

Blind Nasotracheal Intubation for a Infant with Ankylosis of the Mandibular Joint

A Case Report.

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INTRODUCTION

Endotracheal intubation should be done to patients with limited opening of mouth due to the ankylosis of the temporomandibular joint under general anesthesia, although it is extremely difficult and dangerous, especially in the infants. If the ankylosis of the temporomandibular joint is left untreated, the growth of mandible is disturbed resulting in a deformed face and general growth is retarded because of the insufficiency of oral intake of food. Articulation becomes obscure and it is sometimes difficult to maintain the normal social life.

In the past, for the operation of ankylosis for infants, the tracheotomy was first carried out under local anesthesia and then endotracheal intubation was performed through that incision to get the general anesthesia. Since the difficulty of decannulation often occurred after tracheotomy in infants, tracheotomy was seldom planned.

In the present case, a satisfactory result was obtained by the blind nasotracheal intubation for the infant who had the ankylosis of the temporomandibular joint with micrognathia.

CASE REPORT

The subject case was a 2-year and 2-month old male, weighing 10.2 kg. The patient was born normally at an obstetric clinic in Fukuoka city. His birth weight was 2900 g. From the birth a severe dyspnea and cyanosis was observed. He was moved on the first day after birth to the pediatric ward of the National Fukuoka Central Hospital where he received treatment for a month. There, he had the tube-feeding because

of the difficulty of oral intake of milk. From approximately 7 months for the eruption of the deciduous teeth, the degree of the mouth-opening gradually decreased and the feeding difficulty became more serious. In addition, at the time, he was noticed the distortion of the right side of the lower lip and the right side of the jaw on opening the mouth.

At the age of 1 year and 2 months, his parents consulted the Kyushu University Hospital and the osteoarthrotomy of mandible was recommended to have in the near future. Gradually the facial deformity, especially the micrognathia became deteriorated and was admitted at the age of 2 years and 2 months. There was a severe funnel chest but no dyspnea. There were no abnormalities in the blood, urinalysis or cardio-pulmonary function. The mouth could be opened for 6 mm between \bar{a} and \bar{a} and through the aperture the fluid was taken.

The osteoarthrotomy of the right condyle was performed under general anesthesia. The blind nasotracheal intubation was performed on the present case. The patient was unable to open his mouth enough and he had micrognathia. Moreover, he had a characteristic form of the airway, such as narrow nares, large tongue, high glottis, slanting vocal

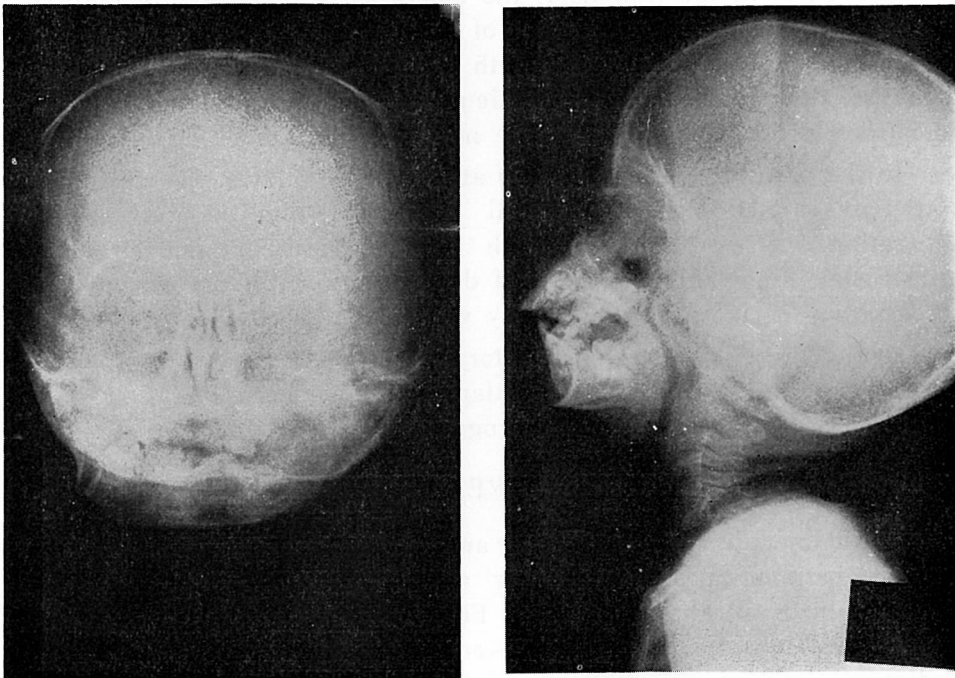


Fig. 1. Frontal and lateral cephalogram. Age 2-year 2-month old, male, weight 10.2 kg. Ankylosis of the temporomandibular joint with micrognathia was remarkable.

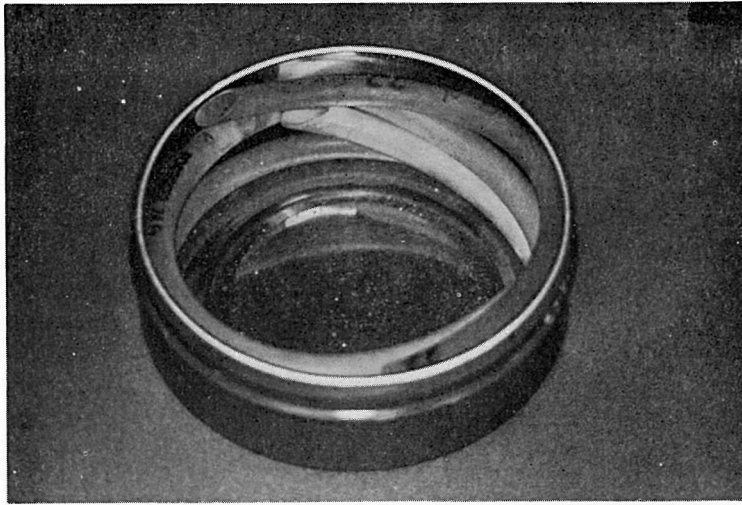


Fig. 2. An empty can of about 100mm diameter to form a sufficient curve to the endotracheal tube.

cord and narrow cricoid ring. The development of his mandible was extremely poor as shown in Fig. 1 and the entrance to the trachea was narrower and sharper in curve than that of the normal children. As direct blind nasal application as the adult case of the ankylosis was thought to be difficult, a nasotracheal tube with a curve formed for a few days in advance as shown in Fig. 2 was used and at intubation a copper stylet covered with vinyl was inserted to form a hook-shaped curve to the nasotracheal tube. This tube with the stylet was successfully used for the intubation as shown in Fig. 3. The stylet was 5 mm shorter than the nasotracheal tube. There was no injury on pharynx or trachea by the copper wire. The copper wire was chosen for the stylet corresponding to F. 4 [diameter ca. 1 mm] size.

As for anesthesia, initially the open drop method of methoxyflurane was used and after losing consciousness nasal airway tube was inserted and switched to ether using the induction mask. After reaching at plane III in stage III, under spontaneous respiration, F. 22 (left bevel, diameter ca. 7 mm) nasotracheal tube by Foregger with the curve formed as described above was inserted from the left nostril, opposite of the affected side. The bleeding at the intubation was little and neither the closure of the airway nor the respiratory acidosis in the blood gas was observed. Halothane was used to maintain anesthesia so that an earlier awakening was obtained after the operation. Osteoarthrotomy was completed in 2 hr. and 50 min. For the protection of edema of the pharynx,

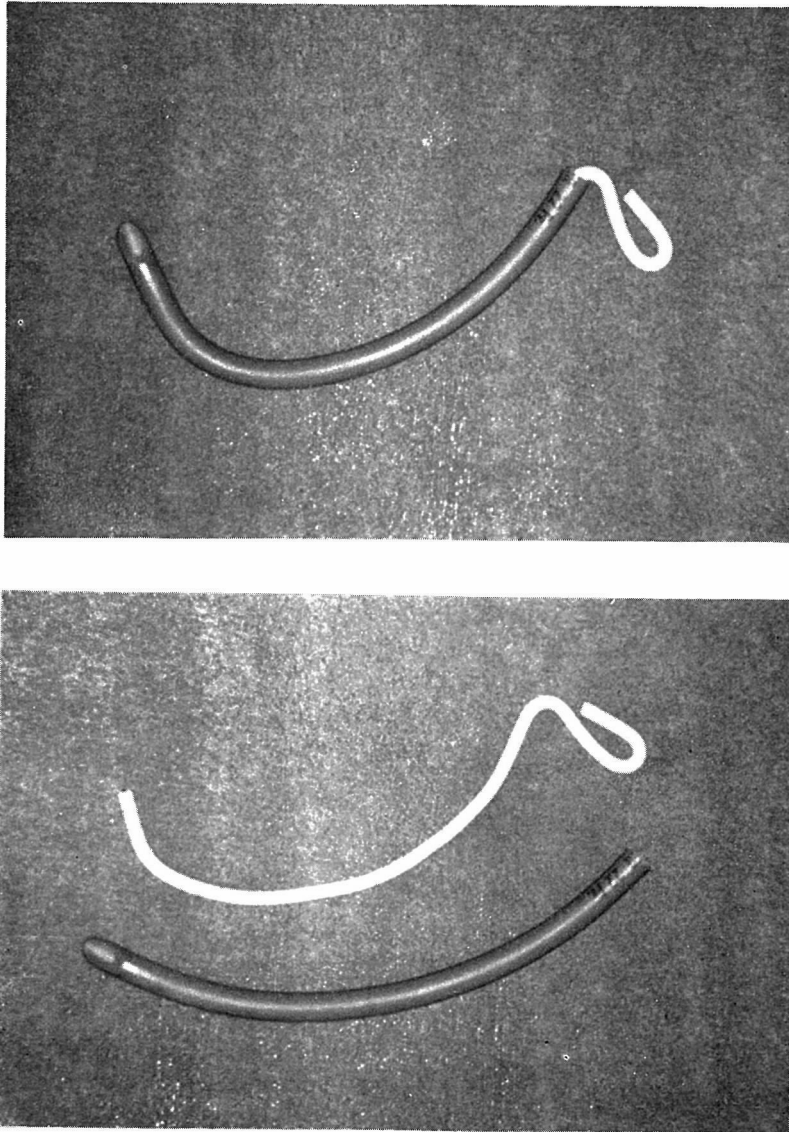


Fig. 3. Nasotracheal tube and stylet. The stylet was covered with vinyl and inserted to form a hook-shaped curve. The stylet was 5 mm shorter than the nasotracheal tube.

vocal cord and subglottis due to the intubation, 16 mg of dexamethasone was injected intravenously during the operation.

The nasotracheal tube was removed after awakening at 9 hr. post-operatively. After the removal a slight hoarseness was observed, but no

dyspnea. Feeding through mouth was possible from the day of operation. Four days after the operation, mouth-opening exercise was started and continued for two weeks. A year postoperatively, he could open his mouth for 27 mm. The movement of the temporomandibular joint was favorable and its development has been well.

DISCUSSION

Many cases¹⁾ of ankylosis of the temporomandibular joint are the result of the acquired disease such as inflammation around the joint, trauma, tympanitis, tonsillitis or temporomandibular ostitis.

The advancement in the limitation of the mouth opening is slow in most cases of the ankylosis of temporomandibular joint and the onset of the illness is in the infancy when the development of the jaw is active. Because of the difficulty of the general anesthesia, the operation tends to be postponed to the adulthood in many cases and because of the facial deformity such as bird face and rock jaw, severe tooth decay and gingivitis is common due to the poor oral hygiene. In addition, the micrognathia which presents another problem to performing general anesthesia occurs with growth in the cases of ankylosis. The induction of anesthesia and nasotracheal intubation was furthermore disturbed due to the difficulty of applying the induction mask to the maldeveloped lower jaw. Therefore, it is desirable to perform operation when the jaw is growing.

Table 1. Methods of blind nasotracheal intubation

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| 1) After spraying the local anesthetics to the nasopharynx and laryngeal wall, blind nasotracheal intubation under consciousness |
| 2) Using intravenous anesthesia and muscle relaxants, blind nasotracheal intubation |
| 3) Guided endotracheal intubation |
| 4) Intubation with the use of fiberscope |
| 5) Intubation during spontaneous respiration with deep ether or methoxyflurane |
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Nasotracheal intubation is essential in modern general anesthesia even in the case of ankylosis of temporomandibular joint with micrognathia. Tracheotomy was generally done for endotracheal intubation in such cases. In fact it is an effective aid for obtaining the airway under emergency or especial general anesthesia, but a regard must be paid also to the great complication of it, it results in the scar on the neck which handicaps the patient physically and mentally throughout

life. Blind nasotracheal intubation is worth trying first whenever possible in such cases. For adults, several methods of blind nasotracheal intubation are shown in Table 1. According to seriousness of micrognathia and the ability of the anesthesiologist it may be chosen.

On trying the blind nasotracheal intubation the configuration of the tracheal tube holds the key to success. As shown in Fig. 2, the nasotracheal tube should be placed in an empty can of approximately 100 mm in diameter for a few days in advance to give a sufficient curve on it. A stylet made of copper may be used then as shown in Fig. 3. For knowing the adequate diameter of empty can or stylet to form a curve of the tube, frontal and lateral cephalograms are available. If the subject is a child and the cephalogram cannot be taken for disobliging, a single rentengenogram may be used.

The practical methods of blind nasotracheal intubation is shown in Table 1. The method (1) should generally not be used the infant as the present subject because it requires the enough patient's co-operation. Both the methods (3)²⁾ and (4) are not popular at present because the technique and the device are too complicated. With the recent development of the endoscope, the method (4) will become predominant in a near future. If the subject is a infant, either the method (1) or (5) may be chosen. The author prefers the method (2) on adult patients. But it is dangerous on infant because of the possibility of a large amount of

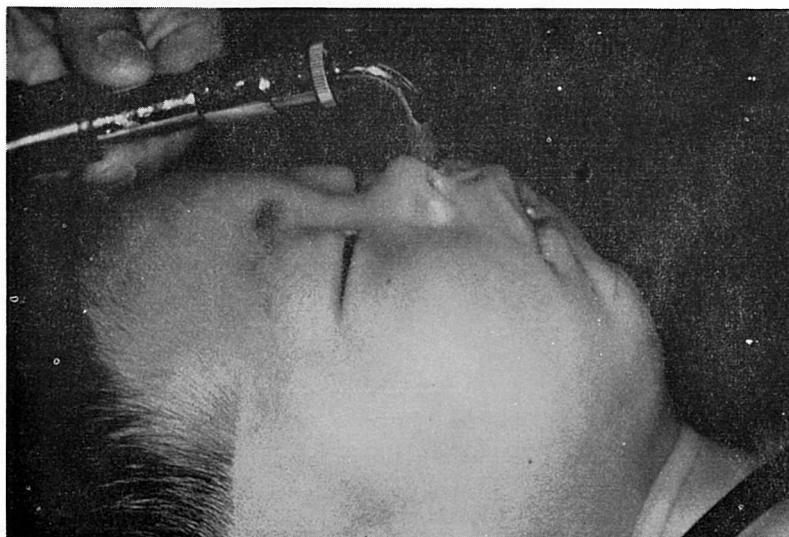


Fig. 4. Intubation was performed during spontaneous respiration with deep ether anesthesia.

hemorrhage from nasal cavity or trachea. The author used the method (5) under spontaneous respiration on the present case as shown in Fig. 4.

SUMMARY

A 2-year and 2-month old male infant, weighing 10.2 kg with ankylosis of the temporomandibular joint accompanied by a micrognathia was subject to blind nasotracheal intubation.

Intubation was performed during spontaneous respiration with deep ether and methoxyflurane anesthesia. Cephalogram prior to the operation of the head and neck confirmed the route and curve of the airway. A nasotracheal tube with stylet corresponding to F. 4 size was used.

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