A RANDOMIZED CLINICAL TRIAL TO COMPARE THE SUCCESS RATE OF BLOCKBUSTER INTUBATING LMA VERSUS FACTRACH INTUBATING LMA DURING BLIND ENDOTRACHEAL INTUBATION

By

Dr. YUVARAJ.V.

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Dr.SHIVANAND L.K.

PROFESSOR

DEPARTMENT OF ANESTHESIOLOGY

BLDE (Deemed to be University)

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ABBREVIATIONS

ILMA-Intubating Laryngeal Mask Airway

LMA-Laryngeal Mask Airway

ID-Internal Diameter

OD-Outer Diameter

SGD-Supraglottic Airway Device

ETT-Endotracheal Tube

BB ILMA-Block Buster Laryngeal Mask Airway

F ILMA-Fastrach Intubating Laryngeal Airway

ASA-American Society of Anesthesiologists

FOB-Fiber Optic Bronchoscope

PR-Pulse Rate

BP-Blood Pressure

SBP-Systolic Blood Pressure

DBP-Diastolic Blood Pressure

$EtCO^2$-End Tidal Carbon Dioxide

RR-Respiratory Rate

SPO_2-Saturation

ABSTRACT

Background and aims :

Blockbuster intubating laryngeal mask airway (BB ILMA) is a device that was developed recently in 2012. Fastrach intubating laryngeal mask airway (F ILMA) is another supraglottic airway equipment that was invented in 1997 by Dr. Chandy, and in today's world, these intubating devices are used more frequently by replacing the normal direct laryngoscopy. It is a randomized study, and the primary purpose is to determine which method, Blockbuster or Fastrach, is more likely to successfully intubate a laryngeal mask airway (LMA).

Methods

In 110 patients, out of which 55 patients were given BB ILMA and 55 patients were given F ILMA, in the selective age category of more than 20 years but less than 70 years, undergoing general anesthesia for tracheal intubation using either of these ILMAs. The patients were divided into two groups. The induction was performed in the same location where the ILMAs were put, and they checked to see if adequate ventilation was accomplished with either of these devices. Once ventilation has been attained, we can proceed with fiberoptic scopy with a brimacombe score for visualization of the glottis. Following this, blind intubation was performed, with the primary objective being a comparison of the first pass successful intubation between Blockbuster ILMA and Fastrach ILMA. The secondary outcomes included the amount of time it took to perform intubation, the ease of intubation, the grade of the fiberoptic view of the glottis

Result

The first pass successful attempt rate of the BB ILMA (B Group) and the F ILMA (F Group) are respectively 94.5% and 87.3%, whereas the ILMAs insertion time in group B and group F are respectively (25.02 sec) and (42.77 sec). In contrast to the F ILMA group, in which the p-value is significantly higher, the BB ILMA group experienced less complications such as blood stains and sore throat (0.0001). where there is a statistically significant relationship between the first successful attempt on the first pass and the ILMA's insertion time.

Conclusion

The BB ILMA group has a higher success rate for blind tracheal intubation. Additionally, the BB ILMA group has a shorter insertion time for the ILMA when compared to the F ILMA group. Finally, the BB ILMA group has fewer complications, such as blood staining, when compared to the F ILMA group.

Keywords:

The Blockbuster Intubating Laryngeal Mask Airway and the Fastrach Intubating Laryngeal Mask Airway ,first successful attempt, Intubating Laryngeal Mask Airway insertion time, ease of intubation, and fiberoptic grading were all evaluated.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

A RANDOMISED CLINICAL TRIAL TO COMPARE THE SUCCESS RATE OF BLOCKBUSTER INTUBATING LMA VERSUS FASTRACH INTUBATING LMA DURING BLIND ENDOTRACHEAL INTUBATION

INTRODUCTION

The most important effect of general anaesthesia on the respiratory system is the reduction of the airway reflex mechanism, laxity of the pharyngeal and laryngeal muscles, hypoventilation, and apnea. In patients undergoing general anaesthesia, airway management is a set of actions that results in the creation of a safe and secure airway for ventilation. Failure to manage the airway and hypoxia can result in irreversible brain damage in just a few minutes. **[1]** As a result, anesthesiologists must ensure that the airway is secure.

Being obese raises the likelihood that mask ventilation will be difficult, that tracheal intubation will be necessary, and that oxygen saturation will drop quickly when breathing stops.Supraglottic airway devices now play a wider range of responsibilities, including airway management among obese and high-risk patients, acting as a route for safer tracheal intubation during regular procedures or during challenging ones, and more. and after the unsuccessful intubation attempt, an airway rescue was performed. When used in conjunction with the general approach, a supraglottic airway device can help to improve the quality of airway management as well as the patient's level of safety in patients who are obese. [2]

As a connection between ventilation and intubation in patient populations of all different sorts, supraglottic airway equipment that contain a channel enabling blind tracheal intubation are becoming increasingly popular.The Tourens BlockBuster LMA is a relatively new laryngeal mask airway (LMA) that was designed in 2012 by Tuoren Medical Instrument co., Ltd. in Changyuan city, China.It is increasing in popularity since it increases anaesthetic safety and quality. It was developed by Professor Ming Tian, benefits include enhanced ventilation and a larger green channel that can be used for intubation. [3]

This is the second generation of supraglottic airway instruments, and Blockbuster is one of them. The device consists of an airway tube that has been anatomically constructed and is inserted into the throat. It is intended to generate high airway seal pressures all around laryngeal apertures and has a separate route for introducing a stomach tubes to minimize gastric reflux. This revised supraglottic airway device has been specifically designed to make it possible to perform tracheal intubation either blindly or with the assistance of fiberoptic guidance.

This study compares the first pass success rates for blind tracheal intubation using Fastrach ILMA and BlockBuster ILMA.

Due to the lack of literature on these two recently developed intubating LMAs In order to determine the success rate, intubation times and attempts are compared.

The primary purpose of this investigation is to evaluate and contrast the effectiveness of the Block Buster ILMA and the Fastrach ILMA in performing blind tracheal intubation on the patient's first attempt. Secondary outcomes that must be reviewed following a successful tracheal intubation oinclude the ease, timing, number of attempts, rate of success, fibreoptic grade of glottis. All of these factors should be taken into consideration.

Figure no 1-Blockbuster ILMA

A crucial duty of anesthesiologists is maintaining airway. Supraglottic airway technologies with a blind tracheal intubation channel are gaining appeal as a bridge between ventilation and intubation in a variety of patients.These devices are designed to act as a bridge between the two procedures. According to the instructions published by the All India Difficult Airway Association in 2016, laryngeal mask airways that come equipped with intubation conduits are advantageous and ought to be utilised. [4]

To improve anaesthetic quality and safety, a more recent ILMA named Tourens BlockBuster ILMA, developed in 2012 (Tuoren Medical Instrument co, Ltd, Changyuan city, China), has gained popularity. It was developed by Professor Ming Tian and offers ventilation and a larger green channel for intubation. [5] One such ILMA with a focus on intubation is the 1997-created Fastrach ILMA (Teleflex Medical, Dublin, Ireland). According to research, the percentage of successful blind intubations in both expected and unexpected airways is about 90–95%, with a lower frequency of problems.

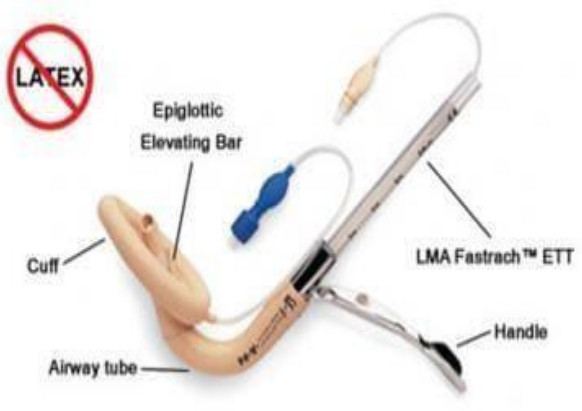


Figure no 2- FASTRACH ILMA

Extensive study has been conducted on the topic of determining the chances of success of blind intubation while employing the BlockBuster ILMA. They chose to do a blind tracheal intubation due to the similarities between the designs of these two types of devices permit unhindered transit of a tracheal tube and because prior research had shown that they match well with the glottis intake. This study compared the first pass success rates of blind tracheal intubation with ILMA Fastrach and BlockBuster ILMA. The study was believed that BlockBuster would have a higher rate of success during blind tracheal intubation.ILMA due to higher airway seal pressure, a smaller angle of emergence (30°) of endotracheal tube through the cuff of BlockBuster ILMA, and the special tip of the Parker flexi tip tube to prefer nonresistant areas.

During general anaesthesia, Dr. Chandy invented the Fastrach Intubating Laryngeal Airway (Fastrach ILMA) around 1997, to serve as a tracheal intubation assist and guide. At the moment, Fastrach ILMA is offered in three different sizes: 3, 4, and 5. Each of these sizes can be utilised either once or multiple times.

The incidence of airway-related problems was the most common cause of anaesthetic malpractice cases, which accounted for a considerable number of claims for fatality and head injury all over the world. According to a study of airway management data that was conducted as part of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society, there is space for improvement in the management. [Citation needed] The Difficult Airway Society has published a recommendation that recommends use of a laryngeal mask airway (LMA) or an intubating LMA in situations when direct laryngoscopy was ineffective in intubating the patient. Second-generation supraglottic airway devices offer an extra layer of protection against aspiration because they come equipped with a stomach access port. Air-QTM (Cookgas

LLC, St. Louis, USA) is a supraglottic airway device that features an anterior curve, mask ridges, and an inflated cuff that entirely fits the oropharyngeal structure. This device is manufactured by Cookgas LLC. Additionally, it can function as a channel for endotracheal intubation if required [6]. The i-gelTM is the brand name of a different second-generation supraglottic airway equipment that includes an integrated stomach drain tube (Intersurgical, Wokingham, Berkshire, UK). It is a thermoelastomer gel that makes it up (styrene ethylene butadiene styrene). It prevents neurovascular compression at the larynx thanks to its noninflatable cuff and anatomically accurate hard tube segment, which together block the laryngeal intake. In addition to this, it has an epiglottic rest that prevents the fold from descending. The LMA SupremeTM (LMA-STM, Laryngeal Mask Co. Ltd., Le Rocher, Victoria, Mahe, Seychelles) is a single-use, anatomically shaped supraglottic device that is composed of polyvinyl chloride. It contains a stomach insufflation port. Both the i-gelTM and the LMA-STM were shown to be equally effective in adult patients, despite the fact that a number of randomised controlled trials as well as a meta-analysis were conducted to compare the oropharyngeal leak pressure that each device provided (OLP). [7,8] They searched the available research, but they were unable to find any study that compared air-QTM with either of these two devices in adult patients up to this time. This was the case when they looked through the available literature. Both air-QTM and i-gelTM were evaluated for their usefulness in the process of fiberoptic-guided endotracheal intubation of paediatric patients by Jagannathan et al. It is not possible to extend the findings of research conducted on children to those conducted on adults andvice versa.

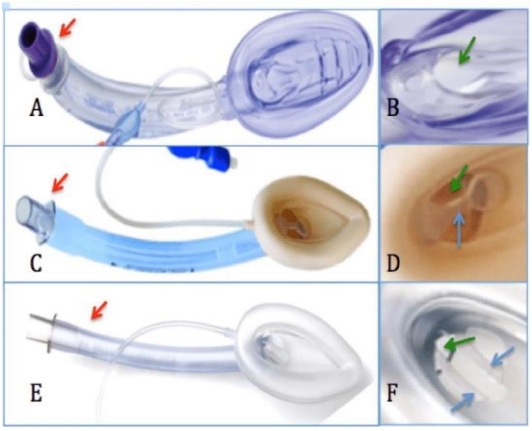


Figure no 3-AIR Q LMA

Management of the airway is considered to be the most important aspect of safe and effective anaesthetic practise. A negative haemodynamic stress response is produced as a result of rigorous laryngoscopy-assisted tracheal intubation, despite the fact that this technique is considered to be the gold standard for attaining a permanent airway.

When a patient or a procedure does not call for the intrusive technique of endotracheal intubation, the utilization of supraglottic airway equipment is an excellent alternative that can be used instead. In addition, the treatment of airway emergencies has demonstrated the efficiency of the supraglottic airway equipment in saving lives.

Since the advent of laryngeal mask airways, numerous supraglottic airway devices are developed. Some of these devices have been converted to operate as conduit for endotracheal intubation, and this has led to an increase in the availability of endotracheal intubation.

During general anaesthesia, Daniel Cook developed the Air-Q® Intubating Laryngeal Airway (ILATM, Cookgas® LLC, Mercury Medical, Clearwater, Florida, United States) in 2005 as a device for preserving the airway and as a channel for tracheal intubation. ILATM stands for intubating laryngeal airway.

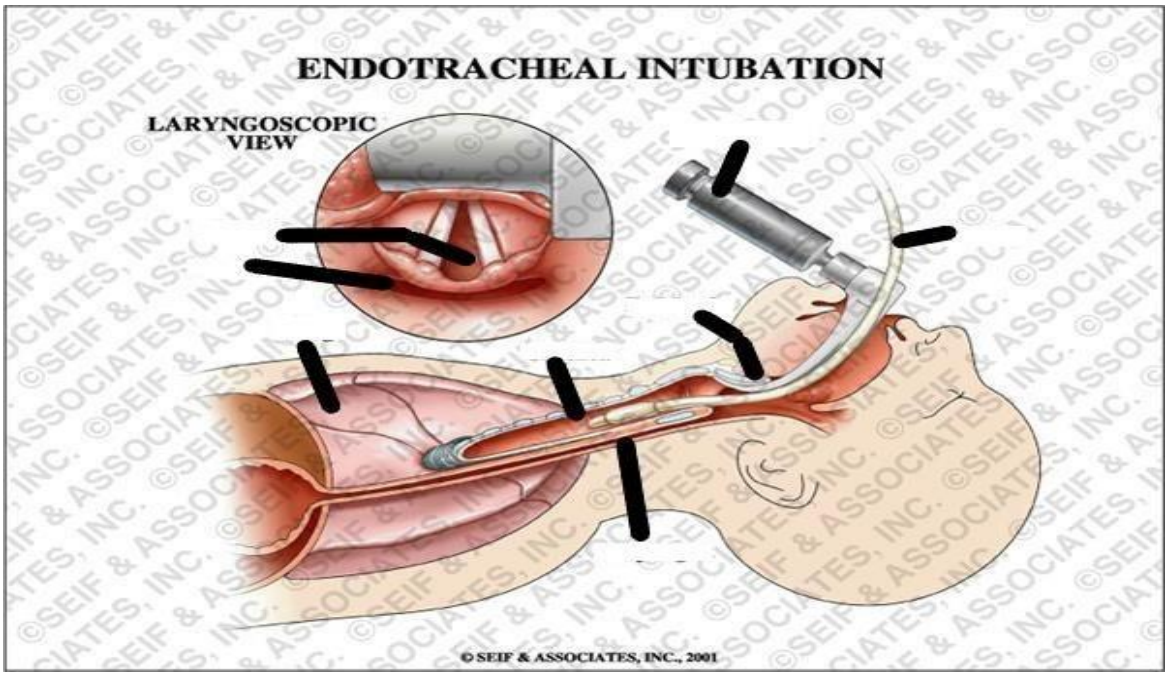


Figure no 4 -Endotracheal Intubation

The diagram shows that how often the endotracheal intubation was carried out usually by direct laryngoscopy method after the induction of anaesthesia , with appropriate size of endotracheal tube (ET TUBE) , once the tube is in trachea inflate the pilot ballon cuff and check for bilateral eaqual air entry by auscultating with the stethoscope, with the help of capnography we can assure that wether the tube was in the trachea or in the oesophagous.

AIMS AND OBJECTIVES

AIM:

To compare the success rate of Blockbuster inubating LMA VS Fastrach intubating LMA.

OBJECTIVE:

1) PRIMARY OBJECTIVE :

To compare the first pass successful intubation between Blockbuster ILMA vs Fastrach ILMA.

2) SECONDARY OBJECTIVE :

1. Time taken for intubation
2. Ease of intubation
3. Fibre optic grade of laryngeal view
4. Complications like sore throat and blood stain.

AIRWAY ANATOMY [9]

The upper airways are involved in respirations, which is a very complex neurophysiological process and plays a significant function in the system. Both anatomy and function have an impact on the flow of air during inspiration and expiration. The mouth is the beginning of the upper respiratory tract, which continues on to the trachea and comprises the nose, palate, uvula, pharynx, and larynx. It runs from the mouth to the trachea. In order to keep the patient's airways normal, the anesthesiologist needs to have a thorough understanding of the functional anatomy of the airways. The following categories make up the airways:

The nasal cavity, oral cavity, pharynx, and larynx are the four components that make up the upper respiratory system.

The tracheobronchial tree is a part of the lower respiratory system, which also contains the bronchi.

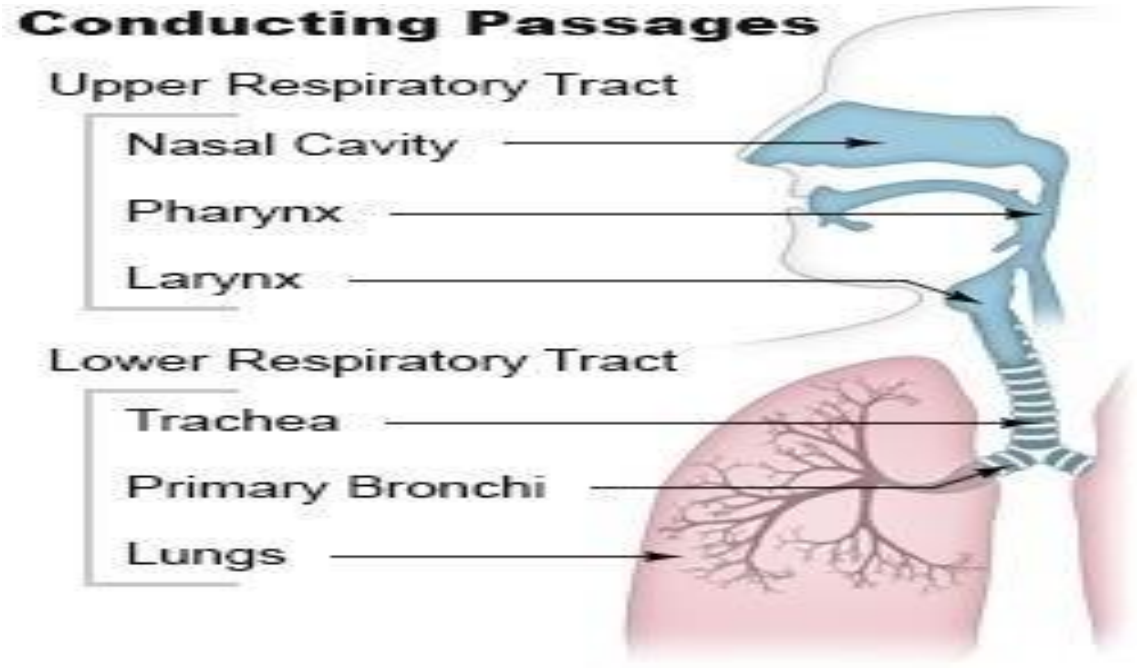


Figure no 5: Showing anatomical structures in upper and lower airway

NOSE

The nasal bones, the upper and lower lateral cartilages, the cartilaginous section of the nasal septum, and the skin all contribute to the formation of the external portion of the nose. The flexible portion of the nasal septum and the bridge of the nose are what separate the paired nostrils from one another. The two nasal bones come together to form a skeletal structure that makes up the upper section of the nose. The vertical ethmoidal plate forms the upper half of the posterior septal bones, whereas the vomer forms the bottom part of the bones in this structure. The lower and frontal parts of the nose are held together by cartilage.

NASAL CAVITY

The nasal cavity can be divided into two passageways by the septum of the nose. The nasal septum is a vertical plate that is formed from the ethmoid bone, the vomer bone, and the cartilage that lines the septum. It often takes the form of a middle structure but can take other forms. Each nasal cavity has a roof, a floor, a nasal septum serving as the medial wall, and a lateral wall. These walls open either forward via the anterior nostrils or backwards through choanae to the nasopharynx. The nasal septum acts as the nasal cavity's medial wall. The nasal vestibule is located just above each of the anterior nostrils on the front side of the nasal cavity. The nostrils and the auricle are encircled by the medial and lateral crus of the alar cartilage. The anterior half of the cartilaginous septum and the columella (connective tissue septum) constitute the medial wall of the vestibule. The lateral region of the vestibule contains the coarse hairs - vibrissae - in the skin that guard the nasal entry and help in air filtering.

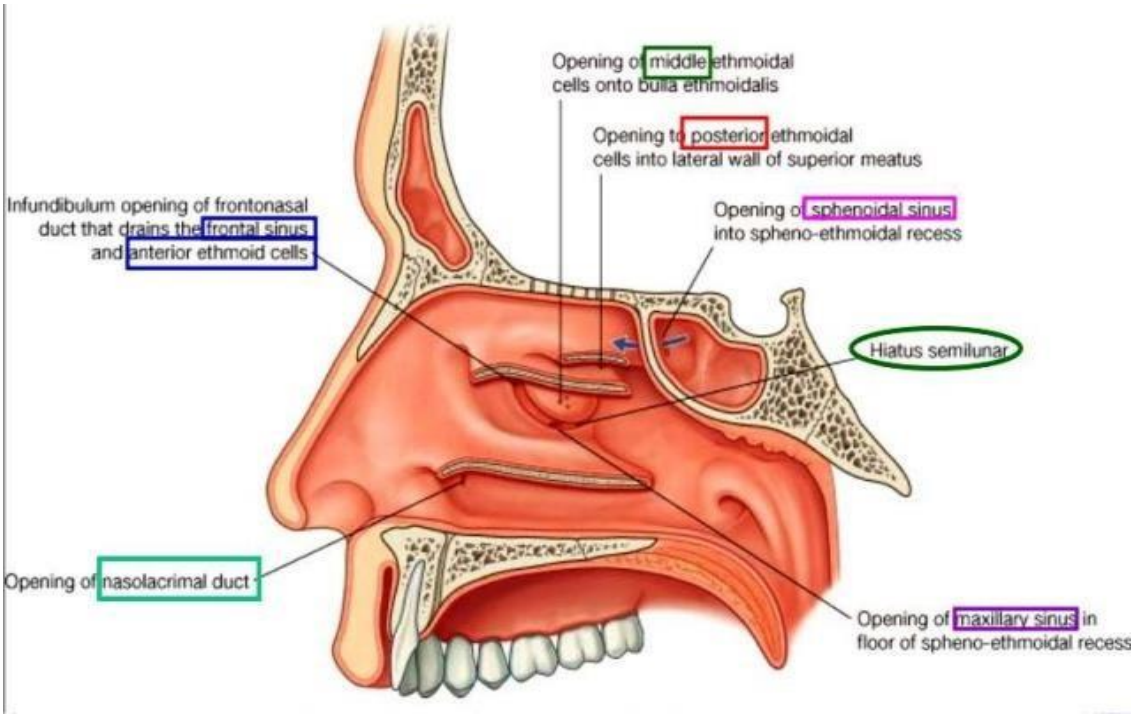


Figure no 6: Shows the opening of all sinuses in the lateral wall of nose.

Lateral wall:

It is made up of bony prominences that are uneven in shape and are covered with a layer of soft tissue and mucous membranes. These projections are the turbinate's lower, middle, upper, and upper shells, respectively. The area directly below each turbinate is referred to as the meatus, and its name mirrors that of the turbinate to which it is close. The structure of the upper, upper, and middle turbinates is derived from the ethmoid, but the structure of the lower turbinates is derived from different bones. In the lateral wall, you'll find both the ostia of the paranasal sinuses as well as the lacrimo-nasal duct. The aperture of the lacrimo-nasal duct can be found about three centimetres behind the middle turbinate, which is the external nostril. This opening can be found in the lower nasal canal. The superior nasal meatus houses the entrance of the posterior ethmoidal cells in the nasal cavity. In the region of the sphenoethmoidal cavity and the front wall of the sphenoid sinus is where the opening of the sphenoid bone can be found.

Posterior Nares(Choana):

Each choana has an oval shape and approximately 2.5 centimetres on the vertical dimension and 1.5 centimetres on the horizontal dimension. It is coated by mucoperiosteum and is surrounded

by bone on all sides. Even though the posterior section of the septum is normally solid, posterior septal blockage can occasionally be caused by congenital choanal atresia and posttraumatic bone anomalies. These conditions are extremely uncommon.

THE PHARYNX

This musculofacial tube connects the larynx and the oesophagus to the nasal and oral cavities of the mouth and nose. The bucco-pharyngeal fascia is the outermost and most superficial layer of the pharynx tube's fascial system. At the bottom, it fuses with the adventitia of the oesophagus, and at the very top, it connects to the skull bone.

The muscles that constrict: The intermediate muscular layer is composed of the pharyngeal constrictor muscles, which number three in total. These muscles are referred to as the superior, middle, and inferior constrictor muscles, respectively.

The superior constrictor makes its attachments at the base of the skull, in the middle of the hyoid bone, and underneath the cricoid cartilage. The lower part leads to the band of muscles known as the cricopharyngeus, which is the upper esophageal sphincter. This sphincter prevents food from going further down the oesophagus. Each of the segments has a tendinous attachment to the posterior portion of the median raphe.

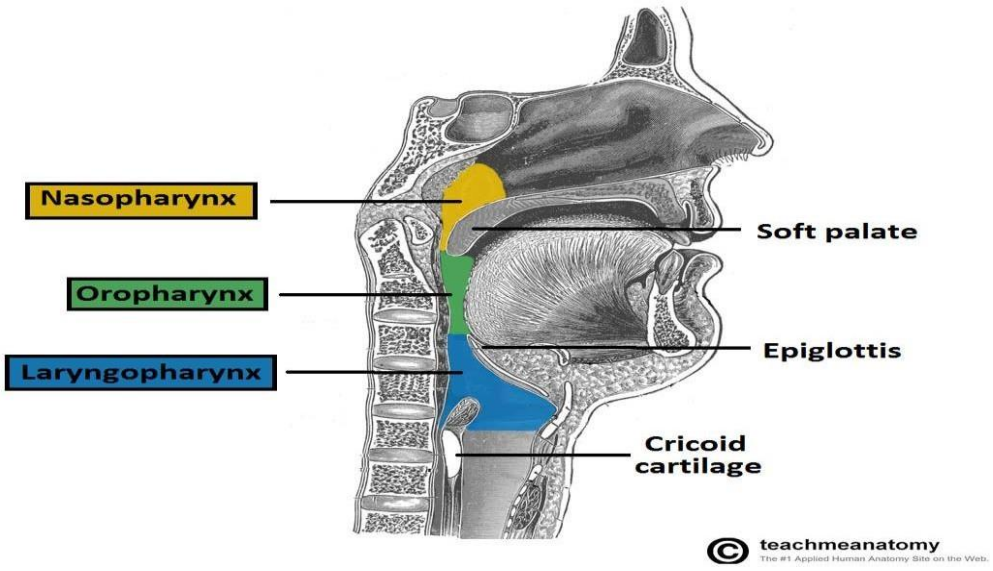


Figure no 7: Sagittal section through the head and neck showing the subdivisions of the pharynx.

NASOPHARYNX:

It can be found right behind the nasal cavity in its normal position. There are two nasal choanae, two openings from the Eustachian tube, and an inferior route that leads to the oropharynx that all communicate with the nasopharynx. bones at the back of the head that are called the occipitals. Proceed with the posterior wall of the nasopharyngeal cavity. The longus capitis muscle, the deep prevertebral muscle, and the arch of the first cervical vertebra are all contained inside the prevertebral fascia, which separates the posterior wall from the vertebral column. This fascia also contains the arch of the first cervical vertebra.

This is the Eustachian tube. When dilated by the palate muscles, it brings the pressure in the middle ear and the atmosphere to a level that is equal. The cartilaginous prominence called as the torus tubarius is located on the lateral aspect of the tube, and the opening of the tube is located medially to it. The Rosenmullar's pit is a depression that can be found both in front of and behind the torus. The lymphoid tissue that is found in the mucous membrane of the roof and posterior walls is what makes up the adenoid tonsil. Because of its hypertrophy, it can cause chronic nasal blockage, which in turn may lead to sleep apnea and lower than normal levels of carbon dioxide.

OROPHARYNX:

This structure can be found behind the oral cavity and reaches all the way down to the epiglottis from the upper soft palate. The posterior wall of the oropharynx is made up of the prevertebral fascia as well as the bodies of the second and third cervical vertebrae in the neck. The paired tonsillar fossae are located in the lateral wall of the tonsil. These pits hold the palatoglossal folds, which are located in the anterior pillar, and the palatine tonsils, which are located in the palatopharyngeal folds, which are located in the posterior pillar.

The tonsillar fauces are located on either side of the base of the tongue. The epiglottis is connected to the base of the tongue by the single medial glossoepiglottic fold and the paired lateral glossoepiglottic folds. The posterior dorsal region of the tongue is where the lingual tonsils are found. There are two different kinds of tongue muscles. The first kind are the muscles that attach to fixed locations, such as the styloglossus, genioglossus, hyoglossus, and palatoglossus. The second kind are the muscles that do not attach to specific places. There are three types of muscles that are free to move across the body of the tongue: vertical, upper and lower longitudinal, and transverse muscles. Myohyoid muscles are paired muscles that stretch from the mandible and insert into the hyoid bone. These muscles are responsible for creating the floor of the mouth.

Cellulitis that affects the floor of the mouth, such Ludwig's angina of the submandibular and submental regions, has the potential to restrict the airway. In these kinds of circumstances, a tracheotomy might be necessary to successfully secure the patient's airway.

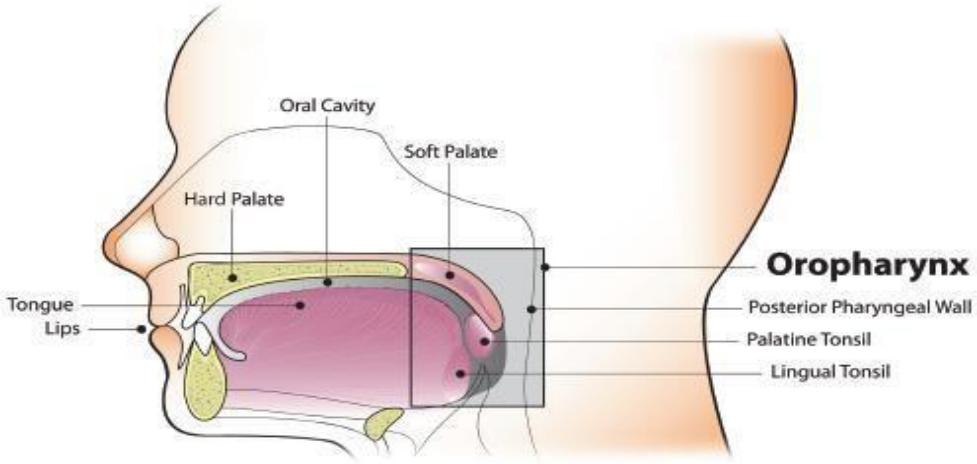


Figure no 8: Sagittal section showing various parts of oropharynx.

HYPOPHARYNX:

Between the fourth and sixth cervical vertebrae is where you'll find the hypopharynx. It reaches all the way down to the cricoid cartilage's inferior surface, which is located at the base of the epiglottis. The oropharynx, which acts as a gateway to the larynx and also the oesophagus, is where it all starts. The piriform fossa can be seen on each side of the hypopharynx, and it is surrounded by the lateral glossopharyngeal folds on its upper border. The buccopharyngeal and prevertebral fascia, in addition to the deep prevertebral musculature, make up the posterior boundary.

THE LARYNX:

It does so by dividing the trachea from the upper gastrointestinal tract, thereby performing the function of a protective airway sphincter and preventing aspiration during the swallowing process. It houses the vocal cords, which seem to be necessary for successful communication as well as the Valsalva technique and coughing. The vocal cords are also required to complete a valsalva

motion. The larynx can be found in the front section of the neck, specifically anterior to the bodies of the C4-C6 vertebrae and the laryngopharynx. The larynx is also known as the voice box. On either side of the larynx, you'll find the sheath that surrounds the carotid artery, as well as one lobe of the thyroid gland. The thyroid isthmus, which covers the second and fourth tracheal rings, connects the anterior portion of the thyroid to the trachea. The superficial and deep fascia, in addition to the platysma muscle, are situated in a more anterior position.

The skeleton of the larynx is composed of nine cartilages that are joined to one another by a variety of ligaments and membranes. The thyroid, the cricoid, and the epiglottis are the three examples of unpaired cartilage, while the other three are paired cartilage (arytenoid, corniculate, cuneiform).

The hyoid bone is connected to the thyroid cartilage by the thyroid membrane, which is located at the level of C3. The three unpaired cartilages of the midline can be found below.

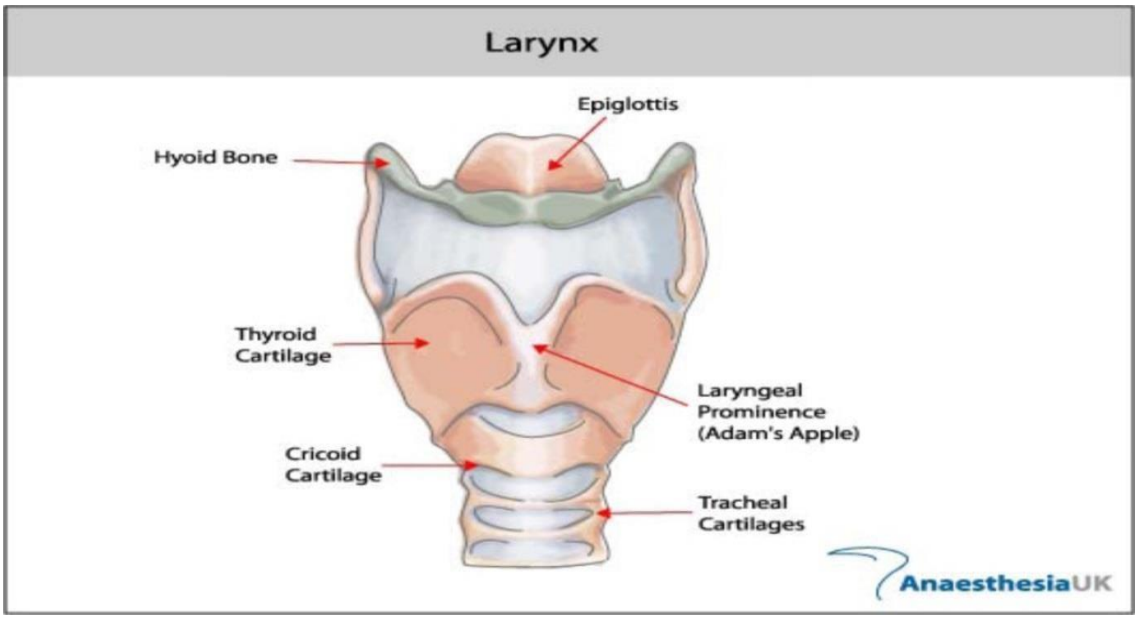


Figure no 9: Anterior view of laryngeal cartilages

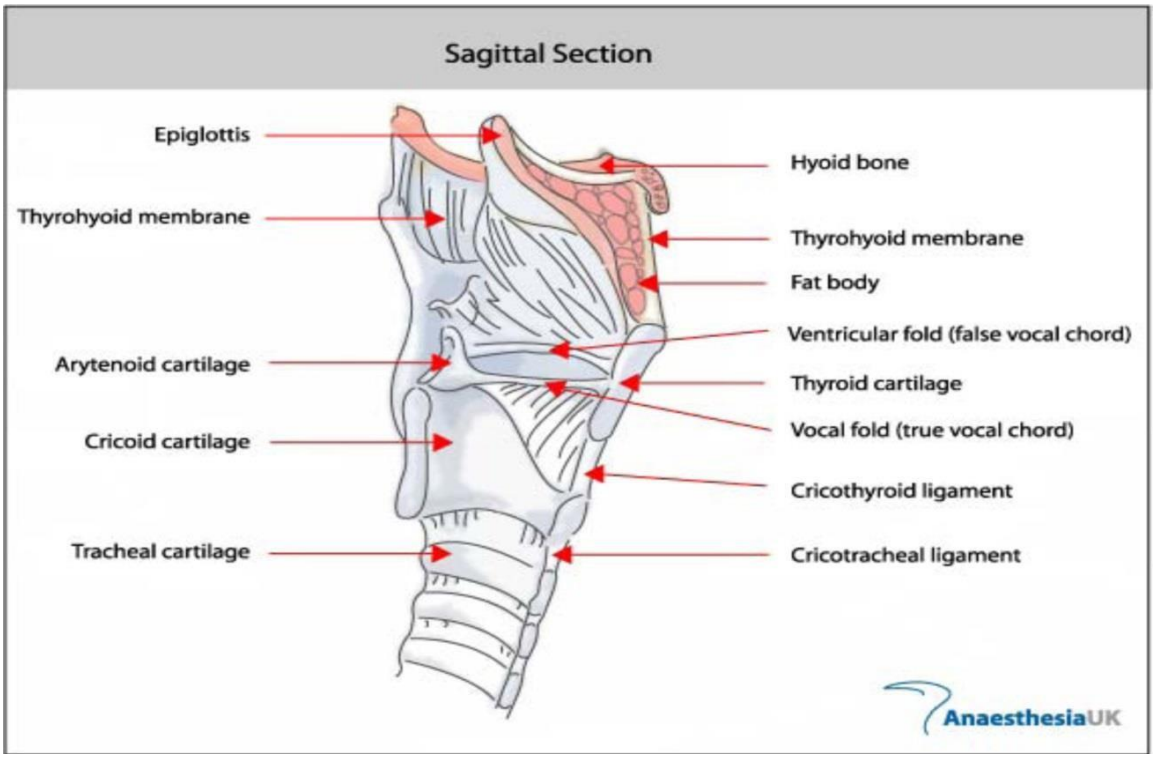


Figure no 10: Lateral view of laryngeal cartilages

Thyroid cartilage:

The largest of the laryngeal cartilages, which has the appearance of a shield and protects the vocal cords. The subcutaneous laryngeal process, also known as Adam's apple, is formed by the fusion of two laminae in the middle of the structure at an angle of 90 degrees in men and 120 degrees in females. Upper (C4) and lower (C5) border horns are made up of upper and lower horns respectively (antlers). A portion of the hyoid bone is attached to the superior edge of the thyroid membrane. The inferior horn and the annular cartilage are joined together via an articulation.

Cricoid cartilage is a whole ring of cartilage that sits at the C6 vertebral level. It has a more substantial posterior lamina but a more condensed anterolateral arch. It has a line of communication with inferior horn of the thyroid gland on the lateral side and the laryngeal cartilage on the posterior side. It is attached to the upper border of the first tracheal ring by the cricotracheal ligament and the lower border of the thyroid cartilage by the cricothyroid ligament. The cricothyroid ligament also binds it to the lower border of the thyroid cartilage. (Cricoid pressure, Sellick manoeuvre) Because it is a full annulus, applying pressure to the anterior region will compress the posterior region of the oesophagus. This is a technique that is utilised during the rapid induction of anaesthesia to avoid aspiration of regurgitated gastric contents.

The epiglottis is a stretchable cartilage that is fashioned like a leaf. The lower, more thin end is attached to the thyroid cartilage by the thyroepiglottic ligament (back of the laryngeal prominence). It is held in place in front of the hyoid bone by a ligament called the hyoepiglottic ligament. The vallecula is the depression that may be found between the mucous membrane that covers the back of the tongue and the epiglottis. The upper border of the tongue is free to extend upwards**.**

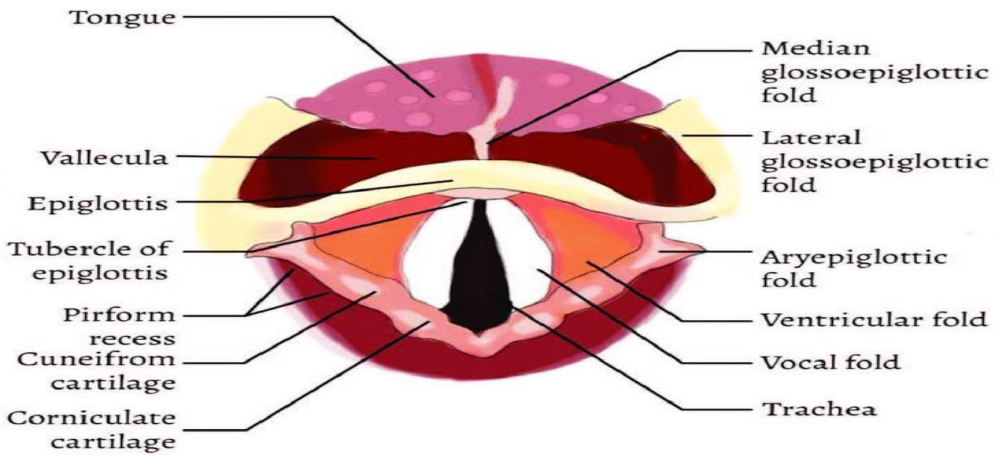


Figure no 11: Showing the paired cartilages

The three cartilages are:

Arytenoids: These are paired cartilages that have the shape of a pyramid and are attached to the cricoid's superior border. Each one has an apex that articulates with the corneal cartilage, an anterior vocal process that serves as the posterior attachment of the vocal ligament, and a lateral muscular process that articulates with the cricoarytenoid muscles. All of these processes are connected to each other by the vocal ligament. Due to the fact that they are the posterior attachments of the vocal cords, the arytenoids are the only structures that can be seen in a "anterior" airway.

Cuneiform and corniculate.:A cartilage present in the aryepiglottic folds that is quite small.

Multiple ligaments and membranes can be found in the larynx. The larynx also contains many membranes. Together with the membrane, the ligaments comprise the speech structures, which are responsible for connecting the cartilage to one another. The hyoid bone and the thyroid cartilage are connected together by the membrane that covers the thyroid gland. At its lower end, the epiglottis is connected to the hyoid bone by a ligament known as the hypoepiglottic ligament. the beginning of the trachea's first ring at the cricoid.

The cricovocal membrane is the membrane that extends from superior border of the cricoid to the laryngeal process of the thyroid cartilage and to the vocal process of the arytenoid. The real structure of the vocal fold can be described as the vocal ligament, which would be formed by the upper border.

The larynx receives its blood supply from the superior laryngeal artery is a branch of the superior thyroid artery, and the inferior laryngeal artery is a branch of the inferior thyroid artery. Both of these arteries provide blood and nerve supply to the larynx.

The larynx receives its innervation from the larynx receives its sensory input from the following branches of the vagus nerve (X): The superior laryngeal nerve leaves the vagus high in the neck and splits into the internal branch and the external branch. The internal branch provides the sensory supply to the glottis, supraglottic, and cricothyroid muscle, while the external branch provides the motor supply to the cricothyroid muscle, which is the tensor of the vocal cords. The recurrent nerve laryngeal supplies motor afferents to all intrinsic laryngeal muscles, with the exception of the cricothyroid, and sensory afferents to the subglottis. The glossopharyngeal nerve is responsible for supplying the base of the tongue and the vallecula, that together constitute the top border of the epiglottis, with sensory information.

AIRWAY ASSESSMENT [10, 11]

History

- Difficult airway management in the past to predict challenging airway.
- Old medical records to be reviewed for anaesthetic records like number of intubation attempts, ability to mask ventilate, type of blades ,use of adjunctive equipments, modification of techniques.
- Diseases that affect the airways.
- Symptoms of airway compromise such as hoarseness, stridor, wheezing, dyspnoea, dysphagia.
- Associated diseases such as rheumatoid arthritis, morbid obesity. Physiological conditions such as pregnanacy.
- Prior surgery, burns, injuries, or malignancies affecting the mouth, neck, or spine.
- Congenital syndromes , other diseases of infectious, traumatic , neoplastic or inflammatory that involve the airway.

General examination

• Patency of the nares: masses found within the cavity, such as polyps, growth, DNS

• Teeth: Upper incisors and canines are very prominent.

• Palate: The palate is high and arched, and the mouth is long and narrow.

• Prognathism is the capacity to project the lower jaw further forward than the upper incisors.

• Mouth opening – at least two large fingerbreadths of space between the upper and lower incisors.

• Temporomandibular joint – movement may be restricted in cases of ankylosis/fibrosis, tumours, and other conditions.

• The measurement of the submental space must be greater than 6 centimetres for hyomental and thyromental

• The neck is short and thick, there are masses in the neck, and it lacks extension and mobility. Having a tracheostomy in the past is suggestive of stenosis.

• Infections of the airway, including bronchitis, pneumonia, croup, bronchitis, and epiglottitis

Difficult mask ventilation BONES

- B – Beared individual
- O– Obesity
- N – no or lack of teeth
- E – elderly
- S – snorers

Specific tests

To predict difficult laryngoscope and intubation. Combination of two or more tests improves positive predictive value.

Direct assessment:

Assessing the flexion and extension of neck – To assess the flexion ,ask the patient to touch the manubrium sterni with his chin which ensures the neck flexion of 25-30 degree.

To assess the neck extension - Instruct the patient to look skyward without elevating their eyebrows, allowing neck extension for intubation.

Indirect assessment:

Palm print : In a sitting position, the patient is requested to push his right hand firmly against a white paper placed on a hard surface, with his palm and fingers smeared with blue ink.

All pharyngeal regions are evident in grade 0

Grade 1 - a deficit in the 4th and 5th digits' interphalangeal regions.

Grade 2 - the interphalangeal portions of the 2nd and 5th digits are poor.

Only the tips of digits are visible in Grade 3.

Prayer sign *:* The patient is asked to make "Namaste" by bringing both the palms together.

Positive : when there is gap between palms, which suggest limited cervical mobility leading difficulty in laryngoscopy and intubation.

Negative : when there is no gap.

Assessment of tempero-mandibular joint function :

The space between the upper and lower incisors is referred to as the interincisor gap. If the patient is able to place his three finger in the opening ,that is >5cm then it is adequate for direct laryngoscopy and <2 finger breadth that is <3cms is associated laryngoscopy.

TMJ movement : Ask the patient to open his mouth as the examiner places his index finger next to the tragus and his thumb in front of the bottom half of the mastoid process. If the index finger next to the tragus is depressed in its space and the thumb can feel the condyle slipping, this indicates that the mandible has a good sliding function.

Protrusion of the mandible :

When patient protrudes the mandible, examiner should look the position of the lower teeth in relation to the upper teeth.

Class A : the lower incisor is protruded anterior to the upper incisors.

Class B : the lower incisor is edge to edge with upper incisors.

Class C : the lower incisor is not in edge to edge with upper incisor.

Upper lip bite test :

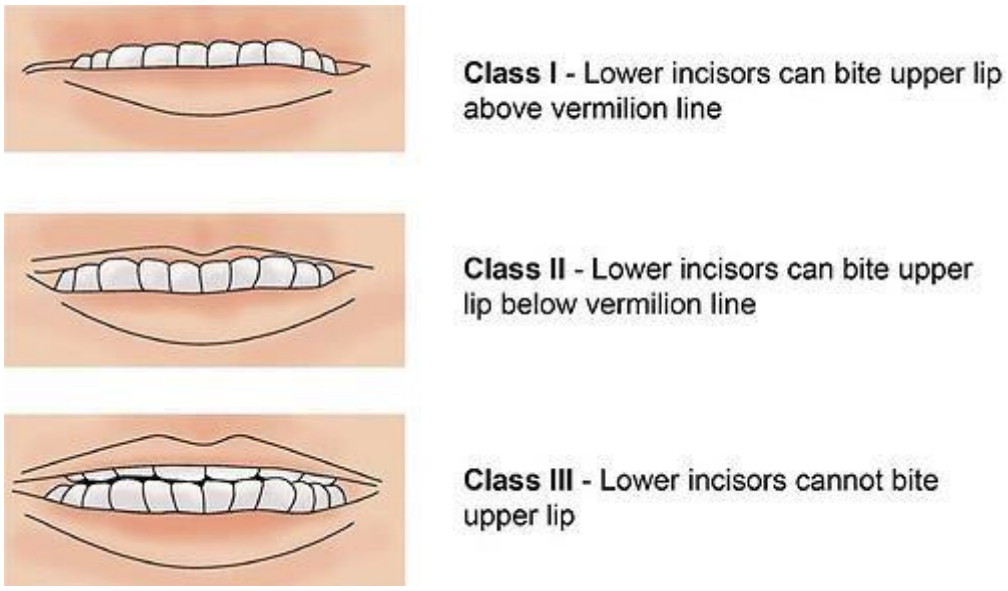


Figure no 12:Upper lip bite test.

Mallampati test :

It shows the correlation between the tongue and pharyngeal size. Examiner should sit in front of the patient, where the patient should be sitting up with their head in the neutral position and ask him to open their mouth maximally and protrude their tongue without phonating.

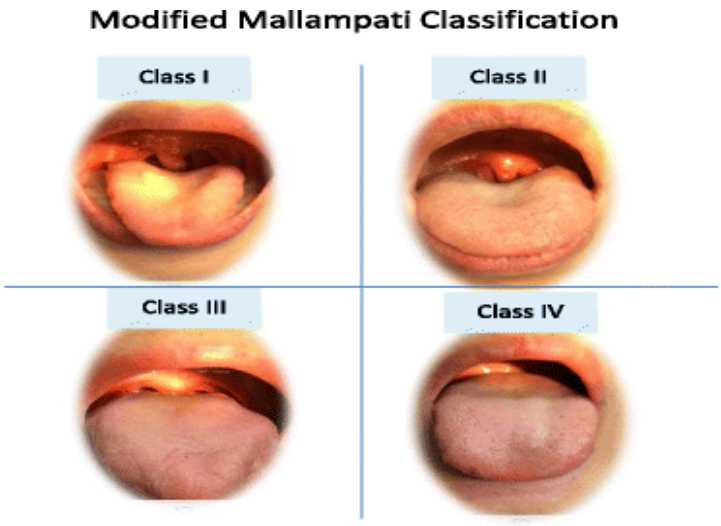


Figure 13: Modified Mallampati Classification

Assessment of mandibular space :

Thyromental distance(Patils test) :

When the patient's neck is fully stretched, the space between the mentum and the thyroid notch is measured which estimates the potential space in to the which the tongue can be displaced on laryngoscopy. Normal is greater than 6.5cm.

Sterno – mental distance : Distance between the suprasternal notch to the mentum with neck full extended and mouth closed. Normal is more than 12.5cm.

Hyo –mental distance : Distance between the mentum to hyoid bone. Normal is greater than 6cm.

Difficulty scores: Wilson score

Wilson risk sum score	0	1	2
Weight	<90 kg	90-110 kg	>110 kg
Head & neck movement	>90 degrees	About 90 degrees (i.e. +/- 10 degrees)	<90 degrees
Jaw movement	IIG >5 cm or Slux >0	IIG <5 cm and Slux =0	IIG <5 cm and Slux <0
Receding mandible	Normal	Moderate	Severe
Buck teeth	Absent	Moderate	Severe

Table no 1- Wilson score

These factors are given scores between 0 to 10, the greater the score , greater the risk for difficult intubation.

LEMON/MELON : A score of up to ten points is derived by awarding one point to each of the following factors. Patient in difficult intubation has high lemon scores.

LEMON Airway assessment method

L	Look externally (Facial trauma, large incisors, beard or moustache, large tongue
E	Evaluate the 3-3-2 rule - Incisor distance: 3 FB - Hyoid-mental distance: 3 FB - Thyroid-to-mouth distance: 2 FB
M	Mallampati Score ≥ 3
O	Obstruction : Presence of any condition like epiglotitis, Peritonsillar abscess, trauma
N	Neck Mobility (Limited neck mobility)

Table no 2:Lemon airway assessment method.

Rapid assessment of the airway by rule 1-2-3 : Three factors to determine the ease visualisation of glottis in an emergency

- Mobility of TM joint
- Mouth opening
- Thyromental distance
- **Cormack and Lehane Classification:** It is divided in to four grades according to degree of glottic exposure.

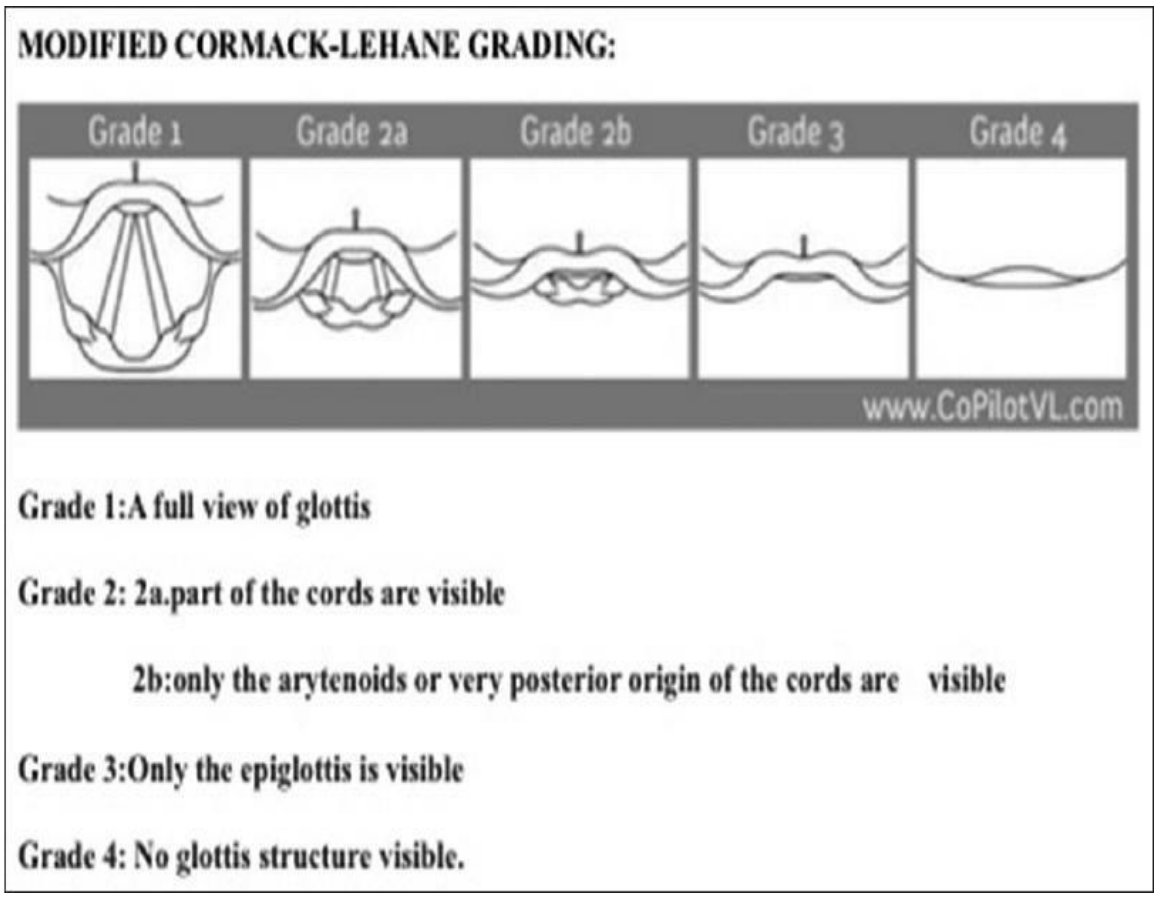


Figure no 14: Laryngoscopic view of glottis-Cormack Lehane Grade

Dr. Archi Brain, a British anesthesiologist, was the one who came up with the idea for a supraglottic airway device that is now known as the laryngeal mask airway (LMA). It has been in use ever since the year 1988. It is an effective alternative to ventilation with a bag- valve- mask, releasing the hands of the caregiver while also providing the benefit of a smaller increase in stomach distention. Its init ial purpose was to serve as an alternative method of ventilation in operating rooms when it was first developed. [1 2] The LMA was at first used predominantly in the operating room environment; but, in more recent years , it has begun to be employed as a necessary additional device in the emergency circumstances for controlling problematic airways [3, 4]

At the distal end of the laryngeal mask airway (LMA), an elliptical mask is attached to it . The proximal end of the LMA is constructed like a large endotracheal tube. It is designed to be inserted into the hypopharynx of the patient and to cover the supraglottic t issues in order to provide a sat isfactory level of tracheal isolation. It is necessary for the patient to be unconscious and unresponsive prior to the insertion of one of these devices. The LMA is effective airway equipment in a number of situation s because it is simple to use and quick to put, especially for practitioners with limited t raining. The operating theatre, the emergency room, and outpatient t reatment are examples of these environments. [1 3] Placing an LMA in the operating room has a succ ess record that is really close to one hundred percent. When dealing with an emergency situation, it is possible to predict a lower success rate for the LMA installation. It causes less stomach distention when compared to bag - valve- mask ventilation, which reduces the risk of aspiration but does not entirely eliminate it . Patients who were not fasting before to having breathing performed on them may find that this is an extremely essential consideration.

Table no 3-DIFFERENT LMA SIZES AVAILABLE AND THEIRSPECIFICATIONS[13,14]

SIZE	ID (mm)	OD (mm)	LENGTH (cm)	CUFF VOLUME-up to(in ml)	PATIENTSIZE
1	5.25	8.2	8.8	4	Neonates/infants upto 5 Kg
1.5	6.1	9.6	10	7	Infants 5-10Kg
2	7	11	11	10	Children 10-20 Kg
2.5	8.4	13	12.5	14	Children 20-30Kg
3	10	15	16	20	Adults 30-50kg
4	10	15	16	30	Adults 50-70kg
5	11.5	16.5	18	40	adults 70-100Kg
6	11.5	16.5	18	50	Large adults >100 Kg

Laryngeal mask airways can be classified into the following categories:

The LMA Unique is a disposable version that is best suited for use in emergency and prehospital situations, whereas the LMA Classic is the first design of its kind to be reusable.

• The Fastrach ILMA (F ILMA) designed to serve as an intubation conduit. [15] While other LMA designs can achieve the same effect, the LMA Fastrach has key distinguishing features that maximise the chances of a successful intubation while imposing no size constraints upon that endotracheal tube (ETT).Some of these features include a rigid shaft that has an anatomically curved shape, an insertion handle, and an epiglottic elevating bar which elevates the epiglottis as the ETT travels through the airway.

• The tubing on the LMA Flexible is much more flexible and comfortable to use. It is not used in any circumstance involving an emergency.

There is a tube for sucking up stomach contents added to the LMA ProSeal. It also permits pressures that are 50% greater without a leak. It is not currently used in emergency situations and does not allow for blind intubation.

• The LMA Supreme, a more recent design, resembles the ProSeal and includes an integrated bite block.

The LMA CTrach is another more recent design; it inserts similarly to the ILMA Fastrach and incorporates fibreoptics with such a video monitor to provide a better sight of the larynx

LARYNGEAL MASK AIRWAY

HISTORY

Dr Ian Archie Jeremy Brain is the one who came up with the idea to create the first supraglottic airway device back in 1981. [14] It is a groundbreaking concept in airway management because it enables air to be exchanged through a mask that was designed to fits inside the hypopharynx as well as faces the laryngeal opening to form a complete seal.In engineering terms, he realised that the solution to the problem of forming a gas tight connection among two tubes is kind of problematic because it necessitates some restriction

at the junction point unless the outer tube (trachea) is stretched to make up for it. In his opinion, it is optimal for both tubes to have the same internal diameter at the point where they converge because this has obvious benefits for gas flow without constriction in the tubes. Since it is not possible to stretch the anatomical tube (trachea), they must be connected end to end.

Dr. BRAIN attempted to create an airway based on the airway ideas that confronted the larynx directly while yet maintaining a gas-tight seal. To determine how such a joint might be made, he looked at adult male and female larynx postmortem specimens. By casting these specimens in plaster of paris, we were able to preserve them (cadavers),he was able to evaluate the pharynx's morphology. He pointed out that an elliptical cuff inflated in the hypopharynx might create an airtight seal against the back of the larynx. He called it the laryngeal mask airway, sometimes known as the classic LMA[12] or the cLMA. It was a rudimentary procedure using a plastic tube attached to the Goldman Dental Nasal Mask, this is utilised throughout the process of dental extractions. [16] Dr. Brain created each and every LMA prototype. Even after the construction of the cLMA, he persisted in his efforts to enhance the model by making it better by the addition of new changes to the previous version of the model.

The first clinical investigations with the traditional LMA were carried out in 1982 on 23 patients undergoing gynaecological laparoscopic procedures. All patients experienced effective insertion and ventilation with a 20 cm water seal.

Figure no 15: Prototype LMA

CHARACTERISTICS OF THE STRUCTURE

The main structural component of the LMA is a latex-free medical grade silicone rubber.. The LMA is made up of an oval, flat mask that is angled slightly and affixed to the end of a huge tubular construction (airway tube) that is proximally encased by a 15 mm airway adaptor.

An inflated cuff surrounds this mask, which is connected to a pilot tubing with a valves and an indication balloon.. By completely covering the airway tube's entry into the mask, two aperture bar prevents the epiglottis from herniating further into lumen.

When properly positioned, the LMA mask's body will rest in the hypopharynx ,its distal tip should be immediately above the upper esophageal sphincter, its proximal feature should be parallel to the base of the tongue, and its sides should be parallel to the pyriform fossa. When inflated, the cuff forms a low-pressure seal all around laryngeal inlet's edge.

Figure no 16: LMA CLASSIC

INTUBATING LARYNGEAL MASK AIRWAY[16]

Because the traditional LMA was insufficiently rigid to permit intubation, the LMA-Fastrach (also known as the intubating LMA or ILMA) was designed specifically for the purpose. The airway tube of a typical LMA is not sturdy enough to act as a guide for proper symmetry of the mask with the glottic structures. Furthermore, it is too thin to fit an adult dimension ETT and too wide to ensure that a regular length ETT reaches the trachea, and too thin to accept an adult diameter ETT. It's possible that the mask aperture bars will block the ETT from going through as well. When intubation is difficult and there is a high anterior larynx, the ILMA-Fastrach may also lessen to observe the laryngeal entrance, the front pharyngeal architecture must be contorted. This is especially useful in patients with a high anterior larynx.

A slender, curving shaft made of stainless steel terminates in a connection measuring 15 millimetres in diameter. Because of the shaft's shorter and thicker shape, it is now possible to implant a tube. Additionally, this form enables the tracheal tubing cuff to pass over the vocal cords. The ILMA consists of a laryngeal mask, which is attached to a guiding metal handle, which is then attached to a silicone-coated, wide-diameter stainless steel tubing that is anatomically shaped.Together, these three components make up the ILMA. It has a guiding ramp and a single adjusting aperture bar, and it may be inserted into an endotracheal tube with a cuff that is 8 mm in diameter (ETT).

FastrachTM silicone tube (FTST), a specialised silicone wire-reinforced tracheal tube, is recommended by the LMA's manufacturers for intubation in trachea with the ILMA.[17] This flexible, straight tube is curved to match the ILMA shaft's curvature. They have a far shorter lifespan than ILMA itself, are more expensive, and are less accessible. Few instances of successful tracheal intubations with the ILMA using standard and reinforced polyvinyl chloride tubes, which are inexpensive, disposable, and easily accessible, have been made.

Figure no 17: ILMA design functions and features

Feature	Function
Rigid airway tube made of stainless steel	• Allows the mask to be stabilised and directed during intubation • Is of adequate length to permit TT to pass through to the desired depth. • Presents an acceptable ratio of internal to external diameter (13:15 mm) • Autoclavable
Integral 15 mm connector	• Facilitates usage as a standard LMA • Reduces the possibility of an accidental disconnection • Enables the use of an ETT with a cuff that is 8.0 millimetres in diameter
Anatomical curve of the tube	• Removes the requirement for head and neck movement; • Removes the necessity to put a finger because external pressure can be applied to the palate • Allows the use of the straight ETT, reducing anterior tracheal wall damage by aligning the ETT to the plane of the glottic vestibule
Integral tube handle	• Enables device adjustment and stabilisation during intubation and extubation • Makes device insertion and removal easier
Bevel on proximal end of stainless steel tube	• Enables compression of the mask aperture to allow passage through a small interdental space.
"V"-shaped TT guiding Tube Ramp	• Function of centeredness • Reduces danger of arytenoid trauma-oesophageal implantation by guiding tube anteriorly.
Epiglottic elevating bar	• Throughout insertion, it serves as an epiglottic ramp • Prevents the epiglottis from blocking the airway • Elevates and protects the epiglottis during tube passage.

BLOCKBUSTER INTUBATING LARYNGEAL MASK AIRWAY

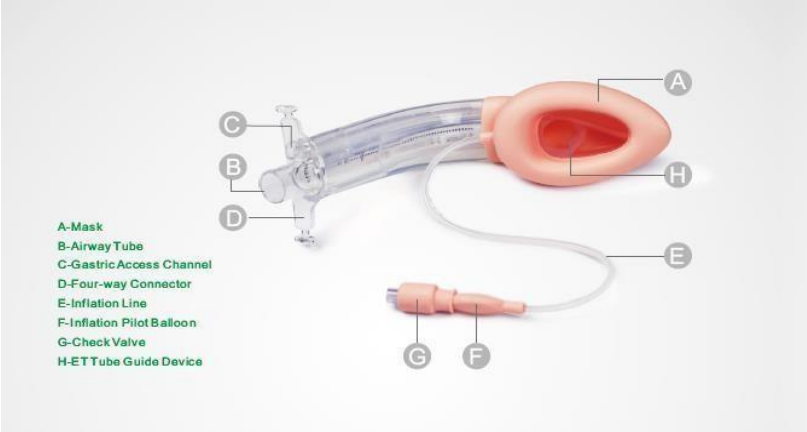
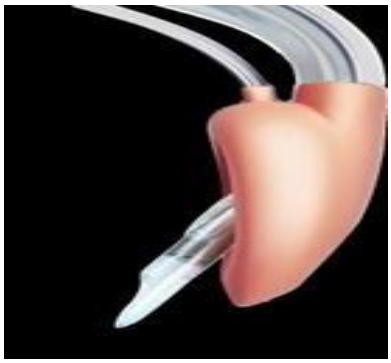


Figure no 18- BLOCKBUSTER INTUBATING LARYNGEAL MASK AIRWAY

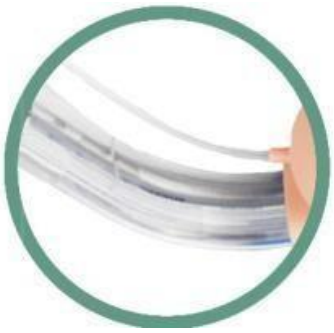
Professor Ming Tian, who is also the co-President of the Worldwide Airway Management Association, invented the well-known laryngeal mask airway. They say that the LMA provides improved hypolarynx breathing and a superior green channel for intubation.They also claim that the LMA offers a nicer green channel. It is claimed that the design of the LMA leads in even less post-intubation tachypnea and a lower risk of aspiration because of the stomach port on the device.

Advantages of BLOCKBUSTER ILMA

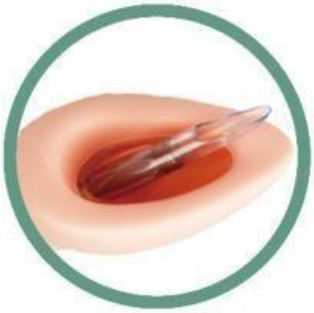
a) The LMA is comprised of soft, pliable silicone, which is gentler and causes lesser trauma than other materials.



b) The airway tube is too smaller and has an angle of more than 95 degrees. It facilitates the insertion and lessens discomfort by conforming to the oropharyngeal curve.



c) The overall performance of blind intubation can be improved with the use of a guidance device that enables an endotracheal tube to be aimed at the laryngeal opening at an angle of thirty



degrees.

d) Ryle's tube insertion is made easier by the way the stomach access channels' inlet and outflow are designed.

e) A tiny amount of sputum can be collected by the cuff's rim, which also serves as a sputum collection device.

f) It comes with a four-way connector, which makes it much easier to make adjustments after it has been installed.

g) It features an inbuilt bite barrier that guards against unconscious biting on the LMA obstructing

airways.

Figure no 19- A look at LMA development milestones

The LMA classic first became available and was used in 1968, three years after Archie Brain created the prototype LMA. It also paved the way for the 1992 invention of the LMA-Flexible has a wire-reinforced shaft .An ETT may flow through the LMA-Fastrach, also known as the ILMA, thanks to its developments in 1997, which made using an LMA for intubation easier. Ambu made yet another change in 2002 when they developed LMAs with built-in curvatures that made insertion simpler and improved ventilation possible with less trauma. ILMA-BLOCKBUSTER, a relatively recent variation of the traditional ILMA, was developed in China by Professor Ming Tian in 2012. It asserted that the use of their BLOCKBUSTER tube resulted in a greater rate of successful intubation procedures.

Cleaning:

ILMA requires a thorough cleaning and sterilisation process before each use. As soon as it is removed from the body, it should be rinsed and to be submerged in 8.4 percentage sodium bicarbonate to dissolve any secretions,that may be present before being cleansed with warm water must undergo an autoclaving process at a temperature that is at least 134 degrees Celsius. If the cuff was not completely deflated before being placed in the autoclave, it was damaged.[17]

DIRECTIONS PRIOR TO USE

There should be no foreign objects or obstructions inside the tube. The exterior should be free of scratches and fissures. Kinking shouldn't happen when the tube is bent 180 degrees. If the cuff inflates on its own after having been completely deflated, or if there are any leaks in the cuff, the valve needs to be examined and possibly replaced.

MASK OF LARYNGEAL AIRWAY CHOICE AND PREPARATION

The manufacturer provides a size chart that suits each person in the size cohort and is dependent on the patient's weight when choosing an LMA size. But the sizes might change up or down depending on the amount of working area inside the mouth.

The LMA must first be cleaned in accordance with the manufacturer's instructions, and the cuff's integrity and symmetry must be checked in both its fully inflated and totally deflated states. To generate a cup-shaped mask with the tapered cuff rim pointing away from the aperture, the LMA cuff must next be uniformly deflated. This is crucial in guiding the mask's tip posteriorly toward the epiglottis as it descends into the hypopharynx. Just prior to insertion, the back surface of the mask must be lubricated with a lubricant that is water-soluble so that it may slide across the palate and the posterior pharynx without any trouble. This will guarantee that the mask fits properly.

TECHNIQUES FOR LMA INSERTION

The technique that is recommended is the midline position, with the cuff deflated to its full extent and the mask opening facing forward. Due to better fiberoptic view , the fully deflated method is more accurate and safer [18].The dominant hand, like a pencil, is used to keep the laryngeal mask airway (LMA) in position at the distal end of the entry tube. The index finger is wedged into the gap formed by the junction between the inserting tube and the mask. The distant end of the mask is positioned adjacent to the proximal hard palate, and the LMA is put into the mouth at the midline, which results in the formation of a caudad angle at the tip of the mask. The next step is to move the LMA forward while pressing with the index finger mostly cephalad and somewhat posteriorly. Along the arch of the palatopharynx, the LMA can be followed with the index finger all the way down into the hypopharynx. After removing the index finger, continuing to move the LMA forward until some resistance is felt, and then securing the proximal end with the other hand, the procedure is complete. As a result of the cuff being slightly inflated, the mask is able to conform to the anatomical contours of the hypopharynx.

The "Guedel" approach is an alternate method. By turning the LMA 180 degrees from the way it is typically used, the mask opening is now facing the hard palate when the device is put in the mouth. The mask is twisted 180 degrees as it is lowered into the hypopharynx. The oropharynx's soft tissues may be more prone to sustain harm using the Guedel technique.
Another technique for facilitating insertion is partial inflation, which can take less time and enhance success rates (96.7 vs. 85.5%);(16 vs. 23 sec).

The "thumb" technique involves putting the LMA in the mouth in the same way as the standard technique, but instead of using the index finger to press the LMA against the hard palate and down into the oropharynx, the thumb is stuck in the groove between both the mask and the insertion tube.

The angle between both the palate and the back of the throat can also be reached by slightly turning the LMA to the side after putting it in. Just before putting the cuff in, lubricant should be put on the back of it, but it shouldn't touch the front.

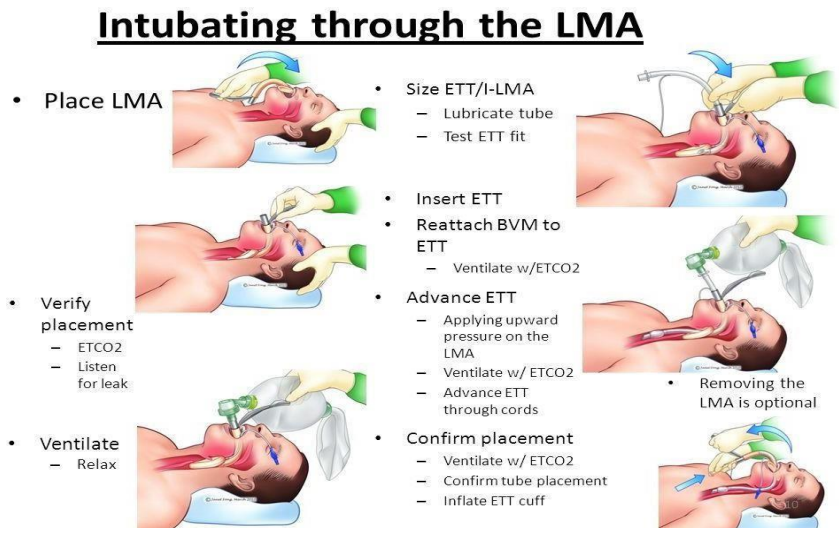


Figure no 20-Insertion of LMA

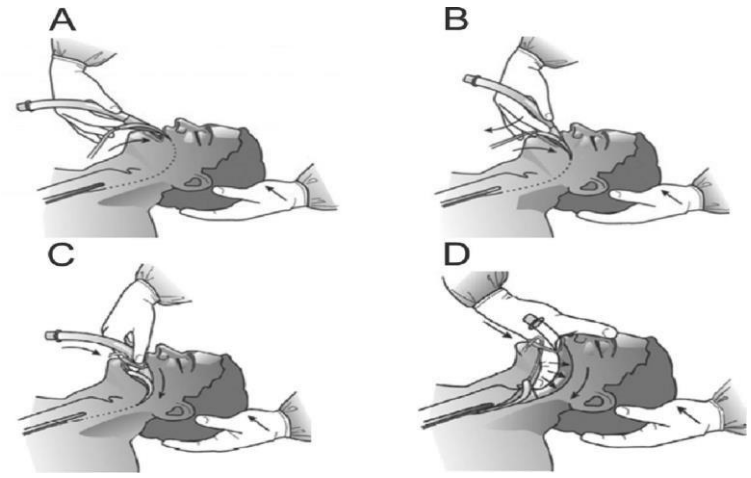


Figure no 21- Intubating through the LMA

INDICATIONS

1. As long as the use of the face mask is not prohibited, the LMA is recommended for normal airway security under general anaesthesia.

2. When tracheal intubation is either unnecessary or unpleasant, the LMA is very helpful

3. It can be used to help tracheal intubation on individual airways as well as to ventilate the lungs when face masks are unable to do so.

4. It gives individuals with restricted neck mobility a proper airway.

5. It can be utilised for bronchoscopy and laryngoscopy diagnostic procedures.

6. It is utilised in typical elective situations tracheal intubation is either unnecessary or is only necessary because the procedure prevents the use of a face mask to maintain the airway.

7. It is helpful in situations where maintaining an airway with a face mask is challenging, including with patients who lack teeth, facial injuries, or burns.

8. Since changes in intraocular pressure are less significant than those caused by intubation, it is helpful during elective eye procedures.

9. The LMA is increasingly employed in MRI anaesthesia.

10. The use of LMA can reduce the need for repeated tracheal intubation in patients receiving radiation while under general anaesthesia.

Elective Ventilation

In the operating room, the laryngeal mask airway (LMA) is a respectable substitute for mask anaesthesia. Short procedures when endotracheal intubation is not required frequently use this technique.

DIFFICULT airway

The LMA is a rescue tool that can be utilised after an unsuccessful intubation. It is a reliable alternative in a difficult airway and blind intubation through these devices is a valuable airway management strategy [19]

The LMA is a good alternative to bag-valve-mask ventilation for people who can't be intubated but who can be ventilated. This is because it is easier to keep up over time and has been shown to reduce, but not completely eliminate, the risk of aspiration.

A surgical airway is necessary and shouldn't be postponed when a patient cannot be intubated or ventilated. However, if the LMA is nearby, it can be promptly tried while a helper gets ready for the cricothyroidotomy [20]

Cardiac arrest

The LMA is listed as a viable alternative to intubation in the 2005 American Heart Association guidelines for treating patients who are experiencing cardiac arrest (Class IIa). [21] This could be especially helpful in the prehospital context, where emergency medical technicians frequently have less success and less intubation experience**.**

Intubation conduit

When direct laryngoscopy doesn't work, the LMA may be used as a way to get the tube into the windpipe

The LMA or ILMA can go through an ETT without any extra work. To help with intubation, a bougie or a fiberoptic scope may be used as well. [17]

Airway control before hospitalisation

In the prehospital situation, the LMA is helpful for treating a difficult airway in addition to patients who are experiencing cardiac arrest.

The LMA can be implanted to successfully manage the airway in patients whose placement or protracted extrication prevents endotracheal intubation until a permanent airway can be established.

In Japan, LMA is often used to make emergency airways for people in cardiac arrest before they get to the hospital. This shows how reliable and effective it is. [21]

Application to Children

Several sizes of laryngeal mask airways are designed specifically for use with children. It has been successfully used as a conduit for tracheal intubation in pediatric difficult airway and in infants. [22].

Contraindications

The following conditions are always cause for immediate medical attention:

It's impossible to open your mouth

Upper airway blockage that is total

In the context of elective surgery, the relative contraindications are as follows:

A greater chance of suffocating suspect or known abnormalities in supraglottic anatomy;

Need for high airway pressures;

• Prolonged bag-valve-mask ventilation in patients with morbid obesity, in pregnant women who are in their second or third trimester, in people who haven't eaten before being ventilated, in patients who have experienced an upper gastrointestinal bleed.

Anaesthesia

Sedation makes it easier to implant a laryngeal mask airway (LMA). You can use either propofol (Diprivan) or midazolam (Versed). [7] When compared to endotracheal intubation for elective ventilation in the operating room, LMA placement and maintenance often require lower doses of anaesthetic. It may not be essential to sedate the patient more for LMA insertion if they are already obtunded or unconscious, as is commonly the case in an emergency scenario. [7] A laryngospasm is occurring because of the potential for insufficient sedation.

Maintaining an LMA does not need paralysis in its recipient.

Patients at risk for cervical spine injury should avoid moving or coughing during insertion, making sufficient anaesthetic all the more crucial.

A deeper anaesthetic dose may be necessary for children.

Equipment

- The following constitutes the equipment:
  Laryngeal mask airway (LMA), shown below

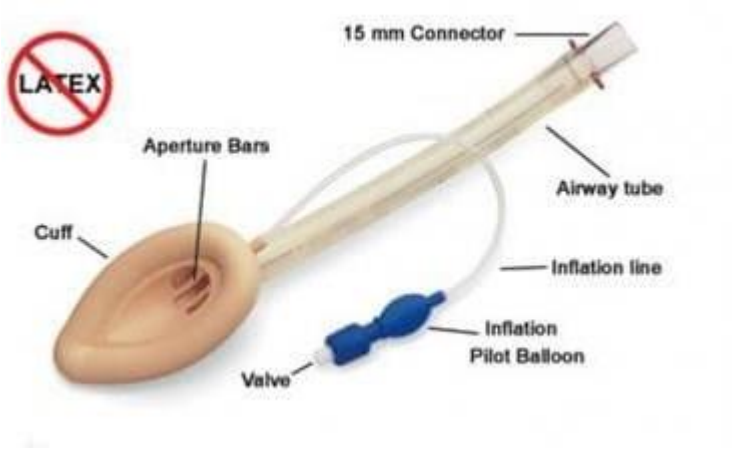


Figure no 22-LMA Classic

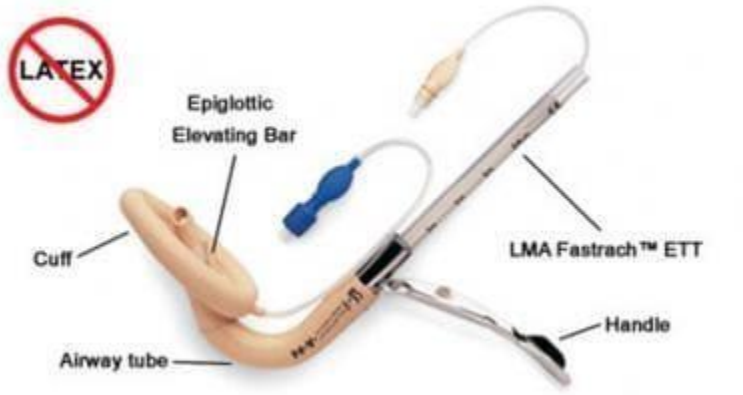


Figure no 23-ILMA Fastrach

- End-tidal carbon dioxide (ET CO2) detector
- Oxygen supply
- Water-soluble lubricant (included in the LMA kit)
- Syringe of an appropriate size for use in inflating the cuff (included in LMA kit)

- Intubation equipment and a cricothyroidotomy kit
- Bag-valve mask
- Yankauer suction device. These things should be handy.

Positioning

The patient's head can be effectively placed for such insertion of the laryngeal mask airway by using the sniffing position, which is the most successful technique (LMA).

The neutral posture of the patient's head is the most effective position for the head to be in when placing an intubating laryngeal mask airway (ILMA).

Preparation

- As soon as time permits, begin preoxygenating the patient with 100 percent oxygen delivered through a mask that does not allow rebreathing.
- It is important to select the correct size of laryngeal mask airway (LMA).
- Examine the LMA cuff to ensure there are no leaks.
- When using the LMA against a level surface, totally deflate the cuff of the LMA.
- The back of the mask should have a generous amount of a lubricant that is water-soluble applied to it.
- When necessary, you should administer sedative.
- Adjust the patient's position.

Cricoid pressure

Cricoid pressure is applied in an effort to lessen the likelihood of aspiration, however the degree to which it is successful can be contested. [23]

The application of cricoid pressure has been shown to result in a reduction in the percentage of successful insertions. As a result of this (ILMA), if cricoid pressure is being applied, it may be required to remove it in order to aptly position the laryngeal mask airway (LMA) or intubate the patient through using intubating laryngeal mask airway.

Putting in place of the LMA:The LMA should be held only with index finger of the hand, just like a pen ,that you use most often at the intersection of the mask and the tube, as shown in the image below.

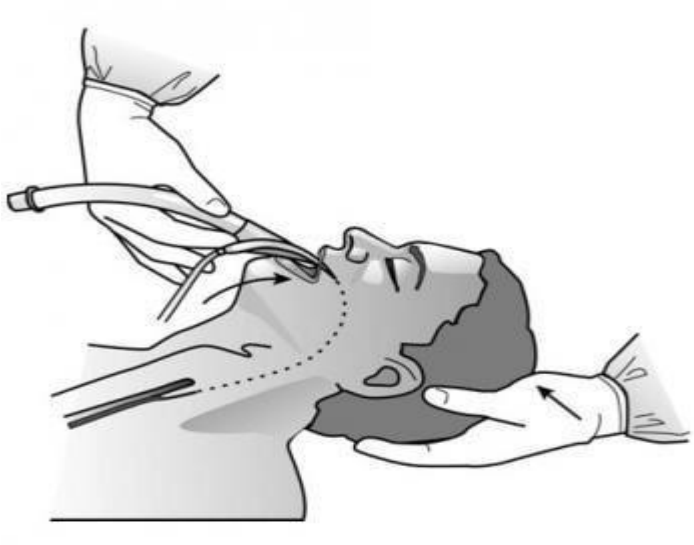


Figure no 24-1)Insertion of the LMA.

Slide the LMA along hard palate as illustrated in the figure that follows while similarly pressing it backward on the palate as it is advanced toward the hypopharynx. This procedure may be found by clicking here. This prevents the tip from collapsing in on itself, which in turn reduces the amount of interference that the tongue causes.

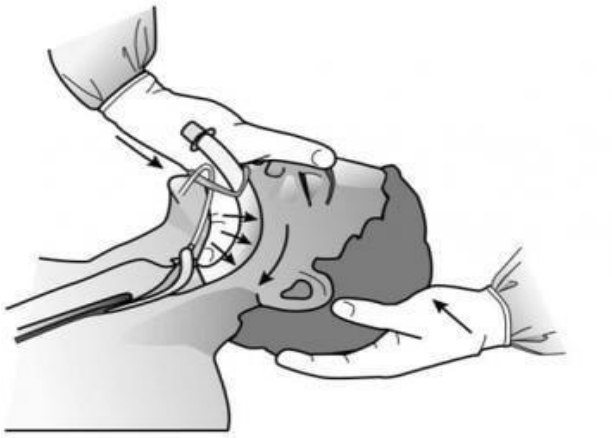


Figure no 25- 2)Insertion of the LMA.

Insertion of the LMA

- Continue advancing while applying light pressure up until you encounter resistance.
- Maintaining pressure on the tube with the hand that is not your dominant hand may be required in order to fully advance the LMA to the correct position.
- After it has been properly positioned, the LMA should be allowed to assume its natural position before the cuff is inflated further.
- Approximately 8 centimetres of the tube can be seen protruding from the lips of the patient.

The intubating laryngeal mask airway is inserted into the patient (ILMA)

• Using the handle, ensure that you keep a firm grasp on the ILMA.

• Insert the mask into the patient's mouth and push it firmly against with the hard palate, as seen in the figure below. This should be done in the same manner as step one.

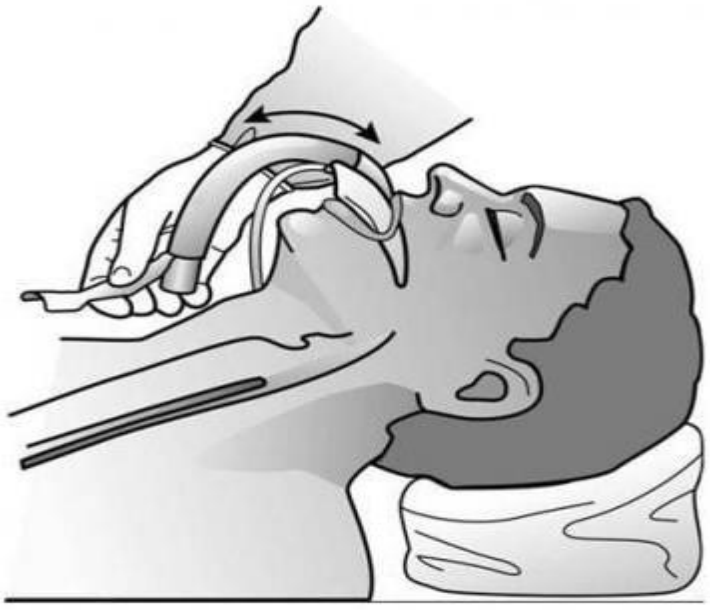


Figure no 26- Insertion of the ILMA.

• Turn the mask around so that it faces in the opposite direction, following the arc of the tube.

- Arrange the ILMA so that it is in the correct place.

• Inflate the cuff in the same way as the LMA.

• Inserting the ProSeal in place of the LMA

• You can insert this model in a manner that is analogous to how the LMA was initially inserted, or you can connect it to a rigid insertion handle and insert it in a manner that is analogous to how an ILMA is inserted.

Another method includes the utilization of a bougie, which is initially introduced into the drainage tube before even being purposefully introduced through into oesophagus by direct laryngoscopy. This procedure is performed in a similar fashion as the previous method.

• Position the ProSeal such that it will enclose the bougie, and then move it into place.

• Establishing credibility for one's position

• Verify the position of the left main bronchus artery (LMA) by auscultating bilateral breath sounds, listening for the lack of noises above the epigastrium, observing the chest rise when the patient is ventilated, and placing an ET CO2 to check for a change in colour if one is present.

• Make sure that the vertical black line on the tube is in the centre of the patient's body. You can check this by placing the tube on the patient's chest.

• Determine whether or not the system is capable of producing water pressure of up to 20 centimetres without developing a leak.

• Inserting the endotracheal tube via the laryngeal mask airway and the intubating laryngeal mask airway,The success rate of intubation achieved with the use of a conventional LMA is approximately 80%, but the success rate of intubation reached through the use of an intubating LMA, such as the LMA Fastrach, is approximately 95%.

• The LMA Classic and the LMA Unique both have a limitation on the largest diameter of the endotracheal tube (ETT) that can be inserted through them. This limitation applies to both devices. It is not impossible to get an LMA of size 3 or 4 through an ETT that is 6.0. An ETT of up to 7.0 is tolerable by the size 5 and size 6 LMAs, respectively.

• Investigate the ETT and make certain that it has the appropriate amount of lubricant.

• You will need to continue doing this until you have effectively intubated the patient into the lumen of the LMA tube and into the trachea.

Confirm the placement using the information below.

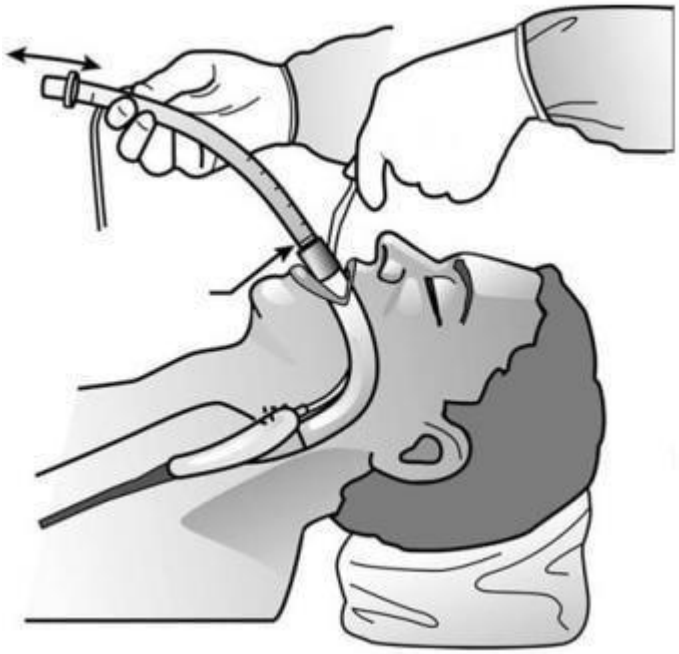


Figure no 27-1)Intubating through the ILMA.

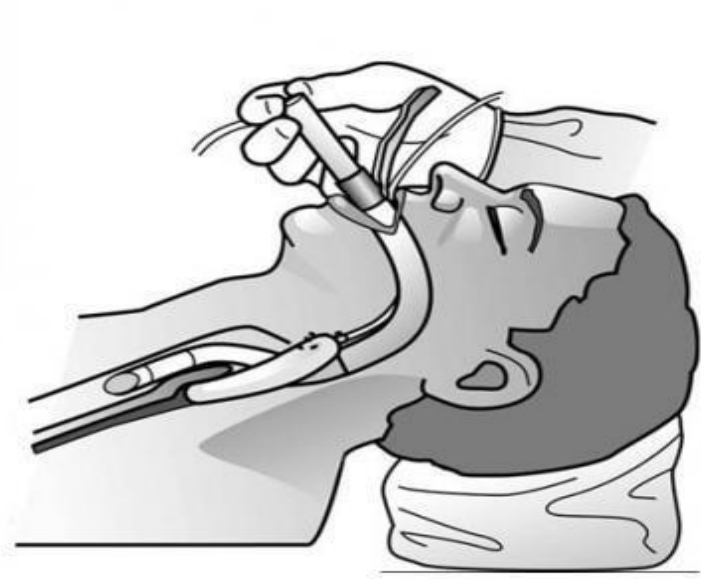


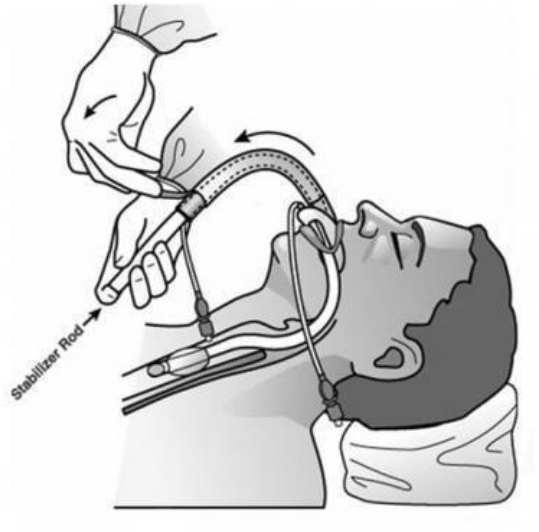
Figure no 28-2)Intubating through the ILMA.

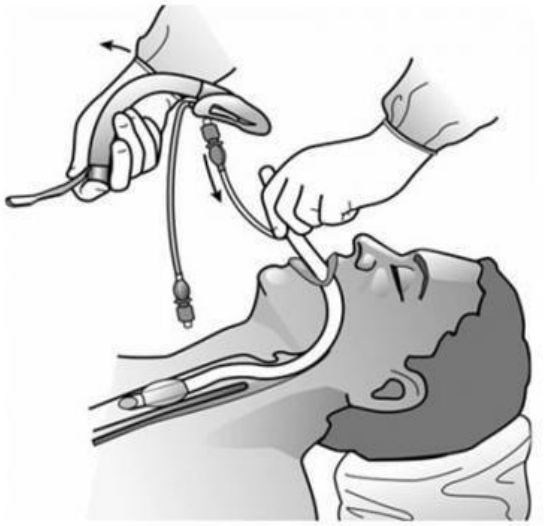
- Intubation might be helped along with the aid of a bougie or a fiberoptic scope.
- The ETT is already attached to the LMA Fastrach, but if you choose, you can also use a regular ETT.

• Once the patient has been successfully intubated, the ILMA can be removed by deflating the cuff, positioning it over the tube with the help of a stabilisation rod, and then taking it off. The graphic provides a visual representation of this process.

• There is evidence to suggest that the placement of the LMA using a laryngoscope as a guide resulted in higher first success rates than the usual insertion technique described earlier . This is something that can be done in place of the typical method as an alternative.

Figure no 29





Removing the ILMA after intubation ***Removing the ILMA after intubation***

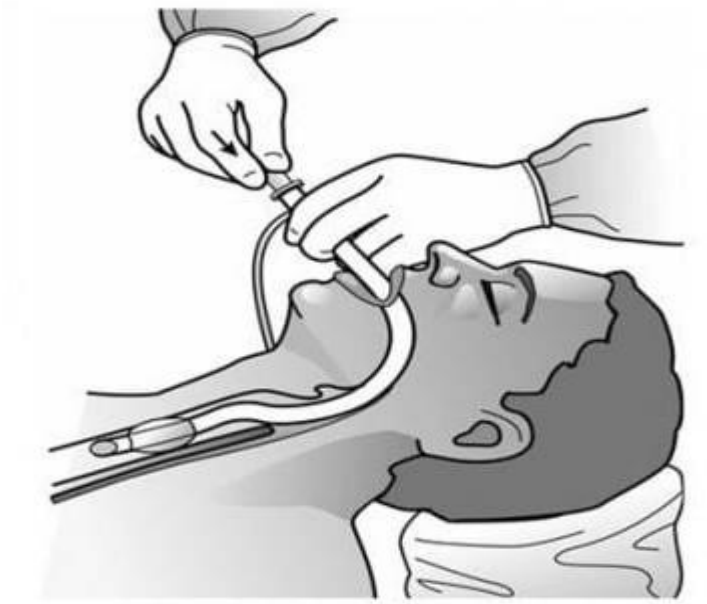


Figure no 30- Intubation complete

CONTRAINDICATIONS AND LIMITATIONS OF THE STATISTICAL MODEL

The trachea is not protected against regurgitation and aspiration by the LMA, and it is not intended to replace an endotracheal tube when the latter is necessary. Contraindications include having a full stomach, not having fasted, having morbid obesity, having recently experienced trauma, having acid reflux, or having an intestinal obstruction. Patients with low pulmonary compliance who may require significant high pressure (>25-30 cm H2O) for respiration are not suitable for this treatment. Periglottic diseases associated with oral malignancies Conditions under which the airway cannot be easily accessed, such as when the patient's head is covered and turned away from the anaesthetist or when they are lying in a prone position, are considered to be relative contraindications to the use of this technique.

PATIENT SELECTION AND PREPARATION

Patients who have lower lung compliance or who have a higher risk of having pulmonary aspiration are not eligible for this study. The study only includes children who have a physical status of 1 or 2 according to the ASA and who do not have any congenital or acquired airway abnormalities (meaning they do not have trouble breathing).

ADVANTAGES

1. It enables the quick formation of an airway in the paediatric patient without the need for the patient's muscles to be relaxed in advance.

2. The skill of placing can be picked up quite quickly.

3. The amount of anaesthesia administered is reduced.

4. In contrast to the face mask, it provides an airway that is not only unobstructed but also more comfortable to breathe through.

5. In contrast to the face mask, the laryngeal mask airway (LMA) does not need the jaw to be supported and allows the anesthesiologist to keep their hands free.

6. In contrast to a face mask or an endotracheal tube, the laryngeal mask airway (LMA) does not need to be positioned in the perfect way in order to maintain a good airway. This makes the LMA a more convenient option.

7. The hemodynamic reaction that is typically associated with intubation is not triggered by the procedure since it does not cause injury to the vocal cords or the trachea.

8. The variations in intracranial and intraocular pressure that take place as a result of the insertion of an LMA are noticeably less severe than those that take place as a result of the insertion of an endotracheal tube.

9. It does not cause bronchospasm in persons who are more susceptible to it.

10. The risk of developing a sore throat and subsequent infections of the respiratory system after having a tracheal tube inserted is lower as compared to the alternative of having the tube inserted.

11. A gradual awakening following the administration of anaesthesia

12. Insertion of an LMA does not result in a significantly increased risk of bacteremia, in contrast to nasal intubation, which does pose this risk.

13. Because of the LMA's increased lumen size, there is a decrease in the amount of rise in airway resistance that happens during spontaneous breathing. This effect can be attributed to the fact that spontaneous respiration takes place.

DISADVANTAGES

1. The LMA is not beneficial for stent placement or maintaining integrity in tracheomalacia or in a trachea that is constricted or congested at or beneath the laryngeal inlet.Tracheomalacia is a condition in which the trachea becomes soft and spongy, and it can occur anywhere along the trachea. Tracheomalacia is a disorder where the trachea has a mushy and sponge-like consistency. Tracheomalacia is another condition that can lead to the trachea

2. When utilising an LMA, distinguishing between bronchospasm and laryngospasm may be more difficult. Furthermore, delivering positive pressure to break laryngospasm may be more challenging.

3. People who are fat have an increased chance of aspirating stomach contents, which is a risk factor that is already elevated.

4. The prone and jack knife positions of the LMA pose a significant risk to the user.

COMPLICATIONS

1. Unintentional dislodgement can occur.

2. Blockage of the airway in addition to potential damage to the airway

3. Damage to the nerves - After using LMA, some individuals have reported developing palsies in their hypoglossal, recurrent laryngeal, and lingual nerves.

ENDOTRACHEAL TUBE

As a result of In 1543, Andreas Vesalius treated a pneumothorax in a pig by putting a reed into the trachea of the animal. This is considered to be one of the earliest descriptions of the insertion of an artificial airway.This was followed by Benjamin Pugh in 1754 performing the first endotracheal intubation to resuscitate a neonate with a leather covered coiled wire. [24]

In the 1840s, ether was first used clinically, which paved the way for an increase in the number of surgical procedures performed. A mask that covered the patient's nose and mouth was used as the primary method for administering general anaesthesia to the patient. The risk of aspirating stomach contents was not widely understood, and postoperative pneumonia was a typical complication. It is believed that Trendelenburg (1869) was the first person to build an inflatable cuff. During the procedure, this cuff consists of a little rubber bag that was slipped so over tip of a tracheostomy tube in order to produce a hermetic seal and prevent the patient from aspirating.

Macewen (1880) described the technique of alleviating an obstruction in the trachea by inserting an oral tube into the trachea as an alternative to performing a tracheostomy. In addition, he became the first person to describe how anaesthesia (chloroform) might be administered through an orotracheal tube. In addition, he was the first person to explain the use of a metal tube with a sponge collar that's been inserted into the neck to avoid aspiration. This was done so that the patient would not accidentally swallow any liquid. Eisenmenger (1893) became the first person to clarify how a cuffed ETT was supposed to be used. In addition to this, he was the first person to articulate

the idea of employing a pilot balloon in order to determine the pressure that was present within the cuff.

During the early 1900s, anesthesiologist Franz Kuhn made important contributions to the field. In addition to using metal tubes, he favoured administering anaesthesia through the oral route rather than tracheostomy and popularised the use of orotracheal anaesthesiaRowbotham and Magill (1926) were the ones who invented larger rubber tubes that enabled gas to travel in either direction through the tube. These tubes had pharyngeal sponges used as a seal, and they had gauze pull threads that were hand-sewn in order to make removal simpler.

It is stated that the era of ETT design began when Guedel (1928) and Waters (1931) returned the inflated cuff to Magill's rubber tube. This is when the ETT design period began. This accomplishment is credited to both Guedel and Waters. The very first cuffs ever made were fashioned by cutting the fingers off of rubber gloves as well as inserting them into condoms made of rubber.

The application of positive pressure ventilation (PPV) for respiratory failure was made possible by the development of cuffed endotracheal and tracheostomy tubes during the polio pandemic that occurred in Europe and the United States in the late 1950s and early 1960s respectively.A polyvinyl chloride (PVC) tube that was disposable and included a high-pressure low-volume cuff was not commercially available until the year 1968. The technology pertaining to polymers had advanced to this degree. Excessive cuff pressure is the cause of a decrease in regional tracheal blood flow. Tracheomalacia, tracheal dilatation and stenosis, and tracheoesophageal fistula are also related with this disorder. [25]

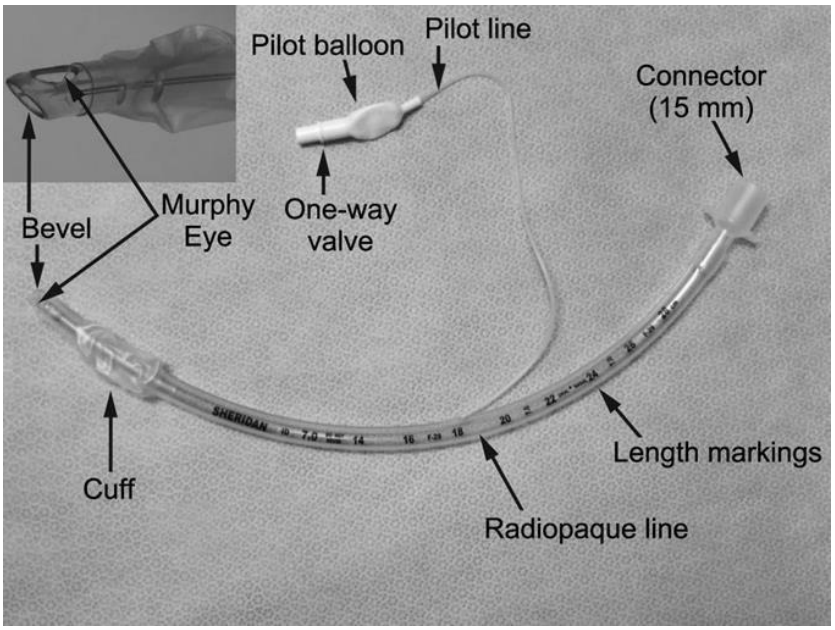


Figure no 31- POLYVINYL CHLORIDE ENDOTRACHEAL TUBE [26] (PVC-ETT)

The high volume low pressure (HVLP) PVC-cuffed ETT was first made available for purchase by manufacturers in the 1970s. Since then, it has been the industry standard for ETTs. PVC possesses many desirable qualities, including the fact that it is see-through, non-toxic, and affordable, and that it adapts to the anatomy of the patient when it is at body temperature.

THE STRANDED ENDOTRACHEAL TUBE: ITS INTERNAL STRUCTURE

PVC is the most common material used in the construction of ETTs; however, other materials such as rubber, silicone, and metal are also used. The majority of ETTs that are utilised in operating rooms or other areas that require critical care have design characteristics and features that are conventional. Using marks along the entire length of the tube that indicates the number of cm from the tube's tip, clinicians are better able to evaluate initial insertion depth and monitor tube movement. This is because markings let clinicians monitor tube movement. Some tubes also include a mark that serves as a depth guide to assist the user in inserting the tube to the appropriate level. This mark is intended to guarantee that the tube is properly positioned in direct view, with the vocal cords laying at a single or even between two line markings on the tube's surface. The purpose of this mark is to confirm that the tube is properly positioned over direct vision.

A radiopaque continuous marker has been inserted in the length of the tube so that it can be seen along the length of a chest radiograph. This allows the distal tube tip to be located and

identified.This helps to ensure that the tube has been inserted to the correct depth. At the very end of the tube, there is a slight angle or bevel that slopes to the left.The tube's apex looks like this. Because the laryngoscope tube is normally introduced from the right side of a standard left-handed laryngoscope, the left-sided blade allows for better visibility of the region in front of the tubing and smoother passage through the vocal cords. This is because the tube is usually entered on the right side of the device.

In most cases, there is an additional side hole that is known as the Murphy eye, and it is located directly opposite the bevel. In the event that the tip of the tube becomes clogged, which can happen when it is pressed up against the tracheal wall or when mucus plugs it up, this device is designed to permit the passage of gas and ventilation. The majority of tubes feature a cuff, which is an inflating balloon located near the end of the tube. By going all the way around the tracheal tube, this balloon creates a tight seal against the inside surface of the tube. During PPV, the cuff plays a critical function in keeping fluid and secretions from leaking downwards into the trachea and lungs, along with gas from spilling surrounding it. This can be accomplished by avoiding fluid and secretions from leaking via the cuff.

Through a hollow catheter that is referred to as the pilot line, the cuff is connected to a more compact inflating balloon. The balloon, which is located outside of the patient and is referred to as the pilot balloon, serves as a tactile gauge of the pressure in the cuff in addition to functioning as a small reservoir to assist in mitigating modest variations in intracuff pressure. A one-way valve that is connected to the pilot balloon prevents gas from escaping the cuff and provides a connect or to attach a syringe or other monitoring the pressure equipment. In addition, this valve allows the pilot balloon to be used. Additionally, this valve allows for easy inflation and deflation of the balloon.

Every tube comes equipped with a universal adapter that may be used to link a wide variety of respiratory or anaesthetic apparatus to the tube. One end of the connector has a standard exterior diameter of 15 millimetres so that it can be attached to various pieces of apparatus, and the other end is appropriately sized so that it can press-fit into the tube.

UNIQUE TUBE TYPES -Tubes with Parker Flex-Tips [27,28]

When doing an orotracheal or nasotracheal fiberoptic intubation, the standard procedure entails inserting a fiberoptic bronchoscope into the trachea, followed by extending a preloaded ETT over the scope in a blind manner. This method has been connected to a variety of issues and difficulties that are associated with the standard design of the ETT.These complications and challenges include tissue trauma and an inability to reroute the ETT or pass by anatomic structures. When compared to the Parker Flex-Tip tube, which is produced by Parker Medical in Englewood, Colorado, the standard endotracheal tube (ETT) has a tip that is rigid, right-sided, and straight. On the other hand, the Parker Flex-Tip tube has to have a tip that is flexible, hemispherical, pliable, and curved so that it points towards to the centre of the distal lumen of the tube. This was done in an effort to assist in resolving this issue. It is well known that the curved tip is able to wrap around fiberoptic scopes (in addition to bougies and exchange catheters) more firmly than other tubes, and it has been related to a better rate of initial success in addition to a quicker tube passage than a conventional ETT. [Curved tip]. While performing nasotracheal intubation, the Parker Flex-Tip has now been associated to less tissue trauma, haemorrhage, and nasal pain than conventional nasotracheal intubation devices, so long as its bevel and tip do not confront or make contact with the turbinates or septum. Nasotracheal intubation resulted in decreased subglottic impingement on the tracheal wall with the use of the Parker Flex-Tip, and it was simpler to pass through a bougie tube exchanger, according to case reports.

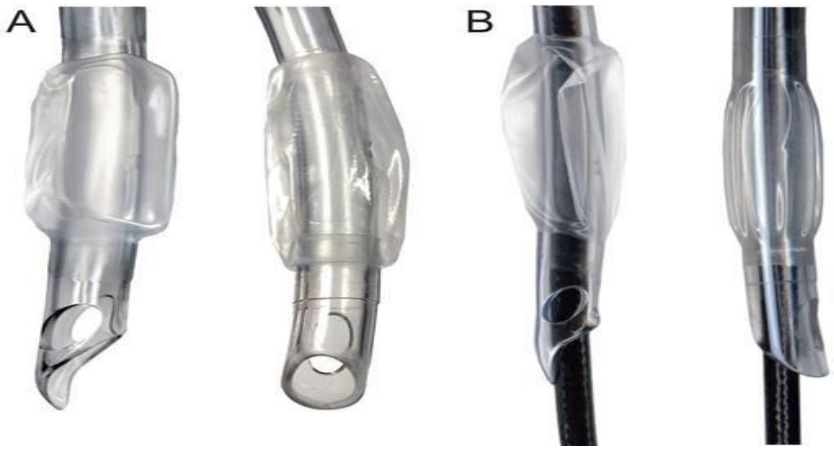


Figure no 32- PARKER FLEX TIP TUBES

The Cobra Perilaryngeal Airway (CobraPLA) is another unique supraglottic device that has design

features that make it suitable for fiber optic-guided tracheal intubation. The flat "Cobra head" which lies on the posterior pharynx prevents the device from rotating and makes it a stable LMA [29]

FASTRACH ILMA DURING BLIND ENDOTRACHEAL INTUBATION

The intubating LMA, also known as the LMA-Fastrach TM and manufactured by LMA North America Inc. in San Diego, California, was made readily available to patients for the very first time in the year 1997. When performing blind or fiberoptically guided tracheal intubations, the ILMA-Fastrach is an excellent choice for the conduit. In spite of the fact that it was designed specifically to offer an improved conduit for these procedures, it retains all of the ventilatory characteristics of the conventional LMA. [4,5] There have only been a handful of studies that have been published that evaluate how effective the ILMA-Fastrach TM is in the treatment of individuals who have been diagnosed with Difficult Airway (DA) [7,8]. In this study, we report the knowledge and experience that four institutes have gained from the utilisation of the ILMA-Fastrach in the treatment of 254 patients who do have DA. These patients have all been diagnosed with DA. In each and every one of the cases, the ILMA- Fastrach was inserted, and intubation was performed, by investigators who had a great amount of prior clinical expertise employing the conventional LMA for the elective and emergency treatment of patients who had DA. Prior to the publication of this article, these scientists had already begun employing the ILMA-Fastrach in their clinical treatment of patients who had DA because of the exceptional characteristics of the device as a conduit for blind or fiberoptically guided intubations. This is as a result of the excellent properties that the apparatus possesses.

The ILMA-Fastrach insertion method

To ensure that the patient's head remained in a neutral position throughout the insertion process, as instructed by the ILMA-Fastrach instruction manual, a support was positioned between the patient's occiput and the operating table. This allowed the patient's head to remain in the position that was most comfortable for the patient [12] . After the device was inserted, ventilation was verified by watching the patient's chest movement and doing a capnography. After some research, the following anaesthetic methods for inserting the ILMA-Fastrach were found to be

effective.

The intubating LMA, also known as the LMA-Fastrach and manufactured by LMA North America Inc. in San Diego, California, was made available to patients for the very first time in the year 1997 [12]. Propofol from the ILMA-Fastrach was administered to patients undergoing elective procedures at a dose ranging from 2.0–2.5 mg/kg in order to induce general anaesthesia. These patients did not have any airway pathology, hence the procedure was considered to be safe. Patients whose airways had been altered as a result of tumours, surgery, or radiation therapy were given inhalation induction with sevoflurane at concentrations ranging from 2% to 4%, and spontaneous respiration was allowed to continue throughout the process.This was done while maintaining spontaneous respiration. To achieve topical anaesthesia to the airway in patients in whom the ILMA-Fastrach was inserted while the patient was awake, a 4% lidocaine spray was applied to the oropharynx, after that, three to four millilitres of lidocaine solution containing four percent being injected through into the cricothyroid membrane.This was done in order to achieve topical anaesthesia to the airway. It was necessary to execute emergency insertions of the ILMA-Fastrach in patients who were unconscious outside of the operating room and in patients who were anaesthetized inside the operating room who had tried other methods for intubation but were unsuccessful.

ILMA-Fastrach insertion and intubation were accomplished on patients who had unstable cervical spines while they were wearing hard Philadelphia collars made by the Philadelphia Cervical Collar Co., located in Westville, New Jersey. In order to provide adequate accessibility to the patient's mouth for insertion of the ILMA-Fastrach and to enable the appropriate manner of insertion, it is necessary to,a little amount of the foam from the chin section of the Philadelphia collar had to be removed. This was done by cutting away a portion of the foam. Before employing the ILMA-Fastrach, the neurosurgeons established that this alteration did not influence the stabilisation of the patient's neck in any way.

Intubation utilising the ILMA-Fastrach system

In individuals who did not have any intrinsic tumours that distorted the airway, blind intubation with the ILMA-Fastrach was attempted as an elective procedure. Every patient was given an endotracheal tube (ETT; ILM Endotracheal Tube; Euromedical, Lake Zurich, Illinois) that was made of non-disposable silicone and was designed for blind intubation using the ILMA-

Fastrach. Before inserting the ETT into the ILMA-Fastrach, a lubricant that was water-soluble was applied to the tip of the device.

Dr. Chandy Verghese came up with a beneficial move that helps with the right positioning of the ILMA-Fastrach and makes blind intubation easier. The Chandy manoeuvre is broken down into two stages that are carried out in the prescribed order. The first phase, which is critical for the formation of appropriate ventilation, is using the metal handle to perform a minor rotation of the device in the sagittal plane until the level of resistance to bag ventilation that is lowest is reached. Just prior to blind intubation, Using the metal handle, the second process of the Chandy technique involves slightly elevating (but not tilting) the ILMA-Fastrach away as from posterior pharyngeal wall. However, this should not be done in a tilting motion.This step is performed during the Chandy manoeuvre. This makes it easier for the ETT to move through the trachea without causing any complications. Only one of the authors routinely implemented the Chandy manoeuvre into his clinical work, despite the fact that all of the authors were familiar with it.

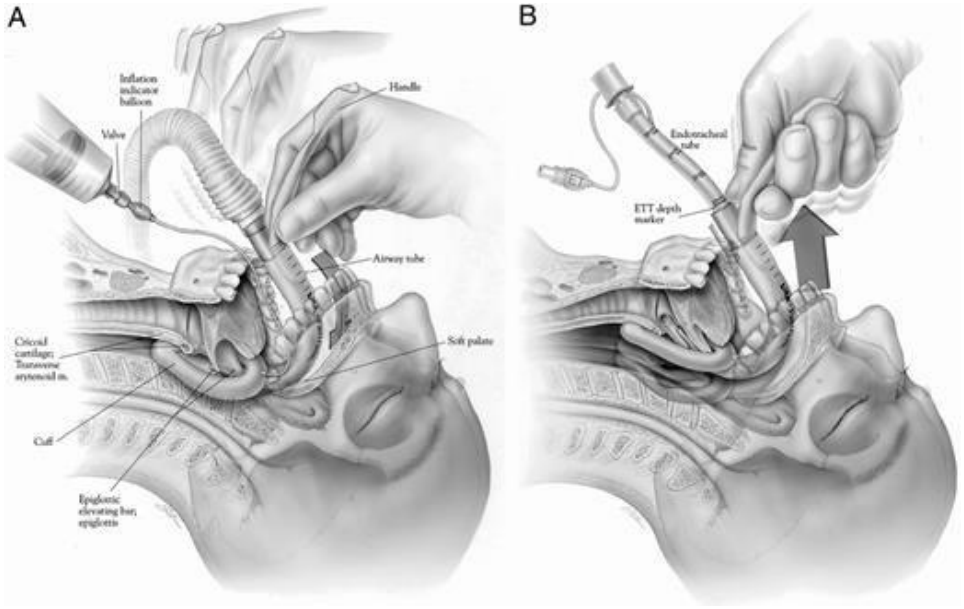


Figure no 33-Method of insertion of Fastrach ILMA

When the ILMA-Fastrach is positioned such that it is aligned with the opening of the glottis, the amount of resistance that is encountered when inserting the ETT into the trachea is minimal at

best. In the event that resistance is encountered when attempting to pass the tube, with LMA-Fastrach instruction manual recommends making some additional changes to facilitate the passage of the ETT. In order to carry out these manipulations, you will first need to determine how far the ETT has now been developed far beyond distal opening of the metal tube that composes the ILMA- Fastrach before you meet resistance. This can be done by measuring how far the ETT has been advanced beyond the distal opening. Counting the lines on the ETT that are spaced one centimetre apart and are positioned above a black transverse mark is an easy way to get an accurate reading on this distance. This symbol identifies the location at which the ETT exits from the distal aperture of the metal tube that constitutes the ILMA-Fastrach device. The following guidelines were established by the investigators for subsequent attempts to intubate the patient. The suggestions that can be found in the guidebook served as the foundation for these principles.

1. If there was still resistance after pushing the ETT three centimetres after the distal aperture of the ILMA-Fastrach tube, it was determined that the device was insufficient and a larger ILMA-Fastrach TM was used.

2. A smaller ILMA-Fastrach was utilised if it was determined that the device was too large if it was possible to feel resistance when trying to advance the ETT inside the first centimetre.

3. If resistance was felt two to two and a half centimetres beyond the distal entrance of the ILMA-Fastrach tube, this signified that the epiglottis had gotten down-folded during the process of insertion and that there was no longer within reach of the epiglottic elevating bar (EEB). In this particular incident, a piece of the ILMA-Fastrach was taken out and then put back in again.

When moving the tracheal tube forward, force was not employed to overcome the resistance because this would have caused damage to the airway. In addition, the number of attempts to successfully intubate the patient was capped at five, after which a fiberoptic bronchoscope was utilised to successfully complete the procedure (FOB; Olympus LF-2, Olympus BF XT-30; Olympus America, Inc., Melville, NY).

Intubation with the assistance of fiberoptics was chosen to be the initial method of intubation for patients who had tumours in their airways, as well as for patients whose airways had been changed in the past by either surgery or radiation therapy. At the beginning of the fiberoptically guided

intubations that were performed with the ILMA-Fastrach, the FOB was kept within the ETT. These intubations were performed with the ILMA-Fastrach. But, as once tip of the ETT had reached and elevated the EEB, the FOB was then passed via the tip of the ETT and passed between the vocal cords and down into the trachea. This procedure was repeated until the ETT had reached and elevated the EEB. After several attempts, the patient was finally able to have their breathing tube removed successfully. After that, the endotracheal tube (ETT) was positioned over the FOB, and the process of tracheal intubation was continued until it was finished.

REVIEW OF LITERATURE

- According to the findings of **Hosseinzadeh H et al (2013)** [30], blind nasotracheal intubation is a type of intubation that does not involve the inspection of the glottis and is utilised in situations in which orotracheal intubation is either difficult or impossible. Warming the endotracheal tube can make it more flexible, which can help reduce the amount of damage done to the nasal cavity during the procedure. In this study, the researchers wanted to evaluate endotracheal intubation by using endotracheal tubes that had been softened by hot water at a temperature of 50 degrees Celsius. Additionally, they wanted to compare the patients in terms of the success rate and the complications that they experienced. We recruited sixty ASA Class I and II patients who were scheduled to have elective jaw and oral operations under general anaesthesia. In the study group, the success rate for blind nasotracheal intubation was 83.3%, while the success rate in the control group was 70%. This difference in success rates between the study group and the control group was not statistically significant, despite the fact that the success rate in the study group was greater than in the control group. The tracheal location of the nasotracheal intubation tube was used the most often, followed by the esophageal position, and then the anterior position, in that order. In conclusion, their research demonstrated that using an endotracheal tube that had been lubricated with warm water could lessen the likelihood of epistaxis occurring during blind nasotracheal intubation as well as its severity; however, this technique did not make blind nasotracheal intubation any easier. Regarding the ILMAs, there is a very limited amount of information available. As a result, we are unable to draw many conclusions from this study.

- **Panwar M et al 23 (2013)** [31] investigated the fact that rapid loss of airway in patients who were positioned in the lateral position has always been demonstrated to be challenging to manage with conventional laryngoscopy. They carried out a randomised controlled trial to determine the ventilation and intubation success rate in the lateral position using an intubating laryngeal mask airway (ILMA). Ninety patients were randomly assigned to one of three positions—supine, right lateral, or left lateral—and then divided into three groups of thirty patients each. Each group consisted of patients of both sexes, grade I and II according to the American Society of Anesthesiologists, aged between 18 and 55 years old, and having a normal airway posted prior to surgery while under general anaesthesia. Patients were premedicated with fentanyl before being given propofol and rocuronium to induce anaesthesia and block neuromuscular activity, respectively. After inserting the ILMA, a blind tracheal intubation was

performed using the ILMA. It was documented how successful each procedure was, along with how long it took and how many times adjustment movements were performed. Tabulation and analysis of the data were performed using ANOVA (analysis of variance), the multiple t test, and the chi-square test. The success rate of intubation, which was found to be 96% across all three groups, as well as the amount of time needed for insertion and intubation were found to be relatively comparable. They came to the conclusion that the ILMA has a vital part to play in the emergency management of airways in patients who were positioned in the lateral position in terms of how easy it was, how successful it was, and how much time it took. However, the only two categories that we will be comparing in this part of our research are the blockbuster movies and the fast-paced action movies with regard to their goals.

- The utilisation of supraglottic airway devices (SADs) was noted by **Ramachandran SK et al [32] (2014)**. These devices are utilised to keep the upper airway open in order to facilitate unobstructed ventilation. Because of their adaptability and user-friendliness, early (first-generation) SADs were able to swiftly replace endotracheal intubation and face masks in more than forty percent of general anaesthetic instances. By incorporating design enhancements, second-generation devices have even more increased efficacy and utility than their predecessors. Individual second-generation SADs have allowed for more reliable positive-pressure ventilation; they are made of materials that are disposable; they have integrated bite blocks; they are better able to act as conduits for the placement of tracheal tubes; and they have reduced the risk of pulmonary aspiration of gastric contents. SADs are currently capable of providing successful rescue ventilation in more than 90 percent of patients who are unable to have mask ventilation or tracheal intubation performed. However, there are still several issues that need to be addressed with these devices, including the fact that they do not provide enough ventilation, that they might cause damage to the airway, and that they can increase the probability of pulmonary aspiration of stomach contents. In order to successfully use these devices, it is vital to pick patients with extreme caution and to possess outstanding technical abilities. Intubating laryngeal mask airways are able to give great ventilation for any kind of patient, and it is common practise to utilise them on patients who have a difficult time maintaining an airway.
- According to the findings of **JC GS et al. [33] (2014),** supraglottic airway devices are

increasingly being employed as a rescue for intubation and ventilation in the fields of anaesthesia and emergency medicine. The purpose of this research was to explore the ILMA-FastrachTM supralaryngeal device and compare it to the air-Q(®) supralaryngeal device for rescuing airways and intubating patients. In accordance with the guidelines provided by the manufacturer, the devices were implanted in a total of 80 patients (40 patients in each group). In order to determine whether or not there were any air leaks, a ventilation system was used to apply an inspiration pressure of 20 cm H2O. Following the use of a paediatric fiberoptic bronchoscope to check the state of the glottis, an endotracheal tube was then inserted through the supraglottic device. This was only done if there was no evidence of an air leak. In the event that the initial attempt was not successful, the device was removed, and the process was repeated with the same parameters. The overall success percentage of the intubation procedure was the most important finding. Other measurements included the presence of effective ventilation, an unfavourable occurrence, and a fiberoptic picture of the glottis. The FastrachTM had a higher rate of successful first-attempt ventilation compared to the air-Q® (90 vs. 60%, P=.0019), and the ILMA-FastrachTM had a higher rate of overall ventilation success (first and second efforts combined) compared to the air-Q® (95 vs. 80%, P=.04). According to the Brimacombe scale, the view of the glottis was improved with air-Q(®) at the second attempt (84.62 vs. 37.50%, P=.0017), while it was not improved at all during the first effort. When comparing the two different devices, there was no discernible difference in the percentage of successful intubations. The number of people who experienced a sore throat was comparable with both devices. In the group that received air-Q®, there were two patients who experienced hoarseness and arterial desaturation; nevertheless, the difference did not reach statistical significance. The rate of effective intubation was comparable with the ILMA-FastrachTM and the air-Q(®), although the ventilation capabilities of the ILMA-FastrachTM were superior. Both devices had a rate of adverse events that was comparable to one another. Because there was no extra technique utilised to make intubation easier, these findings need to be confirmed by further research before they can be considered reliable. Although we are aware that ILMAs are beneficial for ventilation, the only type of ILMA that we used in this research was the fastrach model.

- It was discovered by **Jayaraman L et al [34] (2019**) that supraglottic airway devices, also known as SGAs, are utilised to rescue problematic and failed mask ventilation (DMV). Patients who

had undergone surgery and had a body mass index (BMI) of more than 35 kg/m2 were looked at. A negative correlation was found between the SAT and both BMI and NC. In this study, the difference between the mean body mass index (BMI) of Block Buster [24.14 3.255] and Fastrach [25.32 2.803] was statistically significant (p=0.026), with Block Buster having a lower BMI. In this particular trial, a greater proportion of male patients participated in the Fastrach group (32, or 58.2%) than participated in the Block Buster group (27, or 49.1%), however this difference did not reach statistical significance (p=0.4437).

- According to the findings of **Lal J et al [35] (2020),** the issue of difficult and unsuccessful intubation led to an increase in the development of technology for airway management. Patients with ASA physical status classes I and II who were scheduled for elective surgery under general anaesthesia and required endotracheal intubation were included in the study. Based on the results of the study, we can draw the conclusion that the mean LMA insertion time was significantly longer in Fastrach [42.77 16.289] compared to Block Buster [25.02 10.811] (p 0.0001) than it was in Block Buster.

- **Vyas AB et al [36] (2014)** showed that to observe the various pressor responses to laryngoscopy and intubation in normotensive patients undergoing elective surgery under general anaesthesia and use of three different attenuating doses (400, 800, 1200 mcg) of intranasal nitroglycerine administered five minutes before laryngoscopy and intubation, to observe the efficacy and safety in order to observe the various press The research was conducted on a total of sixty different participants. Patients with an ASA grade of 1 or II who were scheduled to have elective surgery while under general anaesthesia were considered for inclusion. Patients were administered varying amounts of intranasal nitroglycerine five minutes prior to induction, as outlined in the table below. Patients in Group 1 were given a total of 400 micrograms of 20 Patients in the second group were given 800 micrograms of 20 Patients in the third group were given 1200 micrograms-20. The results were subjected to statistical analysis. All three groups were successful in dampening the pressor response to the laryngoscopy and intubation procedures. The greatest increase in heart rate was observed in group III, which was 23.86 percent. The greatest reduction in systolic blood pressure (19.6%), diastolic blood pressure (30.76%), and mean arterial blood pressure (25.53%) was seen in group III during the 10th minute of the laryngoscopy and intubation procedure. The most effective doses of intranasal

nitroglycerine for reducing the pressor response were found to be 400 and 800 micrograms. Because a dose of 1,200 micrograms generated the greatest increase in heart rate and the greatest drop in blood pressure, it is recommended that a higher dose be used with extreme caution when attenuating the pressor reaction to laryngoscopy and intubation. When we intubated using blockbuster and fastrach LMAs, there was no increase in heart rate, pulse rate, or blood pressure despite the fact that we used propofol as the induction dose in this part of our research and that we utilised it as the induction dose.

- The elderly have been found to demonstrate morphological and physiologic alterations in the upper airway, which might impact the performance of the supraglottic airway (SGA) in geriatric populations, as seen by **Kim EM et al [37] (2015**). This research was published in 2015. The purpose of this research was to determine whether or not the classic laryngeal mask airway (LMA-C) is equally effective in treating elderly individuals as it is in treating young adult patients. Participants in this prospective, non-randomized, comparative study included fifty patients in the senior group, aged 65-85 years, and fifty patients in the young group, aged 20-40 years, all of whom were scheduled to undergo surgery utilising the LMA-C as their method of general anaesthesia. Assessments were made of the LMA-manipulation C's requirements during insertion, success rate, insertion time, oropharyngeal leak pressure, stomach insufflation, and intraoperative insufficient ventilation. Evaluation using fibre optics was utilised in order to locate the LMA-C in its proper location. The rate of successful insertion on the first try was substantially lower in the elderly group than it was in the young group (84 vs. 96%, P = 0.02) The average amount of time it took to insert the catheter in the older group was substantially higher than the average amount of time it took to insert the catheter in the younger group (28.5 19.6 vs. 22.2 6.4 seconds, P = 0.001). However, once the LMA-C was properly positioned, there was no discernible difference between the two groups with regard to the oropharyngeal leak pressure or the fiberoptic grade. During the procedure, incidents of inadequate ventilation occurred much more frequently in the older group (31.3 vs. 4.0%, P 0.001) than they did in the younger group (4.0%). When compared to the clinical efficacy in young adult patients, the LMA-C had a lower rate of success in treating older individuals. For this reason, additional research is essential to identify the subtype of SGA that has the potential to deliver outstanding therapeutic efficacy in the elderly population.

- According to the findings of **Yoo H et al [38] (2015),** anesthesiologists have a significant amount of anxiety over airway problems. Although fiberoptic intubation is the procedure that is universally acknowledged for the management of problematic airways, it is not without drawbacks. It requires the patient's participation and it cannot be conducted on an airway that is filthy or on upper airways that have pre-existing constriction disease. In addition, fiberoptic bronchoscopy is not readily available at all hospitals and other medical facilities. In this particular instance, they had trouble managing the patient's airway because he was 71 years old, had a high Mallampati grade, and had a thick neck. He had also recently undergone urologic surgery. There were multiple attempts made, including one that was guided via a bronchoscope, but none of them were successful. In the end, a successful blind nasal intubation was achieved on the patient while the patient's neck was flexed and a light pressure was applied on the tracheal cartilage. They suggest that blind nasal intubation is a useful alternative in the management of problematic airways, and that it can be a procedure that saves lives in critical situations. In addition, because of its ease of use, it is a more cost-effective alternative when more sophisticated airway equipment, such as fiberoptic bronchoscopy, is not accessible. In the course of our research, we have experienced problems with or been unable to successfully intubate patients using ILMAs. As a result, we have resorted to doing standard intubation procedures using direct laryngoscopy.

- **Shamaa MA et al [39] (2015)** investigated the fact that the management of the airway continues to be a significant challenge in the clinical practise of anaesthesia. Comparing the intubating laryngeal mask airway (ILMA) and the air-Q for blind tracheal intubation during surgical procedures while the patient was under general anaesthesia was the purpose of the current investigation. This study involved 70 adult patients who were scheduled to undergo elective surgical procedures under general anaesthesia with controlled ventilation. These operations included gynaecological, orthopaedic, ophthalmology, or general surgery and lasted up to 2 hours. The evaluation of the airway, changes in hemodynamics, the length of time it took to insert the device and the endotracheal tube, the number of times blind tracheal intubation was attempted, the degree of difficulty in inserting the tube, and any complications that arose were all subjects of the data that was collected. The airway assessment parameters of the patients in both groups were comparable to one another. The incidence of hemodynamic changes was statistically significantly higher in the air-Q group than it was in the fastrach group, and the

insertion time of the endotracheal tube, as well as the percentage of ease of insertion, showed a statistically significantly higher value in group I (fastrach) than group II (air-Q) (air-Q). Nevertheless, there was not a statistically significant difference between the two groups in terms of the number of insertion attempts (a success rate of 88.57% for the fastrach compared to a success rate of 82.86% for the air-Q) and the problems. Blind tracheal intubation can be performed successfully with either the fastrach or the air-Q device. When it comes to blind tracheal intubation, the success rate of the fastrach is significantly higher than that of the air-Q.

- After emergence from anaesthesia, the incidence and severity of adverse airway effects caused by the laryngeal mask airway (LMA) can vary, depending on when the device was removed, as shown by **Huang RC et al [40] (2016);** however, reports differ regarding the exact optimal timing of LMA removal. [Citation needed] This study aimed to compare the rates of adverse events that occurred in two groups of participants: those whose LMA was removed under general anaesthesia (referred to as the "deep" group) and those whose LMA was removed under target-controlled infusion (TCI) of propofol (referred to as the "awake" group). Following the acquisition of approval from the Institutional Review Board and written informed consent from 124 patients, they were then randomly assigned to either the "awake" group or the "deep" group. Propofol administered by a transcutaneous infusion (TCI) was combined with fentanyl administered intravenously in order to establish and sustain anaesthesia. In the "awake" group, the LMA was withdrawn after surgery while the patients were following vocal instructions. In the "deep" group, the LMA was removed after surgery while the patients were deeply sedated using a target effect-site propofol concentration of 2 g/mL. Coughing, straining, bronchospasm, laryngospasm, clenching, breath holding, gross intentional movement, airway obstruction, retching, vomiting, and oxygen desaturation were some of the unpleasant events that were noted as having occurred. In the case that any of these things took place, the LMA removal was declared a failure. The severity of the cough, holding one's breath, and oxygen desaturation were taken into account when recording and grading the patient's airway hyperreactivity. The percentage of people who did not succeed was much higher in the "awake" group (15/61, or 24.6%) compared to the "deep" group (5/60, or 8.3%). Both groups had a score of less than three indicating that their airway hyperreactivity was modest. It is possible that removing the LMA while the patient is under deep anaesthesia with a target-controlled,

effect-site propofol concentration of 2 g/mL is both safer and more likely to be successful than removing the LMA when patients are completely awake following surgery. In our research, we encountered only a few minor issues, such as a blood stain here and there and an occasional sore throat.

- According to the findings of **Malhotra SK et al [41] (2016),** Air-QTM is a recently developed airway device that can be utilised to make the process of endotracheal intubation easier.AirQ The primary objective of this research was to determine whether or not the utilisation of two distinct endotracheal tubes (ETTs) (one made of standard polyvinyl chloride [PVC] and another made of reinforced PVC) increases the success rate of blind intubation through Air-QTM (Group Q) when compared with intubating laryngeal mask airway (ILMA- FastrachTM) while maintaining ILMA as the control (Group I). One hundred twenty patients with American Society of Anesthesiologists physical status I-II, undergoing elective surgery under general anaesthesia, were enrolled in this prospective, randomised, case-control study to compare the success rate of tracheal intubation between ILMA (FastrachTM) and Air-QTM intubating laryngeal airway. The patients' ages ranged from 18 to 60 years, and they all underwent surgery with general anaesthesia. Patients who were thought to have difficulty breathing were not allowed to participate in the trial. The research was carried out successfully on every single patient that was recruited. In order to successfully secure the intubation in both of these airway devices, a reinforced PVC ETT was utilised. Since the use of a standard PVC tube is advised for use in Air-Q, subsequent attempts at intubation with a conventional PVC ETT were undertaken when the first effort at intubation was unsuccessful. There were a total of three goes at each procedure, which were as follows: In contrast, the ILMA group exclusively made use of the reinforced tube during all three of their attempts. In their study, the overall success rate after three attempts was higher with Air-Q (96.6%) compared to ILMA (91.6%). However, there was no significant difference detected between the groups (P = 0.43). According to the findings of the current study, when intubation with a reinforced tube is unsuccessful, the success rate with the use of a conventional PVC tube is higher with Air-Q in comparison to ILMA. When compared to a standard PVC ETT, the Intubating Laryngeal Mask Airways (ILMAs) used in this study have Parker Flex Tip Tubes, which makes them far simpler to intubate.

- In their study, **Choudhary B et al. [42] (2016)** found that supraglottic airway devices, also known as SADs, are an extremely helpful airway adjunct in the management of both anticipated and unanticipated difficult airways. These devices can also be used as a ventilating aid and as a conduit for tracheal intubation. The newer versions of SADs, such as the i-gel and the intubating laryngeal mask airway (ILMA), have the advantages of being able to maintain the airway without the need for tracheal intubation while keeping your hands free, being able to be placed easily without direct visualisation of the larynx, ensuring predictable ventilation, and being able to be used as a conduit for tracheal intubation. The purpose of this study is to compare the ease and success of placing both SADs, as well as the ease and success of placing endotracheal (ET) tubes via both SADs. Eighty patients of both sexes, aged between 18 and 60 years, and belonging to ASA grade I and II were randomly divided into two groups (i-gel and ILMA) of equal number. The surgical operation was performed under general anaesthesia (GA). After the induction was complete, the designated device was positioned, and after ensuring that enough ventilation was present, an attempt at blind ET intubation through the device was made. We documented and compared the first attempt and total success rate of SAD insertion and ET intubation through SAD; the time taken for SAD insertion and ET intubation through SAD; hemodynamic changes and postoperative complications; and so on. There were no significant differences between the groups in terms of demographic profile, success rate of SAD insertion, hemodynamic changes, or adverse effects ($p>0.05$). The total amount of time required for effective SAD insertion was substantially lower in the group that received i-gel (22.525.64 sec) compared to the group that received ILMA (31.155.52 sec) (p value 0.0001). The success rate of blind ET intubation was significantly greater in the group that used i-gel (75%) compared to the group that used ILMA (65%). I-gel took a considerably less amount of time to successfully intubate an ET than ILMA did (26.3011.35 seconds compared to 33.5313.13 seconds; p 0.0001). Although both SADs were shown to be useful alternatives to the traditional laryngoscope for endotracheal intubation, the i-gel needed less time and had a higher success rate of ET intubation than the ILMA did. Even a person with little to no experience may simply steer the ILMAs because they are so comparable to the usual conventional LMAs. This results in extremely secure ventilation.
- According to the findings of **Wang H et al [2] (2017),** the management of the airway in an obese patient who is presenting for surgery is more likely to be a difficult problem. In obese

patients who would otherwise have difficulty being intubated through their trachea, the use of a supraglottic airway device has become commonplace as a bridge between ventilation and tracheal intubation. It is not known what the optimal sevoflurane concentration is for the placement of a supraglottic airway device that will allow for spontaneous breathing in fifty percent of obese people (ED50). In order to evaluate the ED50 of sevoflurane for the insertion of the supraglottic airway device BlockbusterTM with spontaneous breathing in obese patients requiring general anaesthesia, the goal of this study was to estimate the ED50 of sevoflurane. Participating in this study were thirty obese patients who voluntarily decided to have bariatric surgery (body mass index between 30 and 50 kg/m2). The predetermined goal sevoflurane concentration was maintained for more than five minutes using a modified version of Dixon's up-and-down approach, and then the supraglottic airway device BlockbusterTM was placed. The initial sevoflurane concentration was 2.5%, and the step size was 0.5%. The patient's reaction to the installation of the supraglottic airway device was categorised as either "movement" or "no-movement" depending on whether or not the patient moved throughout the procedure. Calculating the midpoint concentration of the crossover point from the'movement' or 'no-movement' response was how the ED50 of sevoflurane was found. When adopting the up-and-down approach to calculate, the ED50 of sevoflurane for the insertion of the supraglottic airway device BlockbusterTM in obese patients was found to be 2.50 0.60 percent. For the implantation of the supraglottic airway device BlockbusterTM, the probit regression analysis yielded the following results for the ED50 and ED95 (95% confidence interval): 2.35 (1.28–3.42)% and 4.03 (3.16–17.83)%, respectively: ED50 and ED95. They came to the conclusion that the optimal end-tidal sevoflurane concentration required for the placement of the supraglottic airway device BlockbusterTM is 2.5 0.6%. This concentration is necessary for allowing spontaneous breathing in fifty percent of obese patients.

- **Endigeri A et al [3] (2019)** investigated the claim that the BlockBuster® Laryngeal Mask Airway, a more recent supraglottic airway device, is an effective conduit for endotracheal intubation. This claim was made by the manufacturer. An intubating laryngeal mask airway, often known as an LMA, is a tried-and-true device for this purpose. This randomised trial was carried out with the intention of determining which of these two LMAs had a higher rate of successful blind intubation. Randomization was used to divide sixty patients in the age range of 20-60 years who were having general anaesthesia into two groups of thirty patients each for

the purpose of performing tracheal intubation using either a BlockBuster® LMA (Group B) or an Intubating LMA Fastrach® (Group F). Following the introduction of anaesthesia, laryngeal mask airways (LMAs) were placed, and once adequate breathing was achieved with the device, fiberoptic bronchoscopy was conducted to evaluate the glottis visualisation score. Through the supraglottic airway devices, an attempt was made to do a blind intubation (SAD). The primary goal was to successfully intubate the patient on the first attempt, and the secondary outcomes were ease, the amount of time it took to insert the LMA, oropharyngeal seal pressure (OSP), the amount of time it took to remove the LMA, fiberoptic scoring, and the occurrence of complications. SPSS V22 was used to perform the analysis on the data. While the overall success rate of tracheal intubation was 96.6% in Group B and 89.9% in Group F (P = 0.3), the first-attempt success rate of tracheal intubation was 90% in Group B and 66.6% in Group F. This was a statistically significant difference. In Group B, the OSP was measured at 33.7 1.8 cm H2O, while in Group F, it was measured at 22.7 1.5 cm H2O (P = 0.001). With BlockBuster® LMA, complications such as sore throat and blood stain were alleviated to a greater extent. BlockBuster® LMA ensures a higher chance of successful blind tracheal intubation on the first attempt while reducing the likelihood of problems such as sore throat and blood staining. The primary purpose of this investigation is to evaluate and contrast the success rates of ILMAs on the first attempt. The blockbuster ILMA is superior to the fastrach ILMA from this point forward.

MATERIALS AND METHODS

SOURCE OF DATA: This study was carried out in Department of Anesthesiology, B.L.D.E.(DU) Shri. B.M. Patil Medical College, Hospital and Research center, Vijayapura.

METHOD OF COLLECTION OF DATA:

Study Design: A prospective randomized comparative study

Study Period: one and half year from December 2020 to August 2022

Sample size:110 patients in each group of both genders randomly divided into two groups which had 55 patients in each group.

Statistical data:

With Anticipated overall success rate of Tracheal intubation 96% in group Block Buster ILMA and 76% in group Fastrach ILMA [intubating laryngeal mask airway]. The study would require a sample size of 55 per group. (i.e. a total sample size of 110 assuming equal group sizes), to achieve a power of 80% for detecting a difference in proportions between two groups at a two sided p- value of 0.05.

FORMULA USED:

- $$n = \frac{(z\alpha + z\beta)^2 \; 2\,p*q}{MD^2}$$

Where Z= Z statistic at a level of significance

MD= Anticipated difference between two proportions

P=Common Proportion

q= 100-p

STATISTICAL ANALYSIS:

- Data was represented using Mean ±SD, percentages and diagrams
- ANOVA test/Kruskal walli's test and Post hoc test was used to compare different groups.
- Significant difference between Qualitative data was found using Chi square or Fisher's Exact test if necessary.
- For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS (version 27.0; SPSS Inc., Chicago, IL, USA) and Graph Pad Prism version 5.
- Data had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Two-sample t-tests for a difference in mean involved independent samples or unpaired samples. Paired t-tests were a form of blocking and had greater power than unpaired tests. One-way analysis of variance (one-way ANOVA) was a technique used to compare means of three or more samples for numerical data (using the F distribution). A chi-squared test ($\chi 2$ test) was any statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate.
- Explicit expressions that can be used to carry out various *t*-tests are given below. In each case, the formula for a test statistic that either exactly follows or closely approximates a *t*-distribution under the null hypothesis is given. Also, the appropriate degrees of freedom are given in each case. Each of these statistics can be used to carry out either a one-tailed test or a two-tailed test.
- Once a *t* value is determined, a *p*-value can be found using a table of values from Student's t-distribution. If the calculated *p*-value is below the threshold chosen for statistical significance (usually the 0.10, the 0.05, or 0.01 level), then the null hypothesis is rejected in favour of the alternative hypothesis.
- p-value ≤ 0.05 was considered for statistically significant.

Randomization:

Group 1: (B)-Blockbuster ILMA

Group 2: (F)-Fastrach ILMA

Results was recorded using a preset performa

STUDY POPULATION

This study was done in patients undergoing various elective surgical procedures (ASA I and II) under general anesthesia.

INCLUSION CRITERIA:

a. Patients with age >20 years and <70 years
b. Patients posted for elective surgeries under general anesthesia (ASA I and II)
c. Both male and female patients

EXCLUSION CRITERIA

a. Inability to consent for the procedure
b. Patients posted for emergency surgery under general anesthesia
c. Local infection of neck
d. Burns and swellings in neck region
e. Previous surgeries in neck
f. Patients with risk of aspiration
g. Patients with poor pulmonary compliance

METHODOLOGY

Preanesthetic evaluation:

Pre anesthetic evaluation will include the following:

HISTORY:

History of underlying medical illness, previous history of surgery, anesthetic exposure and hospitalization elicited

PHYSICAL EXAMINATION

- General condition of patient
- Vital signs -heart rate, blood pressure, respiratory rate
- Height and weight
- Examination of respiratory system, cardio vascular system, central nervous system and the vertebral system.
- Airway assessement by Mallampatti grading
- Procedure was explained to the patient and patient attenders.

INVESTIGATIONS /INTERVENSIONS

Routine investigations which includes CBC, HIV, HbsAg, Urine routine

Procedure:

Informed consent will be taken from the patient attenders

Patients will be kept nil by mouth 6 hours before surgery

After shifting the patient to pre operative room

In group [B]- Blockbuster ILMA

In group [F]- Fastrach ILMA

Technique of ILMA Insertion:

- Patients will be taken to the operation theatre, standard monitoring devices including pulse oximeter, sphygmomanometer cuff, $ETCO_2$, ECG leads will be connected and baseline values will be recorded.
- Iv line will be secured with 18G/20G cannula and patient will be premedicated with Injection ondansetron 0.15mg/kg IV, Injection glycopyrolate 0.008mg/kg IV and Injection Midazolam 0.08mg/kg IV. Pre oxygenation will be done with 100% oxygen for 3-5 minutes
- General anaesthesia will be induced with propofol(2mg/kg) and muscle relaxation achieved by atracurium (0.5-0.8mg/kg) to facilitate the LMA insertion.

• The individual's body weight will be used to determine which size of ILMA will be most suitable. According to the recommendations, a size 3 fits individuals weighing between 30 and 50 kilograms, while a size 4 accommodates those weighing between 50 and 70 kilograms

• After three minutes, one of the devices will be placed into either group using a technique that involves inserting the device midline while the neck is in a neutral position. The Chandy manoeuvre was carried out on a group of patients who were intubated using a Fastrach ILMA.

• The presence of chest motions and ETCO2 waveforms will provide as evidence of adequate ventilation.

• The ILMA cuff will be inflated with air as quickly as possible once the insertion has been completed. A connection will be made between the ILMA and the breathing circuit.

• The capacity to obtain a tidal volume of at least 7 ml/kg using a square wave capnogram will serve as confirmation of a successful placement of endotracheal tube.

INTUBATION:

- Patient’s mouth will be opened and tongue will displaced using a disposable sterile wooden tongue depressor to facilitate the passage of Fastrach.
- Pre lubricated Fastrach ILMA was introduced with gentle inward and downward pressure using the curvature of the device as a guide till a fixed resistance to further advancement was felt.

- Fibreoptic view by fibreoptic bronchoscope 3mm after the ILMA insertion by using Brimacombe score with grading system – 4. Only cords are seen, 3. Cords with posterior epiglottis seen, 2- cords plus anterior epiglottis seen, 1- No cords are seen.
- Intubation is done with ET tube of approximate size and then this Blockbuster and Fastrach ILMAs, tubes are inserted, B/L air entry verified.
- The ease, number of attempts, time taken, success rate of both the ILMA's will be noted.
- Intra operatively the patient will be monitored for associated complications such as inadequate ventilation which will reflect as poor chest expansion, absent or quiet breath sounds, absent or poor end tidal CO_2 trace fall in oxygen saturation
- Aspiration which will be identified by recognition of gastric contents in oropharynx or airway, hypoxia, high airway pressures and coarse creptitations on auscultation of chest and it will be managed by giving head low position ,through oral and endotracheal tube suctioning prior to application of positive pressure ventilation, administration of IV corticosteroids and IV antibiotic
- Post extubation the patient will be monitored for laryngospasm which will present as fall in saturation and stridor for which 100% oxygen will be provided, iv corticosteroids will be given and if required sub optimal dose of injection succinylcholine will be given. In case of persistent laryngospasm the patient will be reintubated .

Figure no- 34 INTUBATION WITH BLOCKBUSTER ILMA

1)

2)

3)

Figure no- 35 INTUBATION WITH FASTRACH ILMA

1) 

2)

3)

4)

RESULT & ANALYSIS

Table no 4

Age(Years)	BLOCK BUSTER		FASTRACH		Independent t test	P value
	Mean	Std. Deviation	Mean	Std. Deviation		
AGE	38.56	13.390	38.42	11.229	.062	0.951
Statistically insignificant						

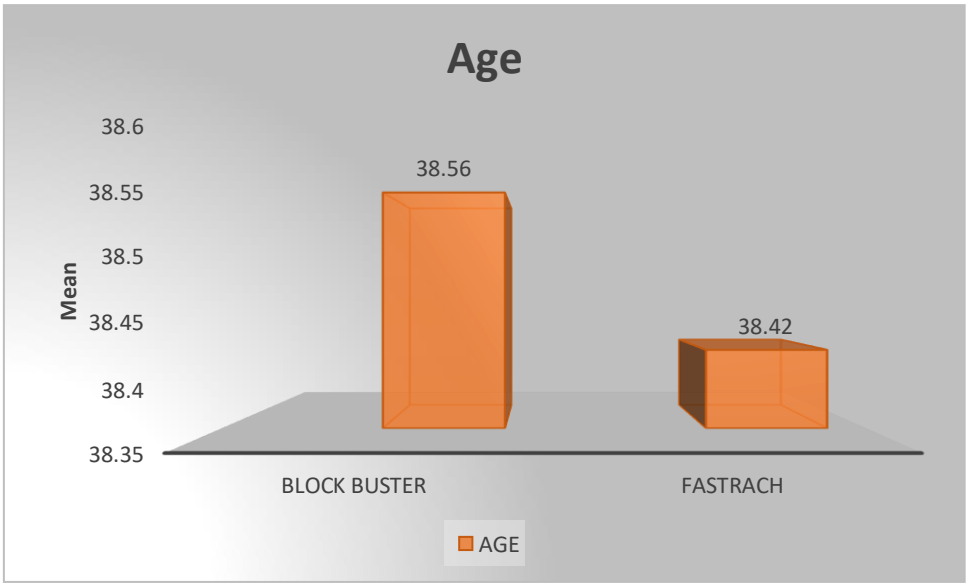


Figure no-36: Age comparision of (B) and (F) Group

In Block Buster, the mean Age (mean± s.d.) of patients was 38.56± 13.390.

In Fastrach, the mean Age (mean± s.d.) of patients was 38.42± 11.229.

Distribution of mean Age was not statistically significant (p=0.951).

Table no 5

BMI	BLOCK BUSTER		FASTRACH		Mann-Whitney U Test	P value
	Mean	Std. Deviation	Mean	Std. Deviation		
BMI	24.14	3.255	25.32	2.803	1140.000	0.026
Statistically significant						

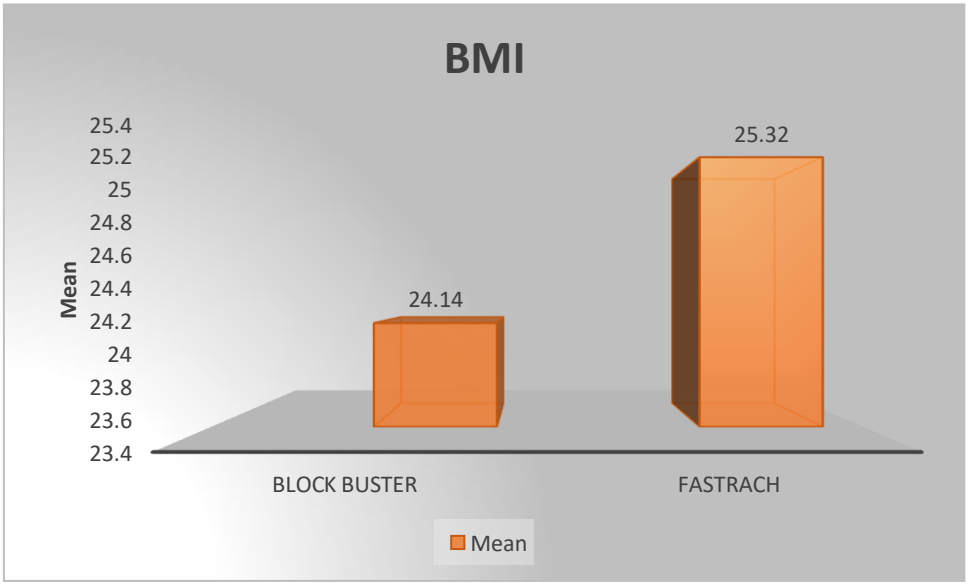


Figure no-37: BMI comparision of (B) and (F) Group

In Block Buster, the mean BMI (mean± s.d.) of patients was 24.14± 3.255.

In Fastrach, the mean BMI (mean± s.d.) of patients was 25.32± 2.803.

Distribution of mean BMI was statistically significant (p=0.026).

Table no 6

ILMA time(seconds)	BLOCK BUSTER		FASTRACH		Mann-Whitney U Test	P value
	Mean	Std. Deviation	Mean	Std. Deviation		
ILMA time	25.02	10.811	42.77	16.289	464.000	0.0001
Statistically significant						

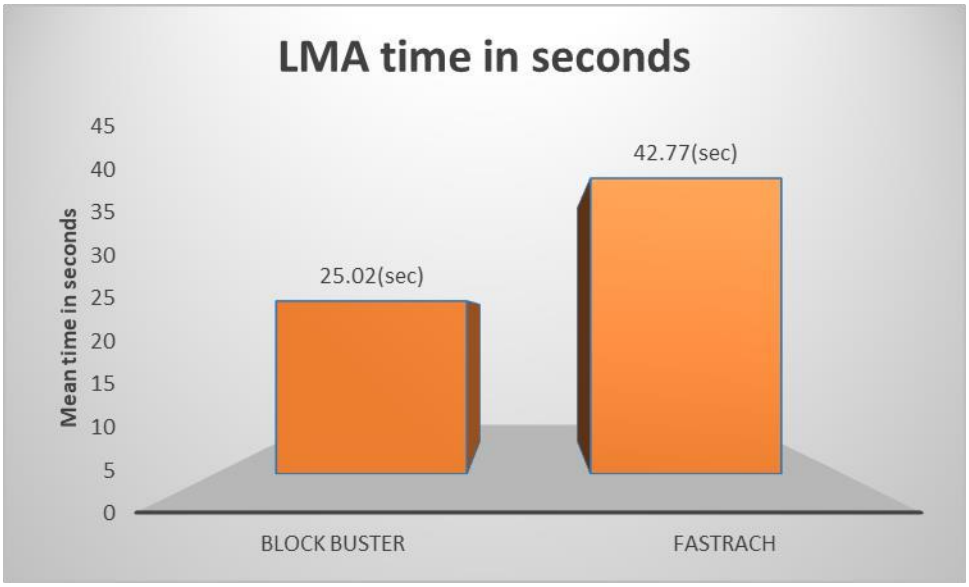


Figure no-38: ILMA time in seconds comparision of (B) and (F) Group

In Block Buster, the mean LMA time (mean± s.d.) of patients was 25.02± 10.811.

In Fastrach, the mean LMA time (mean± s.d.) of patients was 42.77± 16.289.

Distribution of mean LMA time was statistically significant ($p<0.0001$).

Table no 7

Post LMA insertion	BLOCK BUSTER		FASTRACH		Mann-Whitney U Test	P value
	Mean	Std. Deviation	Mean	Std. Deviation		
PR (1st min)	83.18	4.252	69.40	4.860	46.000	0.0001
PR (5th min)	81.95	4.519	84.24	6.067	1211.000	0.071
PR (10th min)	82.71	4.593	86.29	5.028	885.000	0.0001

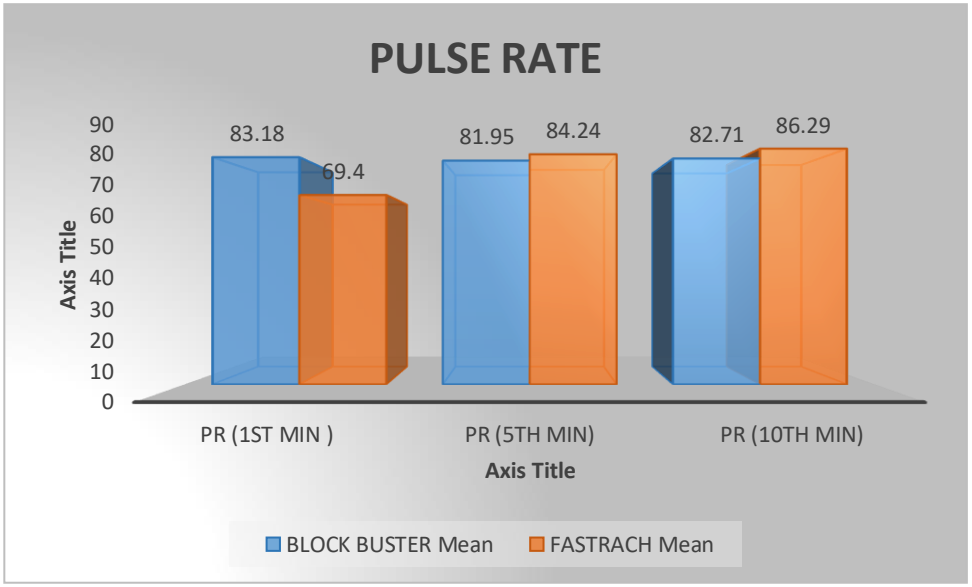


Figure no-39: Pulse rate comparision of (B) and (F) Group

In Block Buster, the mean PR (1st min) (mean± s.d.) of patients was 83.18± 4.252.

In Fastrach, the mean PR (1st min) (mean± s.d.) of patients was 69.40± 4.860.

Distribution of mean PR (1st min) was statistically significant ($p<0.0001$).

In Block Buster, the mean PR (5th min) (mean± s.d.) of patients was 81.95± 4.519.

In Fastrach, the mean PR (5th min) (mean± s.d.) of patients was 84.24± 6.067.

Distribution of mean PR (5th min)was not statistically significant ($p=0.071$).

In Block Buster, the mean PR (10th min) (mean± s.d.) of patients was 82.71± 4.593.

In Fastrach, the mean PR (10th min) (mean± s.d.) of patients was 86.29± 5.028.

Distribution of mean PR (10th min) was statistically significant ($p<0.0001$).

Table no 8

Post LMA insertion	BLOCK BUSTER		FASTRACH		Mann-Whitney U Test	P value
	Mean	Std. Deviation	Mean	Std. Deviation		
SBP (1st min)	117.09	7.619	117.82	6.580	1419.000	0.542
SBP(5th min)	116.36	7.543	116.73	7.467	1485.000	0.859
SBP(10th min)	117.09	7.619	115.64	6.876	1360.500	0.321
Statistically insignificant						

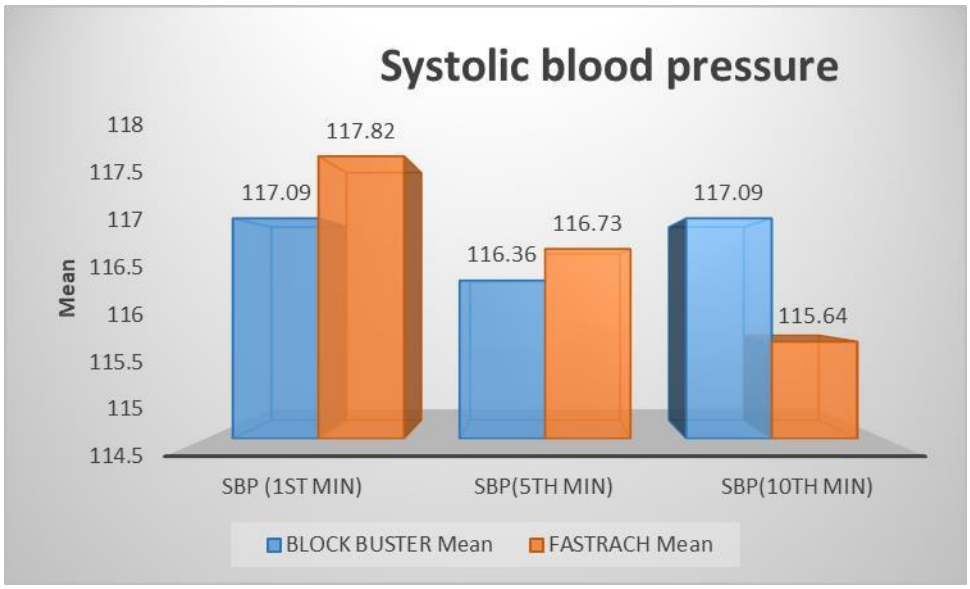


Figure no-40: SBP comparision of (B) and (F) Group

In Block Buster, the mean SBP (1st min) (mean± s.d.) of patients was 117.09± 7.619.

In Fastrach, the mean SBP (1st min) (mean± s.d.) of patients was 117.82± 6.580.

Distribution of mean SBP (1st min) was not statistically significant (p=0.542).

In Block Buster, the mean SBP(5th min) (mean± s.d.) of patients was 116.36± 7.543.

In Fastrach, the mean SBP(5th min) (mean± s.d.) of patients was 116.73± 7.467.

Distribution of mean SBP(5th min) was not statistically significant (p=0.859).

In Block Buster, the mean SBP(10th min) (mean± s.d.) of patients was 117.09± 7.619.

In Fastrach, the mean SBP(10th min) (mean± s.d.) of patients was 115.64± 6.876.

Distribution of mean SBP(10th min) was not statistically significant (p=0.321).

Table no 9

Post LMA insertion	BLOCK BUSTER		FASTRACH		Mann-Whitney U Test	P value
	Mean	Std. Deviation	Mean	Std. Deviation		
DBP(1st min)	77.64	9.019	77.64	9.019	1512.500	1.000
DBP(5th min)	77.09	9.559	76.36	9.302	1453.000	0.709
DBP(10th min)	78.55	8.259	77.09	9.364	1396.500	0.464
Stastically insignificant						

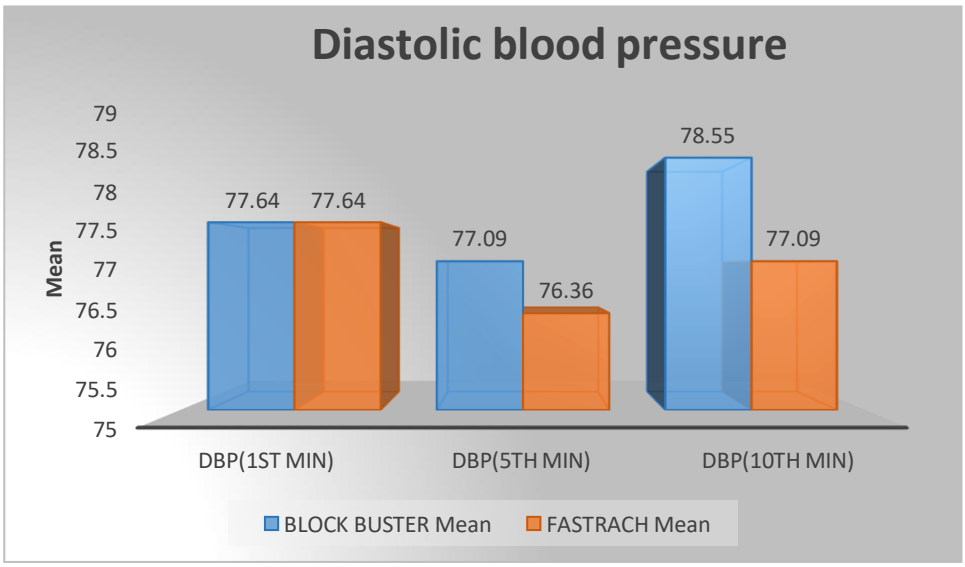


Figure no-41: DBP comparision of (B) and (F) Group

In Block Buster, the mean DBP (1st min) (mean± s.d.) of patients was 77.64± 9.019.

In Fastrach, the mean DBP (1st min) (mean± s.d.) of patients was 77.64± 9.019.

Distribution of mean DBP (1st min) was not statistically significant (p=1.000).

In Block Buster, the mean DBP(5th min) (mean± s.d.) of patients was 77.09± 9.559.

In Fastrach, the mean DBP(5th min) (mean± s.d.) of patients was 76.36± 9.302.

Distribution of mean DBP(5th min) was not statistically significant (p=0.709).

In Block Buster, the mean DBP(10th min) (mean± s.d.) of patients was 78.55± 8.259.

In Fastrach, the mean DBP(10th min) (mean± s.d.) of patients was 77.09± 9.364.

Distribution of mean DBP(10th min) was not statistically significant (p=0.464).

Table no 10

Post LMA insertion	BLOCKBUSTER		FASTRACH		Mann-Whitney U Test	P value
	Mean	Std. Deviation	Mean	Std. Deviation		
RR(1st min)	15.89	1.436	16.09	1.543	1413.500	0.546
RR(5th min)	16.25	1.468	16.11	1.536	1424.500	0.591
RR(10th min)	15.76	1.440	16.24	1.688	1276.000	0.150
Stastically insignificant						

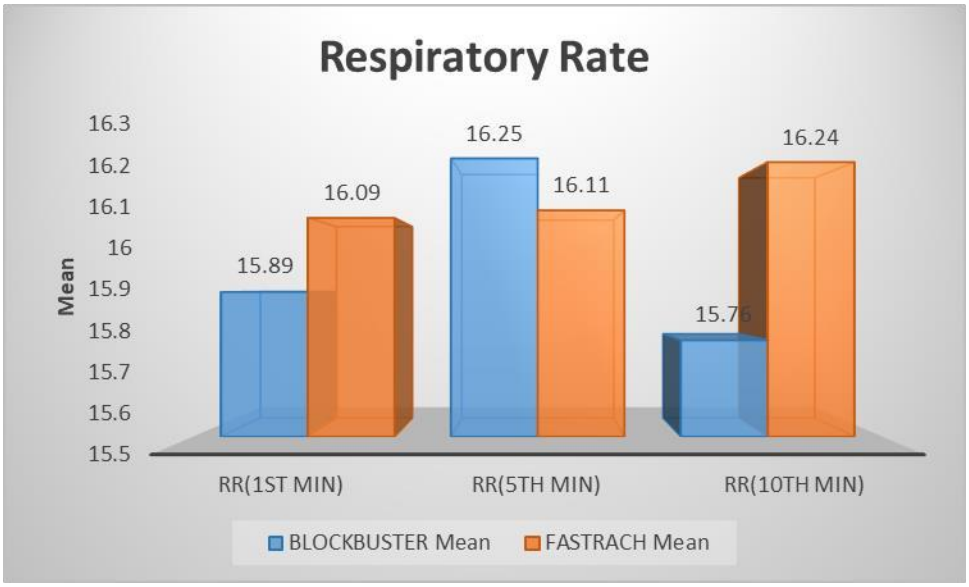


Figure no-42: Respiratory Rate comparision of (B) and (F) Group

In Block Buster, the mean RR(1st min) (mean± s.d.) of patients was 15.89± 1.436.

In Fastrach, the mean RR(1st min) (mean± s.d.) of patients was 16.09± 1.543.

Distribution of mean RR(1st min) was not statistically significant (p=0.546).

In Block Buster, the mean RR(5th min) (mean± s.d.) of patients was 16.25± 1.468.

In Fastrach, the mean RR(5th min) (mean± s.d.) of patients was 16.11± 1.536.

Distribution of mean RR(5th min) was not statistically significant (p=0.591).

In Block Buster, the mean RR(10th min) (mean± s.d.) of patients was 15.76± 1.440.

In Fastrach, the mean RR(10th min) (mean± s.d.) of patients was 16.24± 1.688.

Distribution of mean RR(10th min)was not statistically significant (p=0.150).

Table no 11

Age(Years)	BLOCK BUSTER		FASTRACH		Chi square test	P value
	No. of Patients	%	No. of Patients	%		
< 30	18	32.7	14	25.5	8.3472	0.0796
30 – 39	15	27.3	17	30.9		
40 – 49	5	9.1	13	23.6		
50 – 59	13	23.6	11	20.0		
60+	4	7.3	0	0		
Total	55	100.0	55	100.0		

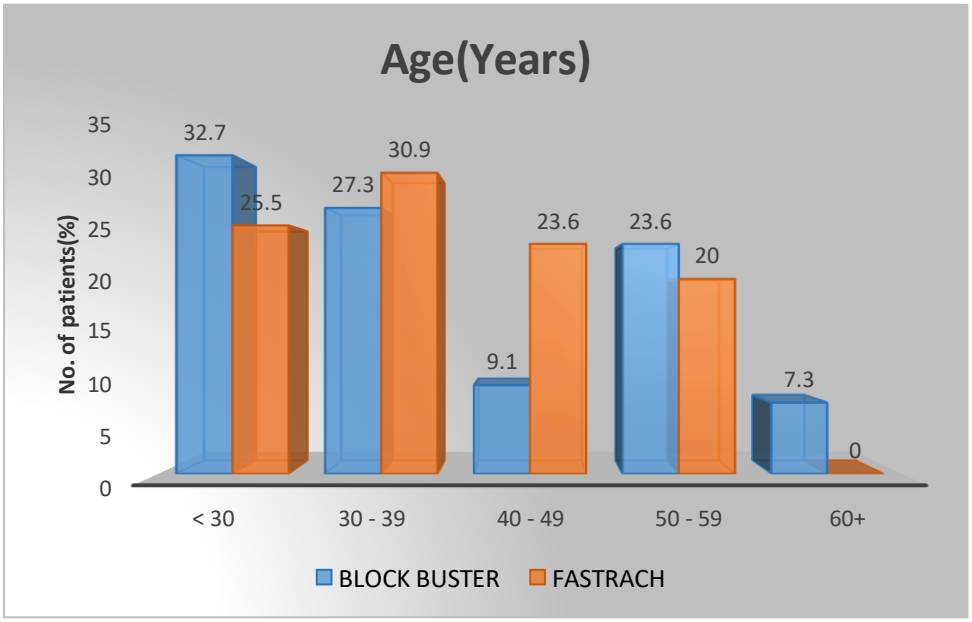


Figure no-43: Age comparision from >30 yrs to <70 yrs (B) and (F) Group

In BLOCK BUSTER, 18 (32.7%) patients were < 30 years of age, 15 (27.3%) patients were 30 – 39 years of age, 5 (9.1%) patients were 40 – 49 years of age, 13 (23.6%) patients were 50 – 59 years of age and 4 (7.3%) patients were 60+ years age.

In FASTRACH, 14 (25.5%) patients were < 30 years of age, 17 (30.9%) patients were 30 – 39 years of age, 13 (23.6%) patients were 40 – 49 years of age and 11 (20.0%) patients were 50 – 59 years of age.

Association of Age (Years) was not statistically significant (p=0.0796).

Table no 12

Gender	BLOCK BUSTER		FASTRACH		Chi square test	P value
	No. of Patients	%	No. of Patients	%		
Female	27	49.1	23	41.8	0.5866	0.4437
Male	28	50.9	32	58.2		
Total	55	100.0	55	100.0		

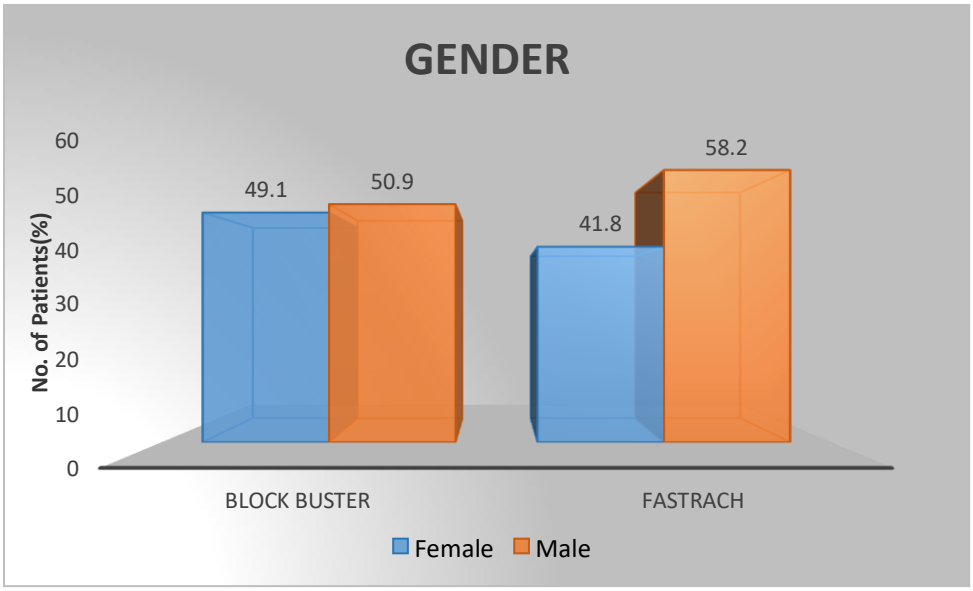


Figure no-44: Gender comparision in (B) and (F) Group

In BLOCK BUSTER, 27 (49.1%) patients were Female and 28 (50.9%) patients were Male.

In FASTRACH,23 (41.8%) patients were Female and 32 (58.2%) patients were Male.

Association of Gender was not statistically significant (p=0.4437).

Table no 13

ASA	BLOCK BUSTER		FASTRACH		Chi square test	P value
	No. of Patients	%	No. of Patients	%		
I	33	60.0	36	65.45	0.3499	0.5541
II	22	40.0	19	34.55		
Total	55	100.0	55	100.0		

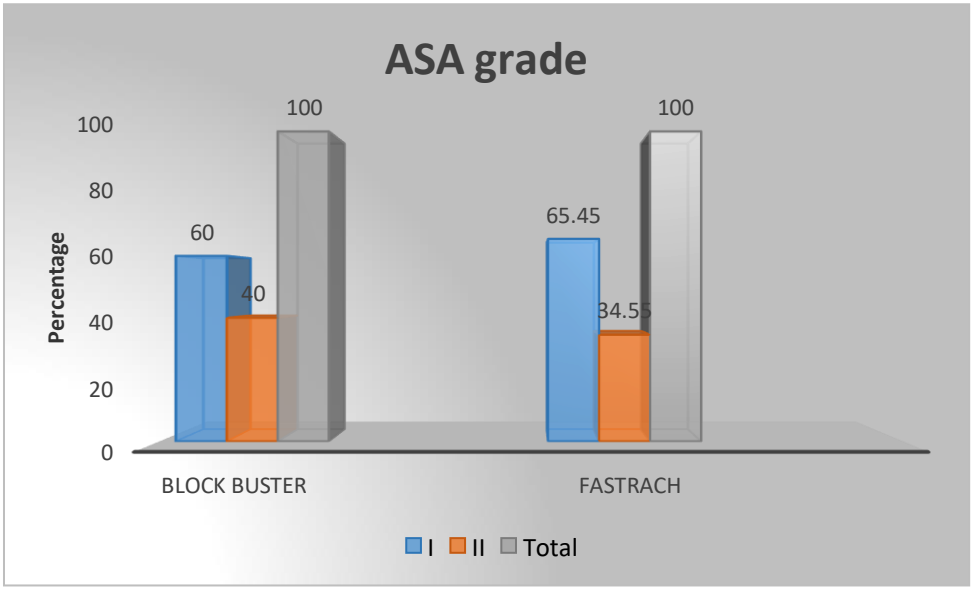


Figure no-45: ASA Grade in (B) and (F) Group

In BLOCK BUSTER, 33 (60.0%) patients had ASA I and 22 (40.0%) patients had ASA II.

In FASTRACH, 36 (65.45%) patients had ASA I and 19 (34.55%) patients had ASA II.

Association of ASA was not statistically significant (p=0.5541).

Table no 14

Mallampati grade	BLOCK BUSTER		FASTRACH	
	No. of Patients	%	No. of Patients	%
I	29	52.7	18	32.7
II	26	47.3	36	65.5
Total	55	100.0	55	100.0

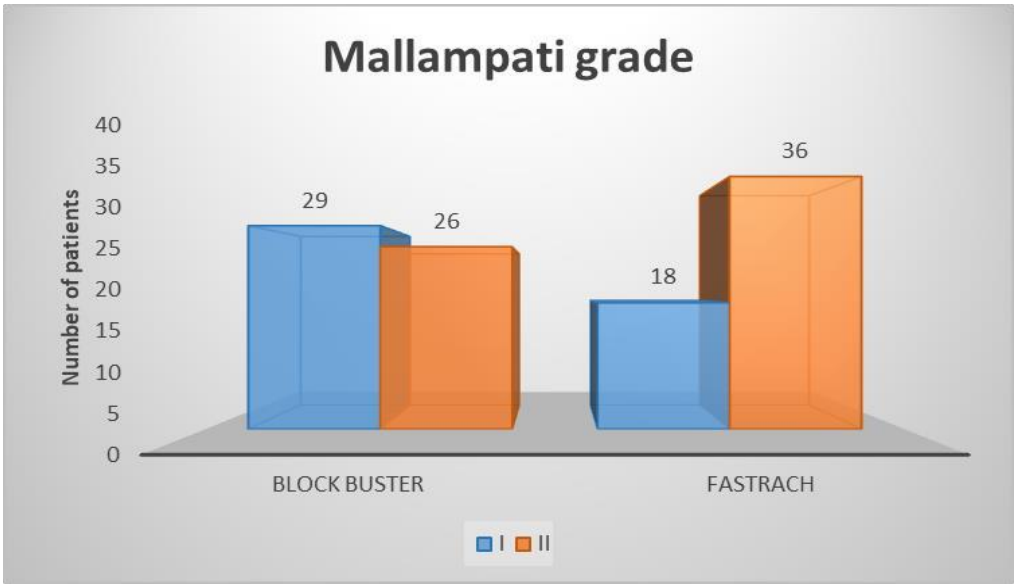


Figure no-46: Mallampati Grade in (B) and (F) Group

In B group study, 29 (52.7%) patients had Mallampati grade I and 26 (47.3%) patients had Mallampati grade II.

In F Group study, 18 (32.7%) patients had Mallampati grade I and 36 (65.5) patients had Mallampati grade II.

Table no 15

1st Pass successful attempts	BLOCK BUSTER		FASTRACH	
	No. of Patients	%	No. of Patients	%
Successful in 1st attempt	52	94.5	48	87.3
Unsuccessful	3	5.5	7	12.7
Total	55	100.0	55	100.0

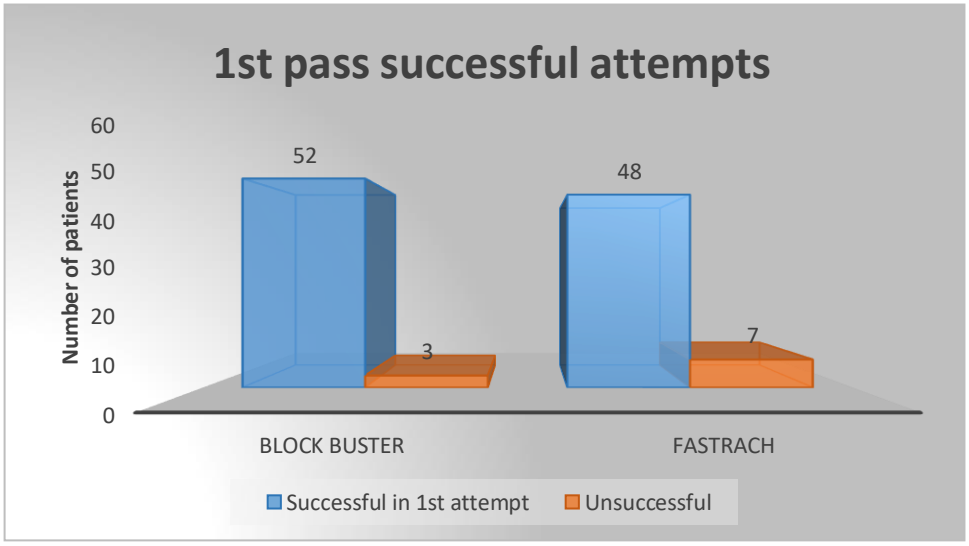


Figure no-47: First pass successful attempts in (B) and (F) Group

In B Group study, 52 (94.5%) patients had Successful in 1st attempt and 3 (5.5%) patients had Unsuccessful in 1st attempt.

In F Group study, 48 (87.3%) patients had Successful in 1st attempt and 7 (12.7%) patients had Unsuccessful in 1st attempt.

Table no 16

Ease of intubation	BLOCK BUSTER		FASTRACH	
	No. of Patients	%	No. of Patients	%
Difficult	3	5.5	7	12.7
Easy	52	94.5	48	87.3
Total	55	100.0	55	100.0

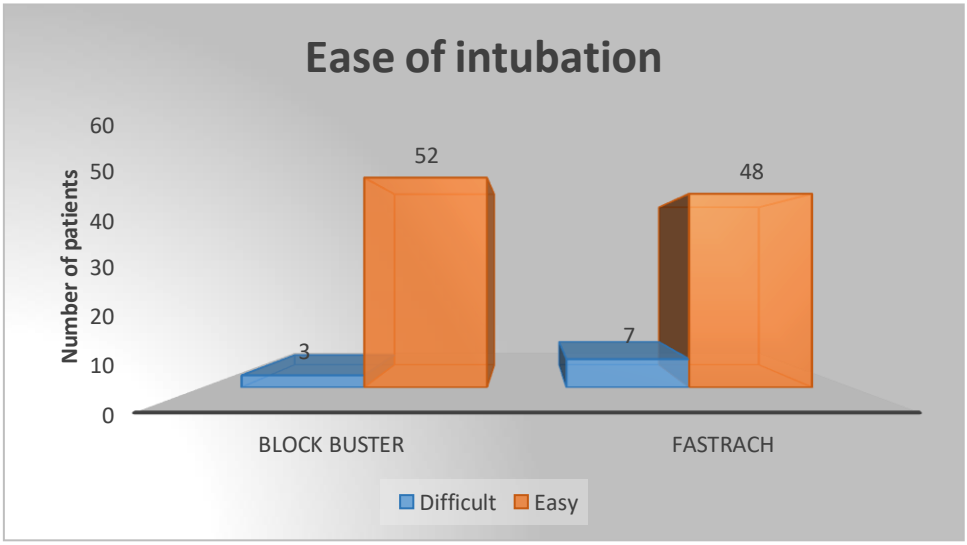


Figure no-48: Ease of intubation in (B) and (F) Group

In B Group study, 3 (5.5%) patients had Difficult Ease of intubation and 52 (94.5%) patients had Easy Ease of intubation.

In F Group study, 7 (12.7%) patients had Difficult Ease of intubation and 48 (87.3%) patients had Easy Ease of intubation.

Table no 17

Fibreoptic grading(brimacombe score)	BLOCK BUSTER		FASTRACH	
	No. of Patients	%	No. of Patients	%
I(4-cords seen)	26	47.3	48	87.3
II(3-cords with posterior epiglottis seen)	29	52.7	7	12.7
Total	55	100.0	55	100.0

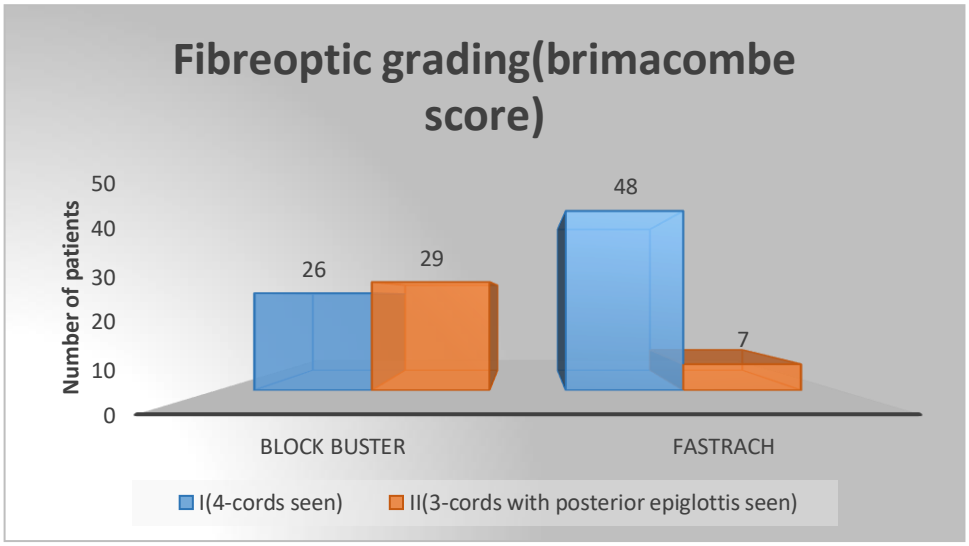


Figure no-49: Fibreoptic grading (brimacombe score) in (B) and (F) Group

In B Group study, 26 (47.3%) patients had Fibreoptic grading 1 and 29 (52.7%) patients had Fibreoptic grading 2.

In F Group study, 48 (87.3%) patients had Fibreoptic grading 1 and 7 (12.7%) patients had Fibreoptic grading 2.

Table no 18

Complications	BLOCK BUSTER		FASTRACH	
	No. of Patients	%	No. of Patients	%
Blood staining	2	3.6	5	9.1
None	53	96.4	49	89.1
Sore throat			1	1.8
Total	55	100.0	55	100.0

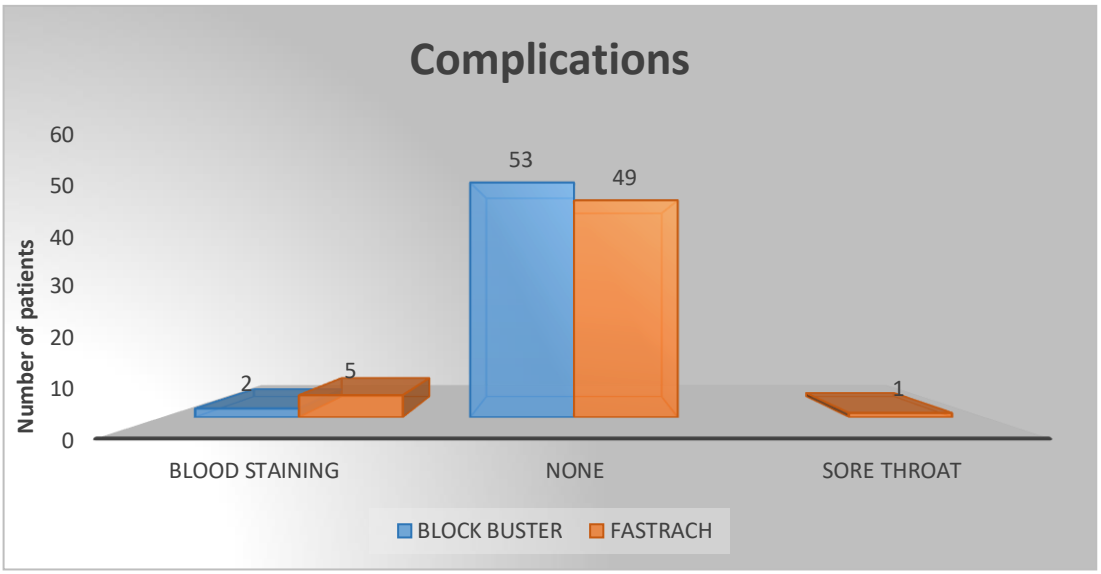


Figure no-50: Complications in (B) and (F) Group

In B Group study, 2 (3.6%) patients had Blood staining.

In F Group study, 5 (9.1%) patients had Blood staining and 1 (1.8%) patient had Sore throat.

DISCUSSION

The origins of the LMA

Dr. Ian Archie Jeremy Brain developed the first supraglottic airway equipment in the year 1981 [12]. It plays a significant part in airway management because it enables air to be exchanged through a mask that was designed specifically for the hypopharynx and is positioned such that it accomodates the laryngeal inlet to produce an complete seal.

Dr. BRAIN made an effort to design an airway based on airway concepts that directly challenged the larynx while still preserving a gas-tight seal. He examined mature male and female larynxes that had been removed after death in order to get a better idea of how such a joint might be constructed. He was able to analyse the pharynx's morphology by first generating plaster of paris casts from the specimens (cadavers), and then examining the casts. He brought up the possibility that an inflatable elliptical cuff placed in the hypopharynx and pressed on the rear of the larynx could produce an airtight seal. He referred to it as the laryngeal mask airway, is also referred as classic LMA or the cLMA in some circles. It was a basic process that involved utilising a plastic tube that was attached to the Goldman Dental Nasal Mask, which is a device that is used for dental extractions. [16] Every single LMA prototype was designed and built by Dr.Archie Brain. Indeed after the construction of the cLMA, he persisted in his efforts to enhance the model by making it better by the addition of new modifications to the previous version of the model.

Different kinds of Intubating LMAs(ILMAs):

As a bridge between ventilation and intubation in patients of all different sorts, supraglottic airway devices that have a conduit for blind tracheal intubation are gaining more and more popularity. The Type 1-Tourens BlockBuster LMA is a more recent laryngeal mask airway (LMA) that was invented in 2012 by Tuoren Medical Instrument co., Ltd. in Changyuan city, China. It is gaining popularity since it improves the safety and quality of anaesthesia. It was developed by Professor Ming Tian, and its benefits include enhanced ventilation and a larger green channel that can be used for intubation. **[3]**Blockbuster is a supraglottic airway instrument of second generation. The device is an anatomically formed airway tube that is placed into the pharynx. This modified supraglottic airway device has been especially created to enable blind or fibreoptic guided tracheal intubation.

A more modern type of LMA called the Tourens BlockBuster LMA, which was created in 2012 by Tuoren Medical Instrument co., Ltd. in Changyuan city, China, has gained favour as a means of enhancing both the quality and safety of anaesthesia. Professor Ming Tian was the one who came up with the idea for it, and it features ventilation as well as a larger green channel for intubation. [5] One of these LMAs that focuses on intubation is the Type 2-Fastrach® LMA, which was developed in 1997. (Teleflex Medical, Dublin, Ireland). Research has shown that the success rate of blind intubation in both expected and unexpected airways is approximately 90–95%, with a decreased incidence of issues occurring throughout the procedure.

Dr. Chandy developed the Fastrach Intubating Laryngeal Airway (Fastrach ILA) in 1997 as a tracheal intubation assist and guide during general anaesthesia. Currently, Fastrach LMA comes in three sizes—3, 4, and 5—and can be used both once and again.

Advantages of ILMA

Blockbuster ILMA

a) The ILMA is comprised of a flexible and supple silicone that is gentle on the body and causes less trauma than other materials.
b) The length of the airway tube is insufficient, and it is angled at a greater than 95 degree angle. By adhering to the oropharyngeal curve, it makes the entry process easier and reduces the amount of discomfort experienced.
c) The success rate of blind intubation can be increased with the use of a guidance device, which enables an endotracheal tube to be directed at a 30 degree angle toward the laryngeal opening.
d) The inlet and outflow of the stomach access channels have been built in such a way that they make it simpler for Ryle's tube to insert for suctioning.
g) The rim of the cuff, which also functions as a sputum collection equipment, can be used to collect a minute amount of the patient's sputum.
f) Because it has a 4-way connector, making adjustments or repairs to it after installation is much simpler.

g) It has a built-in bite barrier that prevents the wearer from inadvertently restricting their airways by biting the ILMA while they are unconscious.

Fastrach ILMA

• Blind or fiberoptically guided tracheal intubations are performed successfully with the ILMA-Fastrach because it is an exceptional conduit.

• In spite of the fact that it was designed specifically to offer an improved conduit for these procedures, it retains all of the ventilatory characteristics of the conventional LMA. There have only been a handful of studies that have been published that evaluate how effective the ILMA-Fastrach is in the treatment of individuals who have been diagnosed with Difficult Airway (DA). It makes it possible to quickly create an airway in the paediatric patient without first requiring the patient's muscles to be relaxed in preparation for the procedure. The ability to place is one that may be learned quite rapidly. Less general anaesthesia will be delivered throughout the procedure.In contrast to the face mask, this device provides an airway that is unobstructed and more comfortable to breathe through. In contrast to the face mask, the intubating laryngeal mask airway (ILMA) does not need the jaw to be supported and allows the anesthesiologist to keep their hands free.

The present study was a prospective randomized comparative study. This Study was conducted from one and half year from December 2020 to August 2022 at Department of Anesthesiology, B.L.D.E.(DU) Shri. B.M. Patil Medical College, Hospital and Research center, Vijayapura. Total 110 patients were included in this study. The main objective of this study was to compare the first pass successful intubation between Blockbuster ILMA Vs Fastrach ILMA.we have compared the time taken for intubation,ease of intubation, fibreoptic grading of laryngeal view and complications like sore throat,blood stain etc.

Comparison of demographic variables :

Demographic profile regarding age, gender, ASA grade in either of the groups was comparable, showed statistically not significant ($p>0.05$) results.

In our study we compared the variables like age among 110 patients out of 55 patients in each group ,in which 33 patients are found to be in age <40 years and 22 patients were found to be in <70 years group in BB ILMA and in other group 31 patients are in <40 years age and 24 patients are <70 years of age in F ILMA.In sex variable female are 27 in number and male are 28 in number in BB ILMA and 23 are female in number, 32 are male in number .In ASA grade we have 33

patients in grade 1 and 26 patients have grade 2 in BB ILMA and 18 patients have grade 1 and 36 patients have grade 2 in F ILMA.All the results are statistically not significant.

Many studies had been done in the past which had similar results to our study.

In a study done by **Endigeri A et al [3] (2019)** randomization was used to divide sixty patients in the age range of 20-60 years who were having general anaesthesia into two groups of thirty patients each for the purpose of performing tracheal intubation using either a BlockBuster LMA (Group B) or an Intubating LMA Fastrach (Group F). They had found no statistical difference in following the induction of anaesthesia, intubating laryngeal mask airways (ILMAs) were placed, and once adequate breathing was achieved with the device, fiberoptic bronchoscopy was conducted to evaluate the glottis visualisation score. Through the supraglottic airway devices, an attempt was made to do a blind intubation (SAD). Their primary goal was to successfully intubate the patient on the first attempt, and the secondary outcomes were ease, the amount of time it took to insert the LMA, the amount of time it took to remove the LMA, fibreoptic scoring, and the occurrence of complications. They had found that the overall success rate of tracheal intubation was 96.6% in Group B and 89.9% in Group F (P = 0.3), with our study the first-attempt success rate of tracheal intubation being 90% in Group B and 66.6% in Group F. With BlockBuster LMA, complications such as sore throat and blood stain were alleviated to a greater extent..They had concluded that BlockBuster LMA achieves a better rate of success on the first attempt of blind tracheal intubation while reducing the likelihood of problems such as sore throat and blood stains.

In contrast to our study, **Jayaraman L et al [34] (2019)** had done a study in which they had included only obese surgical individuals as study subjects whose BMI was more than 35kg/m^2 .They had concluded that a neck circumference that is less than 49.5 centimetres is closely correlated with a poor safe apnea time and the requirement of SGA to attain mask ventilation.,within this patient population, SGA may be able to give a risk-free first treatment option following the induction of anaesthesia where as in our study BMI is lesser in BB ILMA group rather than the F ILMA group.

Lal J et al [35] (2020) had done a study in the past, the participants in the study consisted of one hundred people of either gender, ranging in age from 18 to 60 years old, and belonging to the American Society of Anesthesiologists (ASA) physical status class I or II. In groups A and B consisting of 50 patients each, blind intubation was performed using a regular PVC Tracheal Tube

and a Parker flex-tip tube, respectively**.** When compared with traditional PVC Tracheal Tube, the success rate on the first try for Parker flex-tip Tracheal Tube(TT) was statistically considerably higher (P = 0.002).In our study had shown that due to its one-of-a-kind design, the Parker Flex-tip TT, which was used in this study's group B, was able to intubate patients more easily and achieve a higher success rate overall and on the very first attempt when compared with group F.

Yunluo LY et al[43] (2016) had a very similar results to our study. They had compared the proseal LMA with blockbuster LMA and found that better hyperlarynx ventilation, a larger green channel to intubation, a lower risk of aspiration, and less post-intubation trachyphonia are major ways in which the BlockBuster intubating laryngeal mask improves resuscitation quality for urologic day surgery patients as compared to the Proseal laryngeal mask.So BB ILMA was better in providing ventilation and insertion is easier even in our study .

In hemodynamic variables like vitals we have PR,SBP,DBP,RR they are compared with BB ILMA and F ILMA.In PR at 1^{st} min ,5^{th} min,10^{th} min are 83.18,81.95,82.71 in BB ILMA and 69.40,84.24,86.29 in F ILMA. In SBP at 1^{st} min,5^{th} min,10^{th} min are 117.09,116.36,117.09 in BB ILMA and 117.8,116.7,115.6 in F ILMA group.In DBP at 1^{st} min,5^{th} min,10^{th} min are 77.64,77.09,78.55 in BB ILMA and 77.64,76.36,77.09 in F ILMA group. In RR at 1^{st} min,5^{th} min,10^{th} min are 15.89,16.25,15.76 in BB ILMA and 16.09,16.11,16.24 in F ILMA group.All the results are statistically not significant.

The other variables compared in our study are insertion time(seconds), 1^{st} pass successful attempt,ease of intubation,fibreoptic grading and complications . **Gerstein NS et al [44]** in their study had concluded that FT-LMA has established itself as an effective airway device for usage both in and out of the operating room in cases of airway difficulty. Effective ventilation can be achieved in almost all situations, They were able to perform blind Endotracheal intubation in the vast majority of cases. Complications of a serious nature had not been encountered in their study.

In insertion time(seconds) in BB ILMA has very less time insertion 25.02 sec when compared with F ILMA has a gross difference 42.77 sec.Hence through this insertion time we conclude that BB ILMA is better than F ILMA group.

In 1st pass successful attempt we have failed in 3 patients and rest 52 patients are successful in BB ILMA group.Same way in F ILMA group we have failed for 7 patients and rest 48 patients are successful. **Endigeri A et al [3] (2019)** conducted a similar study for insertion and 1st pass successful attempt shows that B group is better than F group

In ease of intubation we have found that 52 patients had easy ease of intubation and 3 patients had difficult for intubation in BB ILMA group and in F ILMA group we had found that 48 patients had easy ease of intubation, 7 patients we had faced difficult intubation.

In our study the complications like blood stains are found in 2 patients of BB ILMA and 5 patients in F ILMA group and sore throat is seen only in 1 patient of F ILMA group.

In fibreoptic grading with the help of brimacombe score we have found that 26 patients had grade 1 and 29 patients had grade 2 in BB ILMA group but in F ILMA group we had found 48 patients in grade 1 and 7 patients in grade 2.

From the above discussion of entire study we have found that BB ILMA is easier to insert with less number of attempts when compared with F ILMA.Hence the study concludes that BB ILMA is better than F ILMA group.

CONCLUSION

ILMA is simple to use and rapid to insert, even for the least experienced practitioner, the LMA is a good airway device in many settings, including the operating room, the emergency department, and out-of-hospital treatment. In the operating room, there is almost a 100% success rate for placing an LMA. In the emergency context, a decreased success rate for LMA installation may be anticipated.

We conclude that BB ILMA having first pass successful attempt and ease of insertion and less duration for intubation with good fibreoptic grading view(brimacombe score) and lesser complications like blood stain and sore throat when compared with F ILMA .So BB ILMA can be encouraged.

SUMMARY

The study **"A RANDOMISED CLINICAL TRIAL TO COMPARE THE SUCCESS RATE OF BLOCKBUSTER INTUBATING LMA VERSUS FASTRACH INTUBATING LMA DURING BLIND ENDOTRACHEAL INTUBATION"** was carried out in the Department of Anaesthesiology, B.L.D.E. (Deemed to be university) Shri B. M. Patil Medical College, Hospital and Research Centre, Vijayapura amongst patients admitted for elective surgeries under general anaesthesia. The goal of the study was to assess the benefits of Blockbuster LMA and Fastrach LMA during general anesthetic procedures.The primary objective of this study is to compare the first pass successful intubation between Blockbuster ILMA vs Fastrach ILMA.The secondary objective of this study is to determine the time taken for intubation and ease of intubation and fibre optic grade of laryngeal view and complications like sore throat and blood stain.

It was a prospective randomized comparison study done amongst 110 patients who were matched for age, weight and sex and was assigned using computerized random table number into two different groups of which 55 patients in Blockbuster ILMA and 55 patients in Fastrach ILMA. This was done during a study period of one and half year from December 2020 to August 2022. The study population were assigned using computerized random number table in to Group-B is blockbuster ILMA and Group-F is fastrach ILMA.

Group B -Blockbuster ILMA

Group F-Fastrach ILMA

Results were recorded using a preset Performa. Preanesthetic evaluation was done, patients were kept fasting for 6 hours prior to surgery and were inserted with blockbuster ILMA and fastrach ILMA based on the group they were assigned to base on inclusion criteria. The first pass successful attempts were noted and the ILMA insertion in seconds,the ease of insertion was noted down and ease of intubation and complications were also noted down.Unblinded observer recorded the insertion time ,number of attempts, fibreoptic grading, complications were noted down. Data was represented using Mean ±SD, percentages and diagrams. Statistical analysis was done and the results are as follows:

Age and sex-based classification of patients posted for surgery in cases where intubation using blockbusterI LMA and fastrach ILMA was required showed no significant results. Grading of patients based on Mallampati and ASA grading, intra-op monitoring of pulse rate, oxygen saturation, systolic and diastolic blood pressure were comparable in both the groups clinically and statistically did not give significant results.

In our study, all patients had [110 (100.0%)] Preop Vitals.

In our study, mean ILMA insertion time (in seconds) of patients was [42.77± 16.289].We found that out of 110 patients most of the patients were 30 – 39 years old but this was not statistically significant. In our study, mean Age was higher in Block Buster compared to Fastrach but It was not statistically significant.In our study, mean BMI was lower in Block Buster compared to Fastrach which was statistically significant.Our study showed that, mean ILMA insertion time was significantly higher in Fastrach compared to Block Buster.

We conclude that 1st pass successful attempt in BB ILMA was having more successful attempts when compared with F ILMA and the number attempts where lesser in BB ILMA group.In complications also it is the similar manner where blood stains were found to be lesser in BB ILMA when compared with F ILMA group.

The study encourages the use of Blockbuster ILMA due to its advantages and thus, emphasizes the superiority of Blockbuster ILMA over Fastrach ILMA.

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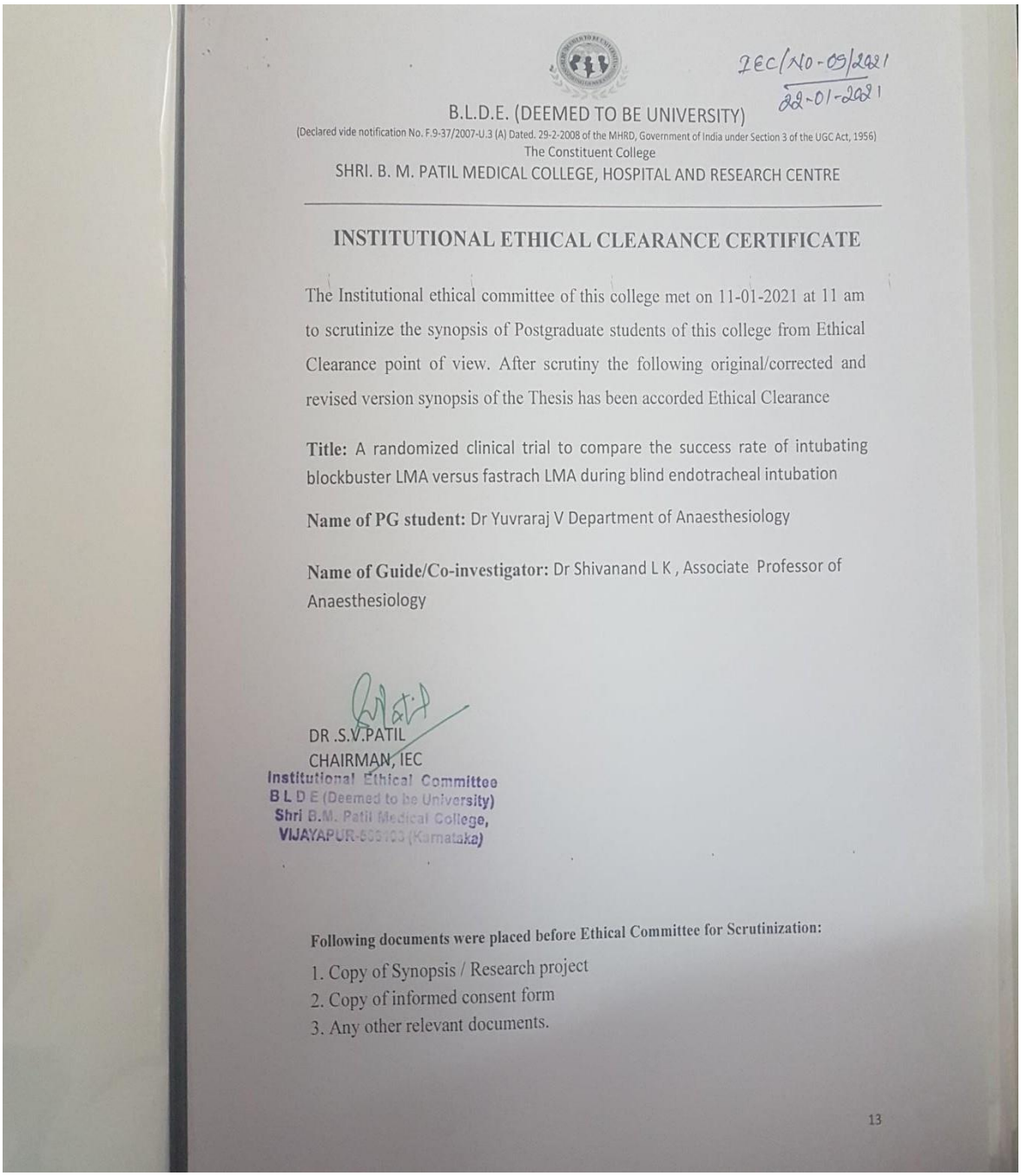
ANNEXURE -1

ETHICAL CLEARENCE CERTIFICATE



IEC/NO-09/2021
22-01-2021

B.L.D.E. (DEEMED TO BE UNIVERSITY)
(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act, 1956)
The Constituent College
SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Institutional ethical committee of this college met on 11-01-2021 at 11 am to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

Title: A randomized clinical trial to compare the success rate of intubating blockbuster LMA versus fastrach LMA during blind endotracheal intubation

Name of PG student: Dr Yuvraraj V Department of Anaesthesiology

Name of Guide/Co-investigator: Dr Shivanand L K , Associate Professor of Anaesthesiology

DR .S.V.PATIL
CHAIRMAN, IEC
Institutional Ethical Committee
B L D E (Deemed to be University)
Shri B.M. Patil Medical College,
VIJAYAPUR-586103 (Karnataka)

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form
3. Any other relevant documents.

13

ANNEXURE – II

SAMPLE INFORMED CONSENT FORM

B.L.D.E.(DU) SHRI B.M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, VIJAYAPURA – 586103, KARNATAKA

TITLE OF THE PROJECT: "A RANDOMISED CLINICAL TRIAL TO COMPARE THE SUCCESS RATE OF BLOCKBUSTER INTUBATING LMA VERSUS FASTRACH INTUBATING LMA DURING BLIND ENDOTRACHEAL INTUBATION"

PRINCIPAL INVESTIGATOR: Dr. YUVARAJ.V

Department of Anaesthesiology

BLDE (Deemed to be university)

Shri B.M. Patil Medical College Hospital &Research Centre,

Sholapur Road Vijayapura-586103

Email: yashasvarunvenkatesan2@gmail.com

PG GUIDE: Dr. SHIVANAND.L.K.

Associate Professor

Department Of Anaesthesiology

BLDE (Deemed to be university)

Shri B.M. Patil Medical College Hospital &Research Centre,

Sholapur Road Vijayapura-586103.

Email: shivanandkarigar82@gmail.com

PURPOSE OF RESEARCH:

I have been informed that this study is comparison of success rate of intubating blockbuster ILMA versus fastrach ILMA.

I have been explained about the reason for doing this study and selecting me/my ward as a subject for this study. I have also been given free choice of either being included or not in the study.

PROCEDURE:

I understand that I will be participating in the study comparison of success rate of intubating blockbuster ILMA versus fastrach ILMA.

RISKS AND DISCOMFORTS:

I understand that my ward may experience some discomfort during the procedure and I understand that necessary measures will be taken to reduce them.

BENEFITS:

I understand that my ward participating in this study will help in finding out success rate of intubating blockbuster ILMA versus fastrach ILMA.

CONFIDENTIALITY:

I understand that medical information produced by this study will become a part of this hospital records and will be subjected to the confidentiality and privacy regulation of this hospital.

If the data are used for publication in the medical literature or for teaching purpose, no names will be used and other identities such as photographs and audio and video tapes will be used only with my special written permission. I understand that I may see the photograph and videotapes and hear audiotapes before giving permission.

REQUEST FOR MORE INFORMATION:

I understand that I may ask more questions about the study at any time. Dr. YUVARAJ V is available to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during the course of this study, which might influence my continued participation.

If during this study ,or later I wish to discuss my participation in or concerns regarding this study with a person not directly involved, I am aware that the social worker of the hospital is available to talk with me. And that a copy of this consent form will be given to me for keep for careful reading.

REFUSAL OR WITHDRAWAL OF PARTICIPATION:

I understand that my participation is voluntary and I may refuse to participate or may withdraw consent and discontinue participation in the study at any time without prejudice to my present or future care at this hospital.

I also understand Dr. YUVARAJ V will terminate my participation in this study at any time after she has explained the reason for doing so and has helped arrange for my continued care by my own physician or therapist, if this is appropriate.

INJURY STATEMENT:

I understand that in the unlikely events of injury to me/my ward, resulting directly due to my participation in this study, such injury will be reported promptly, then medical treatment would be available to me, but no further compensation will be provided.

I understand that by my agreement to participate in this study, I am not waiving my legal rights. I have explained to_____the purpose of this research , the procedure required and the possible risk and benefits, to the best of my ability in patients own language

DATE Dr. YUVARAJ V (investigator)

PATIENT/PARENT SIGNATURE Witness

STUDY SUBJECT CONSENTSTATEMENT:

I confirm that Dr. YUVARAJ V has explained to me the purpose of this research, the study procedure that I will undergo and the possible discomforts and benefits that I may experience, in my own language.

I have been explained all the above in detail in my own language and I understand the same. Therefore I agree to give my consent to participate as a subject in this research project.

_____ _____

(Participant) (Date)

_____ _____

(Witness to above signature) (Date)

ANNEXURE – III

SCHEME OF CASE TAKING

PROFORMA

Study: A RANDOMISED CLINICAL TRIAL TO COMPARE THE SUCCESS RATE OF BLOCKBUSTER INTUBATING LMA VERSUS FASTRACH INTUBATING LMA DURING BLIND ENDOTRACHEAL INTUBATION

Patient details

Name: Ip No:

Age: Sex:

Height: Weight:

Address:

Religion: Occupation:

Chief Complaints:

Past history:

Personal history:

Family history:

Treatment history:

INVESTIGATIONS:

1) Cbc
2) Serum electrolytes
3) Urine examination
4) Hbsag Hiv
5) ASA Grade

GENERAL PHYSICAL EXAMINATION

Height: Weight: BMI:

Mallampati grading:

Pallor Icterus Cyanosis Clubbing Lymphadenopathy Edema

Vitals

PREOP : PR BP RR SPO2

SYSTEMIC EXAMINATION

Central Nervous System:

Respiratory System:

Cardiovascular System:

P/A:

	Blockbuster LMA				**Fastrach LMA**			
	PR	BP	SPO2	RR	PR	BP	SPO2	RR
1st minute								
5th minute								
10th minute								

LMA used : No 3 or No 4

1)Time taken total: (B)group (F)group

a)LMA time:

b)Intubation time:

	Blockbuster LMA	Fastrach LMA
Male to Female sex ratio		
1st pass successful attempts		
Ease of intubation		
Time taken for intubation		

Fibre optic grading (Brimacombe score)

Blockbuster LMA	Fastrach LMA

COMPLICATIONS

	Blockbuster LMA	Fastrach LMA
Nausea,vomiting		
Sore throat		
Blood staining		
Brochospasm		
Post extubation stridor		

PRIMARY INVESTIGATOR SIGNATURE: -

GUIDE SIGNATURE: -

BIO-DATA OF THE GUIDE

Guide Name:	Dr. Shivanand .L.K.
Date of Birth:	20/07/1982
Education:	MBBS., MD ANAESTHESIOLOGY (JNMC, BELGAUM)
Designation:	Associate Professor
	Department of Anaesthesiology
Teaching:	UG Teaching- 13 Years
	PG Teaching-13 Years
Address:	Associate Professor
	Department of Anaesthesiology
	B.L.D.E.(DU)
	Shri B.M. Patil Medical College Hospital and Research Centre
	Vijayapura-586103 ,Karnataka
	(08352)262770 Ext 2052, 08352-263266(R)
	944953421

INVESTIGATOR

Name:	Dr. YUVARAJ V
Qualification:	M.B.B.S (2012-2018), Sri Siddhartha Medical College
	Tumkur, Karnataka
KMC REG.No:	122181
Address:	Department of Anaesthesiology
	B.L.D.E.(DU)
	Shri B.M.Patil Medical College Hospital and Research Centre
	Vijayapura- 586 103, Karnataka
	8919604675

MASTERCHART