

History of Intubation

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Abstract

The history of airway management has become an issue of concern for clinicians because of the remarkable advances that have occurred in airway management in recent years. Endotracheal intubation became a routine medical practice in the second half of the 20th century. Thereafter, progress was made in modern anesthesia and thoracic surgery. As the number of intubated patients increased, the need for a more effective placement of the tube also increased. (*JAEM 2015; 14: 35-6*)

Key words: Intubation, evolution, endotracheal tube

Since considerable evolutions have appeared for airway management during last decades, practitioners interests in endotracheal intubation.

The use of tracheostomy dates back to old times; however, the passage of endotracheal tubes (ETTs) through the glottic opening has been performed in recent times. In Greece, Hippocrates (460-380 BC) described tracheal intubation in humans for supporting ventilation (1).

In 1543, Vesalius described the rhythmic inflation of the lungs by passing a tube or a reed into the trachea of an animal in order to manage the lethal collapse of the lungs in a pneumothorax model (2).

Close monitoring of developments in airway management is required because of the increased number of ETTs in daily practice. At first, there were only blind or tactile techniques to visualize the larynx using indirect laryngoscopy. This concept was introduced by the Spanish singing instructor Manuel Garcia (1805-1868). In 1854, he wrote a paper titled "Observations on the Human Voice," wherein he described the visualization of active vocal cords during vocalization. He managed to view the vocal cords by placing small mirrors at the end of instruments that provided specific angles (3).

The first elective oral intubation for anesthesia was performed by William Macewen in 1879. A couple of years later, Joseph O'Dwyer, of the United States, developed a system of metal tubing that could be blindly passed in order to relieve airway obstruction in children suffocating from the pseudomembrane formed in diphtheria infections. An important issue with the O'Dwyer intubation system and its variants was the necessity to perform a blind placement. Another significant advancement in airway management was the development of direct laryngoscopy, which allowed for the visualization of glottic structures. In 1829, Benjamin Guy Babington, a medical student, created the glottiscope (4).

In 1900, Kuhn (5) encountered a patient who died because of sudden bleeding in the throat. This case motivated him to develop a technique for protecting the airways via flexo-metallic bougies. In 1900, he developed a metal endotracheal tube. This was followed by the first detailed description of orotracheal intubation in 1901. He recognized the importance of safe airways during anesthesia and surgery very early, and he never gave up supporting this opinion. If the airway was insufficient or stooped during the surgery, there would be no safer and faster way than delivering a perioral tube. In 1911, Kuhn published his inventions and studies on tracheal intubation and introduced the first textbook covering this matter (5).

In 1929, Benjamin Guy Babington published the first report in London, England that described the instrument used to view the larynx. In 1930, John S. Lundy, the head of the anesthesia department at the Mayo Clinic in Rochester met Sir Ivan Magill at a medical meeting. At the meeting, Magill taught Lundy about the tracheal intubation technique. Lundy et al. enhanced this technique at the Mayo Clinic and published several articles that were related to its use in various surgical procedures. Between 1930 and 1937, they reported intratracheal tube use in a total of 5,117 surgical cases. Based on the information from another active academic center, an endotracheal tube was used in 7% of surgical cases in Wisconsin in 1933 (6).

Chevalier Jackson (1865-1958) suggested his handle-held laryngoscope for the placement of endotracheal tubes, and this laryngoscope increasingly gained popularity. Another variation of the laryngoscope with increased popularity was designed by Robert A. Miller in 1941. The most significant difference of this variation was the slight curve at the end of the blade, which facilitated pulling the epiglottis backwards. The most remarkable contribution and unquestionably

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the most popular laryngoscope around the world was developed by Sir Robert Machintosh (1897-1989) in 1943 (7).

Guedel contributed to the advances in providing safe endotracheal intubation. He designed inflatable cuffs for endotracheal tubes, using the finger parts of rubber gloves at his home laboratory. With his friend Ralph Water, an anesthesiologist in Madison, Wisconsin, he developed inflatable cuffs in the trachea, just under the larynx, for endotracheal tubes (8).

Traditionally, uncuffed tubes were used in children under the age of 8 for tracheal intubation. Because a single uncuffed tracheal tube met two needs (leak and cover) only in a small group of children, the anesthesiologists encountered a dilemma in adopting the placement of a large tube effectively covering the airway and the use of an uncuffed tube with an excessive gas leak (9).

Murphy Eye: First suggested in 1941, the "Murphy eye" is a hole through the right tip of the endotracheal tube between the leading edge of the bevel and the inflatable cuff (10).

In the 1960s, rubber was replaced with plastic as the material for endotracheal tubes. By the late 1960s, the high-volume, low-pressure cuffs, the latest step of modern ETTs, were introduced (2).

Endotracheal intubation is a procedure commonly used today. Towards the end of the 20th century it has become an indispensable application for modern anesthesia and thoracic surgery.

The endotracheal tubes in use today are disposable tubes made of plastic. Polyvinylchloride is commonly used because it is cheap, non-toxic, transparent, thermoplastic, and has a flat surface. Fiber optic video laryngoscopes will supersede classic laryngoscopes in the short- or long-term. As a result, we believe that challenging intubation will no longer be a nightmare and a difficult process and will become a routine procedure. Suffice it to say, "The future is near."

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