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# Videolaryngoscopy vs Direct Laryngoscopy for ease of intubation in elective airway management in adult patients- A comparative study

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**ABSTRACT**

**Background** - Video laryngoscope allows an enhanced view of glottis and is a useful equipment while intubating. It's also a good teaching learning tool.

**Aim and objectives** - To compare Video laryngoscopy with Direct laryngoscopy for elective airway management in adult patients for ease of intubation.

**Materials and methods** – We aimed to compare direct laryngoscopy using Macintosh blade and Video laryngoscopy using BPL01 macintosh blade for ease of intubation in elective airway management in adult patients. Total 58 patients were included in the study, with 29 patients in each group.

**Results -** The mean duration for direct laryngoscopy was 16.21 secs and videolaryngoscopy was 28.31 seconds which is statistically significant. The mean duration for tracheal intubation with direct laryngoscopy was 13.79 seconds and videolaryngoscopy was 28 seconds. In this study, time taken for laryngoscopy and intubation was more when videolaryngoscope is used which was statistically significant. Though visualization of glottis assessed with Cormack Lehane grade was better with Videolaryngoscopy.

**KEY WORDS:** Direct Laryngoscopy, Video Laryngoscpopy, ease of intubation

## INTRODUCTION

Direct laryngoscopy is most widely used method for orotracheal intubation but sometimes it could be difficult to perform. Video laryngoscope is a new intubation tool which furnishes better visualisation of airway and enhanced view of glottis making oro-tracheal intubation easy. It's also a good teaching learning tool.

The aim of this study was to prospectively compare the use of Video laryngoscope (BPL01) versus Direct (Macintosch) laryngoscope for ease of intubation in routine airway management.

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**OBJECTIVES**

- To assess ease of intubation with direct laryngoscopy for elective airway management in adult patients.
- To assess ease of intubation with video laryngoscopy for elective airway management in adult patients.
- To compare videolaryngoscopy with direct laryngoscopy for elective airway management in adult patients for ease of intubation.
- To compare complications if any.

**MATERIALS AND METHOD**

This study was performed at People's Hospital associated with People's College of Medical Sciences& Research Institute, Bhopal, during August 2024. Approval from the institutional Ethics Committee was taken before conducting the study. Written informed consent was obtained. 58 patients aged between 18 and 65 years of ASA (American Society of Anaesthesiologists) class 1 and 2 undergoing elective surgery under GA with endotracheal intubation were randomized into two groups of 29 each.

Group D(n=29) – patients were intubated using direct laryngoscope.

Group V(n=29) – patients were intubated using videolaryngoscope.

Those for ASA class III and above, emergency surgeries, Inter incisor distance less than 3cm, pregnancy, risk of gastric regurgitation, Modified Mallampati class 3 or 4 were excluded from study.

**MATERIALS**

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- Videolaryngoscope BPL01
- Macintosch laryngoscope
- Stylet
- Stop watch

**METHODOLOGY**

Patient shifted to operation theatre, placed in supine position and standard non-invasive monitor were attached. Premedication was done and induced with Inj. Propofol 2 mg/kg iv and Inj. Succinylcholine 1.5mg/kg iv given as intubating muscle relaxant and then laryngoscopy attempted.

Duration of Laryngoscopy (secs), duration of intubation (secs), Number of Attempts taken and Laryngeal view with Cormack- Lehane grading(Ease of intubation) was assessed.

- **TL: Time taken for laryngoscopy:** Time taken from when tip of blade crosses incisors to glottis visualization.
- **TI: Time taken for intubation:** Time taken from picking up of Endotracheal tube to confirmation of tube
  placement by capnography wave form or on auscultation of breath sounds.
- An **attempt** was defined as the action of inserting a laryngoscope into oropharynx. Everytime the
  laryngoscope was removed and reinsertion attempted, was counted as a subsequent attempt, whether by the first or second (senior anaesthesiologist).

Ease of intubation was assessed on a score of 1 to 3

- 1. Easy – tracheal intubation without maneuver.
- 2. Satisfactory – tracheal intubation with maneuvers.
- 3. Difficult – tracheal intubation not even with maneuvers.

**ASSESSMENT PLAN**

While intubating, the time taken for laryngoscopy and intubation by using Direct laryngoscope & Video laryngoscope, and number of attempts taken for intubating the patient by using these two devices were observed.

**STASTICAL ANALYSIS**

Statistical analysis was performed using Statistical Package for Social Sciences® software (SPSS) trial version

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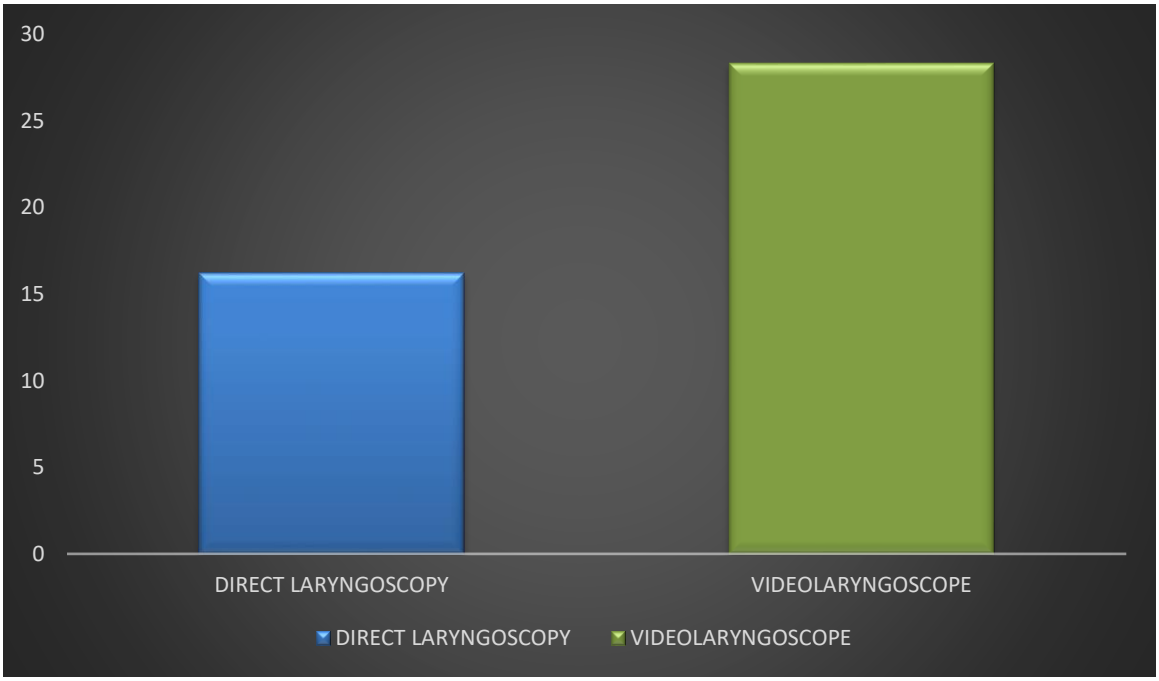
## RESULTS

**Comparison of Mean time of Laryngoscopy (in sec) between study groups (N=58)**

| PARAMETER | MEAN DURATION | DIFFERENCE BETWEEN MEANS | P VALUE |
|---|---|---|---|
| DIRECT LARYNGOSCOPY | 16.21 | 12.10 | <0.0001 |
| VIDEO LARYNGOSCOPY | 28.31 | | |




**Comparison of Mean time of Intubation(in sec) between study group (N=58)**

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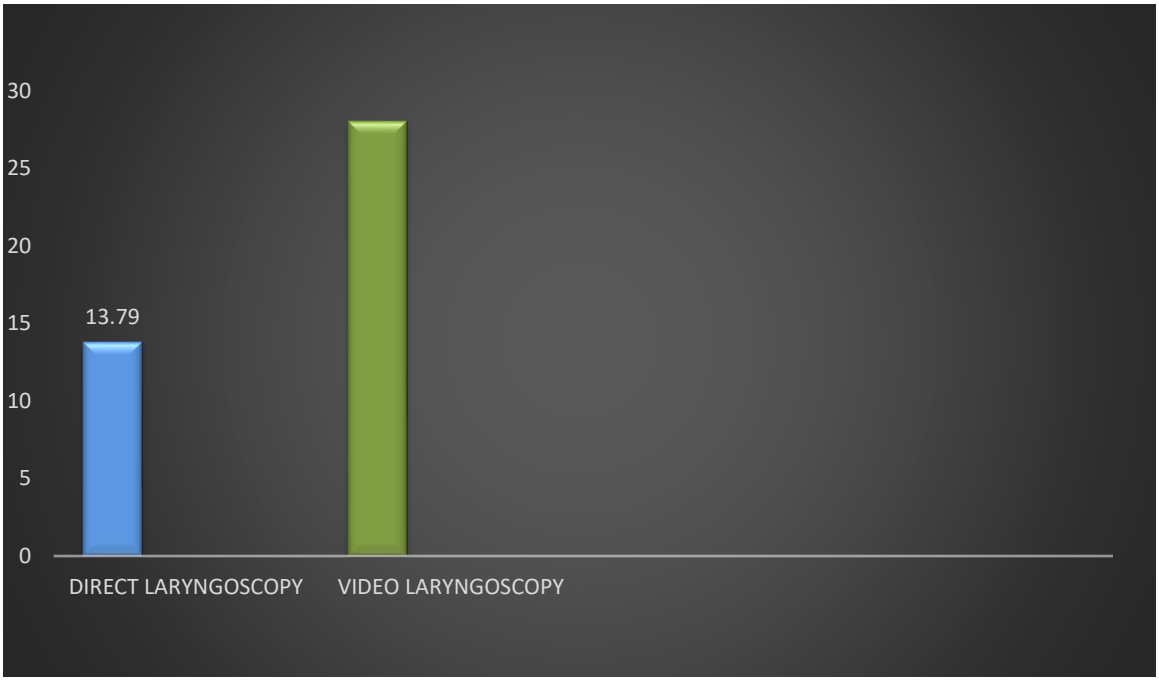
| PARAMETER | MEAN | DIFFERENCE BETWEEN MEANS | P VALUE |
|---|---|---|---|
| **DIRECT LARYNGOSCOPY** | 13.79 | **14.21** | **<0.0001** |
| **VIDEO LARYNGOSCOPY** | 28 | | |



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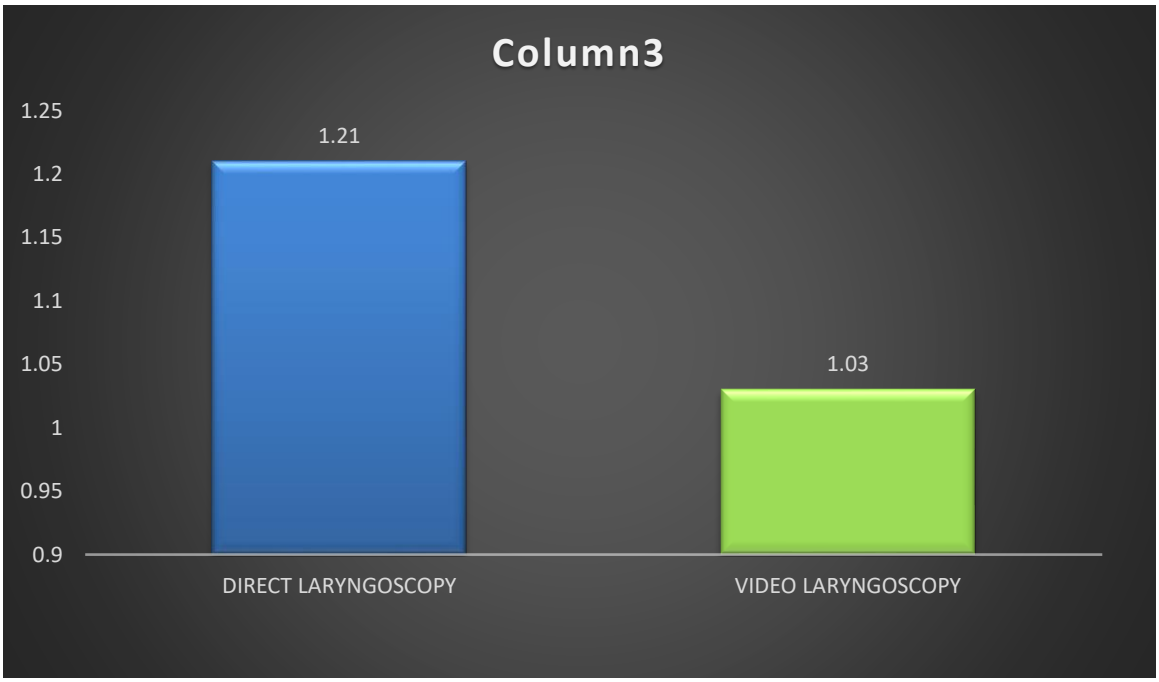
**Comparison of mean of number of attempts between groups (N=58)**

| PARAMETER | MEAN | MEAN DIFFERENCE BETWEEN MEANS | P VALUE | REMARK |
|---|---|---|---|---|
| **DIRECT LARYNGOSCOPY** | 1.21 | 0.18 | <0.05 | SIGNIFICANT |
| **VIDEO LARYNGOSCOPY** | 1.03 | | | |




**Comparison of ease of intubation with Cormack Lehane score between group (N=58)**

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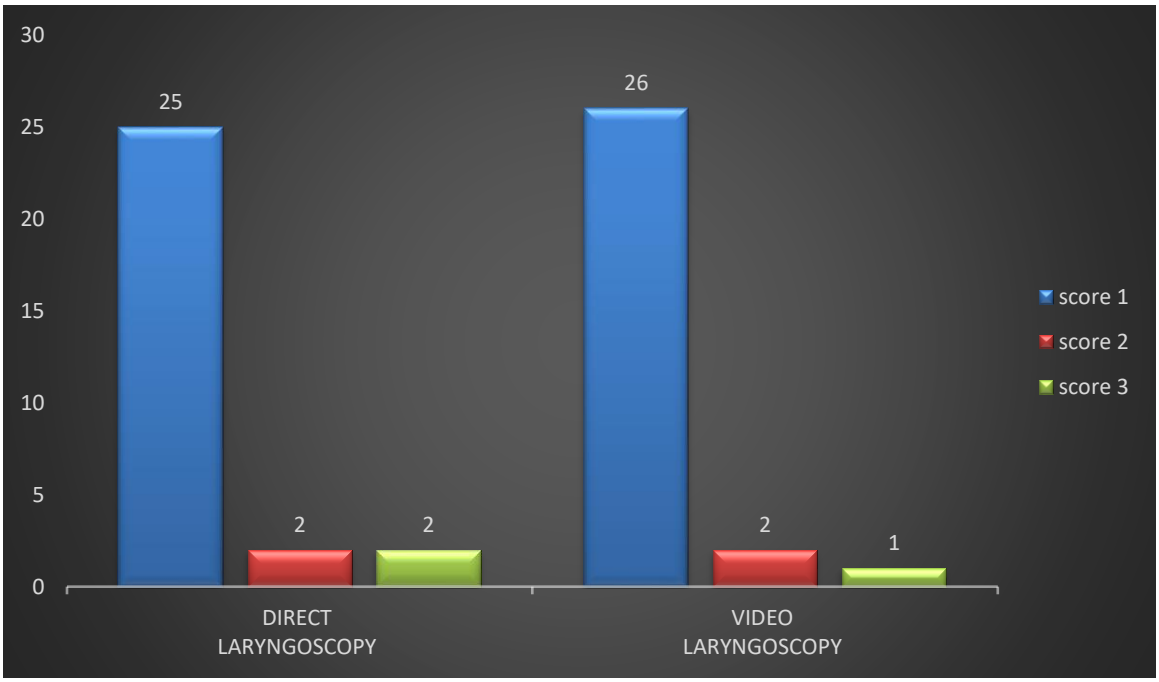
| SCORE | DIRECT LARYNGOSCOPY (n=29) | VIDEO LARYNGOSCOPY (n=29) |
|---|---|---|
| 1(EASY INTUBATION) | 25(86.21%) | 26(89.66%) |
| 2(SATISFACTORY INTUBATION) | 2(6.89%) | 2(6.89%) |
| 3(DIFFICULT INTUBATION) | 2(6.89%) | 1(3.44%) |




**DISCUSSION**

Videolaryngoscope provides an enhanced view of glottis which decreases the number of attempts taken for intubation. Because of its similarity with the much familiar Macintosh blade, learning and sustaining the skill of using videolaryngoscope is easier.

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In this study,.

- The mean difference in time taken for direct laryngoscopy and videolaryngoscopy was 12.10 seconds with p value of <0.0001.

- The mean difference in the time taken for tracheal intubation for direct laryngoscopy and videolaryngoscopy was 14.21 seconds with p value of <0.0001.

- There was a statistically significant time taken for laryngoscopy and intubation when using videolaryngoscope

- In our study, time taken for laryngoscopy and intubation was more when videolaryngoscope is used which was statistically significant. This goes in hand with the study done in June 2009 by, Pei-Chin Lin, Jimmy Ong[1] at Buddhist Tzu Chi General Hospital, where Intubation time was found to be significantly longer in the Glidescope group in easy airway intubation.

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- The visualization of glottis assessed with Cormack Lehane grade was better with videolaryngoscopy with 26 out of 29 patients (89.66%) had score 1, 2 patients (6.89%) had score 2 and 1 patient (3.44%) had score 3 whereas in direct laryngoscopy 25 out of 29 patients (86.21%) had score 1, 2 patients (6.89%) had score 2 and 2 patients (6.89%) had score 3.
- The visualization of glottis assessed with Cormack Lehane grade was better with video laryngoscope .
- We found that the anaesthesia residents with limited experience can perform successful intubation in the first attempt by using Videolaryngoscope as compared with Direct laryngoscope. Park[2] et al found that first attempt success rate was higher while using videolaryngoscope for intubation by novice emergency physicians.
- VL also allows the supporting staff to visualise structures adjacent to the glottis from the monitor which is not possible with DL. Jungbauer et al.[3] used Macintosh VL as the control group where a direct view was possible compared to the direct laryngoscopy.

  Complications such as tooth dislodgement, soft tissue trauma, oropharyngeal bleeding and hemodynamic instability was also assessed. It was found that there was no significant difference in complication rates of both the study groups.

**CONCLUSION**

From above discussion it can be safely concluded that Videolaryngoscopy is advantageous over conventional Macintosh direct laryngoscopy when used for first attempt by anaesthesia residents. It is a useful tool in patients of difficult intubation for ease of intubation in elective airway management.

Videolaryngoscope provides an improved view of the glottis, facilitates guidance for trainees. It can also be used for assessment of and recording of atypical airway findings like vocal cord cyst.

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