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Improved Technique for Fiberoptic Intubation

To the Editor:—Two recent letters[1,2] describe pitfalls related to fiberoptic intubation, which may be avoided if the operator continues to view the airway or the interior of the endotracheal tube throughout the intubation. The operator should always know where the bronchoscope tip is in the airway. As the endotracheal tube is advanced over the bronchoscope, the trachea should remain in view, and as the intubation is completed, the end of the endotracheal tube will come into view as it passes the tip of the bronchoscope. At this point, the endotracheal tube and bronchoscope can be moved as a unit to position properly the endotracheal tube above the carina. If the endotracheal tube does not come into view or there is difficulty advancing the endotracheal tube, then, as suggested by Moorthy and Dierdorf, the endotracheal tube may be passing into the esophagus.

Another potential problem may occur if the tip of the bronchoscope is not in the neutral position as the endotracheal tube is advanced. The tube may then be difficult to advance once it reaches the bending portion of the flexible bronchoscope. Also, the control cables within the bronchoscope may be stretched if the endotracheal tube is advanced with sufficient force over a flexed tip. It is helpful to advance the endotracheal tube with the use of a twisting motion, rolling the tube between the thumb and first two fingers of one hand. This reduces the force needed to advance the tube.

Finally, a stiffer fiberoptic bronchoscope (Olympus® LF-1) is now on the market. This is a superior instrument for intubation because its stiffness helps avoid such problems as those described by Moorthy and Dierdorf.

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Using a Conventional Ventilator in the Presence of a Bronchopleural Fistula

To the Editor:—I was interested to read the report of Albelda *et al.*,[1] which confirms the relationship between airway pressure and bronchopleural fistula (BPF) flow during high-frequency jet ventilation. They recommend documentation of airway pressures and fistula flow when this modality is used to treat patients with BPF.

We recently treated a 20-yr-old man who had been injured in a motor vehicle accident. His major injury was

TABLE 1. Ventilator Settings

Tidal Volume ml	Respiratory rate · min^{-1}	Minute Ventilation l	Peak Airway Pressure cmH_2O	PEEP cmH_2O	Mean airway Pressure cmH_2O	Fistula per Breath ml	Flow l/min
1. 800	16	12.8	40	10 ↓	16	170	2.72
2. 800 ↓	16 ↓	12.8	39	5	15	150	2.4
3. 500 ↓	30 ↓	15	33	5	12	70	2.1
4. 250	60	15	24	5	11	20	1.2
5. 250	60	15	22	5	10	10	0.6

1–4: Effect on fistula flow of sequential reduction of mean airway pressure by reduction of PEEP and tidal volume and compensatory increase of rate (↓ change) 5:24 h later, with increased pulmonary compliance.

rupture of the right main bronchus with lung contusions and aspiration of blood. Preoperative ventilation during resuscitation was difficult because of the large (unmeasured) fistula flow, and satisfactory gas exchange was never achieved. The bronchial rupture was repaired at thoracotomy, but postoperatively he continued to have loss of ventilation through the fistula in excess of 2.5 l/min with conventional ventilation with a Bennett 7200® ventilator.

Table 1 shows the effect of sequential changes in ventilator settings to reduce mean airway pressure and the resulting effect on fistula flow (derived simply by subtracting expired from inspired gas volumes). With a tidal volume of 250 ml and rate of 60/min, it was possible to achieve a four-fold reduction in fistula flow with consequent improvement in gas exchange, allowing a reduction of inspired oxygen fraction from 0.65 to 0.3. This ventilation was continued for 72 h, after which it was possible to discontinue mechanical ventilation.

Many institutions do not have high-frequency jet ventilators, and there may be concerns about the safety of some of the earlier models that may not have alarm systems and fail-safe circuitry to protect the patient from inadvertent high pressures. It also may not be easy to measure fistula flow directly because of suction and sterility. The purpose of this letter is to illustrate that it is possible to apply the principles recommended by Albelda *et al.*[1] with conventional ventilators. Equipment such as the Siemens Servo 900B®, Bennett MA 2 + 2®, Bennett 7200®, *etc.* will cycle up to 60/min and usually have built-in expiratory spirometers.

This allows for "slow" high-frequency, positive-pressure ventilation with easy documentation of fistula flow by subtraction of expiratory flow from inspiratory volume. (This, of course, measures total leak from all sources, but is sufficiently accurate for practical purposes).

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A Complication of External Jugular Cannulation

To the Editor:—We encountered an unusual complication of external jugular cannulation, a technique favored by many anesthetists for central venous access.

A 12-yr-old girl presented for surgical correction of idiopathic thoracolumbar scoliosis with the use of Harrington rod fixation. The patient was anesthetized and a radial arterial catheter was placed percutaneously. Her right external jugular vein was easily cannulated with a Cook 18-g J-wire set (Cook PMS-400J®, Cook, Inc., Bloomington, IN). The flexible J-wire was advanced through the needle easily, and the J-tip could be seen distending the vein along its course to the clavicle. Resistance to advancement was felt at this point, and the wire was withdrawn slightly and rotated and readvanced several times without success in passing into the subclavian vein. At the fourth attempt, the wire was withdrawn slightly and then stuck, and neither it nor the introducing needle could be advanced or withdrawn. An AP film of the neck and upper chest showed no apparent mechanical problem. It was noted that with gentle traction, the skin puckered at what appeared to be the site of venipuncture. A 0.5 cm incision was made at the entry site, and the vein, needle, and wire were grasped with a small hemostat. The vein wall distal to the tip of the needle was seen to be pinched into the end of the needle and wedged there by the wire guide. Gentle traction on the distal vein and advancement of the wire freed the entrapped vein wall, and the wire and needle were withdrawn together. No abnormalities were apparent in either, and there was no obvious damage to the vein wall. Successful central venous cannulation was carried out with the use of a similar Cook J-wire set in the left external jugular vein.

Vein wall entrapment during central venous cannulation with the use of a Seldinger technique must be very uncommon. Perhaps motion of the needle tip during repeated manipulation of the guide wire raised an intimal