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Case report

Massive ameloblastoma: A case report of difficult fiberoptic intubation

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ABSTRACT

Introduction: Intubation can sometimes be difficult in patients with lesions in the mouth floor. Ameloblastoma is a frequently encountered tumor of the maxillofacial area. An extensive lesion might occupy the floor of the mouth, prevent displacement of the tongue, limiting the space for inserting a laryngoscope blade and resulting in difficult intubation even with fiberoptic bronchoscopy.

Case presentation: A 66-year-old man (67 kg; 171 cm) with a mental swelling was diagnosed with ameloblastoma and scheduled for surgical resection. The tumor was extensive, occupying most of the anterior floor of the mouth. We were concerned about impossible direct laryngoscopy because the massive tumor in the floor of the mouth compressed the base of the tongue against the posterior wall of the pharynx, restricting the space for inserting the laryngoscope blade. Therefore, we planned to perform awake nasal fiberoptic intubation to secure the airway. Although the procedure was complicated by the massive tumor, successful intubation was achieved by hand-assisted alteration of the direction of the endotracheal tube (ETT) under direct laryngoscopy.

Discussion: Awake fiberoptic intubation was complicated by the tumor protrusion to deviate the ETT. Discovering of the ETT deviation by the insufficient blade insertion facilitated visualizing the vocal cords with the fiberoptic scope.

Conclusion: Identification of ETT deviation even with insufficient blade insertion and hand-assisted alteration of the direction of the ETT might raise the chances of successful fiberoptic intubation. The anesthesiologist should be aware of the likelihood of failed fiberoptic intubation and plan for alternative approaches to secure the airway.

1. Introduction

Lesions occupying the floor of the mouth could often be associated with difficult intubation. Cases of impossible direct laryngoscopy have been reported in patients with mandibular tori [1] and osteoma [2] protruding from the mandibular corpus to the floor of the mouth. Ameloblastoma is a frequently encountered benign tumor of the odontogenic epithelium that frequently occurs in the maxillofacial area. It progresses slowly but has features of aggressive invasion and high rate of recurrence, causing severe abnormalities of the face and jaw. Surgical resection is the most common treatment of this tumor while conservative management such as chemotherapy and radiation are indicated for certain cases. So far, to our knowledge, there is no case report of anesthetic management for resection of ameloblastoma in terms of difficult intubation. However, extensive lesions might occupy the floor of the mouth, preventing displacement of the tongue, and limiting the space for insertion of the laryngoscope blade, resulting in difficult intubation and even death due to problems relating to anesthesia [3].

We present the case of an ameloblastoma arising from the mandibular corpus in the mental region extending to the floor of the mouth in which impossible intubation with direct laryngoscopy and challenging mask ventilation were anticipated. In this case, awake fiberoptic intubation was complicated by tumor protuberance causing deviation of the endotracheal tube (ETT) away from the vocal cords. This case report has been reported in line with the SCARE criteria [4].

2. Case presentation

A 66-year-old man (weight 67 kg; height 171 cm) presented with an approximately 8-year history of mental swelling (Fig. 1A), with recent fistula formation and a purulent effusion. The pathological diagnosis was benign ameloblastoma, and so subtotal mandibulectomy was scheduled for easy reconstruction of the lost hard tissue immediately after the surgical procedure, which could facilitate improved anesthetic recovery and quality of life. Medical history, laboratory data, and physical examination were unremarkable except for orofacial findings. The tumor was extensive, occupying the most anterior part of the floor

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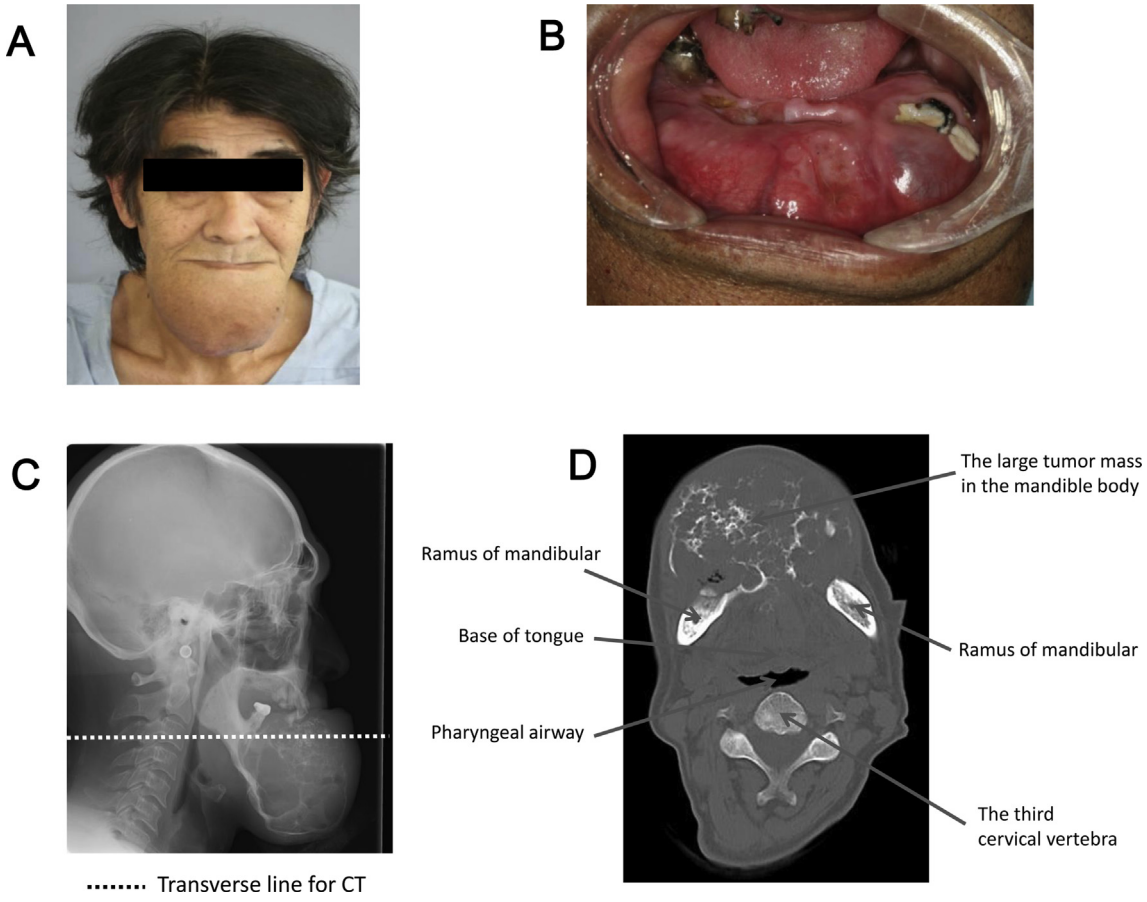

Fig. 1. Preoperative findings. A: Patient with massive ameloblastoma in mental region, B: Ameloblastoma occupies most of the anterior part of the floor of the mouth, C: Lateral radiograph shows limited space in the pharynx. D: CT scan of pharynx in transverse plane.

of the mouth compressing the tongue to a posterior position (Fig. 1B). Movement of the temporomandibular joint and cervical spine was good. Mouth opening was more than three fingerbreadths and the airway was a Mallampati class II.

We were concerned about impossible direct laryngoscopy because the massive tumor in the floor of the mouth compressed the base of the tongue against the posterior wall of the pharynx restricting the space for insertion of the laryngoscope blade (Fig. 1C and D). In addition, the less compliant tongue might not be lifted even if insertion of the blade is achievable. Therefore, we planned awake nasal fiberoptic intubation to secure the airway.

After preoxygenation for 5 min, 2 mg midazolam and 0.1 mg fentanyl were administered to reduce stress during intubation. Both nostrils were prepared with 2% lidocaine containing 1/50000 epinephrine and transtracheal anesthesia was performed with 1.5 mL 4% lidocaine. A lubricated 7.0-mm inner diameter spiral tube (Covidien™, Mansfield, MA) was inserted via the right nostril. The breathing circuit and face mask was placed near the left nostril to administer oxygen at 6 L/min. The bronchoscope was introduced into the ETT and only mucous membrane was seen. Despite changing the position of the ETT, ETT rotation and manipulation of fiberscope could not improve the view through the scope. We could not identify any laryngeal stricture. The surgeons were notified to stand-by in case of emergent tracheotomy. To confirm the position of ETT in the oropharynx, insertion of the direct laryngoscope blade (Macintosh No. 3) was attempted by a second anesthesiologist under topical anesthesia with 8% lidocaine spray with a request for the patient to open his mouth as wide as he possibly could. Although the blade could not be inserted into the oropharyngeal space sufficiently and displacement of the tongue was impossible, the anesthesiologist discovered that the ETT was deviated to the right and there was compression of the pharyngeal wall by the base of the tongue. Again, despite changing the position of the ETT, ETT rotation and manipulation of fiberscope could not help alter the direction of the ETT. The anesthesiologist then introduced his right finger to alter the direction of ETT with insufficient insertion of the laryngoscope blade with his left hand. After some manipulation of the fiberscope, the anesthesiologist who was handling the fiberscope then identified an open space and laryngeal stricture. The vocal cord was visualized, and intubation was successfully achieved. Throughout the intubation procedure vital signs and oxygen saturation remained normal under spontaneous breathing. The surgery was uneventful. After resection of the tumor and plate reconstruction (Fig. 2A), the position of tongue was restored (Fig. 2B). Insertion of the direct laryngoscope blade and visualization of the ETT which passed through vocal cords were easily achieved. The widened oropharyngeal space was identified by postoperative lateral radiography (Fig. 2C). There were no untoward incidents during extubation and subsequent recovery.

3. Discussion

Chukwuneke et al. reported that 3 of 32 patients (9%) who underwent total mandibulectomy for advanced ameloblastoma in a developing country died because of anesthetic problems, although the detailed anesthetic courses were not described [3]. We planned awake fiberoptic intubation because fiberoptic intubation is still considered the gold standard for management of difficult intubation. Nevertheless, the massive ameloblastoma occupying the floor of the mouth impeded this intubation technique. A case of failed fiberoptic intubation has also been presented of a patient with a giant malignant schwannoma of the neck causing pharyngeal obstruction [5]. Shinha et al. reported that

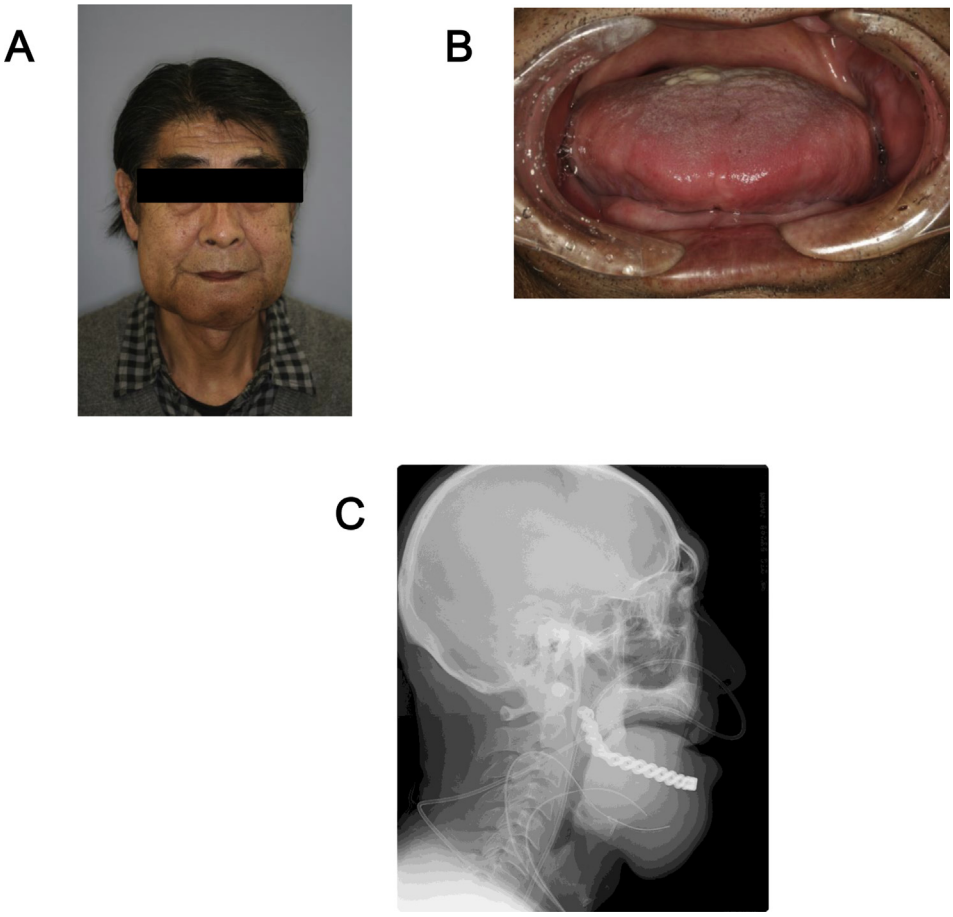

Fig. 2. Postoperative findings. A: Patient without the tumor in mental region, B: The tongue position is restored by resection of the tumor, C: Lateral radiograph shows widened space in the pharynx.

oral fiberoptic bronchoscopy failed to visualize the glottis and epiglottis in a child with a large parapharyngeal mass [6]. Direct laryngoscopy after the unsuccessful fiberoptic bronchoscopy created a very small space between the mass and the parapharyngeal wall. Attempted fiberoptic bronchoscopy through this space with the support of direct laryngoscope enabled successful ETT insertion.

Our maneuver, hand-assisted alteration of the direction of the ETT, is likely to be a kind of modified intubation technique with Magill forceps. When the anesthesiologist discovered the ETT deviation and failed to alter the direction of the ETT by manipulation of fiberscope, the anesthesiologist instantaneously introduced his right finger to alter the direction of ETT. It has been demonstrated that bowed type of Magill forceps facilitated nasotracheal intubation with indirect laryngoscopes [7]. In the present case, we might utilize bowed type of Magill forceps to grab the ETT to change the direction and facilitate intubation with fiberscope.

Successful finger guided intubations have been reported in newborn and infants with difficult airway [8,9]. Although effectiveness of finger assisted intubation need to be argued, this technique should be exercised with caution when airway pathology is suspected [10]. The hand assisted alteration of the direction of the ETT could be accomplished in this patient without pathological lesion in the airway.

Recently, various video laryngoscopes have been developed and can be useful for difficult intubation even after failed fiberoptic intubation [11]. Device insertion would be impossible in patients with limited mouth opening and small oropharynx because of large upper airway or pharyngeal space occupying lesions. Although it is uncertain whether we could have inserted the blade of such video laryngoscopes in our patient, these devices might help to improve the view from the fiberscope. Furthermore, successful nasal intubation by combined use of airway scope, video laryngoscope, and fiberscope has been reported in a patient with a large epiglottic cyst [12].

There are options other than fiberoptic intubation, video-laryngoscopes and its combination about dealing with difficult airway. Using laryngeal mask with bougie technique, the intubation success rate and qualities of intubation indices were assessed in patient with difficult airway, and the overall success rate was reported to be 92% [13]. We did not plan using laryngeal mask with bougie because we are not very familiar with this technique. The intubation technique using laryngeal mask with fiberscope instead of bougie could be another option for difficult airway. Brenman et al. presented successful retrograde intubation after tailed fiberoptic intubation and percutaneous cricothyrotomy [14]. Fortunately, retrograde intubation was avoided in the present study with successful fiberoptic intubation by hand-assisted alteration of the direction of the ETT.

4. Conclusion

Our case report illustrates difficult fiberoptic intubation in a patient with massive ameloblastoma. Identification of ETT deviation even with insufficient blade insertion and hand-assisted alteration of the ETT direction might raise the chances of successful fiberoptic intubation. Although the failure rate is low, the anesthesiologist should be aware of the likelihood of failed fiberoptic intubation and plan for alternative approaches to secure the airway whenever difficult intubation is anticipated.

Conflicts of interest

The authors have no conflicts of interest to report.

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Ethical approval

This report was approved by human ethical committee of Tohoku University Graduate School of Dentistry on 17 February 2017.

Consent

This report was approved by human ethical committee of Tohoku University Graduate School of Dentistry on 17 February 2017.

Written informed consent was obtained from the patient for publication of this case.

Author contribution

YS and EM wrote the article. The final version was reviewed and approved by all authors. All authors participated in patient care.

Registration of research studies

3581.

Guarantor

Eiji Masaki.

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