



# **Video Assisted Laryngoscope in Difficult Intubation**

***Essay***

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In Anesthesiology*

***By***

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# Contents

List of Abbreviations .....	i
List of Tables .....	ii
List of Figures .....	iii
<b>Introduction and Aim of the Work .....</b>	<b>1</b>
<b><i>Chapter (1) :Anatomy of the airway. ....</i></b>	<b>3</b>
<b><i>Chapter (2) :Airway assessment. ....</i></b>	<b>18</b>
<b><i>Chapter (3) :Airway devices. ....</i></b>	<b>36</b>
<b><i>Chapter (4) :Management of difficult airway. ....</i></b>	<b>69</b>
<b><i>Chapter (5) :Video-assisted laryngoscope .....</i></b>	<b>96</b>
<b>Summary .....</b>	<b>128</b>
<b>References .....</b>	<b>130</b>
<b>Arabic Summary .....</b>	<b>--</b>

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## List of Abbreviations

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AC	: Alternating-current
AO	: Atlanto occipital joint
ASA	: American Society of Anesthesiologist
BMI	: Body mass index
BMV	: Bag mask ventilation
CAFG	: The Canadian airway focus group
COPA	: Cuffed oropharyngeal airway
DA	: Difficult airway
ETT	: Endotracheal tube
HFJV	: High frequency jet ventilation
LMA	: Laryngeal mask airway
PPV	: Positive pressure ventilation
RGB	: Red, green, blue
T-M	: Thyromental
C\L	: Cormack and lehane

## List of tables

<b><i>Table</i></b>	<b><i>Title</i></b>	<b><i>Page</i></b>
1	Differences between normal adult and pediatric airway	17
2	Etiology of difficult airway	20
3	Appropriate-Size Selection and Maximum Cuff Inflation Volumes	44
4	Advantages and Disadvantages of Video Laryngoscopy	99
5	Types of Video Laryngoscopes	102

## List of Figures

<b><i>Fig.</i></b>	<b><i>Title</i></b>	<b><i>Page</i></b>
1	Major structure of upper airway	4
2	The Cartilages of the Larynx	10
3	Illustrating laryngoscopic view of interior of larynx	12
4	The intrinsic muscles of the larynx	14
5	Illustrating Mallampati classification (oropharyngeal view)	24
6	The hyoid-chin distance	27
7	LEMON airway assessment method	28
8	Laryngoscopic view .Grades	29
9	Oropharyngeal Guedel airway	38
10	Nasopharyngeal airway	39
11	Cuffed oropharyngeal airway "COPA"	40
12	Ideal position of the cuffed oropharyngeal airway	42
13	Classic Laryngeal Mask Airway (LMA Classic™)	44
14	Types of LMA Flexible™	46
15	Insertion Technique of LMA	47
16	Intubating Laryngeal Mask Airway (LMA Fastrach™)	48
17	Gastric Laryngeal Mask Airway (LMA ProSeal™)	50
18	Intubating Laryngeal Mask Airway (LMA CTrach™)	51
19	I GEL	52
20	Esophageal-Tracheal Combitube	53
21	Laryngeal Tube	54
22	Types of Laryngoscope Blades	58
23	Flexible Tip Laryngoscope	60

## List of Figures (Cont.)

<b><i>Fig.</i></b>	<b><i>Title</i></b>	<b><i>Page</i></b>
24	Glidescope	62
25	Coopdech & Macintosh Video Laryngoscope	62
26	AIRTRAQ® Laryngoscope	64
27	Fiberoptic Laryngobronchoscope	68
28	Types of Cricothyrotomy Sets	82
29	The trachea is exposed and an incision made in the second tracheal r	84
30	The tracheostomy tube is inserted into the trachea	84
31	The position of the tracheostomy tube in the trachea. Note that the balloon on the tube is inflated to prevent secretions from going into the lungs	85
32	The wound is closed around the tracheostomy tube	85
33	Unanticipated difficult intubation during routine induction of anaesthesia	93
34	Unanticipated difficult intubation during rapid sequence induction	94
35	Failed intubation: reseue techniques for the can't not intubate can't ventilate situation	95
36	Glidescope (improving glottis visualization)	97
37	Teaching demonstration using the original GlideScope	98
38	Intubating stylet	103
39	Bullard laryngoscope	106
40	Airtraq laryngoscope	107
41	Pentax AWS laryngoscope	108

## List of Figures (Cont.)

<i><b>Fig.</b></i>	<i><b>Title</b></i>	<i><b>Page</b></i>
42	The Res-Q-Scope	109
43	Coopdech C –scope	110
44	Storz –c mac laryngoscope	111
45	The McGrath video laryngoscope	113
46	Glidoscope Ranger	115
47	Tracheal intubation performed using a GlideScope GVL with the image displayed on both the dedicated 7-inch monitor and exported to a large video display	116
48	GVL glidoscope	117
49	Intubation of patient with cervical spine injury using the GlideScope Ranger	120



## **Introduction**

One of the fundamental responsibilities of an anesthesiologist is to maintain adequate oxygenation. Failure to maintain a patent airway for more than few minutes results in brain damage or death (*Bellhouse, 1997*).

Focusing on the possibility of improving glottis visualization, has rapidly led to new products which can allow intubation to be performed under direct vision, overcoming the restrictions in patient anatomy that make direct laryngoscope difficult or impossible, for example, using fibro optic & video technology (*Agro, 2009*).

In recent decades, video techniques have been employed in the majority of endoscopic procedures because of several distinct advantages provided. These include the following: The displayed anatomy is magnified. Recognition of the anatomical structures and anomalies is easier, and manipulation of airway devices is facilitated. When assistance is required, the operator and assistant can coordinate their movements because each sees exactly the same image on the video monitor. As a result, video techniques have become the method of choice in teaching (*Kaplan, 2002*).

## **Aim of the work**

This essay will present the anatomical relevant data of the airway, assessment and management of the difficult airway, pass through several traditional & new airway devices especially video assisted laryngoscope and their clinical applications in anesthetic practice.

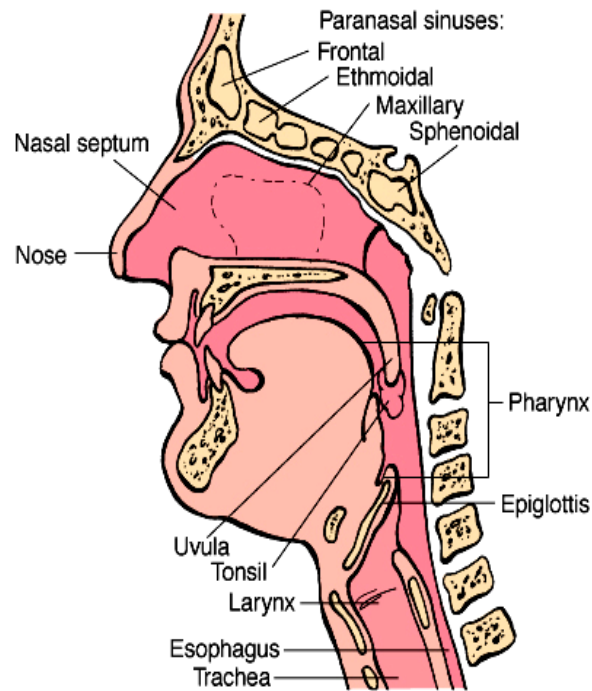
## Chapter (1)

### Anatomy of the Upper Airway

The human airway could be divided by an imaginary line passing through the larynx at the level of the vocal cords into upper airway including "oral and nasal cavities, pharynx and supra-glottic part of the larynx" and lower airway including "sub-glottic part of the larynx, trachea, right and left main bronchi and bronchopulmonary segments (*Hutton et al., 2002*).

#### **A) The Upper Airway**

There are two openings to the human airway, the nose and the mouth. The former leads to nasopharynx and the latter leads to oropharynx. They are separated anteriorly by palate, but joined posteriorly at the base of the tongue where the epiglottis prevents aspiration by covering the glottis during swallowing (*Hutton et al., 2002*).



**Fig. (1):** Major structure of upper airway (*Morris,1998*)

### **The Mouth**

The mouth is made up of the vestibule and the mouth cavity, the former communicating with the latter through the aperture of the mouth.

**Nerve supply:** The palatine nerves provide sensory fibers from the trigeminal nerve to the hard and soft palate. The lingual nerve (a branch of the mandibular division of the trigeminal nerve) and glossopharyngeal nerve provide general sensation to the anterior two-third and posterior third of the tongue, respectively (*Ellis et al., 2004*).

***Tongue:***

**Muscles of the tongue:**

There are two groups; intrinsic muscles that alter the shape of the tongue and extrinsic muscles which move the tongue, they include styloglossus (retracts), genioglossus (protrudes), hyoglossus (depresses), and palatoglossus (narrows oropharynx).

**Nerve supply of the tongue:**

Sensory; by trigeminal nerve for general sensations. Motor; all muscles are innervated by hypoglossal nerve except palatoglossus supplied by vagus nerve.

***The palate:***

Palate is the partition which separates the nasal cavity from the oral cavity and made of two parts; hard palate.(*Ellis, 1997*).

**Nerve supply of the palate:**

Sensory nerve supply; soft palate is supplied by lesser palatine nerve and hard palate is supplied by greater palatine nerve. Motor nerve supply; All muscles of palate are supplied by cranial root of accessory nerve through the vagus nerve except tensor palati which is supplied by mandibular nerve (*Ellis, 1997*).

## **The Nose**

The nose is divided anatomically into the external nose and the nasal cavity (*Ellis et al., 2004*).

*The External Nose* is formed by an upper framework of bone, a series of cartilages in the lower part, The cartilage of the nasal septum comprises the central support of this framework. (*Ellis et al., 2004*).

*The Cavity of the Nose* is subdivided by the nasal septum into two separate compartments Each side of the nose presents a roof, a floor and a medial and lateral wall. (*Ellis et al., 2004*).

### **Nerve supply:**

The olfactory nerve supplies the specialized olfactory zone of the nose, which occupies an area of some 2 cm in the uppermost parts of the septum and lateral walls of the nasal cavity. The ordinary sensory nerves are derived from the nasociliary branch of the 1st division of trigeminal nerve and also from the 2<sup>nd</sup> or maxillary division (*Ellis et al., 2004*).

### **The pharynx**

The pharynx is a wide muscular tube that forms the common upper pathway of the respiratory and alimentary tracts. Anteriorly, it is in free communication with the nasal cavity, the mouth and the larynx, which conveniently divide it into three parts, termed the nasopharynx, oropharynx and laryngopharynx, respectively. In extent, it reaches from the skull (the basilar part of the occipital bone) to the origin of the oesophagus at the level of the 6<sup>th</sup> cervical vertebra (C<sub>6</sub>). Posteriorly, it rests against the cervical vertebrae and the prevertebral fascia ( *Ellis et al., 2004*).

### ***The Nasopharynx***

The nasopharynx lies behind the nasal cavity and above the soft palate. It communicates with the oropharynx through the pharyngeal isthmus, which becomes closed off during the act of swallowing. ( *Ellis et al., 2004*).

### ***The oropharynx***

The mouth cavity leads into the oropharynx through the oropharyngeal isthmus, which is bounded by the palatoglossal arches, the soft palate and the dorsum of the tongue. ( *Ellis et al., 2004* )