

# Ease of Intubation While Using Macintosh and (McCoy's Type) Laryngoscope Blade Undergoing with Anaesthesiology

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## INTRODUCTION

Laryngoscopy forms an important part of general anaesthesia and endotracheal intubation. Laryngoscopes are used to view the larynx and adjacent structures, most commonly for inserting endotracheal tube into the tracheobronchial tree. The aim of laryngoscopy is to obtain good visualisation of vocal cords to facilitate smooth endotracheal intubation. Direct laryngoscopy depends on extension of the head at the atlanto-occipital joint and flexion of the lower cervical spine to align the oral, pharyngeal and laryngeal axis. The hemodynamic response at the time of endotracheal intubation and laryngoscopy should be abolished to balance the myocardial O<sub>2</sub> supply and demand which is a keynote in the safe conduct of anaesthesia.

Thus, the blades used for laryngoscopy should trigger minimal stress response and at the same time facilitate good laryngoscopic view for smooth endotracheal intubation.

Airway assessment and management is an important factor in the expertise of an anaesthesiologist. Maintaining a patent airway is a vital aspect of providing adequate oxygenation and ventilation. Failure to do so for even a brief period can be life threatening. This forthcoming observational study

## ABSTRACT

Various anesthesia devices have been designed to overcome the difficult airway scenario in anesthesia practice. The ease of intubation, timing, and hemodynamic variability between the two groups during intubation are considered as primary results compare. The study was conducted in two groups, each group set aside of 65 patients, named Group A and Group B with normal physical status I-II to endothelial intubation. Determined to perform surgery under anesthesia by consent. This includes simple rigid laryngoscopes for complex fiber-optic incubating devices; However, there is weak evidence to support the superiority of one device over another. McCoy's blade shows overall minimal haemodynamic response and provides better glottic view and ease of intubation as compared to Macintosh blade.

**Keywords:** Laryngoscope, macintosh, anesthesia, intubation, blade

was intended to assess the viability of McCoy's laryngoscope blade (straight) versus Macintosh (curved) blade in giving great glottic view and diminishing haemodynamic reaction during endotracheal intubation. This study was aimed with the at comparing haemodynamic responses, glottic view and intubating conditions utilizing McCoy's blade versus Macintosh blade for intubation.

## AIM AND OBJECTIVES

### AIM OF THE STUDY

To study the stress response following intubation with Macintosh and McCoy's blades in any elective surgery requiring general anaesthesia.

### OBJECTIVES OF THE STUDY

To study the haemodynamic changes while using Macintosh and McCoy's type of blades in patients undergoing general anaesthesia for various surgical procedures. To evaluate the glottic view while using Macintosh and McCoy's type blades in patients undergoing general anaesthesia for various surgical procedures.

## REVIEW OF LITERATURE

## AIRWAY

Airway is the passage through which the air/ gas passes during respiration. It may be divided into an upper and a lower airway. Upper airway structures comprise mouth, nasopharynx, oropharynx, pharynx, and the larynx. The nasopharynx consists of the adenoids, nasal cavity, turbinates, septum. The oropharynx comprises the oral cavities, including teeth and tongue. The lower airway includes the trachea, bronchi and the bronchioles, which terminate in "the alveoli". The epiglottis divides the larynx (which contributes to trachea) from the hypopharynx (which corresponds to the esophagus). [1]

In 1958, Dante Bizzarri and Joseph Ginffrida designed a blade to be both easier to manipulate and cause fewer traumas than the MacIntosh. They argued that the vertical component of the Macintosh flange often causes the blade to come into contact with the upper teeth. This, they stated, limits the amount of rotation of the distal end of the blade that can be safely done in case of difficult intubation. They also argued that the relative thickness of the Macintosh blade prevents its complete insertion of the mandible into patients with limited motion. In order to circumvent these problems, the Bizzarri-Ginffrida blade was designed much thinner than the Macintosh while still maintaining its basic curvilinear shape and the outward component of the flange. The unique thinness of this blade, as its inventors stated, helps to prevent no contact with upper teeth that has special valuable in difficult situation when contact with the larynx requires maximum rotation of the distal end.[2]

Overcoming pharyngeal obstruction due to soft-tissue swelling was the primary concern of Cedric Bainton when he designed and tested his laryngoscopy blade in 1987. In this circumstance as Bainton pointed out, the normal pharyngeal space can become completely obliterated making visualization of the larynx very difficult if not impossible. The standard non-tubular laryngoscope, Bainton argued, fails to create an acceptable viewing space in this situation because the swollen tissue simply envelopes the blade making emergency cricothyrotomy mandatory. On the other hand, Bainton also realized that standard tubular blades such as the early Jackson blade, while creating an adequate view of the larynx, were more cumbersome and left less room for manipulation of the tracheal tube. He therefore worked to design a laryngoscope blade that not only created a pharyngeal space by utilizing a tubular design but also allowed for easy manipulation of both the endotracheal tube and the blade itself. These challenges were met by designing a laryngoscope blade with a distal tubular segment, which created an adequate viewing space while the proximal segment was relatively flat and shallow allowing for maneuverability.[3]

More recently, direct laryngoscopy blades have become mechanized. Activating mechanisms alongside the handle can be employed by the operator during difficult intubations in order to activate hinge type mechanisms within the blade. In this way, the more popularly shaped, non tubular blades can provide an increased distal viewing space analogous to a tubular blade. This lessens the likelihood for the operator

having to use the patient's teeth as the fulcrum, greatly extend the neck, or rotate the blade itself. The McCoy's laryngoscope blade described in 1993 is the most widely accepted blade of this kind. Curved in shape, the McCoy's blade was designed to be used just as the Macintosh with its distal tip placed within the valleculae under circumstances where the operator does not have a satisfactory view of the larynx. Activation of the lever causes the distal tip of the blade to flex upward thus raising the epiglottis without any relative change in handle position. In situation such as suspected cervical spine injury, when ideal head positioning cannot be obtained, the McCoy's blade has been shown to be a very useful instrument.[4,5]

Asai, T., et al. compared of two Macintosh laryngoscope blades in 300 patients to contrast the ease of laryngoscopy and each sort of Macintosh laryngoscope blade. In an irregular outlandish design, after enlistment of sedation and neuromuscular square, the two blade were embedded in thus, and the perspectives on the glottis at laryngoscopy (Cormack and Lehane scores) were compared.[6] Cook et al., found that the blade activation of the McCoy's laryngoscope significantly improves laryngoscopic view. [7]

Henderson et al., In difficult tracheal intubation they demonstrated the use of paraglossal straight blade laryngoscopy. A study was conducted in 10 cases of unforeseen troublesome tracheal intubation utilizing the Macintosh laryngoscope blade, the larynx couldn't be seen. For each situation, a decent view was accomplished utilizing the Miller blade lateral to the tongue, which empowered tracheal intubation under direct vision. The outcomes accomplished utilizing tight, low-profile straight laryngoscope sharp edges with this method are surveyed. [8]

Arino, Jose J., et al. Conducted straight blades improve visualization of the larynx while curved blades increase ease of intubation. Studied 500 patients undergoing elective medical procedure and who required tracheal intubation. The patients were haphazardly relegated to five groups, each were the group of 100 patients. Anesthesia was instigated with intravenol utilizing 1-3 mg · kg<sup>-1</sup> of propofol initiated 1, phenytal 1.5 µg · kg<sup>-1</sup> and atracurium 0.5 mg · kg<sup>-1</sup> or suxamethonium/mg · kg<sup>-1</sup>. The laryngoscopic sees got with the BP and MIL laryngoscopes were comparable, and predominant with those of different kinds of laryngoscopes (P <0.001). The turning tip of the MC blade (P = 0.02) and the fiboptic gadget of the LF (P <0.001) altogether improved laryngoscopic see. Laryngoscopy was better with straight blades yet bended blades gave better intubating positions.[9]

## MATERIALS AND METHODS

### Study Settings

This study entitled "EASE OF INTUBATION WHILE USING Macintosh AND (MCCOY'S TYPE) LARYNGOSCOPE BLADE UNDERGOING WITH ANAESTHESIA" was undertaken in KIMS, Hospital and Research Centre, Karad, after obtaining ethical committee clearance as well as informed written consent from all patients. The study was conducted in two groups, each group set aside of 65 patients, named Group A and Group B

with normal physical status I-II to endothelial intubation. Determined to perform surgery under anesthesia by consent.

Study Design

Prospective, Comparative, Single blind, Randomised Study

Randomisation of the Patients

Randomisation was done with the help of Microsoft Excel. Then proforma was labelled either group A or group B according to randomisation and was put in the concealed envelope (no see through envelope). At the time of performing the study the envelope was taken serially and then Macintosh or McCoy's blade was used accordingly.

RESULTS

Table 1: Distribution of Age and Sex in two Groups

Age in Years	GROUP A		GROUP B	
	M	F	M	F
20-29	10	20	19	11
30-39	9	8	11	9
40-49	6	1	3	5
50-60	8	3	3	4
Total	33	32	36	29
Mean age	32.969±10.576		31.292±9.994	

Student unpaired „t“ test, P value= 0.35(for age); X<sup>2</sup>= 0.278, P value= 0.598 (for gender)

There is no statistically difference in mean age of two groups (P value>0.05).Table shows that males and females were

equally distributed in both groups (p value >0.05). Proportion of males were 50.77% & 55.38% and proportion of females were 49.23% & 44.61% in Macintosh & McCoy's group respectively.(Table 1)

Table 2: Distribution of study subjects according to Ease of Intubation Grading

EASE OF INTUBATION GRADING	Group A	Group B	Total
I	42	55	97
II	23	10	33
III	0	0	0
IV	0	0	0
Total	65	65	130

X<sup>2</sup>=6.86, P value=0.008

In Macintosh group out of 65 patients approximately 64% and 36% patients shows ease of intubation grade I and grade 2 respectively. Similarly in McCoy's group approximately 85% and 15% patients shows ease of intubation grade I and grade 2 respectively. This difference in proportion between both the groups was statistically significant (p value<0.05).

DISCUSSION

Laryngoscopy is an essential part of general anaesthesia and endotracheal intubation. To assist and ease the intubation phase, laryngoscopic blades in various types have been designed and tested. The form of the laryngoscope blade impacts the larynx view. Laryngoscopy and endotracheal intubation cause severe stress reactions in the form of elevated catecholamines contributing to tachycardia and hypertension, which can be disastrous in patients with cardiovascular disease. It has been seen that measure of powers applied during laryngoscopy and intubation is the key determinant for mechanical incitement of stretch receptors present in the respiratory tract. Therefore, utilization of various kinds of laryngoscope blades can help in diminishing this reaction and simultaneously encourage great laryngoscopic view for smooth endotracheal

intubation. The McCoy's blade, a modification of the standard Macintosh blade was introduced in 1993. The tip of the McCoy's blade is pivoted and when the blade is embedded into the vallecula, the tip follows up on the hyoepiglottic ligament and lifts the epiglottis out of view to uncover a greater amount of the glottis by pressure of the switch appended to the proximal finish of the blade.

CONCLUSION

Based on the present study carried out the following conclusion can be made that McCoy's blade shows significant less increase in haemodynamic response, good visualization of glottis, better ease of intubation. Thus we can conclude that McCoy's blade shows overall minimal haemodynamic response and provides better glottic view and ease of intubation as compared to Macintosh blade.

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