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Training in Retrograde Intubation

To the Editor:—Endotracheal intubation can be extremely difficult under certain conditions (e.g., trauma, deformity, or hemorrhage); major problems, however, may also arise unexpectedly.¹ In such situations, the use of translaryngeal-guided retrograde intubation (Waters technique²) may be particularly useful, especially when multiple manipulations have caused secretion and bleeding, conditions which, even in skilled hands, complicate the use of the fiberoptic bronchoscope.

Training programs in retrograde intubation utilizing video tape or slides and practice on phantoms or cadavers have been suggested.³ Training on patients, however, has been discouraged, since practice on elective cases has been considered unethical.³ As a result, few clinicians have seen, much less attempted, intubation using a retrograde technique.

Since our attempts at retrograde intubation in patients who unexpectedly presented problems for endotracheal intubation were, as a rule, unsuccessful, we modified Waters' technique for use in such cases.

Informed oral consent was obtained from the patients on the day before scheduled laryngectomy. The resected larynx served as control of any technique-related injury of the laryngeal tissue. Since the larynx was removed, no permanent damage could be inflicted.

Anesthesia was induced using methohexital; patients were ventilated *via* mask with oxygen and isoflurane. During ventilation, each patient was paralyzed with succinylcholine; the cricothyroid membrane was identified by palpation, and punctured with a 14-gauge needle. Correct position of the cannula in the laryngeal cavity was demonstrated by aspiration of air with a syringe; transtracheal anesthesia was achieved by injection of lidocaine. A 16-gauge catheter (70 cm), which was advanced orally through the cannula and extracted from the mouth, served as guide for guided blind intubation of the trachea. Intubation was performed with a non-kinking (Woodbridge) tube stabilized by a straight guide wire.

Our first study included 36 patients;⁴ to date, the tracheas of over 70 patients have been intubated with this technique. No serious injuries of the mucous membrane or cartilage was observed. No posterior damage or penetration was demonstrated in the resected larynges. Moderate bleeding occurred in one patient and another required tracheotomy because a tumor filling

the laryngeal cavity prevented identification of this cavity. In elective cases, contraindications are coagulation abnormalities (*i.e.*, danger of severe endotracheal bleeding), extensive subglottical tumor growth, failure to identify the cricothyroid membrane due to tumor growth, infiltration of the skin, or radiation damage.

Since retrograde intubation subjects the patient to less cardiovascular stress than does direct laryngoscopy,⁵ cardiac disease is not an absolute contraindication to this technique.

In our opinion, therefore, retrograde intubation of patients scheduled for laryngectomy can be included in a routine procedure in such patients prior to laryngectomy, contraindications can be identified before surgery.

Training in correct puncture of the cricothyroid membrane also facilitates rapid use of devices for emergency cricothyrotomy⁶ to establish a temporary airway.

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