A Complication of Lightwand-guided Nasotracheal Intubation

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The lightwand, a flexible endotracheal tube stylet with a light at the distal tip, may simplify otherwise difficult oral endotracheal intubation.1,2 We report here a complication of the use of a lightwand for nasotracheal intubation. The endotracheal tube was inserted successfully in the trachea, but loss of the lightwand bulb necessitated bronchoscopy for its retrieval.

REPORT OF A CASE

A 51-year-old, 60-kg male with a two-month history of dysphagia was admitted to the hospital for esophagoscopy, soft palate biopsy, and laryngoscopy. In 1977 carcinoma of the left vocal cord had been treated with radiation, as was a second carcinoma in the left retromolar trigone in 1982. A barium swallow and head and neck examination 1 month prior to admission showed no obvious masses.

Physical examination revealed a thin individual with a supine blood pressure of 160/100 mmHg. Extension of the neck was limited due to radiation-induced fibrosis. Indirect laryngoscopy, made difficult by trismus, demonstrated pooled secretions in the pyriform sinuses. The remainder of the physical examination was unremarkable.

In the operating room, fentanyl 100 mg was given iv over 5 min. Lidocaine anesthesia was administered topically to the oropharynx with an atomizer, and an additional 100-μg fentanyl iv was given. In spite of these measures, direct visualization of the larynx with first a #3 Macintosh and then a #5 Miller blade was unsuccessful. Blind nasotracheal intubation with a 6.0-mm (ID) endotracheal tube coated with 2% lidocaine jelly also failed. At this point the patient was breathing spontaneously 10 times/min and was barely arousable.

A lightwand then was inserted into a 6-mm (ID) endotracheal tube and, with the room darkened, nasotracheal intubation was accomplished after visualizing the illuminated lightwand tip in the midline of the neck just above the thyroid cartilage. The lightwand was withdrawn with some difficulty, and the light bulb was noted to be missing from the distal end. A visual search of the oral cavity and glottic area failed to locate the bulb.

The patient could be ventilated easily, and in conjunction with the surgeons the decision was made to postpone further search for the bulb until after the planned procedures had been performed. Anesthesia consisted of 50% N₂O in O₂, an additional 50 μg of fentanyl iv, and thiopental 450 mg iv in 50–100-mg increments, along with succinylcholine in repeated 40–60 mg iv boluses as required for quiet surgical conditions for the subsequent hour-long series of procedures.

Esophagoscopy, soft palate biopsy, and laryngoscopy were completed without incident. A chest roentgenogram was obtained and showed the lightwand bulb to be in the lower right lung field (fig. 1). Flexible bronchoscopy located the bulb in the lateral basal segment of the right lung, from whence it was retrieved with the aid of the flexible bronchoscope biopsy forceps.

The patient was taken to the recovery room, where he had increasing respiratory distress over the next several hours. A chest roentgenogram demonstrated a right lower lobe pulmonary infiltrate consistent with aspiration pneumonitis. Antibiotics were begun, and the patient remained intubated 4 days, after which he made an uneventful recovery.

DISCUSSION

Use of a lightwand to facilitate orotracheal intubation was described 25 years ago.1,2 Transillumination of the anterior pharynx via nasotracheal tube using a thin,

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Fig. 1. Roentgenogram showing location of errant light bulb in patient's right lower lung.
floppy wire connecting light bulb and power source had been described at about the same time. More recently, use of a stylet to aid in nasotracheal intubation has been reported. The case we present above documents a combination of the above methods.

Successful endotracheal intubation was accomplished, yet a serious complication resulted from this technique. Foreign bodies in the airway present a problem, and retrieval may be accompanied by infection, hemorrhage, tracheobronchial irritation, atelectasis, damage to lung parenchyma, and the need for thoracotomy for removal. When a foreign body is suspected to have entered the tracheobronchial tree, spontaneous ventilation probably should be continued insofar as is possible to avoid forcing the object distally with positive-pressure ventilation. Had a potent inhalational anesthetic been employed instead of fentanyl, adequate spontaneous ventilation throughout the procedure might have obviated the need for succinylcholine and controlled ventilation.

Several points can be made regarding the technique we employed. The lightwand we used was designed as a single-use instrument but in fact had been used and resterilized at least once previously. Disconnection of the bulb from the stylet may well have occurred due to repeated sterilizing and handling, for which the instrument was not intended. Also, the stylet was bent fairly sharply near its distal end, and the force used to remove the stylet from the endotracheal tube may well have caused the bulb to come loose, even had the instrument been new. Before using a lightwand, either nasally or orally, care should be taken that no sharp bends in the stylet are present. Certainly the device is not intended to withstand great force, and no fault on the part of the manufacturer is implied, especially as this was not the first time this particular instrument had been used.

In summary, a lightwand was used via a nasotracheal tube to facilitate a difficult intubation. Disconnection of the light bulb required bronchoscopy for its retrieval from the right lung. Employing the lightwand to facilitate nasotracheal intubation may, on occasion, prove useful, but it is not entirely risk free.

REFERENCES

Erratum
In the article "Optimization of the Radioimmunoassays for Measuring Fentanyl and Alfentanil in Human Serum," by J. Schütter and P. F. White (Anesthesiology 61:315–320), the equation for accuracy (bias), page 316, first column, last line, should read as follows:

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\left( \frac{\text{measured} - \text{actual}}{\text{actual}} \times 100 \right)
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