

Controversy Surrounding the Introduction of Pediatric Endotracheal Anesthesia

Kenneth K. Cheng, David B. Waisel

Boston Children's Hospital, Department of Anesthesia, 300 Longwood Avenue, Boston, MA

Introduction: The practice of endotracheal intubation met with considerable resistance when first introduced. The story of the gradual acceptance of tracheal intubation into pediatric anesthesia practice illustrates how more specific equipment and formal and informal discourse among physicians can lead to improved care.

Methods: Literature review using Pubmed and available primary resources.

Results/Discussion: The resistance to incorporating endotracheal intubation into pediatric anesthesia practice persisted after its efficacy was accepted in adult practice. As tracheal intubation became more common in the 1930s and 1940s, an early barrier to pediatric intubation was the lack of age-specific equipment. Anesthesiologists did not have the laryngoscope handles, blades or endotracheal tubes that were appropriate for small sizes. Introduction of laryngoscopes like Gillespie's modification of the Chevalier Jackson laryngoscope in 1939, and subsequently blades such as the Miller, Robertshaw, and Oxford infant blade in the next several decades improved the ability to intubate infants. The development of smaller red rubber tubes, with thinner walls to reduce resistance, and eventually the introduction of sterile nontapered polyvinyl chloride tubes in the 1960's made intubation safer.^{1,2}

Acceptance of pediatric endotracheal intubation in the United States lagged behind Canada and Europe. While the many advantages of intubation, such as control of respiration and prevention of aspiration, were well known, life-threatening complications such as acute edema, subglottic stenosis and tracheitis curbed the enthusiasm of many surgeons. For example, in 1946, a prominent pediatric surgeon advocated omission of an endotracheal tube for open chest surgery.³ Indeed, having treated many of the serious complications associated with intubation, otolaryngologists voiced some of the most vehement concerns over its routine use in many surgeries, including adenotonsillectomies.⁴ There were also differences in opinion amongst anesthesiologists as some advocated intubation for all procedures while others were less aggressive. Even as late as the 1950's, Robert M. Smith, MD, the "Father of Pediatric Anesthesia" in the United States, published indications for intubation, in an attempt to define which surgeries and patients would benefit from intubation.⁵ After this period, we see a growing acceptance for pediatric intubation in many routine surgeries. Undoubtedly, the increasing experience of anesthesiologists and the use of appropriate equipment helped make this a safer process. In addition, the growing number of anesthesiologists specializing in pediatrics allowed for a stronger and more concerted effort in advocating appropriate intubation. Finally, it is not unreasonable to suggest that through their clinical practices, surgeons found increasing benefits to appropriate tracheal intubation. Therefore, we see that the acceptance of pediatric endotracheal anesthesia was a slow and difficult process, and that pediatric anesthesiologists were at the forefront in this struggle to establish safe and effective airways for children during surgery.

References:

1. Steward, D.J. History of Pediatric Anesthesia. In Gregory, G.A. Pediatric Anesthesia 2nd Ed. New York: Churchill Livingstone, pp. 1-14, 1989.
2. Rendell-Baker, L. History and evolution of pediatric anesthesia equipment. *Int. Anesth. Clin.* 30(3):1-34. 1992.
3. Gross, R.E. Technical considerations in surgical therapy for coarctation of the aorta. *Surgery.* 20(1):1-8, 1946.
4. Baron, S.H., Kohlmoos, H.W. Laryngeal sequelae of endotracheal anesthesia. *Ann. Otol. Rhinol. Laryngoscopy.* 60:767-792, 1951.
5. Smith, R.M. Indications for endotracheal intubation in pediatric anesthesia. *Current Researches in Anesth. and Analg.* 33:107-114, 1954.