
(Accepted for publication February 7, 2000.)

In Reply—The suggestion by Candido et al. to change the words in the title of my editorial from "Potential Great Danger" to "Prohibitive Danger" is the result of a poor risk-benefit analysis. No one disputes the great benefit and small risk of having a stylet already in situ in the trachea should the planned or unplanned need for reintubation arise ("simple concept"). What is disputed is the risk-benefit of using the stylet for jet ventilation. The benefit of having a safe ventilatory and oxygenating mechanism already in situ in the trachea in case reintubation is unsuccessful is also obvious ("simple concept"). My editorial simply pointed out the many ways in which the risk of jet ventilation can be greatly increased and, conversely, the many ways in which the risk of jet ventilation can be greatly decreased. Therefore, if one jets with a 25-psi and 0.5-s inspiratory time through a relatively small airway exchange catheter (AEC) inserted no more than 26 cm in an adult, the ventilation risk is small. Figure 1 and the legend of figure 1 of the letter to the editor by Candido et al., which shows some displacement of subcutaneous tissue caused by a sustained 0 psi jet from a large AEC, is misleading because the arm is richly endowed with adipose tissue and the flows over a very short period of time from this system are well-known. The tidal volume from a 25-psi, 0.5-s jet from a large AEC into a lung with static compliance of 50 ml/cm H2O is approximately 350-400 ml. The title of my editorial does not need to be changed; what needs to be changed is the mindset and knowledge of practitioners who use AECs about how to achieve the optimally low risk-benefit ratio of AECs.

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References

(Accepted for publication February 7, 2000.)

In Reply—Thank you for referring to me the letters to the editor from R. P. Haridas and Kenneth D. Candido regarding my manuscript, "Tension Pneumothorax as a Complication of Jet Ventilation via a Cook Airway Exchange Catheter."

The patient described could easily receive ventilation by a face mask after induction of anesthesia and before laryngoscopy and tracheal intubation. The exchange catheter was advanced until resistance was felt; the airway exchange catheter might have wedged in the bronchus, obstructing the air escape. As recommended in the editorial view of Benumof that accompanied the report, "A prudent rule to follow is never to allow the centimeter calibration on the AEC to exceed a depth of 26 cm in an adult and never to insert an AEC when resistance is encountered [to avoid tear beneath the tracheal]."

The tension pneumothorax that developed in our patient may be secondary to barotrauma or a result of direct trauma to the tracheobronchial tree by the tip of the catheter or by the force generated by the jet per se. The case report and the accompanying editorial view of Benumof outlined the different precautions that may decrease the incidence of this serious complication, such as limiting the jet pressure and the inspiratory time. These parameters may be difficult to control with use of a hand-controlled jet ventilation technique. Automatic jet ventilation can be achieved by interrupting the pipeline oxygen (50-60 psi) by a Bird Ventilator Mark II (Bird Products Corp., Palm Spring, CA) or by a solenoid valve, which is electronically controlled; the system controls both the inspiratory and the expiratory times, and the delivered pressure of the jet.

We have used automatic jet ventilation safely in children anesthetized by the T-piece circuit or undergoing rigid bronchoscopy. Also, the technique was used in adults undergoing airway surgery. In all these situations, the jet is delivered via the anesthesia circuit, the bronchoscope, or the endotracheal tube, not directly by a catheter placed in the tracheobronchial tree. This may attenuate the jet and does not interfere with the air exit during passive exhalation.

Barotrauma may be more frequent when the oxygen jets are delivered by an exchange catheter directly into the tracheobronchial tree. Because of the "prohibitive dangers associated with jet ventilation..."