TRACHEOSTOMY IN THE INTENSIVE CARE UNIT

CONTROVERSIES AND UPDATES

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قَالُوا سُبْحَانَكَ

لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا

إِنَّكَ أَنتَ العَلِيمُ الحَكِيمُ

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List of Abbreviations

Abbrev	Term
APACHE	Acute physiology and chronic health evaluation
ARDS	Acute respiratory distress syndrome
CO_2	Carbon dioxide
COPD	Chronic obstructive pulmonary disease
ETT	Endo tracheal tube
FIO_2	Fraction of inspired oxygen
ICU	Intensive care unite
LMA	Laryngeal mask air way
LOS	Length of stay
OR	Operating room
OS	Open surgical tracheostomy
$PaCO_2$	Partial pressure of carbon dioxide in arterial blood
PDT	Percutaneous dilatational tracheostomy
PEEP	Positive end expiratory pressure
UK	United kingdom
VAP	Ventillator associated pneomonia
WOB	Work of breathing

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Introduction

Tracheostomy is a surgical procedure to create an opening through the neck into the trachea. It remains a very important life saving surgical procedure worldwide particularly in our environment. As the trachea is easily accessible at bed side it provides access for emergency airway cannulation and for long-term airway access.**(Neacy KA,2009).**

The decision to perform tracheostomy should be made after considering various factors, including the patients' characteristics, ICU diagnosis, severity of illness, morbidities, response to treatment, overall hospital course, and the physician's judgment. **(D.C.Scales et al, 2008).**

The most common indications for tracheostomy are relieve of upper airway obstruction, prolonged mechanical ventilation, airway protection in the comatose and facilitation of tracheo-bronchial toileting**. (Adoga AA, 2010).**

However Long-term mechanical ventilation, failure of extubation is the most common situations where tracheostomy is indicated for patients in intensive care units.

'Early' and 'late' tracheotomies are two categories of the timing of tracheotomy somewhat conflicting but there is still lack

of consensus on what constitutes early versus late tracheostomy**. (Gomes Silva BN et al, 2012).**

This is evident from the fact that different cut-off points, ranging from 2 to 28 days, have been used for this definition but the advantages attributed to early over late tracheostomy is that Early tracheostomy is associated with decreased time to liberation from mechanical ventilation and decreased ICU length of stay**. (Freeman BD et al, 2008).**

Tracheostomies were indifferently performed by a surgeon/ENT specialist or by an intensivist, in the operating room or in the ICU. Surgical techniques were largely preferred to percutaneous techniques, Medical ICUs were twice as prone as others to adopt a percutaneous technique. **(Engoren et al, 2004).**

In many medical institutions, percutaneous tracheotomy techniques have more popularity because of the advantages of this technique over open tracheostomy, which include cost effectiveness, safety, ease and speed of performance. The use of PCT at the patient's bedside means decreasing the need to transport a very ill patient to the operating theater. **(Christenson TE et al, 2007).**

Tracheostomy is generally safe, but do have risks. complications include Bleeding, damage to the trachea, infection of stoma, subcutaneous emphysema, pneumothorax, displacement,

obstruction of the tracheostomy tube, narrowing of the trachea and tracheoesophageal fistula. **(Custalow CB, 2010).**

Tracheostomy removal (decannulation) after acute upper air way obstruction will only be performed if apatent air way is reestablished

Tracheostomy removal in patients who were weaned from prolonged mechanical ventilation can be considered if they are clinically stable, don't have psychiatric disorders, have adequate swallowing and are able to expectorate. **(Christopher KL, 2005).**

Aim of the work

This essay aims at reviewing the use of tracheostomy in the intensive care unit: why, When? how to do tracheostomy in the intensive care patient?, with special emphasis on recent techniques of tracheostomy ,advantages ,disadvantages ,follow up and timing of decannulation with discussion of its controversies and up dates.

Anatomy and physiology of the trachea

Tracheostomy have been performed for many years as an essential intervention for patients in critical conditions or injured patients, multi-organ injury, and it provides improved care for patients in the trauma or critical care setting and reduced the hospital and patient costs .as the trachea is easily accessible at the bedside, it provides ready access for emergency airway cannulation (eg, in the setting of acute upper-airway obstruction) and for long-term airway access after laryngeal surgery. More commonly, tracheostomy tubes are placed to allow removal of a translaryngeal endotracheal tube (ETT). The procedure can be done surgically or percutaneously, and with either technique the procedure can be performed in the operating room or at the bedside in the intensive care unit (ICU). **(Epstein Sk, 2005).**

Complications associated with the tracheostomy include arterial injury, esophageal injury, recurrent laryngeal nerve injury, pneumothorax , hemothorax ,hemorrhage, brachial plexus injury, false passage of the tube, infection, tracheoesophageal fistula, subglottic stenosis and tracheal stenosis after the decannulation can be prevented with thorough knowledge of the anatomy of the neck region**. (Gulsen S et al, 2010).**

(1)ANATOMY

The aim of this part is to analyze the anatomical features of the larynx and trachea and to show the relationship between the laryngotracheal region and the surrounding structures, the anatomy of the neck with thyroid, cricoid and ithmus of thyroid are Shown in fig.1

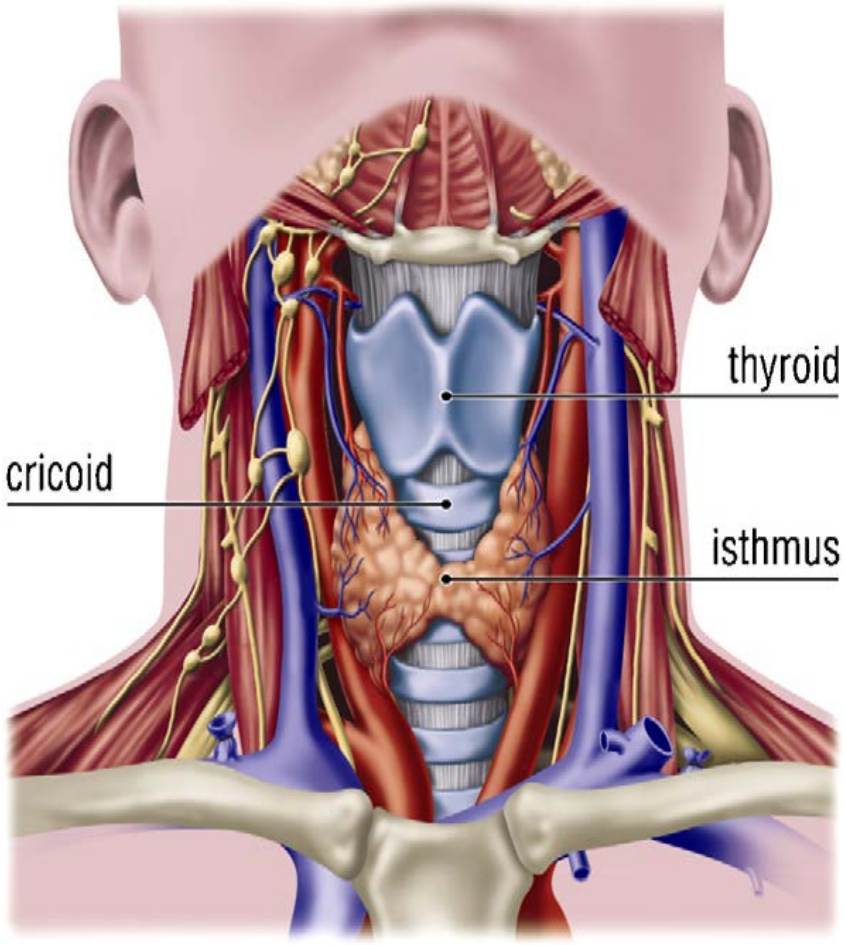

Fig (1): Anatomy of the neck. (Greay H, 2000).