Recent Updates for Management of the Difficult Airway

Essay

Submitted for Partial Fulfillment of Master Degree.
in Anaesthesia

By

Joseph Farouk Atta Hakiem
M.B. B.Ch.
Kasr Al Ainy -Cairo University

Under Supervision of

Prof. Galal Adel El kady
Professor ofanaesthesia ,I.C.U and Pain management
Faculty of Medicine-Ain Shams University

Dr.Ehab Hamed Abdel salam
Assistant prof. ofanaesthesia ,I.C.U and Pain management
Faculty of Medicine-Ain Shams University

Dr.Amr Sobhy Abdel Kawy
Lecturer of anaesthesia , I.C.U and Pain management
Faculty of Medicine-Ain Shams University

Faculty of Medicine
Ain Shams University
2016

Contents

Acknowledgment

Many thanks to ***GOD****, who granted me the ability to perform this essay.*

I would like to thank ***Prof. GalalAdel El kady,*** *Professor ofanaesthesia ,I.C.U and Pain management Faculty of Medicine-Ain Shams University as the senior supervisor for his help and great support during this work. I am indebted to him for fathering this research.*

It is also a pleasure to express my deep gratitude to ***Dr.Ehab Hamed Abdel Salam*** *Assistant prof. ofanaesthesia ,I.C.U and Pain management Faculty of Medicine-Ain Shams University To him goes the credit of bringing this work to light . His continuous encouragement and generous help have promoted me to carry this work. I feel greatly indebted and grateful to him.*

I would like also to thank ***Dr.Amr Sobhy Abdel Kawy****lecturer of anaesthesia, I.C.U and Pain management Faculty of Medicine-Ain Shams University, for his guidance and encouragement throughout this work. I was fortunate to carry out this essay under his guidance*

List of Abbreviations

A-O gap	:	Atlanto-occipital gap
A-O joint	:	Atlanto-occipital joint
CC	:	Cricoid cartilage
CICO	:	Cannot intubate, cannot oxygenate
CT	:	Computed tomography
DA	:	Difficult airway
DAS	:	Difficult Airway Society
ETC	:	EsophagotrachealCombitube
ETI	:	Endotracheal intubation
ETT	:	Endotracheal tube
EzT	:	Easy Tube
GVL	:	GlideScope video-laryngoscope
ICU	:	Intensive care unit
IHD	:	Ischemic heart disease
IPPV	:	Intermittent positive-pressure ventilation
LMA	:	Laryngeal Mask airway
LT	:	Laryngeal Tube
LTS	:	Laryngeal Tube S
MRI	:	Magnetic resonance imaging
NODESAT	:	Nasal Oxygenation During Efforts Of Securing A Tube
PEEP	:	Positive end-expiratory pressure
PES	:	Pre-epiglottic space
PPV	:	Positive pressure ventilation
SAD	:	Supraglottic airway device
SLIPA	:	Streamlined Liner of Pharyngeal Airway
SM	:	Strap muscles
TC	:	Thyroid cartilage
TMJ	:	Tempromandibular joint

List of Abbreviations(Cont.)

TR	:	Tracheostomy
TT	:	Tracheostomy tube
US	:	Ultrasonography
VL	:	Video-laryngoscope

List of Figures

List of Figures (Cont.)

List of Figures (Cont.)

List of Tables

Abstract

Management of the difficult airway remains one of the most relevant and challenging tasks for anesthesia care providers. This essay focuses on airway management devices and techniques and their clinical application, with particular emphasis on the difficult or failed airway. It includes descriptions of many new airway devices.also it includes airway assessment techniques,algorithms of difficult intubation in different situations and finally complications of difficult intubation and other airway management procedures.

Key words

Difficult airway, difficult intubation,airway assessment,strategies and algorithms of difficult intubation,complications

Introduction

Management of the difficult airway remains one of the most relevant and challenging tasks for anesthesia care providers. This essay focuses on airway management devices and techniques and their clinical application, with particular emphasis on the difficult or failed airway. It includes descriptions of many new airway devices. **(Apfelbaum *et al.*, 2013).**

Adverse outcomes related to airway management may have deleterious consequences such as brain damage, cardiac arrest and death due to hypoxia. Thus if the anaesthetist loses control over the airway he may severely harm or even lose his patient. (**Cheney *et al.*, 2006).**

A difficultairway is defined as the clinical situation in which a conventionally trained anesthesiologist experiences difficulty with facemask ventilation of the upper airway, difficulty with tracheal intubation, or both. **(Apfelbaum *et al.*, 2013).**

Development of algorithms for the management of the difficult airway should be primarily based on clinical needs. The following scenarios should be covered: Expected difficult airway, unexpected difficult airway, and

difficult ventilation by mask and/or supraglottic devices and difficult intubation. **(Schaeuble & Heidegger 2012).**

The purpose of these Guidelines is to facilitate the management of the difficult airway and to reduce the likelihood of adverse outcomes. The principal adverse outcomes associated with the difficult airway include:brain injury, cardiopulmonary arrest, airway trauma, and damage to the teeth. **(Apfelbaum *et al.*,2013).**

Aim of the Work

- ✓ Discussing new devices and techniques for difficult airway management.
- ✓ Discussing recent airway management guidelines and algorithms.

Anatomy ofthe Airway

The airway extends from the external nares to the junction of the larynx with the trachea. It includes the nose, oral cavity,tongue, the pharynx and the larynx. Functions of the airway include phonation, olfaction, digestion, humidification and warming of inspired air.***(Brown, 2000)***.

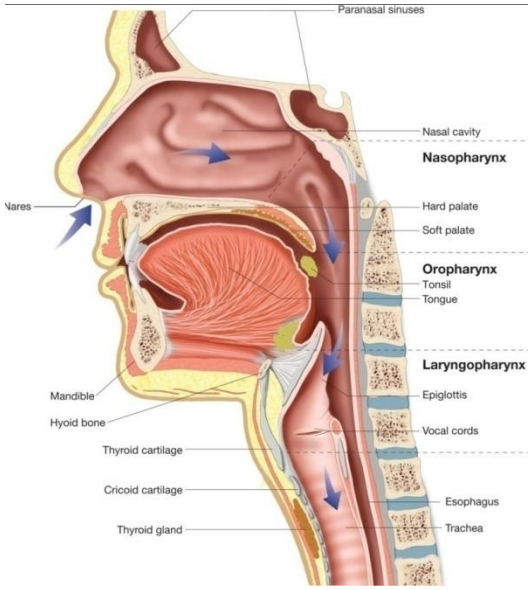

Fig. 1.1 The Airway ***(Brown 2000)***

Thenose:

The external nose is a pyramidal structure, situated in the midface, with its base on the facial skeleton and its apex projecting anterior. The paired nasal bones form the external nose superiorly and two sets of paired cartilage inferiorly. The upper lateral cartilages provide the shape of the middle third of the nose and support for the underlying nasal valve. The paired lower lateral (alar) cartilages are butterfly-shaped and consist of medial and lateral crura. The medial crus forms the columella, and the lateral crus

defines the shape of the nasal alae. Together, these crura maintain the patency of the underlying nasal vestibule. Internally, the cartilage is supported by the nasal septum. **(Dion *et al.*, 1978).**

Vestibule:

The nasal vestibule is the most anterior part of the nasal cavity. It is enclosed by the cartilages of nose and lined by the same epithelium of the skin (stratified squamous, keratinized). The other part of the nasal cavity, which is lined by the respiratory epithelium, is called nasal cavity proper. Inside the vestibule are small hairs called vibrissae, which filter dust and other matter that are breathed in. Within the vestibule, the epithelium loses its keratinised nature and undergoes a transition into typical respiratory epithelium before entering the nasal fossa. **(Cauna1982).**

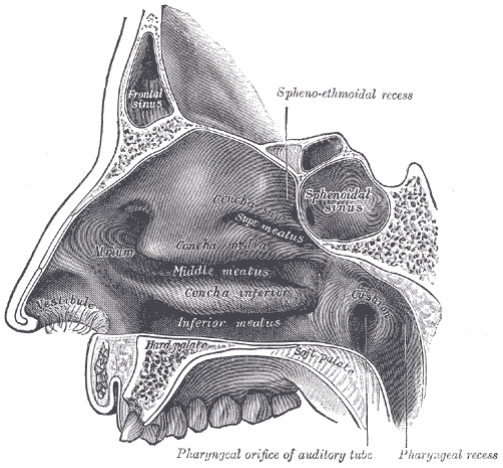

Fig. 1.2 The nasal cavity ***(Gray, 1918)***

- **Blood supply to the nose:**

Blood supply to the nose is by both internal and external carotid arteries. The anterior and posterior ethmoidal arteries are branches of the ophthalmic artery,