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## Percutaneous Transtracheal High-frequency Jet Ventilation as an Aid to Fiberoptic Intubation

*To the Editor:*—Boucek *et al.* have described an innovative technique using transtracheal jet ventilation during difficult intubations.<sup>1</sup> While this method may be useful in unusual circumstances, it requires special equipment, is unfamiliar to many anesthesiologists, and is not without risk. Furthermore, simpler alternatives are available.

We disagree that one must necessarily ventilate the anesthetized patient during fiberoptic laryngoscopy. Spontaneous inhalation of anesthetic agents, oxygen, and even nebulized lidocaine can be easily achieved by connecting the breathing circuit to a nasopharyngeal tube or a "dual purpose connector."<sup>2</sup> Transparent adhesive dressing will provide a seal where needed. This technique, preceded by an inhalation induction, is applicable to patients with difficult airways except in the presence of: 1) decreased intracranial compliance, where hyperventilation is most reliably achieved by conventional positive pressure ventilation, and 2) a "full stomach," where jet ventilation offers no demonstrated advantage, and awake intubation is indicated.

The safety and efficacy of topical anesthesia for awake fiberoptic intubation should not be downplayed. Stating that "potentially toxic doses of local anesthetic may be necessary," the authors have quoted a paper which, in fact, demonstrated low peak plasma concentrations of lidocaine (mean  $0.6 \pm 0.3 \mu\text{g/ml}$ ) despite the high administered doses (mean  $5.3 \pm 2.1 \text{ mg/kg}$ ).<sup>3</sup>

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*In Reply:*—We appreciate the comments of Drs. Todesco and Williams. We recognize that multiple strategies are possible in dealing with patients who have difficult airways. Our technique does require special equipment—a fiberoptic laryngoscope and a HFJV—both now commonly found in modern operating suites.

We have found that the simple, familiar, and, therefore, safer adjuncts to fiberoptic laryngoscopy allow for successful intubation under most circumstances. Therefore, the use of percutaneous transtracheal jet ventilation should be reserved for extraordinary situations.

J. M. TODESCO, M.D., F.R.C.P.  
*Resident in Anaesthesia*R. T. WILLIAMS, M.D., F.R.C.P.  
*Assistant Clinical Professor**Department of Anaesthesia  
Foothills Hospital at the University of Calgary  
Calgary, Alberta, Canada T2N 2T9*

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In our report, we clearly mention the possibility of anesthesia induction *via* mask followed by fiberoptic intubation; this technique is frequently inappropriate when ventilation *via* mask is anticipated to be difficult, as in case 2 of our report, or when intracranial pressure may be elevated, as in our case 3. Although there is

evidence that HFJV may prevent aspiration,<sup>1</sup> we do not propose to routinely supplant awake intubation with this technique. We assert that multiple strategies are necessary for dealing with patients who have difficult airways. The technique we described is useful in selected circumstances, and should be added to the anesthesiologist's armamentarium.

CHARLES D. BOUCEK, M.D.  
*Assistant Professor*

HELENA B. GUNNERSON, M.D.  
*Assistant Professor*

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### Hazards of a New System for Placement of Endotracheal Tubes

*To the Editor:*—In their report on a technique for placement of endotracheal tubes to prevent endobronchial intubation, Owen and Cheney<sup>1</sup> advocate a position of 23 cm for men and 21 cm for women as marked on the endotracheal tube at the incisor teeth. While no endobronchial intubations occurred in their "study group" with this system, 14 patients (4.6%) were noted to have the tip of their endotracheal tube 9 cm or more above the carina. The authors observed no cases of tracheal extubation. They noted the study by Conrardy *et al.*<sup>2</sup> which showed up to 5.2 cm outward movement of endotracheal tubes on extension of the head; however, Owen and Cheney state that ". . . migration of the cuff between the cords would be easily recognized by the presence of an airleak with positive pressure ventilation."

Conrardy *et al.*<sup>2</sup> note the length of the adult human trachea to be  $12 \pm 3$  cm. Thus, the patients found by Owen and Cheney to have high tube placements may be at great risk for accidental extubation after head extension. Such an occurrence would clearly be hazardous and merits the rejection of their system. I have found

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*In Reply:*—Dr. Sosis' letter focuses attention on a potential problem with the technique of securing oral endotracheal tubes, which we recently described. We can only say that accidental extubation was not a problem in 304 patients studied in a prospective fashion in an ICU setting. As mentioned in the article, the tube tip may

WILLIAM C. TULLOCK, M.D.  
*Assistant Professor*  
*Anesthesiology and Critical Care Medicine*  
*University of Pittsburgh*  
*Montefiore Hospital*  
*Pittsburgh, Pennsylvania 15213*

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that accidental extubations are not always quickly recognized, especially if the anesthetist does not have good access to the head.

Interestingly, in Owen and Cheney's "control group," consisting of those patients whose endotracheal tubes were not adjusted after intubation, only two patients (0.7%) had the tip of the tube 9 cm or more from the carina. The conclusion that the "control" group is at greater risk for endobronchial intubation must be compared to its potential for fewer extubations. In my practice, I have found the latter to be more dangerous.

MITCHEL SOSIS, M.D., PH.D.  
*Assistant Professor of Anesthesiology*  
*Indiana University Medical Center*  
*Indianapolis, Indiana 46223*

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have been higher in the x-ray than *in vivo* because of the natural extension of the head when the patient was on an x-ray cassette. This extension would tend to move the tip higher. We disagree in general that accidental extubation is harder to *diagnose* than endobronchial intubation. Even with a pulse oximeter to make a prompt