

## Comparison of Laryngeal Intubation Time and Attempts Needed for Various Laryngoscopes

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### Original Research Article

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**Abstract:** The first use of elective oral intubation for anesthesia was undertaken by William Macewan. To compare the laryngeal intubation time and attempts needed for Truview laryngoscope and Macintosh laryngoscope. Material and methods: A comparative study was carried out among 90 cases to study the intubation time required for Truview laryngoscope and Macintosh laryngoscope. Depending on that two groups of 45 patients each were made and they were intubated by Truview laryngoscope (T) and Macintosh laryngoscope (M) respectively. Results: shows that mean intubation attempt required in M-group was  $1.33 \pm 0.47$  as compared to T- group in which was  $1.04 \pm 0.20$  which is statistically significant ( $P < 0.001$ ). Conclusion: The intubation time needed for Truview is less. No of more than one attempt required was more in M-group as compared to T-group.

**Keywords:** Laryngoscope, intubation time, attempt.

### INTRODUCTION

The first use of elective oral intubation for anesthesia was undertaken by William Macewan. He had practiced passing flexible metal tubes through the larynx of a cadaver before attempting the maneuver on an awake patient with an oral tumor. He was first to use endotracheal intubation for a surgery [1].

Then came glottiscope which was created by medical student. Manuel Garcia (1805-1906) is generally credited for the discovery of laryngoscopy [2]. Around 1857, Professor Czermak taught "the art of laryngoscopy."

He developed some modifications that made the task easier so that it could be used routinely in the examination of patients. He was the first who used laryngoscopy as a clinical method of examination and successfully proved the practical medical value of laryngoscope [1]. The first endotracheal tubes were developed for the resuscitation of the new born and victims of drowning, but were not used in anaesthesia till 1878.

Truview Evo-2 laryngoscope was developed by Truphatek International® in 2004. The blade has been designed to accommodate a tubular optical assembly in a groove on its dorsal surface. The optical tube uses prism to produce anterior refraction of more than  $35^\circ$  and thereby enables the viewer to get images of objects situated more anterior to actual line of vision. The proximal view piece of the assembly is also compatible with endoscopic camera and normally

unmagnified image of the scope can be viewed in the monitor with magnification and clarity [3].

In 1943, Robert Macintosh introduced a curved blade, which worked by exerting a force at the base of the tongue and thus elevating epiglottis. This laryngoscope was devised to lessen the difficulty of exposing the larynx by direct elevation of the epiglottis, as the blades existing that time did not allow correct visualization of vocal cords. These blades later were modified in various ways to improve the glottic view, Like English, Polio, Oxiport, English with reduced flange, Tull, Fink Macintosh blade etc[4].

The Truview EVO2(C) laryngoscope (TL) is a recently introduced optical device designed to provide an unmagnified anterior image of the glottic opening and allow indirect laryngoscopy [5]. The Truview EVO2 blade facilitates the view of vocal cords by indirect laryngoscopy and does not require the proper

alignment of the oral, pharyngeal and tracheal axes as with the Macintosh blade [6].

### AIM & OBJECTIVES

To compare the laryngeal intubation time and attempts needed for Truview laryngoscope and Macintosh laryngoscope.

Also to compare the rescue technique used for Truview laryngoscope and Macintosh laryngoscope.

### MATERIALS AND METHODS

A comparative study was carried out among 90 cases to study the intubation time required for Truview laryngoscope and Macintosh laryngoscope. Two groups were made of which group T i.e patients in whom Truview Evo-2 laryngoscope n= 45 was used, & group M in whom Macintosh laryngoscope n=45 was used to perform endotracheal intubation in patient undergoing elective surgical procedure under general anaesthesia after taking written informed consent from the patients.

#### Data collection

Sedation was given with inj. Midazolam 0.03 mg/kg and inj. Fentanyl 2 mcg/kg. After sedation patients was induced with inj. Propofol 2 mg/kg and confirming the mask ventilation muscle relaxant inj.vecuronium.0.1mg/kg was given. Trachea was intubated with appropriate no. endotracheal tube by an anesthetist with either of two blades & placement of

endotracheal tube was confirmed by equal chest movement, 5 point auscultation & capnography. Patient was mechanically ventilated during procedure after confirmation of successful intubation. Anesthesia was maintained with intermittent positive pressure ventilation with Oxygen & Nitrous oxide, muscle relaxant inj.vecuronium 0.1 mg/kg & inhalational agent. During laryngoscopy 6 liter of oxygen/min was administered via oxygen port of Truview Evo 2 laryngoscope. Intubation time was noted from introduction to removal of laryngoscope blade from mouth. POGO score & Cormack Lehane grading was done. Hemodynamic changes were recorded from baseline value to 10 min post intubation interval.

No other medication was administered or procedure done affecting the above parameter during 10 min data collection period after tracheal intubation. This was considered as end point. Rescue technique was applied in cases of failed intubation in the form of

- External pressure
- Bougie

Surgery was allowed to commence only after collection of last hemodynamic data at 10 min post intubation interval. Statistical analysis was done using micro soft excel and SPSS 20.

### RESULTS

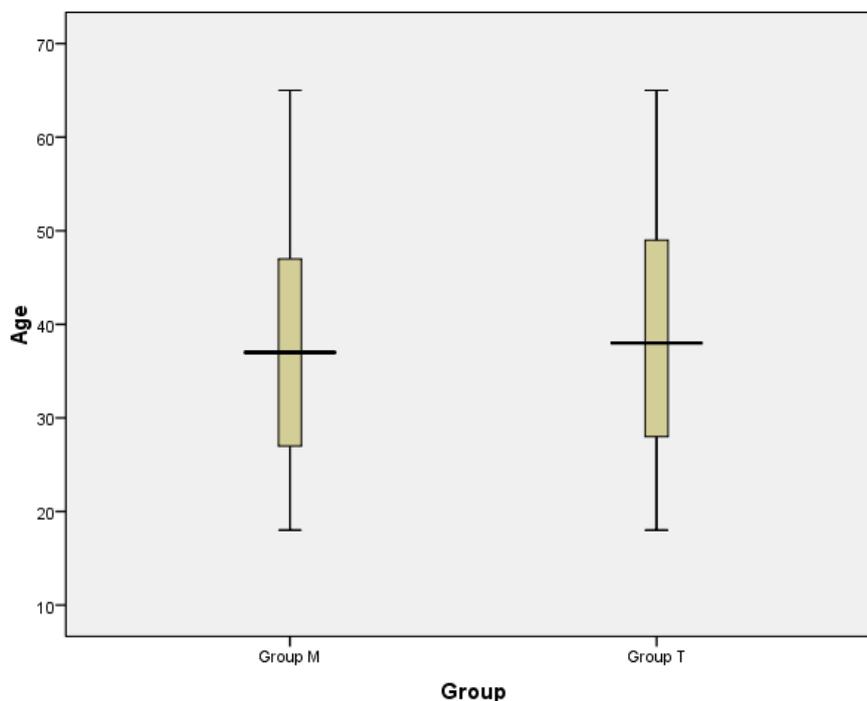
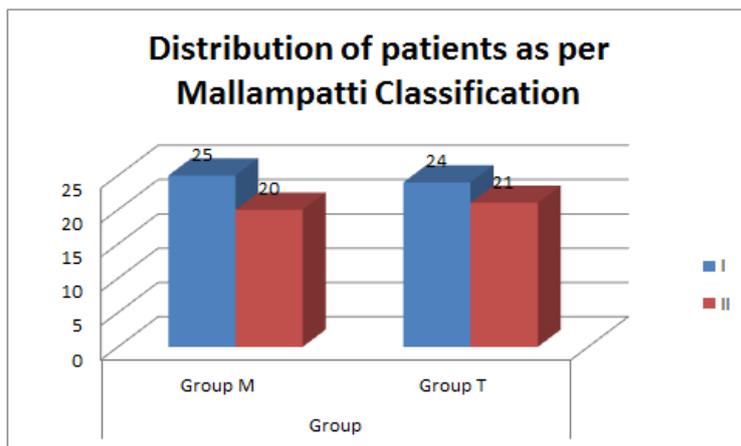


Fig-1: Age distribution among the study population

Figure 1 shows that the mean age in M-group was 38.07yrs±12.95 and the mean age in T-group

was 39.62yrs±13.07. These values are not statistically significant.



**Fig-2: Distribution of patients as per Mallampatti Classification**

Figure 2 shows that 55.6% of the patients in M-group and 53.3% of the patients in T-group belonged to MPC I. 44.4% of the patients in M-group and 46.7% of the patients in T-group belonged to MPC II. These

values are not statistically significant. Patients belonging to MPC III and above were excluded from the study.

**Table-1: No of Attempts**

	Group	N	Mean	Std. Deviation	P value	Significance
No of Attempts	Group M	45	1.33	0.47	<0.001	Significance
	Group T	45	1.04	0.20		

(Unpaired t test) (P < 0.05 –Significant)

Table 1 shows that mean intubation attempt required in M-group was 1.33±0.47 as compared to T-

group in which was 1.04±0.20 which is statistically significant (P< 0.001).

**Table-2: Comparison of Laryngeal intubation time**

Laryngeal intubation time in seconds	Group M	Group T
15-30	10 (22.2%)	4 (8.9%)
31-45	20 (44.5%)	7 (15.6%)
41-60	15 (33.3%)	17 (37.8%)
61-75	0 (0%)	15 (33.3%)
76-90	0 (0%)	2 (4.4%)
Total	45 (100%)	45 (100%)

Mean time for Laryngeal intubation in Group M was 41.7sec and in Group T it was 55.2sec.

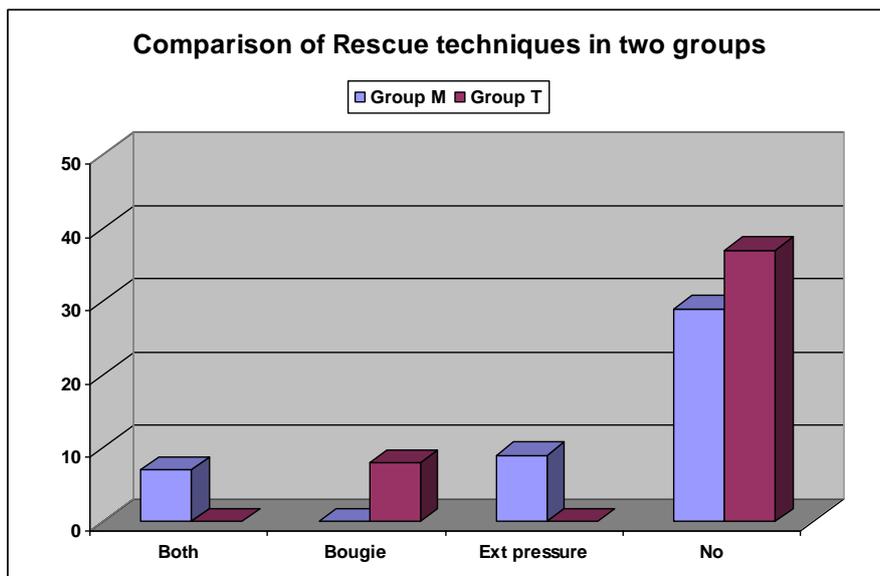
Applying test of significance, p value is 0.0003. as p value is <0.05 it shows high significance.

Figure 3 shows that requirement of rescue technique in the form of external pressure was 20.0%, external pressure and bougie was required in 15.6% of cases in M-group where as 17.8% of cases in Group T required Bougie for passage of tube which shows statistical significance(p<0.001)

**DISCUSSION**

Present study showed that mean time for Laryngeal intubation in Group M was 41.7sec and in Group T it was 55.2sec and the difference was

statistically significant. Study by Suman Arora *et al.* [6] showed that the average time of intubation was slightly more with the Truview laryngoscope (12.1±3.8s) compared to the Macintosh laryngoscope (10.9±2.1s); however, the difference was not statistically significant. The Visual analogue scale VAS score used to assess the ease of use of the laryngoscope showed no statistically significant difference between both the laryngoscopes. Similar results were obtained by Li *et al.* Barak *et al.* and Timanaykar *et al.* [7-9]. The prolonged time of intubation in the various studies conducted with Truview has been explained by the indirect method of viewing the larynx through this optical laryngoscope. It is difficult to direct the tracheal tube through the vocal cords whilst viewing the image through the view tube.



**Fig-3: Comparison of requirement of rescue technique**

M. A. Malik *et al.* [10] demonstrated that the Truview EVO2 laryngoscope reduced the number of optimization maneuvers when compared with the Macintosh laryngoscope. In our study requirement of rescue technique in the form of external pressure was 20.0%, external pressure and bougie was required in 15.6% of cases in M-group where as 17.8% of cases in Group T required only bougie for passage of tube showing statistical significance.

Ishwar Singh *et al.* [11] performed a study comparing Macintosh laryngoscope and Truview laryngoscope in 100 patients with 1 or 2 predictors of difficult intubation. The Cormack and Lehane grading improved with Truview as also confirmed by other investigators mentioned above. They experienced requirement of certain manipulative movements while negotiating the endotracheal tube under Truview evo2 vision even when the best of the laryngeal view was available. This was the main reason for requirement of longer time for tracheal intubation under Truview vision as compared to conventional laryngoscopy and experienced by other authors also.

### CONCLUSION

The intubation time needed for Truview is less. No of more than one attempt required was more in M-group as compared to T-group. 35.6% cases of M-group required rescue technique and 17.8% cases of T-group required rescue technique. We opine that although Truview provides a better laryngoscopic view than Macintosh in difficult cases, it does not have an extra benefit over Macintosh otherwise, further indicating the need for more experience with the use of a Truview laryngoscope.

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