CASE REPORT

Role of Regional Blocks in Awake Intubation in Emergency Airway Managements in Mandibular Hypoplasia or Ankylosis

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Awake intubation is the choice for airway management in anticipated difficult airway (DA), which means establishing airway without induction of deep sedation; however, in cases where sedation is precarious, decision in emergency situations, success in awake intubation is dependent on proper regional airway block. A 21 year old man with bilateral temporo-mandibular ankyolosis and a 25 years old female with mandibular hypoplasia suspected of having Pierre Robin syndrome were candidate for elective facial plastic surgery. Case one was intubated by flexible fiberoptic bronchoscope and case two with retrograde intubation. In DA with mandibular problem, awake intubation is indicated under regional airway block and topicalization.

Keywords: regional; awake; intubation; mandible; ankylosis

The fundamental responsibility of clinician in emergency situations is to establish patent airway and ensure adequate ventilation and oxygenation. The term airway management refers to establishing and securing a patent airway. It is a cornerstone of anesthetic practice, because failure to secure a patent airway can result in hypoxic brain injury or death in only a few minutes.

The most recent update of ASA Guidelines for Management of the Difficult Airway, published in 2013, defines the difficult airway (DA) when trained clinician experiences difficulty with mask ventilation, tracheal intubation, or both [1]. Difficulty with airway management has potentially grave implications and increases the risk of death or brain damage by 15-fold [2]. DA complications are still the second-most common cause of claims [3]. Current guidelines of anticipated difficult airway are published recently [4].

Anticipated DA requires a range of knowledge and skill sets, formulating an airway management plan, and to have the skills necessary to execute that plan using variety of available airway devices [5].

Most commonly, awake intubation is the choice for airway management in anticipated DA, which means establishing an airway by using local anesthesia of the airway or sedation instead of induction of deep sedation.

The benefits of awake airway management include the preservation of pharyngeal muscle tone and patency of the upper airway, the maintenance of spontaneous ventilation, and most importantly a safe guard against aspiration attributable to the preservation of protective airway reflexes [6].

Flexible fiberoptic bronchoscopy (FFB) intubation is well-accepted as the gold standard for the management of the difficult airway, although other techniques have been successfully used, including video laryngoscopes, optical stylets, intubating LMAs, and retrograde intubation (RI).

Case Description

Both patients and/or the patient's family reviewed the case and gave written permission for the authors to publish the report.

Case one was retrograde intubation in a patient with mandibular hypoplasia suspected of having Pierre Robin syndrome. A 25 year old female patient who had multiple musculoskeletal deformities including micrognathia, thoracic vertebral scoliosis, bilateral hip dysplasia, but no cleft palate or congenital heart anomalies was referred for elective facial plastic surgery (Figure1A). She was normal in other lab tests and heart echocardiography. At the time of her operation, fiberoptic device was out of order and therefore we performed retrograde intubation with epidural catheter.

Case two was Flexible fiber optic bronchoscopy (FFB) intubation in bilateral temporo-mandibular ankyolosis. A 21 year old man who had multiple trauma 14 years ago; his TMJ was involved with ankylosis after ward and his mouth opening was less than 1 centimeter. He was neglected for 14 years with severe mouth opening limitations (only could drink not eat) and had malnutrition (BMI=15.5) due to his living condition in farfetched area was referred to surgery. His teeth hygiene was poor due to inability to brush. He was candidate for elective facial plastic surgery (Figure1B). Other lab tests were normal

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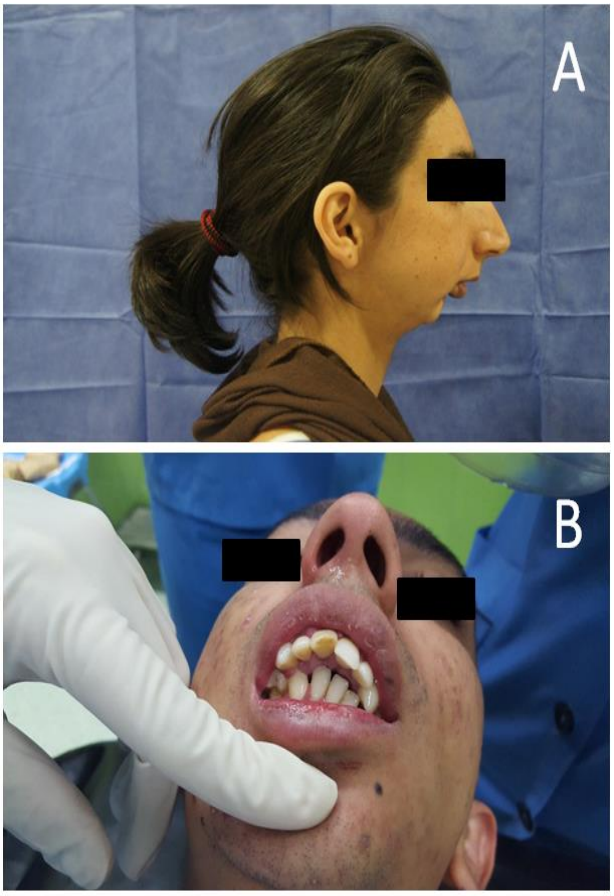
Figure 1- Case A with mandibular hypoplasia. Case B. bilateral temporo-mandibular ankyolosis



Methods

Two different approaches were selected to intubate these two cases. First approach was retrograde intubation and second approach was flexible fiberoptic intubation. Regional anesthesia was the mainstay for both approaches. Method of intubation was fully explained to the patient and written consent was obtained from them. A close rapport was maintained with patient. An experienced surgeon was present to perform tracheostomy in case of an incident.

After standard monitoring, for both approaches following nerve blocks were performed. Airway nerve blocks for proper awake intubation are listed below (Table1):

1-Topicalization of the airway with local anesthetics (10% Lidocaine): Topicalization of the larynx was achieved by spray-as-you-go (SAYGO) method, which involved intermittently injecting local anesthetics as it is advanced toward the trachea.

2-The glossopharyngeal nerve block which supplies sensory innervations to the posterior third of the tongue, vallecula, the anterior surface of the epiglottis, and the posterior and lateral walls of the pharynx and is the afferent pathway of the gag reflex was performed by topical spray due to limited mouth opening in both cases.

3-The superior laryngeal nerve block: a branch of the vagus nerve, provides sensory input from the lower pharynx and the upper part of the larynx, including the glottis surface of the epiglottis and the aryepiglottic folds.

4-Translaryngeal (or transtracheal) block: provides anesthesia of the trachea and vocal cords.

Table 1- Nerve blocks and innervations for awake intubation

Nerve block	Provide local anesthesia for
Topicalization	mouth, upper pharynx
Glossopharyngeal nerve block	posterior and lateral walls of the pharynx
Superior laryngeal nerve block (SLN)	lower pharynx and the upper part of the larynx
Translaryngeal block	vocal cords and upper trachea below vocal cords

Discussion

In this study we showed that the safest plan for cases of anticipated airway difficulty in adults is to perform awake tracheal intubation under regional blocks. These two cases of anticipated difficult intubation were managed with success. The safest approach to anticipated DI is to secure the airway while the patient remains awake [7]. These two cases show the necessity of performing regional blocks in management of awake intubation in anticipated difficult intubation.

When airway difficulty is anticipated, the point that clinician risks loss of control is when deep sedation is induced and respiratory drive is obliterated and tone of airway muscles are ablated. Therefore, regional anesthesia and nerve blocks are of paramount importance to control patient airway and decrease dose of sedatives and hypnotics. Regional blocks have few side effects and could be of assistance in operating rooms with limited resources and equipments.

Fiberoptic bronchoscopy (FOB) has a vast application in adult airway management in anticipated difficult intubation [8]. Retrograde intubation is a well-described technique for orotracheal or nasotracheal intubation that involves guiding an ETT into the trachea with a narrow, flexible guide that has been percutaneously placed into the trachea and passed retrograde through the larynx and pharynx, exiting the mouth or nose [9].

The most important part of awake intubation under regional anesthesia is the level of expertise and familiarities of clinician. The previous expertise in awake intubation and knowledge to the toxicity and adverse reactions of local anesthetics is necessary. Besides, appropriate and in-time application of sedation is another necessity of awake intubation which a combination of remifentanil and midazolam has been recommended due to short half-life [10].

Being familiar with new devices for awake intubation is critical for the clinicians managing anticipated DI in emergency situations. Nevertheless, DA is not an appropriate setting to experiment with a new technique. An expert technician familiar with the technique is not less helpful than expertise of clinician himself in awake intubation.

In conclusion, awake intubation is the choice for airway management in anticipated difficult airway (DA), which means establishing airway without induction of deep sedation in emergency situations; however, in cases where sedation is precarious, success in awake intubation is dependent on proper regional airway block. Awake

intubation under regional block of airway innervations is of paramount importance in management of DA with mandibular problem. It should be performed with appropriate planning, experience and good equipments.

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