Supraglottic airway devices as a new method for difficult airway management

Essay

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Aim of the Essay

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1. ASA:American society of anesthesia.
2. DAS: Difficult airway society.
3. AO:Atlanto-occipital joint.
4. TM:thyromental distance.
5. LMA-Classic:laryngeal mask airway-classic.
6. ILMA:intubating laryngeal mask airway.

7. LMA-PROSEAL:laryngeal mask air way –proseal.
8. LMA_Ctrach:laryngeal mask airway C-trach.
9. LMA-Fastrach:laryngeal mask airway Fastrach.
10.ETT: endotracheal tube.

11.SILPA:The Streamlined Pharynx Airway Liner.

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Introduction

The major responsibility of the anesthesiologist is to provide adequate respiration for the patient. The most vital element in providing functional respiration is the airway. No anesthetic is safe unless diligent efforts are devoted to maintain an intact functional airway ***(Thomas J. Gal, 2005).***

Maintenance of airway depends on proper knowledge of anatomy of patent upper and clear lower airways, with proper use of drugs, early detection and proper management. Failure to maintain patent airway for more than few minutes results in cyanosis, cardiac arrthymias, ischemic pains, agitations, and finally brain death ***(Ward KR, Yealy DM. 1998).***

Airway assessment is the first step in successful airway management. Several anatomical and functional maneuvers can be performed to estimate the difficulty of the airway passages; however, it is important to note that successful ventilation (with or without intubation) must be achieved by the anesthetist if mortality and morbidity are to be avoided ***(John F. Butterworth et al., 2013).***

Airway management, specifically ensuring uninterrupted oxygenation and ventilation is a fundamental part of the practice of anesthesia and of emergency and critical care medicine. Difficulty in airway management can be categorized as difficult mask ventilation and/or difficult tracheal intubation ***(American Society of***

Anesthesiologists Task Force on Management of the Difficult Airway, 2003).

Practice guidelines have been established to aid management of the difficult airway and to reduce poor outcomes, and several algorithms have been developed. Maintenance of patient oxygenation is the cornerstone of difficult airway management, and is highlighted in algorithms from these various airway management guidelines ***(Petrini F. et al., 2005).***

Supraglottic airway devices **(SADs)** have being used increasingly since their introduction into clinical practice, and are included in many guidelines and recommendations for securing the airway ***(Timmermann A., 2011).***

Archie Brain has revolutionized airway management since the 1980s with his original laryngeal mask invention. Introduction of the second generation supraglottic airway devices with a gastric drain port and separate breathing channel then heralded a new era where these devices are now widely used for surgery in patients who would have been traditionally intubated for general anesthesia. ***(Van Zundert TC et al., 2012).***

Airway Anatomy

Knowledge of anatomy is essential to the study of airway management. First, anatomical considerations are helpful in diagnosing certain problems. Second, some procedures involved in establishing and maintaining an airway are performed under emergency conditions. Third, in many procedures involving the airway, such as intubation, anatomical structures are only partially visible ***(Brendan T. Finucane and Albert H. Santora, 2003).***

(A) The Mouth

The mouth extends from the lips (anterior) to the isthmus of the fauces (posterior). There are two sections connected together through the mouth aperture: Vestibule - slit-like cavity between the cheeks/lips and gingivae/teeth, Oral cavity – from the alveolar arch of the maxilla and the mandible and teeth to the oropharyngeal isthmus **(*figure1) (Erdmann A., 2001*).**

1. RELATIONS:

Roof – hard and soft palate.

Floor – two thirds of the tongue and its reflection mucous membrane on the mandible. The floor of the mouth is mainly supported by the paired mylohyoid muscles arising from the mandible and inserting into the hyoid bone. The mylohyoid muscle subdivides the area beneath the jaw

and tongue into two potential spaces; the submandibular space and the sublingual space. Posterior – isthmus separates the oral cavity from the oropharynx. ***(Erdmann A., 2001).***

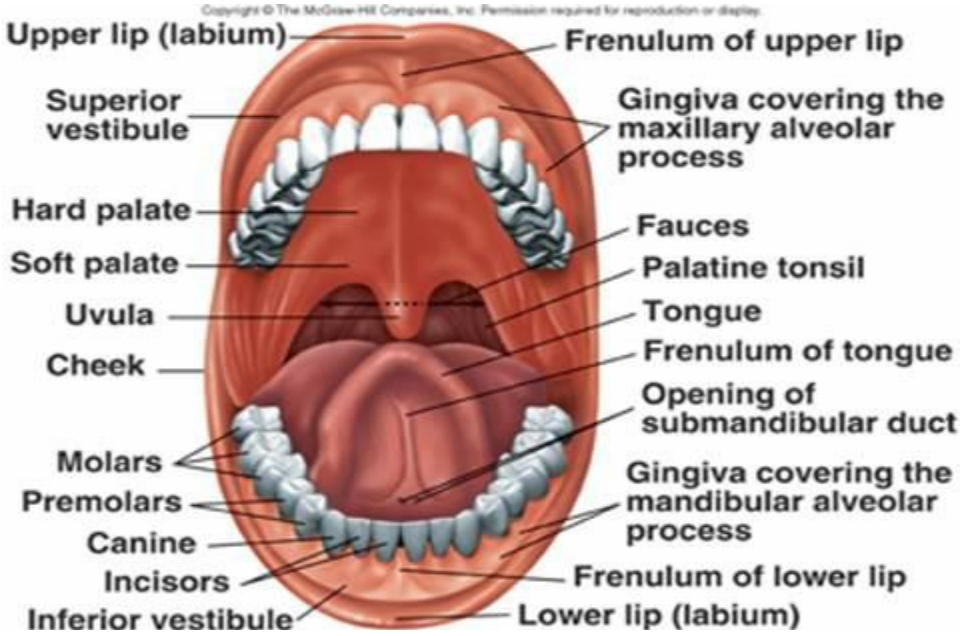

Figure (1): View of the open mouth with the tongue elevated **(*Ovassapian A., 1996*).**

(B) The Palate

The **hard palate** is made up of the palatine processes of the maxillae and the horizontal plates of the palatine bone. The **soft palate** hangs like a curtain suspended from the posterior edge of the hard palate. Its free border bears the uvula centrally and blends on either side with the pharyngeal wall. The anterior aspect of this

curtain faces the mouth cavity; the posterior aspect is a part of the nasopharynx ***(Ellis H. et al., 2004).***

Muscles of the soft palate ***(figure2)***

(1)The tensor palate: Its action is to tighten and flatten the soft palate.

(2)The levator palate: It elevates the soft palate.

(3)The palatoglossus: It approximates the palatoglossal folds.

(4)The palatopharyngeus: It approximates the palatopharyngeal folds.

(5)The musculus uvulae: Injury to the cranial root of the accessory nerve, which supplies this muscle via the vagus nerve, results in the uvula becoming drawn across and upwards towards the opposite side ***(Ellis H. et al., 2004).***

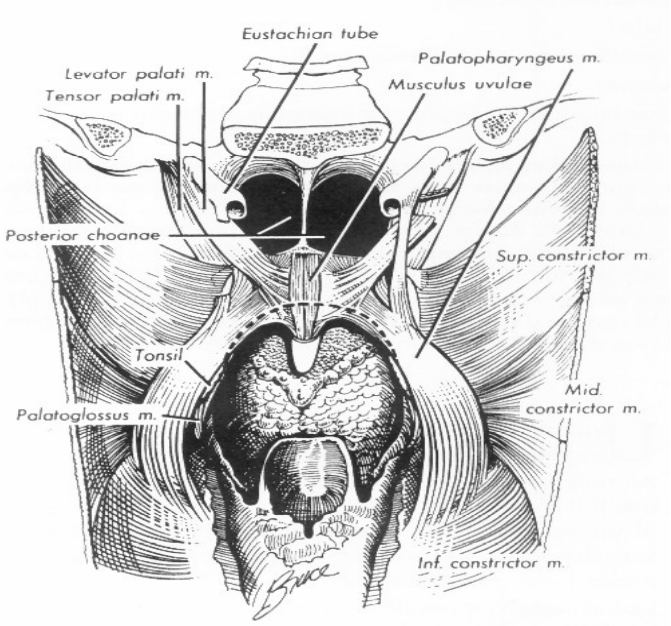

Figure *(2):* *Muscles of the Soft Palate* ***(Harold Ellis and Stanley Feldman, 2000)***

1. Nerve Supply of Soft Palate Muscles:

The tensor palati is innervated by the mandibular branch of the trigeminal nerve via the otic ganglion. The other palatine muscles are supplied by the pharyngeal plexus, which transmits cranial fibers of the accessory nerve via the vagus ***(Ellis H. et al., 2004).***

(C) The Nose

The nasal airway extends from the anterior nares (nostrils) to the posterior nares (or choanae) before the nasopharynx. The nose itself contains the two nasal vestibules, each approximately 2 cm long and 1 cm wide, and leads to a nasal cavity. The nasal cavity is a narrow passage that extends back almost horizontally from the vestibule and is lined mainly by a ciliated columnar epithelium. Its surface area is increased by three horizontally running bony folds: the superior, middle and inferior conchae (turbinates). ***(figure3) (Alan R. Atikenhead et al., 2003).***