بسم الله الرحمن الرحيم

HOSSAM MAGHRABY

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التوثيق الالكتروني والميكروفيلم

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علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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بالرسالة صفحات

لم ترد بالأصل

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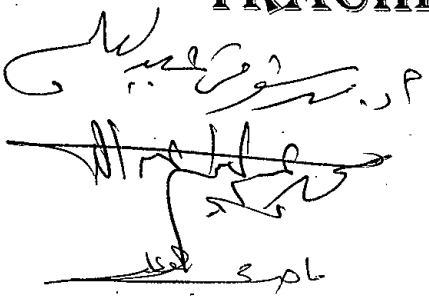
بسم الله الرحمن الرحيم

THE ADVANTAGES OF THE LARYNGEAL MASK VERSUS TRACHEAL TUBE IN CHILDREN



Thesis

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By

Ahmed Ibrahim Morsy
MBBCH Alex

Faculty of Medicine
University of Alexandria

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SUPERVISORS

Prof. Dr. Mohamed Shawki Abdel Alim

Professor of anaesthesia,
Faculty of Medicine,
University of Alexandria

Prof. Dr. Ahmed El-Attar

Professor of anaesthesia,
Faculty of Medicine,
University of Alexandria

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CONTENTS

Chapter I

INTRODUCTION

INTRODUCTION

Anatomical consideration :

The pharynx :

The pharynx is a wide muscular tube, which forms the common upper pathway of the respiratory and alimentary tracts. It has a thin wall which comprises three curved sheets of muscles : the superior, middle, and inferior constrictors. Anteriorly, it is in free communication with the nasal cavity, the mouth and larynx, which divides it conveniently into three parts : the naso-, oro- and laryngo-pharynx respectively. Posteriorly, it rests against the cervical vertebrae and the prevertebral fascia. The pharynx extends from the base of the skull to the level of the lower border of the cricoid cartilage (C_6). [1]

Nerve Supply :

Motor nerves of the pharyngeal constrictors are derived from the axons of the cell bodies of the nucleus ambiguous. The sensory supply of the mucosa of the nasopharynx is derived from the maxillary nerve, while the mucosa of the oropharynx including the vallecula, is innervated by the glossopharyngeal nerve. The pyriform fossa is supplied by the vagus via its recurrent and internal laryngeal branches. [2]

The larynx :

It consists of frame work of articulating cartilages, linked together by ligaments, and move in relation to each other by the action of the laryngeal muscles. It lies opposite the fourth, fifth, and sixth cervical

vertebrae. Three of the laryngeal cartilages are paired : the arytenoid, conrniculate, and cuneiform cartilages, and three are single, these are the thyroid, cricoid and epiglottic cartilages.[3]

Nerve supply :

The nerve supply of the larynx is derived from the vagus via its superior and recurrent laryngeal branches :

- The superior laryngeal nerve, divides into a small external branch which supplies the crico-thyroid muscle, and a larger internal branch which provides sensory supply to the interior of the larynx as far down as the vocal cords.
- The recurrent laryngeal nerve, provides the motor supply to the intrinsic muscles of larynx (except the cricothyroid muscle), as well as the sensory supply to the laryngeal mucosa below the vocal cord.[4] (Fig. 1)

Reflex functions of pharynx and larynx :

In addition to the important and vital involuntary functions of both the pharynx, and larynx including cough, sneezing and deglutition reflexes, both of them trigger a variety of reflexes involving both, the cardiovascular and respiratory systems in response to mechanical, physical and chemical stimulation. [5] Such stimuli are sensed by receptors located in the mucosa and submucosa of the pharynx and larynx, with the afferents being the branches of the glossopharyngeal, the vagus, and the trigeminal nerves, the centers being in the brain stem and hypothalamus, and the efferent limb is formed either by the vagus which supplies the heart, the glottis, and the tracho-bronchial tree, and produces such parasymathetic responses as

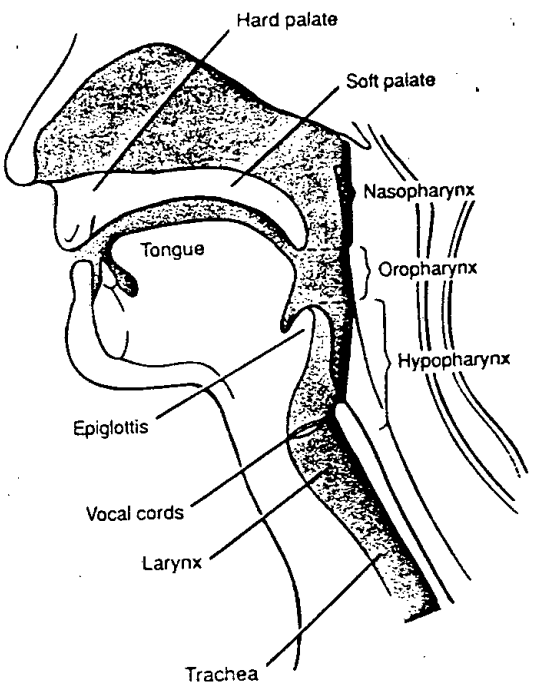

Figure 1. Anatomy of the airway.

laryngeospasm, bronchospasm, bradycardia, and even asystole, [6] or, on the other hand, the efferent may be through the sympathetic nervous system either to the heart through segments T_1 - T_4 producing cardic acceleration and arrhythmias, or to the blood vessels through other segments of sympathetic outflow, causing an increase in the total peripheral resistance and consequently hypertension. [7]

Differences in airway anatomy in children :

Differences in airway anatomy make the potential for technical airway difficulties greater in infants than in teenagers or adults. The airway of the infants differs in five ways : [8,9]

1. The relatively large size of infant's tongue in relationship to the oropharynx increases the likelihood of airway obstruction and technical difficulties during laryngoscopy.

2. The larynx is located higher in the neck, thus making straight blades more useful than curved blades.

3. The epiglottis is shaped differently, being short and stubby, and is angled over the laryngeal inlet. Control with the laryngoscope blade is therefore more difficult.

4. The vocal cords are angled, so that a blindly passed endotracheal tube may easily lodge in the anterior commissure rather than slide into the trachea.

5. The infant larynx is funnel-shaped, the narrowest portion occurring at the cricoid cartilage. In the adult an endotracheal tube that passes the vocal cords will readily pass into the trachea, as the glottic opening is the narrowest portion of the larynx. In the infant or young child an