

## Comparison of Kingsvision Video laryngoscope & Truview videolaryngoscope for Endotracheal intubation with non channel blade in Tertiary care hospital.

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### **Abstract:**

#### **Background**

Video laryngoscopes are recently used for their superiority over conventional oral intubation techniques in last 2-3 yrs.

We evaluated the suitability of 2 different video laryngoscopes with non channel blade (King Vision & True view) for Endotracheal intubation.

#### **Aims & Objectives:**

The present study evaluates and compares the efficacy of these two VLs for tracheal intubation based on the primary outcomes POGO and ease of intubation and secondary outcomes CL grading, IDS score, Time to intubation and successful placement of ETT.

**Study type:** Retrospective comparative double blind Observational study.

**Study place:** Anaesthesia & Critical care department, LG hospital, AMCMET Medical College.

#### **Methods:**

We have enrolled 80 adult patients of ASA grade I/II of various surgeries performed under General Anaesthesia having inclusion criteria & excluding exclusion criteria were enrolled in study

#### **Randomisation**

Randomly. Randomisation done by odd & even number put in sealed opaque envelope. Execution of Randomisation at time of giving general anaesthesia.

#### **Group allocation**

Group A (n=40) -- patients were intubated with Truview Videolaryngoscope.

Group B (n=40) -- patients were intubated with Kingsvision laryngoscope, non channelled blade.

Our primary outcome was successful intubation, Number of attempts, time to intubation, Cormark Lahane classification on scopy, POGO score, additional maneuvers required to supplement intubation, changes in haemodynamic parameters & difficulties faced were notified & analysed.

**Results:** Kingsvision provide good clinical conditions as Truview videolaryngoscope except time to intubation was significantly low in Truview videolaryngoscope (35 sec). POGO score was comparable ( $p > 0.05$ ). CL classification & ease of intubation were comparable.

**Conclusion:** Both kingsvision and Trueview videolaryngoscopes are successful for passing non channel blade however kingsvision is requiring less assistance maneuvers due to its portability.

**Keywords:** kingsvision videolaryngoscope, Truview videolaryngoscope, videolaryngoscopes, Intubation

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### **I. Introduction:**

Videolaryngoscope has opened new horizon in Difficult intubation & worst case scenario.

Truview PCD video laryngoscope is a device with a narrow-angled blade and connecting camera and stylet for using nasotracheal intubation.

King Vision is a lightweight ergonomically designed device with a camera at the distal tip of the blade along with a light source to provide minimal lifting of soft tissue and impact on the dentition.

After taking written informed consent, this Retrospective randomized observational study was conducted on 80 patients of the American Society of Anesthesiologists Class I and II of either sex aged 18–60 years who were scheduled to undergo elective surgery requiring general anesthesia with orotracheal intubation.

**Exclusion criteria:**

Patients having a high risk of pulmonary aspiration; anticipated difficult airway, head- and- neck pathologies; swelling and dressings on the face, neck, or restricted mouth opening (<2 cm); surgery of oral cavity, larynx, and pharynx; and increased intracranial tension were excluded from the study. All patients were informed about the details of anesthetic procedure during preoperative visits.

**Randomisation**

Patients were randomly allotted to two groups of 35 patients each into Group K & T by odd & even numbers put in sealed opaque envelope. Execution of Randomisation at time of giving general anaesthesia.

Intubation was done using Truview video laryngoscope in Group T ( n=40) while in Group K ( n = 40) intubation was done using Kingsvision video laryngoscope. Laryngoscopy and intubation were carried out by the same experienced anesthesiologist. In preanesthetic evaluation, demographic profiles including age, sex, weight, and height were recorded. Airway examination includes assessment of mouth opening, modified Mallampati Class (MMPC), dentition, and neck movements.

All patients were Nil by mouth for 8 hrs

On arrival to operation theatre, all non-invasive monitors applied, IV line secured, IV fluids started. Premedication was Given in the form of glycopyrrolate 0.004mg.kg-1 i.v. and midazolam 0.03mg.kg-1 i.v. & fentanyl 1-2 µg.kg-1 i.v. After premedication, patients were preoxygenated for 3 min. Anesthesia was induced with propofol 2-2.5 mg/kg i.v and For muscle relaxation injection scincylcholine 2 mg/ kg to Facilitate intubation.

after adequate depth of anesthesia and complete muscle relaxation has been achieved, laryngoscopy and intubation were carried out by the same anesthetist using Kingsvision Video laryngoscope & Truview video laryngoscope according to the group they were allocated. In both groups non channel blade was used.

In Group K, intubation was done by Kingsvision Video laryngoscope with non channel blade.

In Group T, intubations were performed using Truview video laryngoscope which was functionally pretested with all components mounted to the hilt of laryngoscope including an oxygen line delivering O<sub>2</sub> at a rate of 6-8L./min and digital camera attached to the ocular piece. For better control of endotracheal tube (ETT) tip, the stylet was used in this group.

Laryngoscopic view was assessed using the modified Cormack and Lehane (CL) class.[7] POGO score Percentage of Glottic Opening score was noted(8)

Intubation was carried out using cuffed ETT of appropriate size. Ease of intubation was assessed by Intubation Difficult Score.[8] Time just before laryngoscopy was recorded as time zero (T<sub>0</sub>). Time to intubation was measured from the time of introducing a laryngoscopic blade in the patient's mouth till the appearance of a square wave capnograph. A maximum of 1 min time was allowed for laryngoscopy. If intubation would not have achieved within 1 min or oxygen saturation (SpO<sub>2</sub>) falls below 92%, laryngoscopic blade is to be removed and mask ventilation is to be given for 30s before a second attempt is to be allowed. A maximum of three attempts were planned. Intubation time in such a situation was planned to be sum of time taken in these steps. If a patient could not be intubated in the three attempts, considered failure and managed according to the difficult airway algorithm. The placement of ETT was confirmed by auscultation of the chest and presence of a square wave capnograph. After endotracheal intubation, ventilation was controlled using O<sub>2</sub> and sevoflurane 2%-2.5%. Anesthesia was maintained as per the requirement of surgery. After completion of the surgery, patients were reversed and extubated according to the standard practice and guidelines. Parameters observed were:

1. Ease of laryngoscopic blade insertion -No difficulty, slight difficulty, and difficult .

2. Laryngoscopic view as assessed by modified Cormack Lahane ( CL )class: •

Class I: visualization of entire vocal cords • Class II: visualization of posterior part of laryngeal aperture •

IIa: visualization of posterior parts of vocal cord and arytenoids cartilages •

II b: visualization of only arytenoids cartilage. • Class III: visualization of epiglottis •

IIIa: epiglottis can be lifted from posterior pharyngeal wall •

III b: epiglottis cannot be lifted. •

Class IV: no glottic structure seen.

**3. POGO score:** Percentage of Glottic Opening was measured on direct laryngoscopy(8)

4. Intubation Difficulty score (IDS)(11)

N1-No of supplementary intubation attempts •

N2-No of supplementary operators •

N3 -No of alternative intubation technique used

N4-Glottis exposure as defined by Cormack and Lehane Grades minus one •

N5-Lifting force applied during laryngoscopy • N5=0 if little effort was used •

N5=1 if subjectively increased lifting force was used for laryngoscopy •

N6–Necessity of applied external laryngeal pressure for optimized the glottic exposure • N6=0 if no external laryngeal pressure applied •

N6=1 if external laryngeal pressure is necessary •

N7–Positions of vocal cords at intubation •

N7=0 if vocal cords are abducted/not visualized •

N7=1 if vocal cords are adducted during laryngoscopy.

5. Time to intubation was defined as the time of introducing videolaryngoscopic blade in the patient’s mouth till the appearance of square wave capnograph.

6. Heart rate (HR), Non Invasive Blood Pressure, and SpO2 were recorded at baseline before induction of anesthesia, time zero (T0) –just before laryngoscopy, and thereafter on 1 min ,3 min, 5 min after intubation.

7. Any injury to lips, teeth, or oral cavity or presence of blood on ETT was notified.

8. Postoperative complications, if any such as sore throat or hoarseness of voice, were recorded 1 h and 24 h after extubation.

### Statistical analysis

Data was entered in spreadsheet with MDExcel & analysed by SPSS software. Sample size calculated from difference in the intubation difficult scale with 80% power of study at two- sided with as significance level of 5%. Continuous variables were presented as mean±standard deviation. POGO score measure by Interquartile range(IQR) Categorical data were expressed as number and percentage. Statistical analysis was done using the Chi- square test, paired and unpaired Student’s t- test, and ANOVA test. P < 0.05 was considered statistically significant.

## II. Results:

**Table1** Demographic parameters

Parameters	Group K( n=40)	Group T( n=40)	P value
Age	40.02±/8.2	41.3±/9.2	>0.05
Gender	18:22	15:25	>0.05
BMI	21.8±/2.2	21.5±/2.5	>0.05
ASA grade(I/II)	20/20	18/22	>0.05

**Table 2** Modified Mullampati classification (MMPC)

MMPC			P value
MMPC I	31	30	>0.05
MMPC II	9	10	

**Table 3** Ease of laryngoscopic blade insertion

Ease	Group K( n=40)	Group T( n=40)	P value
Ease of intubation			
No difficulty	38	37	>0.05
Slight difficulty	2	3	
Difficult	0	0	

**Table4** Modified Cormack Lahane classification(CL classification)

CL classification	Group K( n=40)	Group T( n=40)	P value
I	37	36	>0.05
II a	3	4	
II b	0	0	

**Table V** Tme to intubation, POGO score, assistance manuverures, No. of attempts

Parameter	Group K( n=40)	Group T( n=40)	P value
Time to intubation ( sec)	38±/2	35±/5	0.007
POGO score ( IQR)	82(80-100)	100	>0.05
Assistance manuverures	4±/1	6±/1	<0.001
No. of attempts(1/2/3)	36/4/0	37/3/0	

Assistance manuverures like slight withdrawal of VL blade, manipulation and redirection of ETT after rotation so that it enters the glottis, in cases where it was directed towards the pyriform fossa . In case of Truview videolaryngoscope continous irrigation of O2 for defogging even O2 flush intermittently required as assistance manuverure.

These resulted in a successful intubation in the first attempt. In patients whom second attempt required , 4 cases(10%) in group K& 3cases(7.6) in group T,we used optimization of blade position during re insertion in the oral cavity.we have good POGO score in both groups.

**Table VI**  
Intubation Difficulty score

	Group K( n=40)	Group T( n=40)	P value
0	32(80%)	33(81%)	
1	3(7.6%)	4(10%)	
2	4(10%)	3(7.6%)	
3	0	0	
Mean+/-SD	0.3+/-0.52	0.3+/-0.60	>0.05

**Table VII** Haemodynamic monitoring

Parameters	Group K	Group T	P value
HR at Baseline	68+/-3	66+/-4	>0.05
HR 1 min	76+/-4	74+/-3	>0.05
HR 3 min	84+/-4	83+/-4	>0.05
HR 5 min	70+/-4	72+/-2	0.05
SBP Baseline	122+/-2	120+/-2	>0.05
SBP 1 min	124+/-3	122+/-3	>0.05
SBP 3 min	128/-2	130+/-4	>0.05
SBP 5 min	123+/-5	126+/-2	>0.05
DBP Baseline	80+/-3	78+/-4	>0.05
DBP 1 min	84+/-4	86+/-4	0.05
DBP 3 min	90+/-2	90+/-4	>0.05
DBP 5 min	80+/-4	80+/-4	>0.05

The mean HR, mean SBP, and mean DBP at 1, 2, and 3 min after laryngoscopy slightly differed from their respective baseline values.(p>0.05) However, they were comparable between the two groups at all the time,may be less force required to visualise vocal cords & larynx,also surrounded structures seen clearly. No complications regarding trauma to airway or sorethroat noticed in any patient of both groups.

### III. Discussion

Videolaryngoscopes get popularity in present era for various purposes like a teaching aid,to encounter difficult intubation etc.(1)

Regarding demographic parameters our study population is comparable.

All the patients had normal mouth opening, dentition, and neck movements. MMPC was comparable between the groups (P = 0.78). It is expected that a better laryngoscopic view will be associated with easier intubation.

**Bharadwaj A, etal**(2) have assess& compare Truview videolaryngoscope/ Maccoy blade for cervical spine movement & difficult intubation(2)

**Gaszynska E, Gaszynski T.** have done Endotracheal intubation using the Macintosh laryngoscope or KingVision video laryngoscope during uninterrupted chest compression.(3)

CL classification on videolaryngoscopy was also comparable.

Time to intubation was statistically low in Truview videolaryngoscope but ease was comparatively high with Kingsvision Video laryngoscope as it may be due to portability.

**Gaszynska E, etal** also shown advantages of Kingsvision Video laryngoscope,one of it was portability.(3)

**McNarry AF**(4)etal explore that Clinicians must decide how novel therapies and long-standing practices are adapted to best meet the needs of our patients and prevent harm during airway management ,they told inhalation therapies.

**Akihisa Y,etal** (5) have shown that Kingsvision video laryngoscope & MCintosh blade has comparable te to intubation & success ratewithout complication of oesophageal intubation (5)

Kleine-Brueggeney M, etal have done multi enterstidy with different videolaryngoscopes.(6)

**Vivek B, etal** have done Comparison of success of tracheal intubation using Macintosh laryngoscope-assisted Bonfils fiberscope and Truview video laryngoscope in simulated difficult airway.(10)

**Rajiba lochan samal etal** (11)have compare Truview videolaryngoscope with Macintosh blade & conclude that time to intubation was less with Macintosh blade 29 sec( mean)& with Truview videolaryngoscope it was of 37 sec( mean) which correlated with our result.

**Turan.Inal etal**(12) have compared Miller blade of laryngoscope with Truview videolaryngoscope on paediatric population for intubation.(12)

Regarding MMPC both groups were comparable (  $p>0.05$ )

**Barak et al.(14)** did a study in which he actually measured the lifting force in kg using a Digital Force Gauge (Mark- 10, Corporation; Hicksville, NY, USA) handle connected to the evaluated blade and proposed that significantly higher force was required to intubate with Macintosh laryngoscope than with Truview EVO2 laryngoscope ( $P<0.00$ ). On subjective assessment, they observed that difficulty in intubation was significantly more with Truview was compared to Macintosh ( $P=0.00$ ) and this difficulty was attributed to the “hand eye coordination” technique of intubation under the indirect vision and relatively less experience with the Truview.

Time to intubation is statistically less in Truview group, In our study ( $p<0.001$ )

The mean HR, mean SBP, and mean DBP at 1, 2, and 3 min after laryngoscopy slightly differed from their respective baseline values ( $p>0.05$ ). However, they were comparable between the two groups at all the time, may be less force required to visualise vocal cords & larynx, also surrounded structures seen clearly. (14)

**Timanaykar RT, et al (17)** have suggested that POGO score is improved with Videolaryngoscopes than Direct laryngoscopy by routine Macintosh blade.

Priyanka et al (20) have done comparison of King vision and Truview laryngoscope for postextubation visualization of vocal cord mobility in patients undergoing thyroid and major neck surgeries & conclude that both Kingsvision & Truview both Videolaryngoscopes provide good comparable vision of vocal cords after thyroidectomy.

**Abdulmohsen A, et al (22)** showed that Kingsvision Video laryngoscope provide ease of insertion, success rate, better Glottic Opening, but time to intubation is also more with it than Macintosh blade and Glidoscope.

**Namazi et al (23)** have shown that both Kingsvision & Trueview videolaryngoscopes are comparable in their performance. They have measured less time to intubation in Truview group.

#### IV. Conclusion

In nutshell we conclude that both, Kingsvision & Truview videolaryngoscope provide comparable ease of insertion, Percentage of Glottic Opening score, Cormack Lahane class, Intubation difficulty score for normal airway management. In view of time to intubation Truview videolaryngoscope is better than Kingsvision Videolaryngoscope, however portability, single use & lack of sterilisation issues, Kingsvision is more advantageous than Truview videolaryngoscope in Covid era.

**Limitations:** This study was retrospective in nature.

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