RECENT ADVANCES IN UPPER AIRWAY TRAUMA MANAGEMENT IN ADULTS & ITS RELATION TO ANESTHESIA

An Essay

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ATLS	:	Advanced Trauma Life Support
COP	:	Cardiac Output
FAST	:	Focused assessment sonography in trauma
GCS	:	Glasgow coma scale.
IVC	:	Inferior vena cava.
LMA	:	Laryngeal Mask Airway
OR	:	Operating Room.
ER	:	Emergency department.
ETT	:	Endotracheal tube
FFB	:	Fiberoptic bronchoscope.
RSI	:	Rapid sequence induction
BMV	:	Bag-mask ventilation.
NMB	:	Neuromuscular blockade.
CPAP	:	Continuous positive airway pressure
ICP	:	Intracranial pressure.
FDA	:	Food & Drugs Administration
LMA	:	Laryngeal mask.
FOS	:	Fiber-optic scope.

Introduction

The first priority in the care of all trauma patients is the confirmation of a patent airway to ensure adequate oxygenation and ventilation. The ABCs of trauma resuscitation begin with the airway evaluation, and effective airway management is imperative in the care of a patient with critical injury ***(Miraflor et al., 2011)***.

Patients may require emergency tracheal intubation (ETI) for various reasons following injury including hypoxia, hypoventilation, or failure to maintain or protect the airway owing to altered mental status. However, multiple factors may be present, which make the decision to intubate less straightforward ***(Miraflor et al., 2011)***.

One of the most difficult aspects of airway management in trauma is the potential deterioration in clinical status, which may occur during the early phases of resuscitation. The decision to intubate may go well beyond a patient's ability to oxygenate or ventilate.It has long been established that any decrease in oxygen delivery to the injured brain, precipitated by hypoxia or hypotension, increases morbidity and mortality in the setting of severe traumatic brain injury ***(Muakkassa et al., 2010)***.

The decision is not only whether a patient needs intubation but also when and how to intubate. Delays in adequate airway management may have devastating consequences, and this is one of the more common causes of preventable death in both the prehospital and the emergency department setting ***(Wang et al., 2011)***.

Even for patients that are initially stable, a delay in intubation is associated with increased mortality from 1.8% to 11.8% in one study.In addition, ETI has the potential to cause secondary injury if performed inadequately or unsuccessfully by creating or exacerbating hypoxia or hypotension ***(Wang et al., 2011)***.

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Aim of the work

The aim of the work is to discuss and show the recent updates in anesthetic management of severe airway trauma.

I. Anatomy of the upper airway

A. Nose

The airway functionally begins at the nares and the mouth, where air first enters the body. Resistance to airflow through the nasal passages is twice the resistance that occurs through the mouth. Therefore, during exercise or respiratory distress, mouth breathing occurs to facilitate a reduction in airway resistance and increased airflow***(Pohunek, 2004*)**.

The nose serves a number of functions: respiration, olfaction, humidification, filtration and phonation. In the adult human, the two nasal fossae extend 10 to 14 cm from the nostrils to the nasopharynx. The two fossae are divided mainly by a midline quadrilateral cartilaginous septum together with the two extreme medial portions of the lateral cartilages. The nasal septum is composed mainly of the perpendicular plate of the ethmoid bone descending from the cribriform plate, the septal cartilage, and the vomer***(Patil et al., 2007)***.

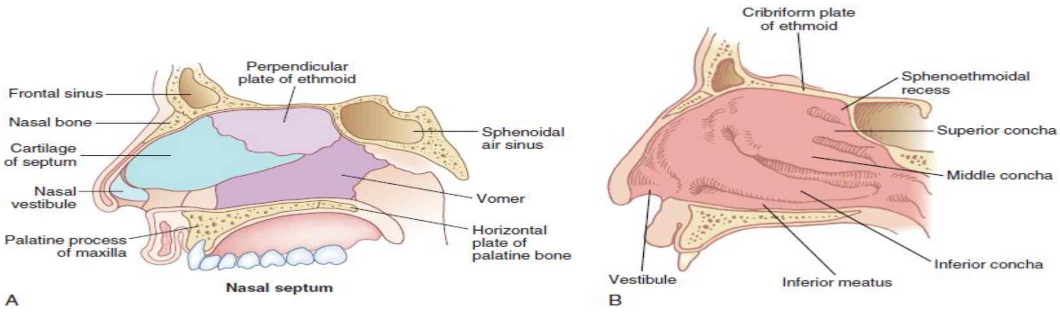

Fig. 1: A. Medial wall of nasal cavity ***(Carin & Hagberg, 2013)***.
B. Lateral wall of nasal cavity***(Carin & Hagberg, 2013)***.

Each nasal fossa is convoluted and provides about 60cm² surface area per side for warming and humidifying the inspired air. The nose is also able to prewarm inspired air to a temperature of 32°C to 34°C, over a wide range of ambient temperatures from 8°C to 40°C. The nasal fossa is bounded laterally by inferior, middle, and superior turbinate bones (conchae) which divide the fossa into scroll-like spaces called the inferior, middle, and superior meatuses. The arterial supply to the nasal cavity is mainly from the ethmoid branches of the ophthalmic artery, the sphenopalatine and greater palatine branches of the maxillary artery, and the superior labial and lateral nasal branches of the facial artery and nerve supply through trigeminal nerve for general sensations and olfactory nerve for sense of smell ***(Thomas et al., 2009)***.

B. Pharynx

The pharynx, 12 to 15 cm long, extends from the base of the skull to the level of the cricoid cartilage anteriorly and the inferior border of the sixth cervical vertebra posteriorly. It is widest at the level of the hyoid bone (5 cm) and narrowest at the level of the esophagus (1.5 cm), which is the most common site for obstruction after foreign body aspiration. It is further subdivided into the nasopharynx, oropharynx, and laryngopharynx ***(Isono et al., 2009)***.

The nasopharynx, which primarily has a respiratory function, lies posterior to the termination of the turbinates and nasal septum and extends to the soft palate. The oropharynx has primarily a digestive function, starts below the soft palate, and extends to the superior edge of the epiglottis.The laryngopharynx (hypopharynx) lies between the fourth and sixth cervical vertebrae, starts at the superior border of the epiglottis, and extends to the inferior border of the cricoid cartilage, where it narrows and becomes continuous with the esophagus. The eustachian tubes open into the lateral walls of the nasopharynx. In the lateral walls of the oropharynx are situated the tonsillar pillars of the fauces. The anterior pillar contains the glossopharyngeus