



From Ancient Wisdom to Modern Medicine: A Concise, Multi-Cultural History of Tracheostomy

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ABSTRACT

Educational objective: At conclusion of this presentation, the participants should be able to discuss the historical development of tracheostomy and the importance of this history on (1) current surgical practice and (2) future innovation in airway management.

Objectives: To familiarize otolaryngologists with the long and multicultural history of tracheostomy.

Study design: Historical review.

Methods: Contemporary and historical sources regarding tracheostomy and airway management were consulted. Relevant data and illustrations were compiled.

Results: The development of tracheostomy occurred over thousands of years and in many cultures. Egyptian and Greek physicians first documented tracheostomy as an uncommon, almost legendary surgery. Renaissance Italy “rediscovered” the procedure, while diphtheria and polio epidemics in the 19th and 20th centuries helped tracheostomy become safer and routine.

Conclusions: The history of tracheostomy illustrates how old ideas gain new prominence with the advancement of medical technology, which may ultimately aid otolaryngologists in the development of new techniques.

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INTRODUCTION

Tracheostomy can be traced back thousands of years. Its utilization has paralleled the development of the medical profession from anecdotal interventions to evidence-based technique. Tracheostomy has been “rediscovered” several times throughout history, as understanding of the pathophysiology of disease (airway obstruction, ventilation, pulmonary toilet) reignited interest in surgical uses of tracheostomy.

EARLY DESCRIPTIONS: LEGEND & MYTH

Ancient Egypt is often claimed to be the birthplace of the tracheostomy. Imhotep (a medical, political, and religious leader) is credited with the first airway surgery,¹ though the veracity of these claims remains questionable.²

In the 4th century B.C., Alexander the Great supposedly used his sword to open the trachea of a soldier choking on a bone.³ Around the same time, the Jewish Talmud described the insertion of reeds to through the trachea to assist in newborn ventilation, and Greek physicians described similar procedures.^{4,5}

In 11th century A.D. came the publication of the Canon of Medicine by the Persian academic Avicenna, who described stridor, upper airway management and tracheostomy using metal cannulas. Despite this, the Middle Ages saw very little advancement in airway surgery, as the procedure was seen to have limited indications.⁶ Through medieval times, *synanche* (a group of miscellaneous inflammatory disorders of the mouth, neck, and larynx) was the primary indication for tracheotomy.⁷



From: Casserius J. De voces auditusque organis histora singulari fide method ac industria concinnati tractatibus duobus eplicatea ac variis iconibus aere excusis illustrate. Ferrera. 1600.



Antonio Brasavola, 16th century, in ermine. National Library of Medicine. Date unknown.



From: Tracheotomy. Armamentarium chirurgicum bipartitum, pl. 34, oppo. p. 71. 1666.

“SCANDAL OF SURGERY” GAINS ACCEPTANCE

Though medical knowledge advanced in the Renaissance, tracheostomy was still viewed fearfully.⁷ Antonia Brasavola performed the first documented tracheotomy in a patient with an upper airway infection.¹ Frenchman Nicholas Habicot described lifesaving “bronchotomies” in the early 17th century in the context of inhaled foreign bodies, while the Royal Society in England showed a live demonstration of tracheotomy on a dog.¹

Innovative devices helped to legitimize tracheotomy. Several physicians developed tubes, dilators, and catheters; the first cuffed tracheostomy tube was developed in Germany in 1869.¹ Endotracheal intubation legitimized airway management (including trachs) during the 19th century diphtheria epidemic.⁸

CHANGING INDICATIONS: MODERN TRACHEOTOMY

Chevalier Jackson (*right*) formalized the indications for tracheotomy in 1909, publishing on techniques and pitfalls. He abandoned the “high tracheotomy” technique previously popularized, due to the complications he observed with laryngeal stenosis.⁵



Chevalier Jackson, 1939. National Library of Medicine.

A sea change occurred during the poliomyelitis epidemic of the mid-20th century, when surgeons used tracheotomy for an indication other than upper airway obstruction: ventilatory support and pulmonary toilet.^{5,9,10} In this context, tracheostomy and endotracheal intubation began to serve complementary purposes.¹¹ As ICUs multiplied in the late 20th century, airway management with tracheostomy was reconsidered.

CONCLUSIONS

The development of endotracheal intubation, percutaneous techniques, and minimally invasive endolaryngeal techniques for airway management will continue to shape the modern practice of tracheostomy. The history of tracheotomy illustrates how surgical techniques may be influenced by emerging indications and better understanding of physiology.

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