Fiberoptic endoscopy: Where to go from here?

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Current state of the art in anesthesia practice requires that anesthetists be able to use the fiberoptic laryngoscope. This article presents a step by step method which will enable the anesthetist to gain the necessary skills to become a skilled endoscopist.

The technology for fiberoptic laryngoscopy has been developed for a number of years; however, few anesthetists feel clinically competent to use the fiberoptic laryngoscope. The purpose of this paper is to suggest ways for the clinical practitioner to learn, improve, and maintain technical skills for the successful use of the fiberoptic laryngoscope.

Many fields of medicine routinely use fiberoptic instruments in the diagnosis and treatment of patients. Fiberoptics are used in anesthesia only when difficulty is expected, or, in too many instances, when all other methods have failed and a crisis has developed. Gaining proficiency with the fiberoptic laryngoscope is a time consuming process; however, it is a process that each anesthetist should pursue.

Two basic designs of fiberoptic laryngoscopes are currently available to the anesthetist. The flexible fiberoptic system (Figure 1), is the most common. After the trachea is identified (via the nasal or oral route), the flexible laryngoscope is passed into the trachea. The endotracheal tube is then slid off of the fiberoptic tube and into the trachea, and the laryngoscope is withdrawn. The newer fiberoptic laryngoscopes have other channels for suction or oxygenation, biopsy, and instillation of fluids as well as the optical system.

Not seen as frequently is the semi-rigid fiberoptic laryngoscope (Figure 2), which is designed for oral intubation in the awake patient. The instrument consists of a curved optical tube which also serves as a stylet. The endotracheal tube is placed over the curved stylet and both are inserted into the oropharynx. The distal 6 cm are malleable, and may be adjusted to each patient’s anatomical variations. When the trachea is visualized,
the tube is slid off the stylet into the trachea. The stylet laryngoscope is not advanced into the trachea.

The first step in becoming familiar with any anesthesia technique is to learn the limits of the instrument to be employed. The future endoscopist should study the instructions that accompany the instrument and learn all the control procedures until he or she is confident and knowledgeable of the limits of each control.

A beginning exercise to help develop the manual dexterity needed to become a successful endoscopist consists of passing the laryngoscope through an empty shoe box. The laryngoscope is guided into the top of the shoe box, through a small hole in a partition, and then into a target (Figure 3). Decreasing the size of the final target hole increases the manual skill required.

The next step is to use the fiberoptic laryngoscope on the intubation manikin. In this situation, the beginning endoscopist becomes more familiar with the anatomical landmarks as seen through the fiberoptic laryngoscope. Here again, practice is essential.

Following these initial steps the beginning endoscopist can take the instrument into the clinical area. After a patient has been intubated and the condition is stable, the endoscopist passes the fiberoptic laryngoscope orally to view the anatomy and correct placement of the endotracheal tube. The endoscopist may then view the normal structures around the endotracheal tube in a relaxed environment (while an assistant monitors the anesthetic management). The endoscopist should be able to identify the epiglottis, vestibular folds, aryepiglottic folds, corniculate cartilage, the endotracheal tube and possibly the vocal folds. Once the endoscopist becomes skilled in this area, the next step is to gain skill with the non-intubated patient.

The best way to view the anatomy of the non-intubated patient is with the help of the gastroenterologist or the bronchoscopist. Explain to the gastroenterologist/bronchoscopist that you would like to view the upper airway structures as the endoscopist advances the fiberoptic laryngoscope into and past the pharynx before entering the esophagus or trachea. A teaching lens attachment for the fiberoptic laryngoscope will facilitate this exercise.

The anesthetist now is ready to return to the operating room and intubate patients with the fiberoptic instrument. Carefully choose the operative procedure, time of day, and surgeon so as to optimize the learning experience and avoid placing unnecessary stress on the patient or endoscopist.

Begin with a patient who would appear to be a normal, easy intubation. Perform an inhalation induction or induce the patient with intravenous drugs, but keep the patient breathing spontaneously. After the patient is in a surgical plane of anesthesia, assist ventilation if necessary, perform a direct laryngoscopy and spray the larynx with 4% lidocaine to reduce the likelihood of laryngospasm. Discontinue the nitrous oxide and keep the patient anesthetized with an inhalation agent. Now perform the endoscopy orally with the fiberoptic laryngoscope. The placement of the fiberoptic laryngoscope in the pharynx will keep the airway open, and the endoscopist will have three to five minutes to view the larynx and pass the endotracheal tube into the trachea. If at anytime the patient is at risk, the standard laryngoscopy procedure may be utilized.

Figure 2
Model of a semi-rigid fiberoptic laryngoscope.

Figure 3
An empty shoe box designed for a beginning exercise in passing the laryngoscope.
When it is desirable to ventilate the patient while passing the fiberoptic laryngoscope, the Patil-Syracuse\textsuperscript{TM} endoscopic mask may be used. The endotracheal tube is passed through an opening in the mask that is fitted with an airtight seal. Use of this mask allows the endoscopist a longer time period in which to perform the endoscopy. The mask keeps the anesthetic concentration within the breathing circuit and allows a means of positive pressure ventilation if necessary.

The use of an antisialagogue about 30 minutes before the induction of anesthesia decreases the secretions in the pharynx to provide a clear view of the anatomical structures. Warming the fiberoptic laryngoscope in warm water to body temperature or using a defogging agent on the lens will assist in providing optimum conditions for this procedure.

The protocol discussed here should help anesthetists to become proficient with the fiberoptic laryngoscope without putting undue stress on the patient.

ADDITIONAL READING


One reference that is particularly useful for the beginning endoscopist is *Fiberoptic Endoscopy in Anesthesia* by Patil, Stehling, and Zauder (1983). This book contains excellent pictures of the larynx taken through the fiberoptic system.

AUTHOR

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