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Use of Atracurium in a Patient Susceptible to Malignant Hyperthermia

To the Editor:—Malignant hyperthermia (MH) frequently is triggered in unknown susceptible patients by administration of a halogenated agent, often halothane, and the depolarizing muscle relaxant, succinylcholine.[1] Pancuronium has been considered the muscle relaxant of choice for this patient.[2] We successfully used atracurium in a MH-susceptible patient.

Report of a Case

A healthy 8-year-old, 25.5-kg girl presented for correction of esotropia. Her preoperative assessment was negative, as was her anesthetic history and her family's anesthetic history. An inhalation induction of anesthesia with halothane, nitrous oxide, and oxygen ensued uneventfully. Administration of succinylcholine 25 mg iv resulted in jaw muscle rigidity that prevented intubation of the trachea. Effective mask ventilation was maintained easily during this period. The initial arterial blood gas analysis revealed a metabolic acidosis, and appropriate measures and medications were administered per MH protocol. Her tachycardia, a creatine phosphokinase (CPK) that increased to 93,800 μ/l, and complaints of total body muscle soreness indicated MH crisis. Surgery was cancelled, and she was observed in the intensive care unit (ICU) overnight. Further hospitalization continued uneventfully.

She returned 4 months later for surgery. The preoperative assessment and blood chemistries to include CPK were normal. She was pretreated orally with dantrolene 65 mg and hydroxyzine 25 mg twice, with hydroxyzine 25 mg immediately prior to surgery. Upon arrival in the operating room, the patient was calm with no nausea. She received dantrolene 60 mg iv, followed by administration of fentanyl 0.05 mg iv, droperidol 2.5 mg iv, nitrous oxide, and oxygen. Atracurium 15 mg iv facilitated easy tracheal intubation. Intraoperative arterial blood gases were within normal limits. Vital signs remained stable. Prior to emergence, specimens were sent to the laboratory for blood chemistry studies to include CPK. Operative course and emergence were uneventful. Reversal of the atracurium was deemed unnecessary because of patient display of adequate movement, strength, and tidal volume. She was transferred to the ICU, where she continued an uneventful postoperative course, receiving dantrolene 25 mg iv every 6 h, preceded by droperidol 1.25 mg iv to prevent nausea. Serial arterial blood gas and chemistry values remained within normal limits.

Atracurium, an intermediate acting muscle relaxant, appears to be an excellent choice for the MH patient population with this demonstration of safe and advantageous use.

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Tracheal Intubation in an Infant with Treacher-Collins Syndrome—Pulling out the Tongue by a Forceps

To the Editor:—Endotracheal intubation is often difficult in children with Treacher-Collins syndrome.[1,2] For difficult intubations in pediatric patients, several approaches, including fiberoptic bronchoscopic technique,[3,4] retrograde technique,[5] or tracheostomy, have been considered. Recently, by pulling out the tongue by a forceps, we were able to intubate the trachea of an infant with this syndrome.

Report of a Case

A 35-month-old, 11-kg male infant with Treacher-Collins syndrome was scheduled for repair of cleft palate, a previous schedule of which was cancelled because of unsuccessful tracheal intubation. One hour after atropine (0.2 mg) and secobarbital (40 mg) im, anesthesia was induced with oxygen and halothane via a mask using a Jackson Rees circuit. Spontaneous respiration was maintained, but it soon became difficult to ventilate without an oropharyngeal airway in right lateral position. After insertion of an iv line, diazepam (3 mg) and fentanyl (100 μg) were given to obtain sufficient depth of anesthesia during intubation procedure.

Direct laryngoscopy was performed with the use of a straight blade or a curved blade with or without external cricoid pressure several times, but the epiglottis and the vocal cords could not be visualized. Then we attempted to use a lung lymph node forceps to retract his tongue. One person retracted the tongue and the other performed the laryngoscopy. With this, his epiglottis came into our vision with the aid of external cricoid pressure. A tracheal tube was

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introduced under the epiglottis and finally inserted into the trachea. His intraoperative course was uncomplicated with halothane, N_2O, and O_2.

After the operation, because of the presence of edema of his tongue and incomplete nasal airway due to the repair of cleft palate, we decided to keep the tracheal tube in until the swelling of the tongue had subsided. Two days after the operation, his tongue became small and his trachea was extubated, and thereafter his postoperative course was uneventful.

Treacher-Collins syndrome is the most common mandibulofacial dysostosis,[2] with which upper airway problems are easy to occur. Because of micrognathia and macroglossia, a laryngoscope cannot be inserted easily into the mouth. The pharyngeal hypoplasia also causes some difficulties in airway maintenance and tracheal intubation.[6]

The technique, "pulling out the tongue," we used could have two effects on enhancing our vision. One is that it should help lift the tongue with the laryngoscope, and the other is by helping to extract the pharynx upward. The vocal cords could not be visualized by a direct laryngoscopy with this technique, but the epiglottis came into our direct vision with aid of external cricoid pressure, and the trachea was intubated. Therefore, we believe that this technique facilitates tracheal intubation for pediatrics with micrognathia and macroglossia. Following this procedure, the trachea should remain intubated until the tongue edema has subsided.

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Elective Tracheal Intubation in the Prone Position for a Neonate with Pierre Robin Syndrome

To the Editor:—The tracheas of infants with the Pierre Robin syndrome[1] are often difficult to intubate.[2] We recently encountered such a patient who required general anesthesia for a tongue–lip adhesion. We placed the infant in the prone position, hyperextended his neck, and then inserted a nasotracheal tube blindly (fig. 1).

REPORT OF A CASE

A 2-week-old, 2.2-kg term male infant presented with Pierre Robin anomalad that included severe micrognathia, extreme glossoptosis, and a wide cleft palate. The infant had difficulty in breathing and feeding that required keeping him in the prone position and feeding through a nasogastric tube since birth.[3] Despite these steps, cyanotic episodes had occurred during gavage feedings, and marked intercostal retractions were observed. Because of this severe upper airway obstruction, a tongue–lip adhesion was performed. After atropine (0.06 mg iv), ketamine in 2-mg iv increments (total dose 6 mg) was given to provide sedation while maintaining spontaneous ventilation with an F_{IO_2} of 1.0. For 40 min, we employed various intubation techniques but were unsuccessful in securing the airway. We elected to attempt blind nasotracheal intubation in the prone position because the airway improved in that position. A 2.0-mm tracheal tube was passed through the nostril into the pharynx and placed where the expiratory flow was maximum. A drop of 5% lidocaine was introduced through the tube to anesthetize the glottis. Following three or four blind attempts, the trachea was intubated successfully. The infant then was anesthetized for 70 min with the use of halothane–oxygen. He then was returned to the intensive care pediatric unit, where extubation was accomplished 4 h later. When respiratory distress recurred 48 hours later, general anesthesia was required for insertion of a tracheostomy. Neither the pediatric nor the otolaryngologic staff were able to intubate the trachea. However, in approximately 4 min after three attempts, we were again successful in placing a nasotracheal tube blindly using the same technique (prone position and topical anesthesia).

Hyperextension of the head in the prone position brings the occiput near the intrascapular area, maximally distracting the epiglottis from the glottis. When inserted into the nose, the curve of the endotracheal tube allows it to pass behind the epiglottis into the larynx, allowing

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