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Case report

Straightforward and efficient topical anesthesia for awake fiberoptic intubation in a patient with micrognathia

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1. Introduction

Micrognathia is a condition where the jaw is undersized. It is also called ''Mandibular hypoplasia''. It can present as a congenital disorder in multiple syndromes including: fetal alcohol syndrome, congenital rubella, DiGeorge's syndrome, Pierre Robin syndrome and others or as developmental disorder. A case with micrognathia and previous history of failed endotracheal intubation was scheduled for radical mastoidectomy (see Figs. 1–3).

1.1. Case report

A 23 year old male patient, 65 kg, was scheduled for radical mastoidectomy. He suffered from purulent discharge with deafness and tinnitus of right ear diagnosed as cholesteatoma of the right middle ear since childhood. The pure tone audiogram showed severe conductive deafness of the right ear and mild on the left. While the patient showed excellent speech discrimination on the audiometry.

The patient has developmental micrognathia. At the age of 10 years, he was admitted to hospital with stiffness of the temporomandibular joint TMJ making chewing difficult. At the age of 16, his TMJ was operated upon with no improvement. A second operation was performed at the age of 18 which improved his chewing.

On the day of the mastoidectomy operation, intubation was attempted (by another 2 anesthesiologists) twice via inhalational anesthesia and rigid laryngoscopy which did not succeed. The patient was awaken and surgery was postponed.

The patient was re-scheduled for surgery 5 days later. X-ray of the patient revealed severe micrognathia, complete blood count and echocardiography showed no abnormality. Preoperative airway assessment by an experienced anaesthesiologist showed: interincisor distance = 5 cm, Mallampati class 3, movement of the head and neck is limited to 90° only, the buck teeth can prognath, the thyromental distance is very short 2.5 cm, his body weight is 65 kg and has previous history of failed intubation. So the total airway score of this patient was 9 which is an indication for awake fiberoptic intubation as the anesthetic plan [1].

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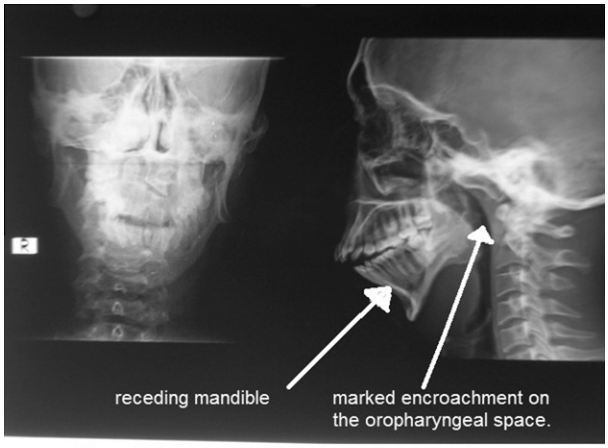

Figure 1 X-ray A/P and lateral view showing micrognathia.

Figure 2 Pre-operative assessment of the patient with micrognathia.

Figure 3 Successful oral intubation.

After psychological preparation and discussion of the plan with the patient, I.V. line was established. Monitors were attached to the patient, ECG, non invasive blood pressure and pulse oximetry. Capnogram was ready awaiting the endotracheal tube to be inserted. The following drugs were given: 0.5 mg atropine sulfate, 3 mg midazolam and 50 μg fentanyl. The patient was cooperative and easy to communicate with.

Lidocaine jel was put on a tongue depressor and the tip of the tongue depressor was inserted inside the patient's mouth. As the lidocaine jel was dissolved, it was carried deeper into the pharynx and swallowed by the patient. The tongue depressor was then advanced deeper as tolerated by the patient every 2–3 min until the tongue depressor reached the base of the tongue. With the help of the ENT surgeon the tongue depressor was used to depress the tongue totally and lidocaine 10% was sprayed around the base of the tongue and the tonsils. Eventually, the awake patient could tolerate the entire William oral airway without gag or discomfort.

The right nostril was prepared using a vasoconstrictor, Afrin nasal drops and lidocaine spray and lidocaine jel in case it is needed.

Preoxygenation of the patient was done via oxygen mask until the oxygen saturation was maintained 100%.

A fiberoptic scope outer diameter 6.00 mm (Pentax) was used while an ENT assistant was standing next to the patient assuring him, fixing the oral airway central and maintaining extension of the head.

The fiberoptic scope was introduced orally and after visualization of the vocal cords, 5 ml lidocaine 2% was injected at the side port of the fiberscope. A minute later the trachea and carina were visualized and a cuffed endotracheal tube ET with ID 7.5 mm smoothly threaded through the trachea. Correct position of the tube was confirmed by the fiberoptic visualization and exhaled CO_2 on the capnogram, the ET was taped at 21 cm. Thereafter, the patient started to receive IV induction: 2 mg/kg propofol, 1 μg/kg fentanyl and 0.5 mg/kg atracurium. Seventy-five mg diclofenac sodium was given IM. Maintenance with isolurane in O_2 and atracurium increments. The patient received 1000 ml Ringer solution over the 2 h procedure. The operation was completed successfully without any adverse events.

At the end of surgery, the patient was extubated awake after opening his eyes to command and maintain head lift for 5 s. After extubation, he was fully awake, with normal breathing, stable vital signs and pain free. Then, the patient was transferred to the recovery unit for an hour for administration of O_2 mask and monitoring of the vital signs. The patient remained stable and pain free. He was very satisfied with the awake intubation technique. Then he was sent to the surgery ward to be discharged home the next day of surgery.

2. Discussion

In the general population the incidence of difficult intubation DI ranges from 0.5% to 2%, and in ENT surgery DI ranges from 8% to 10% [2]. Failed intubation is associated with serious complications [3]. Fiberoptic intubation FOI is a well-documented technique in a patient with an anticipated difficult airway. Guidelines on anticipated difficult airway management DAM emphasize the importance of the FOI technique when a difficult airway is predicted [4–6]. Awake fiberoptic intubation remains the gold standard for patients with anticipated DAM [7].

This case illustrates the challenges of endotracheal intubation in a patient with micrognathia and previous history of failed intubation. Airway assessment is a crucial element in choosing the plan of anesthesia. One component of many of the algorithms for DI is the pre-operative airway assessment and recognition of the difficult airway [4–8]. Prediction uses many factors associated with difficult tracheal intubation DTI, such as mouth opening, Mallampati classification, head and neck movement (atlanto-occipital joint assessment), receding mandible, protruding maxillary incisors (buck teeth), thyromental distance, sternomental distance, obesity and a previous history of difficult intubation [1].

In a recent study, it was found that computerized analysis of facial structure and thyromental distance can classify easy versus difficult intubation with accuracy significantly outperforming popular clinical predictive tests [9].

The presence of the surgeon as a member of the airway management team really helped during psychological assurance and explanation of the procedure to the patient who was really annoyed about the failed intubation trial. Pharmacological preparation with antisialagouge, anxiolytic, narcotic analgesic also helped the patient cooperate during the procedure. Applying lidocaine jel through tongue depressor and advancing it gradually is an easy and very effective technique to anesthetize the oropharynx and well tolerated by the patient. Pressing on the tongue depressor, the pharynx was sprayed so the William airway was totally introduced and tolerated by the patient with no gag. William airway combines the simplicity and benefits that traditional oral airways provide, with the advantage of mechanically guiding fiberoptic intubation. Maintaining the William airway at the central part of the mouth by the assistant and using a proper sized bronchoscope Pentax outer diameter 6.0 mm all are factors that helped the success, easiness, speed besides patient satisfaction of the awake fiberoptic intubation. The technique of topical anesthesia used was very simple, easy, non invasive.

In accordance to this study, EMLA cream was used as a topical anesthestic to the mucus membranes of the oropharynx to help the patient tolerate William's airway during awake fiberoptic intubation [10].

On the contrary, bilateral superior laryngeal nerves were blocked by 2 ml of 2% lignocaine for each one to tolerate William airway during awake fiberoptic intubation [11].

In this case plan A of anesthesia was to intubate the patient through awake fiberoptic bronchoscopy. Plan B was to use air Q after inhalational anesthesia. Plan C was surgical airway, i.e. tracheostomy by the ENT surgeon who was already a member of the airway management team.

3. Conclusion

Difficult intubation can be life-threatening and can result in multiple serious complications and sequelae. Prediction of difficult airway for intubation by airway assessment and having proper plans for management before such situations arise, is an important clinical skill to acquire. Anesthetizing the airway using a lidocaine jel on a tongue depressor was very convenient to the patient and anesthesiologist as it allowed the use of William airway during awake FB intubation which in turn made the management easier for the patient with micrognathia and previous history of failure of intubation. Having the ENT surgeon as a member of the airway management team was of great help.

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