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citor, breath sounds were distant, and oxygen saturation, as monitored by pulse oximetry, began to decrease. A large mucous plug was removed with the aid of a portable suction device we created at our institution (fig. 1). The device consists of a suction catheter (Baxter, Valencia, CA) connected to a luer lok syringe (Becton Dickinson, Franklin Lakes, NJ). The suction catheter is screwed directly onto the syringe, and suction is created by pulling a syringe plunger. Any size catheter can be used in combination with any size luer lok syringe, in a one-size-fits-all fashion.

We tested the negative pressure that could be generated with our device. Using a digital pressure meter (Dynatech Nevada), we generated 600 mmHg pressure without collapsing the catheters (8, 10, and 14 French). Wall suction available in the operating rooms also was tested and noted to be 560 mmHg. The negative pressure generated with the device, unlike that of wall suction, cannot be increased, which limits its use. This easy-to-assemble and simple-to-use portable suction device provides an alternative to cumbersome, battery-powered or pneumatically powered suction devices. Our suction device provides a cost-effective and efficient way to alleviate a common cause of inability to ventilate the lungs in intubated pediatric patients during intrahospital transport.

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New Endotracheal Tube Cuff Recalls Past Efforts: Focuses on Laryngeal Placement

To the Editor—A recent article by Reali-Forster et al. regarding the development of a new, thin-walled endotracheal tube (ETT) is reminiscent of earlier ETT designs. A prior "flanged" cuff was difficult to place and did not perform well, but the new and improved device shows promise because of its use of thin, compliant flanges and a highly flexible ETT molded to reflect airway anatomy. Lombolt developed an "anatomic" ETT in 1971 that later was criticized for being highly dependent on correct orientation and positioning for functional improvement, and, actually, anatomic differences among individual patients could create an inappropriate fit that would threaten worse laryngo-tracheal injury.

Of particular interest, Reali-Forster et al. intentionally position their "cuff" in the larynx. Laryngeal cuff placement may cause vocal cord paralysis because of recurrent laryngeal nerve ischemia, and both a laryngeal cuff and a soft ETT predispose to spontaneous ETT dislocation. Laryngeal positioning has seemed undesirable, probably not because the larynx is more susceptible to ischemic injury than the trachea, but because the patient is likely to be more cognizant and upset by damage to the larynx. My own work convinced me that placing a high volume, low pressure (hi-lo) cuff in the larynx (1) improves its sealing ability by limiting conformational changes that would normally occur, and (2) may result in much lower pressures exerted on the airway wall. Laryngeal cuff placement deserves further investigation.

The assertion that the flanged cuff exerts "no pressure" on the larynx is puzzling. Obviously, the flanges must press against the airway wall with a force at least equal to airway inflation pressure, or gas would escape around the cuff. Although a single flange is highly compliant, in vivo flanges interact with each other, the airway wall, secretions, and the airway inflation pressure. The flanges likely function similar to a "parachute cuff," exerting a pressure on the airway wall equal to but not exceeding the airway inflation pressure.

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Although the merits of a thin-walled ETT are obvious with respect to airway resistance, the impact of this new cuff is less clear to me. Properly inflated, the current hilo cuff functions well in the operating room with little or no major morbidity. It is difficult to argue that the hilo cuff design should be replaced. However, the hilo design functions poorly during mechanical ventilation with high airway pressures, predisposing patients to tracheal ischemia and necrosis. 8 Even under “high pressure” conditions, modifying the hilo design can significantly improve its performance. 9 Real-fortester et al. should be encouraged to develop their new “cuff” for use in patients with reduced lung compliance, comparing their new design to both standard and modified hilo cuffs.

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In Reply—Guyton is puzzled by the mechanism by which the “gills” in our new tracheal tube attain a seal at the level of the glottic opening. 1 The glottic portion (alone) of the new, thin-walled tracheal tube is deformed to approximate the roughly pentagonal shape of the glottic opening. This alone greatly reduces air leak. We then attached to this so deformed section of the tracheal tube numerous, very thin, soft, and pliable polyurethane rings (“gills”), with a thickness of 25–75 am. The purpose of those “gills” was to deform and, together with ever present mucus, fill voids between the glottic opening and the tracheal tube. The “gills” themselves do not exert any pressure on the glottis, except through added bulk. Hence, the term “no pressure cuff.” Any pressure on the glottic structures is exerted through the tracheal tube. By eliminating the tracheal cuff, as in our study, mucosal lesions were greatly reduced/eliminated, aspiration was effectively prevented, and the laryngeal lesions were similar to those caused with conventional tracheal tubes.

We believe the “gills” produce an effective seal, different from the “parachute cuff.” Whereas the parachute cuff produces effective seal only during the inspiratory period of ventilation, the “gills” attain an effective seal during both inspiration and expiration, effectively preventing aspiration.

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