EDITORIALS

New Insights into Tiny Airways

The article by Vigneswaran and Whitfield in this issue of Chest (see page 174) continues the interest and description of experience in the development of smaller fiberoptic bronchoscopes for use in the pediatric population. This progress, documented in recent reports and presentations, is the result of newer instruments to approach the diagnosis and treatment of a multitude of pulmonary problems in a vast and complex group of patients. It is indeed pleasing to see these advances.

Problems in the investigation and treatment of the small patient’s airways are multiple and often insurmountable. The problem has always been primarily the size of the airway, where in the premature newborn the use of endotracheal tubes with 2.5-mm and 3.0-mm internal diameters is commonplace. Small nares and nasal passages often dictate a smaller bronchoscope than could be used orally, yet if the oral route is used, one runs the risk of breaking the very delicate instrument in these uncooperative patients. Anesthesia must be used very carefully, both systemic or local, as secretions or emesis is difficult if not impossible to handle without good suctioning control, with aspiration a hazard. It takes very little mucus in the trachea to obscure the optics in the smallest scopes. The cords and immediate subglottic areas are prone to laryngospasm and to swelling after intubation, jeopardizing ventilation. Sharp distal narrowing of the airways below the carina further limits the use of the fiberoptic bronchoscope. Finally, one of the most common problems of the lower airways in children is that of a foreign-body aspiration, and no presently available fiberoptic bronchoscope can treat this condition in children.

As one approaches the airway of the tiny patient, a constant compromise is made between clarity of vision, or optics, and patency of the airway, or ventilation. The smaller fiberoptic bronchoscopes have excellent optics (and thus their greatest value), but for this the patient’s ventilation is often compromised. The patient always has to breathe around the fiberoptic bronchoscope, never through it. The fiberoptic bronchoscopes (Olympus BF-4B2, outer diameter of 4.9 mm; and Olympus BF-3C4, outer diameter of 3.6 mm) have suction ports to aspirate secretions or instill medications (or both), with the second instrument applicable to the neonate and smallest infants. Other fiberoptic bronchoscopes (Olympus BF-3C3R, outer diameter of 3.8 mm; Olympus BF-3C2, outer diameter of 3.2 mm; and now the Olympus XC, outer diameter of 1.8 mm) are applicable to babies but have no suction ports, with obvious limitations. They are quite valuable in the investigation of problems of the upper airway, almost completely replacing direct laryngoscopic examination in both the inpatient and outpatient settings. Investigation of stridor and elective nasotracheal intubation are prime examples of their efficacy. Observations below the cords in the smallest babies are often done in haste because of the compromise in ventilation, and this limitation is the future frontier to be conquered. Nevertheless, many previously unapproachable conditions in small children, such as lobar atelectasis, can now be easily and safely cared for at cribside. The diagnostic capabilities have been expanded sharply by such progress and, with these, the understanding of disease processes. As this latest, and smallest, bronchoscope becomes more readily available, a greater understanding of its potential will be realized.

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