Facilitation of Percutaneous Dilational Tracheostomy by Use of a Perforated Endotracheal Tube Exchanger

To the Editor:

We read with interest the report of Debilieux and colleagues (CHEST 1995; 108:572-74) in which they described a modification of the percutaneous dilational tracheostomy procedure using a commercial tube exchanger. They concluded that such a technique enhances the safety of the procedure, having developed this modification as a result of the premature endotracheal extubation, which occurred in two of their initial eight patients.

We share their concern about the potential for loss of airway control, the difficulties of simultaneously managing the bronchoscope and the endotracheal tube, and the adequacy of ventilating with the bronchoscope in the endotracheal tube. In addition, we are concerned about the risk of skewering the endotracheal tube with the guidewire during blind percutaneous insertion. Accordingly, we developed and reported a technique involving the use of a commercial tube exchanger (Endotracheal Ventilation Catheter; CardioMed Supplies, Inc; Gormley, Ontario, Canada)1-2 and jet ventilation in critically ill patients undergoing this procedure.

According to Debilieux et al, the primary benefit of this modification is the improved airway management, including continuous bag ventilation, capnography, and lower inspiratory airway resistance. Resistance, however, is a function of flow, and the authors have not provided clinical evidence of the adequacy of flow, minute ventilation, or oxygenation. They have offered neither arterial blood gases nor the results or oximetry or capnography to support their contention. Using an airway exchange catheter (C-AEC 14.0-83; Cook Critical; Bloomington, Ind) the small inner diameter (3 mm), the paucity of distal holes, and the catheter length (83 cm) result in a high resistance system. Coupled with the low pulmonary compliance and high airway resistance frequently encountered in critically ill patients, it would be helpful if the authors had provided evidence that the patients were in fact adequately ventilated.

In our study of 25 patients, we used a manually cycled flow interrupter with oxygen (fraction of inspired oxygen=1.0) at 20 to 50 psi and continuous oximetry. In 12 consecutive patients, dependent upon supplemental oxygen and mechanical ventilation, we measured the arterial blood gases, following such ventilation and immediately prior to ventilation via the tracheostomy tube. These were as follows (mean±SD): pH=7.37 (0.09), PaCO2=45.5 (10.8), and PaO2=256 (126).

In addition, the authors have recommended placement of the tube exchanger to a depth of 5 to 8 cm distal to the tip of the partially withdrawn endotracheal tube. We are concerned that failure to identify the location of the distal end could result in unintended extubation or endobronchial ventilation with consequent hypoxia, overdistension of a lung, tracheobronchial irritation, or perforation.3 We favor placement of the tube exchanger at the same depth as an appropriately placed endotracheal tube.

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REFERENCES

2 Irish JC, Brown DH, Cooper RM. How I do it: airway control during percutaneous tracheostomy. Laryngoscope 1994; 104: 1178-80