

# Awake tracheal intubation through the intubating laryngeal mask

Takashi Asai MD PhD,  
Hideo Matsumoto MD,  
Koh Shingu MD

**Purpose:** To report successful awake insertion of the intubating laryngeal mask (Fastrach™) and subsequent tracheal intubation through it, in a patient with predicted difficult tracheal intubation, due to limited mouth opening, and difficult ventilation through a facemask, due to a large mass at the corner of the mouth.

**Clinical Features:** A 53-yr-old woman with a large post-gangrenous mass on the right cheek to the angle of the mouth was scheduled for its resection. The right side of her face was damaged by a bomb attack followed by cancerum oris 50 yr ago. The distance between the incisors during maximum mouth opening was 2 cm and that between the gums on the right side < 1 cm. After preoxygenation and 50 µg fentanyl and 30 mg propofol iv, propofol was infused at 2 mg·kg<sup>-1</sup>·hr<sup>-1</sup>. Lidocaine, 8%, was sprayed on the oropharynx. A #4 intubating laryngeal mask was inserted with a little difficulty. A fibroscope was passed through a 7.5-mm ID RAE tracheal tube, and the combination was easily passed through the laryngeal mask into the trachea. General anesthesia was then induced. Finally, the intubating laryngeal mask was removed, while the RAE tube was being stabilized using an uncuffed 6.0-mm ID tracheal tube.

**Conclusion:** Awake tracheal intubation through the intubating laryngeal mask is a useful technique in patients with limited mouth opening in whom ventilation via a facemask is expected to be difficult.

**Objectif :** Décrire l'insertion vigile réussie du masque laryngé (Fastrach™) et l'intubation endotrachéale subséquente au travers de ce masque chez une patiente dont l'intubation s'annonçait difficile à cause d'une ouverture limitée de la bouche et d'une ventilation compliquée par masque étant donné une importante masse au coin de la bouche.

**Éléments cliniques :** Une femme de 53 ans a été admise pour la résection d'une importante masse postgangréneuse à la joue droite, au coin de la bouche. Il y a 50 ans, elle avait subi une stomatite gangréneuse à la suite d'une blessure au côté droit du visage lors d'un bombardement. À l'ouverture maximale de la bouche, la distance entre les incisives était de 2 cm, mais < 1 cm entre les gencives du côté droit. Après la préoxygénation et l'administration de 50 µg de fentanyl et de 30 mg de propofol iv, on a fourni une perfusion de propofol à 2 mg·kg<sup>-1</sup>·hr<sup>-1</sup>. On a pulvérisé ensuite de la lidocaïne 8 % sur l'oropharynx. Un masque laryngé n° 4 a été inséré avec un peu de difficulté. Un fibroscope a été placé dans une canule trachéale de RAE d'un DI de 7,5 mm, puis le tout dans le masque laryngé qu'on a facilement introduit dans la trachée. On a ensuite induit l'anesthésie générale. Finalement, on a retiré le masque laryngé et stabilisé le tube de RAE à l'aide d'un tube endotrachéal sans ballonnet d'un DI de 6,0 mm.

**Conclusion :** L'emploi du masque laryngé pour l'intubation endotrachéale vigile s'est révélée utile pour les patients chez qui l'ouverture de la bouche est limitée et la ventilation par masque s'annonce difficile.

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

*Accepted for publication November 22, 1998*

**A**WAKE tracheal intubation is indicated when difficulty in both tracheal intubation and ventilation through a facemask is predicted. The conventional laryngeal mask has a potential role in patients with difficult airways,<sup>1-3</sup> including those with limited mouth opening.<sup>4-6</sup> Since the intubating laryngeal mask, a modified laryngeal mask, has recently become available,<sup>7</sup> its potential use in patients with difficult airways has also been reported.<sup>7,8</sup>

We report the successful awake insertion of the intubating laryngeal mask and subsequent tracheal intubation, in a patient with predicted difficult tracheal intubation (due to limited mouth opening) and difficult ventilation through a facemask (due to a large mass at the corner of the mouth).

### Case Report

A 53-yr-old woman, height 146 cm, weight 52 kg, with a large post-gangrenous mass (5 × 5 cm) on the right cheek to the angle of the mouth, was scheduled for resection of the mass. The right side of her face had been damaged by a bomb attack followed by noma (cancrum oris) 50 yr previously. Since then she had had difficulty in opening the mouth, she could eat only liquidized food until 16 yr of age. At preoperative visit, the right side of her face was disfigured. The distance between upper and lower incisors during maximum mouth opening was 2.0 cm; the right side of the mandible and teeth were missing and the gap between the gums on this side was < 1 cm. Mobility of the head and neck was normal.

Because difficulty in both tracheal intubation and ventilation via a facemask was predicted, awake tracheal intubation was considered necessary. The patient requested that an airway not be inserted in the nose before induction of general anesthesia. In addition, surgeons requested orotracheal intubation because the surgical field would include the upper lip. Therefore, awake orotracheal intubation was planned.

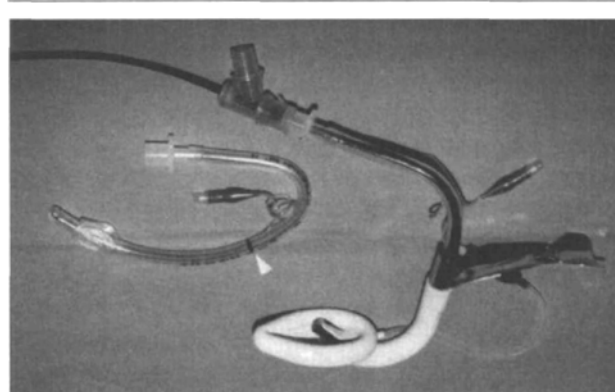
On arrival in the operating theatre, the arterial blood pressure was 130/82 mmHg, heart rate 76 beat·min<sup>-1</sup> and respiratory rate 12 breath·min<sup>-1</sup>. After preoxygenation, 50 µg fentanyl and 30 mg propofol *iv* were injected. Propofol was then infused at 2 mg·kg<sup>-1</sup>·hr<sup>-1</sup>. Within a few minutes, the patient became sedated but was responsive to verbal command. Lidocaine, 8%, was sprayed on the oropharynx.

A #4 intubating laryngeal mask was inserted without difficulty using the method described by the inventor of the device,<sup>7</sup> except that the mask was rotated to the left side when the curved part of the metal tube was passing behind the upper teeth. The cuff was inflated and patency of the airway was confirmed by capnography

and regular movement of the reservoir bag. During insertion of the mask, the patient remained sedated; there was little change in blood pressure or heart rate.

We planned to insert a 7.5-mm ID RAE tube. A mark was made at 15 cm - which is the length of the tube of the intubating laryngeal mask - from the distal tip of the tracheal tube (Figure). The distal 14 cm of the tracheal tube was inserted through the laryngeal mask. After a swivel connector with diaphragm and the breathing system were attached, oxygen was given. A fiberoptic bronchoscope was then inserted through the swivel connector into the tracheal tube (Figure). The tracheal tube was advanced by 1 cm to push forward the "epiglottic elevating bar" existing at the aperture of the mask. Since it was easy to see the vocal cord, both the fibrescope and tracheal tube were inserted into the trachea without difficulty. The time from the insertion of the fibrescope to tracheal intubation was less than one minute. Arterial hemoglobin oxygen saturation remained at 100%.

After correct tracheal intubation was confirmed by fibroscopy and capnography, general anesthesia was induced. The intubating laryngeal mask was then removed while the proximal end of the tracheal tube was gently being pushed with the tip of an uncuffed 6.0-mm ID tracheal tube. Operation proceeded uneventfully, and the trachea was extubated without complications after the patient had regained consciousness and sufficient breathing. Postoperatively, the patient did not recall any event during induction of anesthesia.



**FIGURE** Fibroscope-aided tracheal intubation through the intubating laryngeal mask airway (Fastrach™). A mark is made at 15 cm (arrow)—the length of the tube of the intubating laryngeal mask—from the distal tip of a 7.5 mm-ID RAE tube. The fibroscope and the RAE tube are passed through the laryngeal mask. The mark on the RAE tube indicates when the tube passes beyond the "epiglottic elevating bar". By connecting the breathing system to the RAE tube via a connector with diaphragm, it is possible to provide oxygen during the fibroscope-aided tracheal intubation (The breathing system is omitted from the photograph).

## Discussion

In our patient, intubating the trachea using a laryngoscope was predicted to be difficult because of limited mouth opening. In addition, providing adequate positive ventilation via a facemask was expected to be difficult because of disfigurement of the right cheek and a mass at the corner of the mouth. We inserted the intubating laryngeal mask and subsequent tracheal intubation through the mask while the patient received conscious sedation, since it is safer to secure the airway before the patient is anesthetized if difficulty in tracheal intubation or ventilation is predicted.<sup>2,3</sup> Insertion of the mask did not cause any apparent discomfort to the patient or marked hemodynamic changes.

The use of a fibroscope is useful for tracheal intubation in patients whose tracheas are difficult to intubate.<sup>2,9</sup> However, it may sometimes be difficult to locate the glottis with the fibroscope.<sup>9</sup> In addition, even when the fibroscope is inserted into the trachea, it is often difficult to advance a tracheal tube over the fibroscope.<sup>10</sup> Furthermore, tracheal intubation over the fibroscope becomes more difficult when a large-bored tracheal tube is used.<sup>10</sup>

The use of the conventional laryngeal mask facilitates the location of the glottis with the fibroscope and markedly reduces the difficulty in advancing the tracheal tube over the fibroscope into the trachea.<sup>10</sup> In addition, it is possible to provide sufficient oxygen during fiberoptic intubation, by connecting a swivel connector with diaphragm and the breathing system to the tracheal tube. The use of the intubating laryngeal mask also allows passage of an 8.0-mm ID tracheal tube.<sup>7</sup>

Awake tracheal intubation through the intubating laryngeal mask is a useful technique in patients with limited mouth opening in whom ventilation via a facemask is difficult.

## References

- 1 *Brimacombe JR, Brain AIJ, Berry AM.* The laryngeal Mask Airway. Instruction manual, 3rd ed. Berkshire: Intavent-Orthofix, 1996.
- 2 *Benumof JL.* Laryngeal mask airway and the ASA difficult airway algorithm. *Anesthesiology* 1996; 84: 686–99.
- 3 *Asai T, Latto P.* Role of the laryngeal mask in patients with difficult tracheal intubation and difficult ventilation. *In: Latto IP, Vaughan RS (Eds.). Difficulties in Tracheal Intubation*, 2nd ed. London: W.B. Saunders Company Ltd, 1997: 177–96.
- 4 *Maltby JR, Loken RG, Beriault MT, Archer DP.* Laryngeal mask airway with mouth opening less than 20 mm. *Can J Anaesth* 1995; 42: 1140–2.
- 5 *Chadd GD, Ackers JWL, Bailey PM.* Difficult intubation aided by the laryngeal mask airway (Letter). *Anaesthesia* 1989; 44: 1015.
- 6 *Giraud O, Bourgain JL, Marandas P, Billard V.* Limits of laryngeal mask airway in patients after cervical or oral radiotherapy. *Can J Anaesth* 1997; 44: 1237–41.
- 7 *Brain AIJ, Verghese C, Addy EV, Kapila A, Brimacombe J.* The intubating laryngeal mask. II: a preliminary clinical report of a new means of intubating the trachea. *Br J Anaesth* 1997; 79: 704–9.
- 8 *Joo H, Rose K.* Fastrach—a new intubating laryngeal mask airway: successful use in patients with difficult airways. *Can J Anaesth* 1998; 45: 253–6.
- 9 *Ovassapian A.* Management of the difficult airway. *In: Ovassapian A (Ed.). Fiberoptic Endoscopy and Difficult Airway*. New York: Raven Press, 1996: 201–30.
- 10 *Koga K, Asai T, Latto IP, Vaughan RS.* Effect of the size of a tracheal tube and the efficacy of the use of the laryngeal mask for fibroscope-aided tracheal intubation. *Anaesthesia* 1997; 52: 131–5.