Clinical Workshop

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A Case of Difficult Extubation

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Difficulty in extubation is rarely encountered. The following unusual case describes our first such problem.

REPORT OF A CASE

A 9-year-old girl was brought to the operating room for repair of a patent ductus arteriosus. She appeared small for her age and weighed only 21.6 kg. Premedication included meperidine, 20 mg, and promethazine, 15 mg.

Anesthesia was induced with thiopental, 150 mg, and gallamine, 80 mg, and maintained with nitrous oxide, oxygen, and halothane. A 23 French (ID 6.3 mm) Rusch cuffed nasal tube was passed orally with some force. The anesthesia and operation were uneventful. At the termination of anesthesia, an hour later, the resident anesthetist attempted to remove the endotracheal tube; even by exerting some force, he was unable to do so. The attending anesthetist also attempted removal, without success. The tube, however, could be pushed downward. During this time, the patient regained consciousness, became agitated, and made efforts to remove the tube.

Another attempt at removal was made, this time rotating the tube gently. When turned approximately 180 degrees, the tube slid out smoothly. The tube appeared normal, the cuff was deflated, and no sign of tube deformity was observed. The patient was hoarse for a few days, but recovered fully.

We believe this complication resulted from forceful intubation with a tube which was larger than necessary. The enlargement at the cuff site was apparently held by the tense vocal cords, preventing removal of the tube. Removal could be accomplished either by relaxation and abduction of the vocal cords (by use of a muscle relaxant or by inducing a cough) or by rotation of the tube. Rotating the tube makes the anterior prominence or curvature of the tube face to the back of the rima glottidis, where the laryngeal opening is largest.

A Stylet for Difficult Orotracheal Intubation

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Anesthesiologists periodically encounter a difficult intubation due to inability to expose and visualize the larynx. Not infrequently, the problems faced during preliminary tracheal intubation necessitate tracheostomy. The Siker mirror blade announcying the Huffman prism are very valuable aids in visualization of larynx in these situations; however, it is often difficult or impossible to place an endotracheal tube into the trachea with these devices as the tube blocks the view of the laryngeal opening or distorts the image. A thin stylet can be placed into the trachea with relative ease and used as a guide for subsequent endotracheal intubation, as described below.
METHOD

The technique is used in conjunction with a Siker mirror blade. Originally a special stylet which consisted of a firm stainless steel wire 62 cm long and blunt at both ends was designed, but now the authors exclusively employ a “Tucker lumen finder,”† which is used by the surgeons for dilatation of esophageal strictures (fig. 1). The Tucker lumen finder has a short rubber tip 14–18 Fr in size which is soft and flexible and is affixed to a firm malleable stem 65 cm long. With the patient lightly anesthetized and breathing spontaneously, the oropharynx is thoroughly sprayed with a topical anesthetic. The Siker mirror blade, which has been warmed in hot water to prevent fogging, is introduced into the oral cavity, and the larynx is visualized via the mirror. The stylet is well lubricated. It is passed gently through the glottic chink under indirect vision and advanced 3 to 5 cm into the trachea. The laryngoscope is withdrawn and a preselected endotracheal tube, also well lubricated, is threaded over the stylet and gently manipulated into the trachea (fig. 2). The stylet is then removed. The technique is employed with a warmed Huffman prism in a similar manner. Almost any type of endotracheal tube may be used, but the authors prefer latex- armored tubes as they are flexible and follow the curve of the stylet easily.

During the last three years the method has been successfully employed in 35 difficult intubations, with minimal trauma to the larynx. Tracheal intubation of five of these patients could not be performed with the conventional straight and curved blades.

DISCUSSION

Guided techniques similar to this have been employed in the past. These include use of a wire stylet through a bronchoscope,† illumination introducer,”†” articulated stylet,” retrograde translaryngeal guide,” and flexible fiberoptic endoscope.”

Identification of the laryngeal inlet through the mirror and placement of the stylet may at times be difficult, as the image in the mirror

† Available from Pilling Company, Delaware Drive, Fort Washington, Pa. 19034.
is inverted. The tip of the tube may tend to catch on the epiglottis or other structures at the laryngeal inlet, but use of a smaller tube (e.g., 32 Fr for an adult), good lubrication, and a rotary motion overcome this difficulty.

The soft distal end of the guide reduces the risk of perforation of the trachea to an absolute minimum. Properly performed, the technique is atraumatic, safe, and can be of great help in orotracheal intubation of patients in whom usual methods fail. Thorough practice in using the mirror and the technique in a manikin or cadaver is essential before using it in a patient.

REFERENCES

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Fire in an Ultrasonic Nebulizer
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Ultrasonic nebulizers (fig. 1) convert electrical energy at 50 or 60 Hz into high-frequency acoustic energy in the order of 1.3 megahertz (MHz). The acoustic energy is transmitted to the agent to be nebulized and physically disperses it into a large volume of small particles of uniform small size (0.5 to 1.0 μ). Although it is not generally recognized, the power levels required for high-rate nebulization constitute a potential fire hazard. The following incident may be the first such fire to be reported in the literature.

REPORT OF INCIDENT
The fire occurred in the General Intensive Care Unit of Cook County Hospital during aerosol therapy, using an ultrasonic nebulizer. The patient being treated was a 24-year-old man who had