Clinical Reports

Failed tracheal intubation using a laryngoscope and intubating laryngeal mask

Takashi Asai MD PhD,
Takuji Hirose MD,
Koh Shingu MD

Purpose: To report unexpected failed tracheal intubation using a laryngoscope and an intubating laryngeal mask, and difficult ventilation via a facemask, laryngeal mask and intubating laryngeal mask, in a patient with an unrecognized lingual tonsillar hypertrophy.

Clinical features: A 63-yr-old woman, who had undergone clipping of an aneurysm seven weeks previously, was scheduled for ventriculo-peritoneal shunt. At the previous surgery, there had been no difficulty in ventilation or in tracheal intubation. Her trachea remained intubated nasally for 11 days after surgery. Preoperatively, her consciousness was impaired. There were no restrictions in head and neck movements or mouth opening. The thyromental distance was 7 cm. After induction of anesthesia, manual ventilation via a facemask with a Guedel airway was suboptimal and the chest expanded insufficiently. At laryngoscopy using a Macintosh or McCoy device, only the tip of the epiglottis, but not the glottis, could be seen, and tracheal intubation failed. There was a partial obstruction during manual ventilation through either the intubating laryngeal mask or conventional laryngeal mask; intubation through each device failed. Digital examination of the pharynx, after removal of the laryngeal mask, indicated a mass occupying the vallecula. Lingual tonsillar hypertrophy (1 × 1 × 2 cm) was found to be the cause of the failure. Awake fibroscope-aided tracheal intubation was accomplished.

Conclusions: Unexpected lingual tonsillar hypertrophy can cause both ventilation and tracheal intubation difficult, and neither the laryngeal mask nor intubating laryngeal mask may be helpful in the circumstances.

Objectif : Signaler l'échec imprévisible d'une intubation avec laryngoscope et masque laryngé d'intubation, et la ventilation difficile avec masque, masque laryngé ou masque laryngé d'intubation, chez une patiente atteinte d'une hypertrophie non connue de l'amygdale linguale.

Éléments cliniques : Un shunt ventriculo-péritonéal a été planifié chez une femme de 63 ans qui avait subi une ligature d'anévrisme sept semaines auparavant. Aucune difficulté d'intubation endotrachéale ou de ventilation n'avait eu lieu lors de cette opération. L'intubation nasale de la trachée a été maintenue pendant 11 jrs après l'intervention. Avant le shunt, on a noté des troubles de la conscience. Les mouvements de la tête et du cou ou l'ouverture de la bouche ne présentaient pas de limitations. La distance thyromentonnière était de 7 cm. Après l'induction de l'anesthésie, la ventilation manuelle au moyen d'un masque et d'une canule de Guedel était inadéquate et l'expansion thoracique insuffisante. Pendant la laryngoscopie à l'aide d'une lame Macintosh ou McCoy, seule la pointe de l'épiglotte, et non la glotte, a été visualisée et l'intubation a échoué. Il y a eu une obstruction partielle pendant la ventilation manuelle au travers du masque laryngé d'intubation ou du masque laryngé traditionnel; l'intubation a échoué aussi avec chacun des masques. Le masque laryngé une fois retiré, l'examen du pharynx au doigt a indiqué une masse occupant la fossette glosso-épiglottique. L'hypertrophie de l'amygdale linguale (1 × 1 × 2 cm) a été reconnue comme cause de l'échec. L'intubation fibroscopique vigile a été réalisée.

Conclusions : L'hypertrophie méconnue de l'amygdale linguale peut causer des difficultés de ventilation et d'intubation et, ni le masque laryngé ni le masque laryngé d'intubation ne peuvent être utiles dans ces circonstances.

From the Department of Anaesthesiology, Kansai Medical University, Osaka, Japan.

Address correspondence to: Takashi Asai MD PhD, Department of Anaesthesiology, Kansai Medical University, 10-15 Fumizono-cho, Moriguchi City, Osaka, 570-8507, Japan. Phone: 0081-6-992-1001; Fax: 0081-6-991-1301; E-mail: asait@takii.kmu.ac.jp

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THE laryngeal mask or the intubating laryngeal mask has a potential role in patients with difficult airways.¹⁻³ Nevertheless its placement, or tracheal intubation through it, may fail.⁴⁻⁸ Suboptimal placement is the main reason for failure, but some causes remain unclear.⁴ It is not clear whether or not placement of the laryngeal mask is difficult in the patient in whom tracheal intubation is difficult.^{5,9} We report unexpected failed tracheal intubation after using a laryngoscope and an intubating laryngeal mask in a patient with unnoticed lingual tonsillar hypertrophy.

Case Report

A 63-yr-old woman, 155 cm in height and 55 kg in weight, with normal pressure hydrocephalus was scheduled for ventriculo-peritoneal shunt. The patient had a subarachnoid hemorrhage seven weeks previously and had undergone clipping of an aneurysm. Neither difficulty in ventilation nor difficulty in tracheal intubation was recognized. Her trachea remained intubated nasally for 11 days after surgery.

Preoperatively, her consciousness was impaired and she was unresponsive to verbal commands. There were no restrictions in head and neck movements. The thyromental distance was 7 cm. The mouth could be opened widely and the jaw thrust forward.

Anesthesia was induced with 150 mg thiamylal, 50 µg fentanyl and sevoflurane 3% in oxygen; neuromuscular blockade was produced with 6 mg vecuronium. Manual ventilation via a facemask with a Guedel airway was suboptimal and the chest expanded insufficiently. At laryngoscopy, using a Macintosh blade, only the tip of the epiglottis could be seen. Several attempts at tracheal intubation, including the use of a metal stylet, gum elastic bougie and McCoy laryngoscope, failed. Between these attempts, the lungs were ventilated with difficulty, but arterial hemoglobin oxygen saturation (SpO₂) remained > 98%.

A #4 intubating laryngeal mask was placed while the patient's occiput was resting on a pad of about 4 cm in height. Ventilation through the laryngeal mask was partially obstructed. After a fiberoptic bronchoscope had been passed through a 7.0 mm ID Mallinckrodt reinforced tube, the combination was inserted into the intubating laryngeal mask. However, it was impossible to advance the tube beyond the 'epiglottis elevating bar' at the aperture of the mask. The cause of obstruction could not be assessed, since the fibroscope could not be advanced beyond the 'elevating bar'. Maneuvering the position of the mask as described by Brain³ did not relieve the problem. The intubating laryngeal mask was removed and a conven-

tional laryngeal mask of the same size was placed but, again, there was a partial obstruction. Fibrescopy showed that the epiglottis was obstructing the anterior one third of the aperture of the mask. The epiglottis was folded through 180°, rather than being pressed down toward the glottis by the mask.

Digital examination of the pharynx, after removal of the laryngeal mask, indicated a mass occupying the vallecula. Surgery was canceled and the patient awakened. Postoperatively, no respiratory complications occurred. Using a fiberoptic laryngoscope, an otolaryngologist confirmed a mass at the base of the tongue: the mass (1 × 1 × 2 cm) extended to the vallecula, displacing the epiglottis posteriorly and partially obstructed the glottis. A diagnosis of lingual tonsillar hypertrophy was made. The otolaryngologist suggested that the size of the mass might have increased by prolonged tracheal intubation, but there was no urgent need to remove it because of a lack of symptoms.

A few weeks later, operation was rescheduled. After 1 mg midazolam and 50 µg fentanyl, and bilateral superior laryngeal nerve block with 1 ml lidocaine 1% each side, awake tracheal intubation was attempted. Although the mass partially obscured the glottis, it was possible to pass a fibroscope, and a 6.0-mm ID tracheal tube over it, into the trachea within one minute. General anesthesia was then induced and surgery proceeded uneventfully.

Discussion

The lingual tonsil comprises the lymphoid tissue located in the base of the tongue between the epiglottis posteriorly and the circumvallate papilla anteriorly. Unlike palatine tonsils, there is no definite capsule for lingual tonsils. When swollen, the masses are symmetrically placed on either side of the midline divided by the glosso-epiglottic fold, and the mass may fill the vallecula and press the epiglottis down toward the glottis.¹⁰⁻¹³

The symptoms of lingual tonsil hyperplasia are often not obvious and none are diagnostic of the disease: sore throat, globus sensation, speech change or dysphasia.^{10,14,15} Large hypertrophy may cause obstructive sleep apnea or upper airway obstruction,^{10,11,13,14} but may only be associated with mild symptoms.¹⁰

The incidence of lingual tonsil hypertrophy is believed to be low, although it may often be undetected.^{12,14} In one report, only 25 patients were identified by retrospective screening of notes over a 26 yr.¹⁴ The etiology is largely unknown, but the patient often has a past history of palatine tonsillectomy.^{10,14,15} It is speculated that the lingual tonsils swell as compensation to

removed palatine tonsils.¹² Marked hyperplasia in allergic patients has also been reported.¹⁵

Surgery is usually not indicated unless there is symptomatic airway obstruction.^{14,16} Avoidance of exposure of the tonsils to tobacco smoke, dusts or chemical irritants may reduce symptoms.¹⁴ If symptoms persist or airway obstruction occurs, surgical treatment, such as excision, electrocautery, cryotonsillectomy or carbon-dioxide laser surgery, may be required.^{14,16}

Tracheal intubation and ventilation via a facemask may be difficult in patients with lingual tonsillar hypertrophy.^{10,11} Jones and Cohle¹⁰ reported a death after failed tracheal intubation and failed ventilation of a patient because of an unnoticed large lingual tonsillar hypertrophy—the only apparent symptom in their patient was a ‘nasal’ voice. In our patient, because of unexpected lingual tonsillar hypertrophy, ventilation (via a facemask, laryngeal mask and intubating laryngeal mask) was suboptimal, and tracheal intubation using a laryngoscope, laryngeal mask and intubating laryngeal mask failed.

When ventilation through a facemask is inadequate after induction of anesthesia, it may be useful to examine the presence of lingual tonsillar hypertrophy by laryngoscopy or digital examination. The laryngeal mask may be useful in the “cannot intubate, cannot ventilate” scenario, but a percutaneous transtracheal airway should be prepared during attempts at placement of the laryngeal mask in case ventilation is inadequate and hypoxemia persists. If the patient has upper airway symptoms preoperatively, lateral soft tissue X-ray, if available, can detect the hypertrophy.¹³

There have been several reports of failure of tracheal intubation through the intubating laryngeal mask,^{6,7} but the causes of failure have not been elucidated. Wakeling and colleagues⁶ reported failed tracheal intubation through the intubating laryngeal mask, in a patient with a thyroid goitre. The reason for failure was unclear, but might have been due to inexperience or to a deviated larynx by the goitre. Another possibility for the failure is suboptimal positioning of the patient’s head and neck. It has been claimed that a neutral position, rather than the sniffing position, is more suitable for tracheal intubation through the intubating laryngeal mask.³ In their report, the head and neck were placed in the sniffing position.⁶ In our case, lingual tonsillar hypertrophy hampered the passage of a tracheal tube through the intubating laryngeal mask.

Although it is uncertain whether or not placement of a laryngeal mask is difficult in the patient in whom tracheal intubation using a laryngoscope is difficult,^{5,9}

there are several situations in which both can be difficult:⁴ *e.g.* limited mouth opening; restricted head and neck movement;^{8,17} cricoid pressure application.^{18,19} Our report adds lingual tonsillar hypertrophy to this list.

It has been claimed that the success rate of blind tracheal intubation through the intubating laryngeal mask is high, particularly in patients with difficult tracheal intubation using a laryngoscope.³ However, this blind technique might damage pathological changes near the laryngeal inlet, such as an esophageal pouch.²⁰ Therefore, caution is required in using the blind technique,²¹ particularly when there is resistance during the advancement of a tracheal tube or when ventilation via the mask is suboptimal. We recommend the use of a fibroscope whenever it is available.

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