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Failure of the Augustine Stylet to Detect Tracheal Intubation

To the Editor:—We would like to report a case where an incorrect assessment of tracheal tube position was suggested by the Augustine stylet.

Intubation with the Augustine Guide (Augustine Medical, Inc., Eden Prairie, MN) was attempted after induction of anesthesia and muscle relaxation in a healthy 36-yr-old woman undergoing elective surgery. The stylet was successfully advanced into the trachea on the second attempt, and its position was confirmed by aspiration of "air" through the stylet. A 7.5-mm ID endotracheal tube could not, however, be advanced over the stylet. The guide was separated from the endotracheal tube and removed from the patient's mouth, but the tube still could not be advanced and thus was thought to be caught at the laryngeal inlet. After slight withdrawal and rotation, the tube advanced easily over the stylet. With repeat aspiration through the stylet, there was resistance after 10 ml of "air" was aspirated. Our initial impression was that esophageal intubation may have occurred as a result of the manipulations that had just been performed.

The endotracheal tube was connected to the breathing system, and positive pressure breaths were given. Auscultation of the chest and epigastrium indicated tracheal intubation, and the capnogram showed normal waveforms with no decrease in height of the waveforms over about eight breaths. This was highly suggestive of tracheal intubation. On examination of the stylet, clear thick secretions were seen occluding the tiny holes near the distal end. Room air could not be aspirated through the stylet. The secretions were wiped off and cleared from the holes by forceful suction. When the guide was reinserted through the endotracheal tube, air could be easily aspirated (as expected with tracheal intubation).

Although the manufacturer's package insert warns that thick secretions may lead to a false impression of esophageal position, we are not aware of any other report of failure to detect tracheal intubation with the stylet. The Augustine stylet has six holes (with diameters of approximately 1 mm each) near the distal end. Such small holes are easily occluded by thick secretions. We believe that larger side-holes in the stylet may reduce the chances of occlusion by secretions during the aspiration test.

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In Reply:—This seemingly rare but anticipated occurrence reflects Augustine Medical's intent to err on the side of patient safety. Certainly, the most serious error with the esophageal detector stylet would arise from a false-positive, indicating tracheal intubation with the stylet. Extensive research has shown that a false-positive will arise only when the stylet passes alongside an esophageal obturator airway.* Not surprisingly, this situation develops because an indwelling esophageal obturator airway opens the esophagus to air.

To minimize the incidence of a false-negative, we designed redundancy into the system by placing three holes on each side of the distal stylet. Any air leak negates a vacuum. The chance of all six holes obstructing is exceedingly small. We rejected the idea of increasing the hole size, as suggested by Haridas and Arsiradam, because it would have decreased the shaft strength, making it vulnerable to kinking.

* Kovac AC: Evaluation of the Augustine guide esophageal detection device stylet, The 5th Annual International Trauma Anesthesia and Critical Care Symposium, Amsterdam, The Netherlands, June 1992.

CORRESPONDENCE

Ultimately, verification of endotracheal intubation requires confirmation by one of the commonly accepted methods: auscultation of breath sounds or detection of carbon dioxide in the expired breath. The esophageal detection stylet merely provides evidence of correct stylet positioning at an intermediary point in the technique.

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A Unique Use of the Univent Tube

To the Editor:—I wish to report a case in which a Univent tube was used to isolate only the left upper lobe in a patient who had previously undergone extensive right-sided pulmonary resection.

A 59-yr-old woman who had previously undergone right middle and lower lobectomies presented for left thoracotomy for tumor resection. Because this patient had undergone a double lobectomy on the right, it was decided to attempt placement of a Univent tube in such a way as to isolate only the left upper (operative) lobe, thereby permitting ventilation of both the left lower lobe and the remaining right upper lobe. After induction of general anesthesia, a 7.0 Univent tube was inserted easily into the trachea. The bronchial blocker was advanced without difficulty into the left mainstem bronchus, and a fiberoptic bronchoscope (Olympus Corporation, Lake Success, NY) was passed through the tracheal lumen of the tube into the left mainstem alongside the blocker. However, the blocker could not be manipulated into the left upper lobe bronchus because it could not negotiate the relatively sharp turn required to enter the bronchus. A 150-cm J-wire (Cordis Corporation, Miami, FL) was obtained, bent slightly at its distal end, and passed into the blocker lumen. The J-wire was advanced through the blocker lumen into the left mainstem and directed, with relative ease, into the left upper lobe bronchus. This was used as a guidewire over which the blocker was passed. The J-wire was withdrawn, and the blocker cuff was inflated with approximately 2 ml of air. The blocker was secured and its lumen opened to atmosphere. During placement of the blocker, ventilation of both lungs was easily accomplished *via* the tracheal lumen of the tube. On entering the pleural cavity, excellent isolation of the left upper lobe was noted. The left upper lobe remained fully deflated and quiescent throughout the case, and the left lower and right upper lobes were ventilated without difficulty. A left upper-posterior segmentectomy was performed. The patient had an uncomplicated recovery and was discharged home on postoperative day 8.

In summary, the unique design of the Univent tube permits segmental lung blockade. In this case, selective left upper lobe collapse was achieved to facilitate pulmonary resection. Isolation of a single lobe rather than the entire lung may decrease morbidity in pulmonary surgery by excluding a smaller portion of the lung from gas exchange.

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