كلية الطب
إدارة الدراسات العليا

Title:

Validity of ultrasonography in predicting difficult laryngoscopy and confirming endotracheal intubation in obese emergency surgical patients

عنوان الرسالة باللغة العربيه

صلاحية الموجات الصوتية في التنبؤ بصعوبة تنظير الحنجرة وتأكيد التنبيب داخل الرغامي في مرضي الطوارئ الجراحية الذين يعانون من السمنة

Protocol of Thesis submitted
To the Faculty of Medicine
Minia University
In partial fulfillment of the
Requirement of Master
Degree
In Anesthesia and Intensive
care

By :
Hemmat Amer Mohamed

خطة بحث مقدمة
لكلية الطب
جامعة المنيا
ايفاءا جزئيا لشروط
الحصول على درجة الماجستير
في التخدير والعناية المركزة

من الطبيبة :
همت عامر محمد

Supervisors

Dr. Omyma Shehata Mohamed

Assistant professor of Anesthesia and Intensive care

Faculty of Medicine Minia University

Dr. Tarek Abd El-Moneim Abd El-Zaher

Lecturer in Anesthesia and Intensive Care

Faculty of Medicine - Minia University

Dr. Mohamed Ahmed Amin

Lecturer of Diagnostic radiology

Faculty of Medicine - Minia University

المشرفون

أ.م د. اميمة شحاتة محمد

استاذ مساعد التخدير والعناية المركزة

كلية الطب - جامعة المنيا

د. طارق عبد المنعم عبد الظاهر

مدرس التخدير والعناية المركزة

كلية الطب - جامعة المنيا

د. محمد احمد امين

مدرس الأشعة التشخيصية

كلية الطب - جامعة المنيا

Introduction

Proper airway management (AM) is an essential goal for anesthesia providers. Poor airway assessment and planning contributed to unfortunate airway outcomes. Airway management skills are indispensable for an emergency physician. Unrecognized airway accidents such as esophageal intubation tend to occur more in emergency settings [(1)] where it is reported as 6%-16%.[(2)]

The inability to successfully intubate a pharmacologically paralyzed patient can be a disastrous situation. Although patients who are potentially difficult to intubate can often be predicted clinically, this method does not provide complete assurance, providing a requirement to consider other methods. [(3)] Also, confirmation of proper tracheal intubation could be performed primarily by direct laryngoscopy, auscultation of Gurgling sounds in the epigastric region, lung auscultation, observation of water vapor on endotracheal tube wall, using esophageal detector device, CXR and ETCO2 (end-tidal CO2 pressure) that each of the above-mentioned methods have its own limitations [(4-8)].

Obesity is a well-known independent predictor of difficult intubation, but increased body mass index poorly predicts difficult laryngoscopy.

A large neck circumference is among the suggested predictors of difficult intubation, especially in obese patients and it has been reported to predict difficult laryngoscopy. Neck circumference, though, does not indicate the amount of soft tissue at various topographic regions within the neck. Distribution of fat in different neck areas may provide better information than neck circumference. [(9)]

Ultrasound (US) offers a number of attractive advantages compared with competitive imaging techniques or endoscopy for imaging critically ill patients. It is widely available, portable, repeatable, relatively inexpensive, pain-free, and safe.

Although the earliest reports dealing with US applications in clinical medicine include the description of soft-tissue imaging of the pretracheal structures and anterior Ultrasound (US) evaluation of the airway is found to be an excellent tool in different medical settings including the operating room, intensive care unit and in the emergency department (ER). The utility of the US in the airway management is not limited to the upper airway assessment; it has been also used to evaluate the lower airway, lungs and pleura [(10)].

Aim of the work

The aim of the study is to determine whether preoperative ultrasound assessment of of the upper airway can predict difficult laryngscopy in emergency surgical obese patients , by analysis correlations between ultrasound measurements of anterior cervical soft in the upper airway, and the Cormack–Lehane grade. And evaluate its role in confirming the endotracheal placement

The secondary objective was to determine whether clinical screening tests are independent predictors of difficult airway.

Inclusion criteria:

Adult obese patients (BMI>35) of both sex aged from 18 to 60 years undergoing urgent surgeries under general anasthesia with tracheal intubation.

Exclusion criteria:

. Patients with removable upper dentures, upper airway pathology, cervical spine fractures, full stomach, maxillofacial trauma or unstable patients and pregnant women will be excluded from the study.

Patients and Methods

Patients:

This prospective study will be conducted in Anesthesia and ICU department in Minia University Hospital after obtaining approval from our faculty ethical committee and obtaining written informed consent from the patient's or the relatives in each case.

Methods

Preoperative evaluation and ultrasonography:

Preoperative evaluation and ultrasound examination will be performed by an anesthesiologists who will not be involved in laryngoscopy and intubation before the surgery, data was obtained in standard fashion. The patient's information, medical history,) history of obstructive sleep apnoea (OSA) (diagnosed by polysomnography, or undiagnosed sleep apnoea suspected by the presence of snoring and cessation of breathing during sleep); Physical examination height, weight, body mass index (BMI), loose or protruding upper teeth, or partially missing upper incisors or canines;

Will evaluate the following variables:

1- Mallampati score
2- Neck mobility (flexion/extension degrees from midline),
3- Upper lip bite test,
4- Temporomandibular joint mobility assessed by mouth-opening and forward movement of the jaw and the ability to protrude the lower teeth further than the upper teeth;
5- . A flexible ruler will be used to measure airway parameters, mouth opening (cm), thyromental distance (cm), sternomental distance

(cm), hyomental distance (cm) and neck circumference (cm) at the level of the thyroid cartilage.

The thicknesses of the anterior neck soft tissues will be measured with a portable ultrasound machine). A 6 to 13 MHz high frequency curvilinear ultrasound transducer was used for ultrasound scanning. Patients will be explained about the ultrasonography procedure and positioned in supine with the head in a neutral position. Ultrasonography with the probe placed in the transverse axis, craniocaudal sagittal scan, submental region of the neck. The distances will be measured at five levels (hyoid bone, epiglottis, cricothyroid membrane, thyroid isthmus and suprasternal notch) with normal and extended neck position in the median axis.

Intraoperative:

After 5 min. preoxygenation, anesthesia will be induced with fentanyl (1-2 μg/kg), propofol (2-4 mg/kg) and succinylcholine (1 mg/kg). with patient's head in sniffing position on a standard operating room pillow at a height of 5 cm., an anesthesiologist who is unaware of the ultrasound results will perform laryngoscopy with a Macintosh

No. 3 blade and insert an endotracheal tube of the proper size.

Laryngoscopic view will be graded according to the method described by Cormack and Lehane as grade 1 (full view of the glottis), grade 2 (glottis partly exposed, anterior commissure not seen), grade 3 (only epiglottis seen), or grade 4 (epiglottis not seen). No external laryngeal pressure will be applied while reporting the laryngeal view.

If intubation failed after three attempts, the study ended and alternative methods for airway placement will be pursued.

To confirm endotracheal intubation, tracheal ultrasound during endotracheal intubation (ETI) will be performed. Ultrasound probe will be set on the outside of larynx and glottis during intubation and tube passage through trachea is checked.

Statistical analysis; Our results will be statistically analyzed and expressed as tables and figures.

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