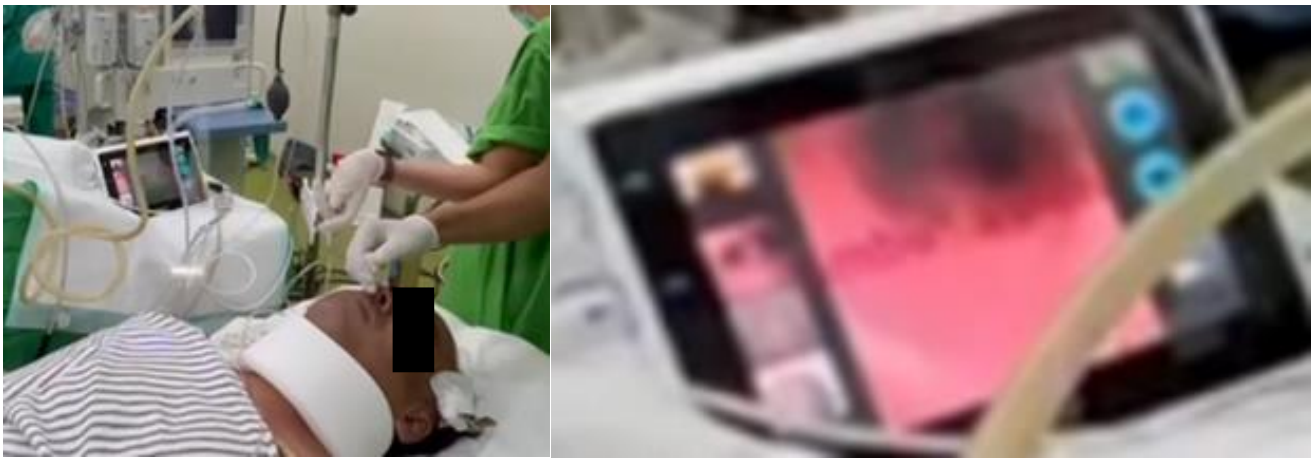
response to conscious intubation. One technique that is gaining popularity is the recurrent laryngeal nerve block. A laryngeal recurrent nerve block is a method that eliminates sensation and movement of the vocal cords during an intubation procedure by blocking the nerve pathways that connect the brain to the vocal cords. Thus, patients remain conscious and able to control their own breathing but do not experience a cough reflex or be bothered by the passage of the tube into the airway.[3,4] This study presents a case report on the use of recurrent laryngeal nerve blocks in patients who were consciously intubated.

2. Case Presentation

This case is a man aged 49 years, weight 76 kg, with a unilateral dislocation of the facet joint level C5 - C6 ASIA D and a fracture of the transverse process of the vertebral columna (CV) 5. This man was planned to undergo decompression, stabilization, fusion and it concluded that his physical status was ASA III. This man is an active smoker with consumption of 1 pack of cigarettes per day for more than the last 15 years and was still smoking 5 days ago. The LEMON and MOANS scores were 3 and 0. The magnetic resonance imaging (MRI) results of this man showed anterior compression of the CV C5 and anterior spondylolisthesis of CV C5-C6 grade I accompanied by facet dislocation and surrounding bone marrow edema.

This man was premedicated in the reception room using 10 mg IV dexamethasone, 10 mg IV diphenhydramine, 2 drops of 0.05% oxymetazoline on the right nose, 4 ml of 4% lidocaine nebulization, 10% lidocaine spray on the uvula and 2 puffs of pharyngopalatine fauces. Once in the operating room, this man was given midazolam 1.5 mg IV, fentanyl 25 mcg IV, followed by recurrent laryngeal nerve block with USG guidance. The local anesthetic used was 2 ml of 2% lidocaine. After that, right intranasal conscious intubation was performed with hemodynamics before intubation, namely blood pressure (BP) 112/84 mmHg, heart rate (HR) 72 beats per minute, respiratory frequency (RR) 16 times per minute, peripheral oxygen saturation (SpO_2) 99% room water. During intubation, this man started showing discomfort in the form of frowning during flexible scope (FIS) in the larynx and briefly past the vocal cords. This is in accordance with the increased hemodynamics, namely HR 110 times per minute and BP 145/89 mmHg, and SpO_2 99%. Besides that, gag reflexes and cough were seen during FIS, and a breathing tube through the larynx and vocal cords. Intubation is done in about 4 minutes with 1 attempt.

Figure 1. Clinical photo of a patient with unilateral facet joint dislocation C5- C6 ASIA D and fracture of the CV 5 transverse process attached to the collar neck.



(A) (B)

Figure 2. (A) Patient response while (B) FIS is in the larynx.

3. Discussion

Endotracheal conscious intubation using flexible scope requires skill and adequate anesthesia. Fear and anxiety in patients undergoing this procedure require adequate anesthesia and sedation to avoid these effects.[1,4] Topical anesthesia by nebulization, pressure dressing, or spray has low anesthetic intensity. In addition, in some people with topical anesthesia, the partial block can occur because the submucosal receptors are stretched, so it is necessary to do an airway block to improve the quality of anesthesia.[5,6]

This case was performed with topical anesthesia and recurrent laryngeal nerve block. The patient's hemodynamic response and discomfort can be seen from an increase in heart rate, expression of discomfort and gag reflex, and cough, especially when the FIS is in the larynx and enters the vocal cords. These results contradict the study of Bindu et al., which stated that recurrent laryngeal blocks facilitate intubation, speed up intubation time, and increase patient satisfaction during intubation.[7] In addition, Ahmad et al. study showed that the recurrent laryngeal nerve block was as effective as the combination of the recurrent laryngeal nerve block and the superior laryngeal nerve in preventing coughing and gag reflex during conscious intubation.[8] However, the study by Alesandri et al. showed similar results to this case. Namely, the recurrent laryngeal nerve block was less optimal than the combination of superior laryngeal and recurrent laryngeal nerve blocks in increasing patient comfort during intubation.[9]

This difference in results may be caused by several factors, such as the dose and method of administration of topical anesthetics, as well as laryngeal reactivity. The success of laryngeal recurrent nerve block is quite high because it is done using ultrasound-guided. In the study of Ahmad et al. and Bindu et al., laryngeal reactivity was eliminated by lidocaine spray and superior laryngeal nerve block. Ahmad et al. used topical anesthesia with 2 ml of 1% lidocaine spray and 2 ml of 4% lidocaine mouth rinse accompanied by a superior laryngeal nerve block, while Bindu et al. used 4 sprays of 10% lidocaine and 1 ml of 2% lidocaine gel.[7,8] Dhooria et al. showed that lidocaine spray was more dominant than nebulization or a combination of nebulization and small-dose sprays. Local anesthetics via nebulization are widely dispersed in a small and uneven proportion, whereas sprays are more targeted and concentrated where desired.[10] In addition, laryngeal reactivity is increased by the presence of airway inflammation, which can interfere with the infiltration of topical anesthetics.[9] In this case, patients with active smoking can increase airway reactivity.[11] Airway conditions also affect the spread of topical anesthetics. In this, man uses a collar neck which restricts neck movement.[7]

4. Conclusion

Awake intubation can be performed with topical anesthesia, airway block, or a combination of the two. Awake intubation with a combination of laryngeal recurrent nerve block and topical anesthesia, in this case, was inadequate because there was coughing, gag reflex, and increased heart rate during intubation.

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