Reliability of Auscultation of Bilateral Breath Sounds in Confirming Endotracheal Tube Position

To the Editor.—Proper positioning of the endotracheal tube (ETT) commonly is confirmed by auscultation of bilateral breath sounds. However, Brunel et al. reported that 60% of mainstem bronchial intubations occurred despite the presence of equal breath sounds from the bilateral chest. Schwartz et al. noted that endobronchial intubation was not detected by chest auscultation. We used a fiberoptic bronchoscope (FOB) to evaluate the reliability of auscultatory confirmation of ETT position.

After nasotracheal intubation, the FOB (Olympus LF-2) was inserted through the ETT. Then, the FOB and the ETT with the cuff inflated were advanced. When it was confirmed with the FOB that the ETT tip reached the carina, a mark was made on the ETT at the nare. When unilateral breath sounds became first more bronchial in quality and then disappeared, second and third marks were made on the ETT, respectively. In this fashion, the distance from the carina to the nare and the distances from the ETT tip to the nare at change and at disappearance of breath sounds were measured.

The carina was 28.7 ± 1.2 cm from the nare in females who averaged 156 ± 7 cm in height. The ETT tip advanced beyond the carina invariably entered the right mainstem bronchus at 30.1 ± 1.3 and 31.9 ± 1.0 cm from the nare at change and disappearance of breath sounds, respectively. The FOB used in this study, Portex Blue Line Tracheal Tube (ID 7.5 mm), had a cuff 2.5 cm from the tip, a 1.0 cm bevel facing to the left, and no Murphy's eye. Taking into consideration these structural features, it was presumed that breath sounds changed when the proximal end of the bevel was advanced about 0.5 cm into the right mainstem bronchus, perhaps because of gas flow through the narrow space between the ETT and the bronchus. Breath sounds disappeared when the cuff was advanced about 0.7 cm into the intubated bronchus, possibly because of interruption of gas supply to the opposite bronchus. Therefore, the ETT tip should be withdrawn at least 1.5 or 3.2 cm if breath sounds from the left side of the chest change or disappear, respectively, after intubation and during anesthesia. Our results suggest that the fiberoptic bronchoscopy is more reliable than chest auscultation in confirming ETT position.

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Simple Method of Tracking Patients with Difficult or Failed Tracheal Intubation

To the Editor.—The problem of difficult or failed tracheal intubation poses potentially serious risks to patients undergoing general anesthesia. Adverse sequelae are common, and particularly when such cases are unanticipated, morbidity can be significant and frequently results in litigation. For many years, anesthesiologists focused on devising clinical techniques of predicting difficult intubation pre-

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operatively, but such efforts have been frustrated by disappointing sensitivity and specificity.1,2,3

Logic suggests that the most useful means of predicting difficult intubation in a patient with a previous history of this complication is obtaining this information preoperatively. Unfortunately, in the past, anesthesiologists often were remiss in providing such information to patients and their attending physicians in a manner that sufficiently stresses its importance in future preoperative encounters.4

More recently, a wider awareness of the need for a comprehensive system for disseminating clinically important information among patients and physicians has produced efforts on local and national levels.5,6,7,8 For example, the nonprofit Medic Alert Foundation, in conjunction with a multicity advisory panel, is assembling a national registry for difficult airway/intubation.9 However, the registry is not "searchable" from a remote locale, and enrollment is voluntary and depends on the role of the practitioner in effectively communicating its value to the patient.

Using readily available technology, our department developed a local database of patients in whom tracheal intubation has proved difficult. Equipment includes an IBM-compatible, Microsoft Windows-capable personal computer and any commercially available database manager (we use Lotus Approach 3.0 because of its simplicity). A data entry form is completed when a difficult intubation arises. This records demographic information on the patient and attending physicians as well as details concerning the nature of the difficulty, e.g., whether it was anticipated and on what basis, equipment used, whether anesthesia and surgery were continued.

Creating such a database serves two purposes. First, it provides a reliable means of alerting us to this aspect of a patient's history if we must conduct a subsequent anesthetic. Given that our department performs several thousand general anesthetics annually, many of which involve patients whom we have previously anesthetized, and given that the vast majority of our patients are not admitted before surgery and their anesthetic records often are unavailable to us at interview, the ability to conduct a search of our database for a history of difficult intubation has proved useful. Moreover, our hospital's networked medical information system will contain a field that alerts medical personnel to the presence of a history of anesthetic complication; this can trigger a search of our database preoperatively.

Eventually, our data can be shared with the national difficult airway/intubation registry. Should it become feasible to develop a national "electronic medical record"—i.e., a comprehensive system linking all health care facilities, designed for rapid retrieval of critical medical information by qualified personnel—we are hopeful that the Medic Alert registry would choose to support it.

The second purpose served by our database is generating a form letter (fig. 1) to any patient who experiences a difficult or failed intubation, with copies forwarded to their surgeon and primary care physician. We developed a series of such letters, depending on the presence or absence of specific sequelae. In every case, the letters recommend enrollment in the Medic Alert emergency identification program, and enrollment forms are included.

Along with the use of Medic Alert identification materials (e.g., bracelet, necklace, wallet card), we believe that providing these letters likely will do more to improve the preoperative identification of patients with a history of difficult or failed intubation than any other technique. Further, it encourages patients to be engaged in the health-care process by sharing the responsibility for continuing patient safety efforts initiated by their physicians. Ultimately, this will create a more informed surgical population.

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