

# Comparative Evaluation of Hemodynamic Responses and Ease of Intubation with Airtraq Video Laryngoscope versus Macintosh Laryngoscope in Patients with Ischemic Heart Disease

## Abstract

**Introduction:** Hemodynamic responses during laryngoscopy can potentially precipitate ischemia in patients with coronary artery disease. There are conflicting reports regarding the hemodynamic stress responses between the conventional Macintosh and video laryngoscopes. There is a paucity of studies regarding the same in cardiac surgical patients. **Materials and Methods:** A prospective, randomized control study to compare the hemodynamic responses and ease of intubation using Airtraq video laryngoscope and Macintosh laryngoscope in patients with ischemic heart disease. **Results:** Seventy patients were randomized into two groups. Baseline variables including age, weight, Mallampati score, and comorbidities were comparable between the two groups. There was statistically significant elevation in mean heart rate in the Macintosh group at 2<sup>nd</sup>-min ( $P = 0.02$ ) and 3<sup>rd</sup>-min ( $P = 0.05$ ) postintubation. Similarly, there was a significant increase in mean arterial pressure at 2<sup>nd</sup> ( $P = 0.06$ ), 3<sup>rd</sup> ( $P = 0.03$ ), and 4<sup>th</sup> ( $P = 0.03$ ) in the Macintosh group. The time for laryngoscopy and Intubation Difficulty Scale was significantly better in the Airtraq group ( $P = 0.001$  and  $0.001$ ). However, the median time to intubation was longer in the Airtraq group (13 s vs. 11 s,  $P = 0.05$ ). Laryngoscopy view was better with Airtraq even in patients with Mallampati score 3 (ten patients). The incidence of trauma was same in both the groups. **Conclusion:** Airtraq provides the better hemodynamic stability and ease of intubation and may be considered superior to conventional Macintosh laryngoscope for intubation in patients with ischemic heart disease.

**Keywords:** Airtraq, hemodynamic response, ischemic heart disease, Macintosh

## Introduction

Laryngoscopy is an essential part of airway management with endotracheal intubation used in many surgeries including coronary artery bypass surgeries. Hemodynamic response during laryngoscopy and intubation can alter the myocardial oxygen “demand and supply” balance and potentially precipitate coronary ischemia, especially in patients with ischemic heart disease. It is therefore important to attenuate these hemodynamic responses in these patients who are undergoing coronary revascularization.<sup>[1]</sup>

Laryngoscopy-induced tissue tension in the supraglottic region elicits a vagal response and stimulation of the cardioaccelerator fibers, whereas passing endotracheal tube (ETT) through the cords causes greater stimulation of cardioaccelerator fibers than vagal response.<sup>[2]</sup> These are responsible for the hemodynamic responses seen during

endotracheal intubation. The hemodynamic response during laryngoscopy and intubation directly depends on the force applied and the duration of intubation.<sup>[2,3]</sup>

The Macintosh laryngoscope has been used conventionally for most of the intubations since it was designed by Robert Macintosh in 1943.<sup>[4]</sup> Airtraq is a channeled, rigid video laryngoscope that has an exaggerated curvature of the blade and an internal arrangement of optical components which provides the high-quality glottic view without need for alignment of the oral pharyngeal and laryngeal axis (sniffing position). The head can be kept in neutral position. Hence, the traction on mandible and the force applied during laryngoscopy are expected to be less along with decreased requirement of maneuvers to aid in intubation which ultimately results in less airway trauma.

The aim of the present study was to compare between conventional Macintosh

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laryngoscope and Airtraq video laryngoscope, the hemodynamic response to laryngoscopy, and intubation in patients with documented coronary artery disease undergoing coronary artery bypass surgery (CABG). We also proposed to assess the ease of intubation by comparing the laryngoscopy and intubation time, Intubation Difficulty Scale (IDS), laryngoscopic view obtained, and complications related to intubation between the two groups.

## Materials and Methods

After obtaining approval from the Institutional Review Board (IRB Min No. 9947) and registering in Clinical Trials Registry (CTRI/2018/03/012455), we randomized 70 consecutive consenting patients aged between 35 and 75 years, undergoing elective CABG into two groups either Macintosh or Airtraq group using computer-generated random numbers table [Figure 1]. Concealment of allocation was done using sequentially numbered, sealed, and opaque envelopes.

All patients undergoing CABG, belonging to the ASA Grade 3, with ejection fraction >40%, age group between 35 and 75 years with a Mallampati score up to Grade 3, thyromental distance >6 cm, and mouth opening >3 cm were included in the study.

The patients with associated valvular heart disease, pulmonary artery hypertension and left main disease, ejection fraction <35%, conduction abnormality, on permanent pacemaker, and emergency procedures were excluded from the study. Furthermore, those patients with anatomic features predictive of difficult airway, Mallampatti score of 4, history of reactive airway disease, obesity (BMI >35 kg/m<sup>2</sup>), gastroesophageal reflux, and vital organ dysfunction (creatinine >2 mg/dl, bilirubin >2 mg/dl, and liver enzymes >3 times normal and bleeding diathesis) were excluded from our study.

All patients enrolled for the study received tablet lorazepam 1–2 mg half an hour before the scheduled surgery, depending on the age and risk factors. All preoperative cardiac medications were continued except for angiotensin-converting enzyme inhibitors and angiotensin receptor blockers. Invasive arterial blood pressure, 5-lead electrocardiogram (ECG), End-tidal carbon dioxide (ETCO<sub>2</sub>), and saturated pressure of oxygen (SpO<sub>2</sub>) were monitored in all patients before induction. Induction of anesthesia was done with midazolam 0.05 mg/kg and fentanyl 4 mcg/kg, given slowly over 60 s and deepened with sevoflurane titrated to a MAC of 1%. Vecuronium 0.1 mg/kg was used for muscle relaxation given 3 min after fentanyl. Laryngoscopy was done 3 min later after the confirmation of “train of four” count of zero on peripheral nerve stimulator (Model NS-100 [Inmed Equipments Pvt. Ltd]). The patients were randomly allocated to one of the two groups using computer-generated random

number table. Group A was intubated using Airtraq video laryngoscope and Group B with conventional Macintosh laryngoscope (No. 3 or No. 4 Macintosh blade). All intubations were done by one of the four investigators who had >7-year experience with Macintosh laryngoscopes and had done 20 intubations with Airtraq. The heart rate, systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), ST changes, and SpO<sub>2</sub> were recorded in eight specific intervals of time, namely,

1. T1 = baseline prior to anesthetic induction
2. T2 = after anesthetic induction prior to muscle relaxation
3. T3 = after muscle relaxant just prior to intubation
4. T4 = 1 min after endotracheal intubation
5. T5 = 2 min after endotracheal intubation
6. T6 = 3 min after endotracheal intubation
7. T7 = 4 min after endotracheal intubation
8. T8 = 5 min after endotracheal intubation.

Recording of hemodynamic parameters was continued till stable hemodynamics were attained. The “5-min” data collection period after endotracheal intubation was included based on stress responses observed in the previous studies.<sup>[1,2]</sup> Duration of laryngoscopy, time to intubate after glottic view, and total duration of intubation were noted. Number of attempts and intubation-related complications such as oral trauma and bleed and dental injury were also recorded. The additional maneuvers and techniques that were needed for intubation (repositioning the head of the patient, need for external larynx manipulations, and usage of stylet) were recorded. Additional dose of fentanyl (if required) to control hemodynamic stress response or vasopressors to maintain heart rate and blood pressure were also recorded with time.

Duration of laryngoscopy was defined as “the time from insertion of laryngoscope blade into mouth to getting the best view of glottis.”<sup>[5]</sup> Duration of intubation was defined as “the time from insertion of insertion of laryngoscope into mouth to obtaining three capnographs waveforms after intubation.” An attempt was defined as “insertion of laryngoscope into the mouth to its removal.” Three attempts were permitted in all cases if required. More than three attempts to intubate or “intubation taking more than 120 s” was considered as “failed intubation.” In case of an unanticipated difficulty in intubation with failure of three attempts, the patients were excluded from the study and managed according to Difficult Airway Society (DAS, UK) guidelines. Difficulty in intubation was scored using “Intubation Difficulty Scale” assessed as the sum of the following seven variables<sup>[6]</sup> [Table 1]. A continuous ECG monitoring with automatic ST segment analysis (leads II and V) was used according to the standard criteria for myocardial ischemia (ST elevations 2 mm from the baseline in leads II and V5 or ST depressions 1 mm from the baseline in leads II and V5, with the elevation or depression lasting for 1 min or more).

“Hypotensive” response was defined as reduction in MAP >20% from the baseline value and was treated with 50 µg aliquots of phenylephrine if heart rate was >60 beats/minute or 6 mg of ephedrine if heart rate was <60 beats/minute. “Hypertensive” response was defined as MAP >20% above baseline or SBP persistently >160 mmHg for >1 min and was treated with 50 µg aliquots of fentanyl. ETCO<sub>2</sub> was maintained within 35 + 5 mmHg to avoid the effects of hypercarbia or hypocarbia. Neither was any procedure done nor any other drugs administered during the data collection period after tracheal intubation. Subsequent management was left to the discretion of the anesthesiologist providing care for the patient.

**Statistical analysis**

A sample size of 70 (35 in each group) was calculated based on power analysis from a previous article<sup>[7]</sup> to achieve a power of 80% and a level of significance of 5% to detect a difference of 20 beats/min or 20 mmHg from paired hemodynamic data.

Statistical analysis was done using SPSS version 17.0 (SPSS, Chicago, IL, USA). Continuous variables were presented as mean, median, and standard deviation. *T*-test and Chi-square tests were done for statistical comparisons for parametric variables. Mann–Whitney U-test was done for nonparametric variables. *P* ≤ 0.05 was considered as statistically significant.

**Results**

**Demographic data**

Data of 70 patients included in the study (35 in each group) were analyzed. None of the patients recruited were excluded from the study. Table 2 shows that the demographic and clinical data of the patients in both the groups are comparable. The data are presented as mean (standard deviation) or number (%). Around 90% of patients in both groups were on beta-blockers preoperatively, hence excluding any bias regarding difference in hemodynamic response.

Hemodynamic data of both the groups are compared in Table 3. The baseline hemodynamic parameters in both groups are comparable. Both the groups showed a drop in blood pressure following induction of anesthesia, and this drop was comparable in both the groups. It was noted that in the Macintosh group, there was a statistically significant rise in heart rate compared to the Airtraq group during the 2<sup>nd</sup> and 3<sup>rd</sup> min after intubation after which the heart rate comes down in the 4<sup>th</sup> min. There is a significant rise in the DBP in Macintosh group in 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> min after intubation and a significant rise in SBP and MAP seen in 3<sup>rd</sup> and 4<sup>th</sup> min after intubation in Macintosh group [Figure 2]. The mean percentage rise in MAP from the time of intubation is 34% and 27% in the 2<sup>nd</sup> and 3<sup>rd</sup> min after intubation in the Macintosh group which was clinically

**Table 1: Intubation difficulty scale (sum of seven variables)**

Variables	Score
Number of attempts at intubation	n=1
Number of operators attempting intubation	n=1
Number of alternative techniques used for intubation	n=1
Cormack-Lehane grade of laryngoscopy	Grade 1
Increased lifting pressure required	1
External laryngeal pressure applied	1
Vocal cord mobility	1

**Table 2: Comparison of baseline demographic variables between the two groups**

	Airtraq (%)	Macintosh (%)	<i>P</i>
Age (years)	57.34 (9.66)	59.00 (9.5)	0.47
Sex (female/male)	5/30	2/33	0.46
Height (cm)	163.74 (7.31)	161.14 (7.71)	0.15
Weight (kg)	64.20 (7.05)	64.85 (6.60)	0.68
Diagnosis (TVD/DVD)	34/1	33/2	0.55
Hypertension	28 (80)	25 (71.4)	0.27
Diabetes mellitus	22 (62.8)	24 (68.5)	0.61
CKD/CVA/thyroid	2/1/3	0/2/3	0.15
Beta-blocker use	33 (94.3)	31 (88.5)	0.39
MPS (1/2/3)	3/22/10	1/17/17	0.18

Data have been represented as mean (standard deviation), median (range minimum-maximum), or number (percentage). TVD: Triple-vessel disease, DVD: Double-vessel disease, CKD: Chronic kidney disease, CVA: Cerebrovascular accident, MPS: Mallampatti score

significant [Figure 3 – represented as MAP5 and MAP6, respectively]. Furthermore, there is a 24% mean rise in HR in the 2<sup>nd</sup> min from the baseline at intubation in Macintosh group [Figure 3 – represented as HR5]. In addition, though the ephedrine requirement preintubation was comparable in both the groups, the Airtraq group required more ephedrine postintubation which was statistically significant (*P* = 0.03). Furthermore, the percentage of patients requiring additional fentanyl boluses to treat the intubation response in Macintosh group was higher though not statistically significant (20% vs. 8.76%, *P* = 0.17). These facts suggest that the hemodynamic response in Airtraq was significantly lesser compared to Macintosh. There were no ST changes or desaturation at any time in both the groups during the study period.

The laryngoscopy and intubation data in Table 4 show that the laryngoscopic view grade (assessed by Cormack–Lehane grade) and duration of laryngoscopy were significantly lesser in Airtraq compared to the Macintosh group. All the 35 cases recruited in Airtraq group had Cormack–Lehane Grade 1 view. Of note is the fact that, the Mallampatti scores of both the groups were comparable. Furthermore, none of the cases in the Airtraq group required more than one attempt to intubation. The IDS, a quantitative scale of difficult intubation with seven variables assessing the

**Table 3: Comparison of the mean heart rate, systolic blood pressure, diastolic blood pressure, and mean arterial pressure between the two groups (Airtraq A, Macintosh M) during the period of study**

	T1 0 min (induction)	T2 3 min (muscle relaxant)	T3 6 min (intubation)	T4 7 min	T5 8 min	T6 9 min	T7 10 min	T8 11 min
HR (bpm)								
A	73.03 (11.99)	65.77 (10.46)	61.06 (9.77)	66.37 (13.90)	69.71 (12.44)	68.23 (11.96)	64.97 (11.56)	62.69 (10.99)
M	73.43 (9.256)	68.43 (9.02)	62.43 (9.72)	68.54 (12.41)	76.86 (12.76)	73.20 (10.39)	69.03 (9.68)	66.09 (8.77)
P	0.87	0.25	0.56	0.49	0.02*	0.05*	0.12	0.16
SBP (mmHg)								
A	152.06 (19.57)	126.97 (21.06)	108.66 (13.99)	119.37 (25.54)	129.06 (26.01)	121.91 (22.90)	113.71 (19.32)	108.46 (13.31)
M	154.40 (21.09)	128.77 (24.01)	111.83 (22.94)	118.29 (27.56)	121.91 (22.90)	133.63 (25.46)	124.20 (23.55)	115.22 (21.10)
P	0.63	0.74	0.48	0.86	0.20	0.04*	0.04*	0.11
DBP (mmHg)								
A	76.00 (11.46)	66.66 (11.43)	57.80 (9.50)	63.86 (14.68)	67.89 (13.34)	64.29 (12.20)	60.11 (9.44)	58.46 (8.13)
M	76.74 (10.48)	66.17 (14.34)	58.11 (13.03)	63.17 (14.83)	76.34 (19.38)	71.60 (15.89)	66.51 (12.66)	61.14 (11.54)
P	0.78	0.87	0.91	0.84	0.03*	0.03*	0.02*	0.26
MAP (mmHg)								
A	104.11 (14.11)	88.66 (14.59)	75.46 (10.86)	84.31 (19.04)	90.26 (18.33)	85.23 (16.16)	79.86 (12.98)	76.29 (9.66)
M	105.77 (14.64)	88.49 (17.21)	76.91 (16.15)	83.31 (20.40)	100.09 (24.88)	94.97 (20.58)	87.74 (16.86)	80.63 (15.03)
P	0.63	0.96	0.65	0.83	0.06	0.03*	0.03*	0.15

\*P≤0.05 (significant), Values have been represented as mean (standard deviation). HR: Heart rate, SBP: Systolic blood pressure, DBP: Diastolic blood pressure, MAP: Mean arterial pressure

**Table 4: Comparison of the airway assessment and intubation parameters between the two groups**

Data	Airtraq	Macintosh	P
Attempts (1/2/3)	35/0/0	33/2/0	0.15
Duration of laryngoscopy (s)	5 (3-12)	10 (3-28)	0.001*
Time to intubate after glottic view (s)	13 (4-35)	11 (3-35)	0.05*
Total time for intubation (s)	19 (12-50)	21 (12-60)	0.2585
Cormack-Lehane grade (1/2/3)	35/0/0	17/7/11	0.001*
IDS	0.23 (0.49)	1.85 (1.97)	0.001*

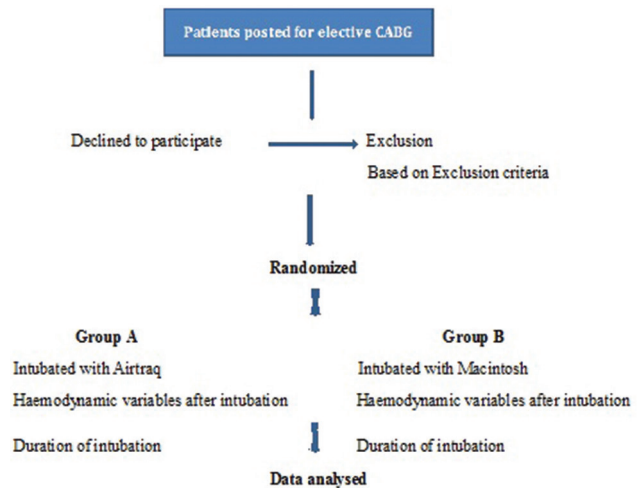
\*P≤0.05 (significant), Data have been represented as mean (standard deviation), median (range minimum-maximum), or number (percentage). IDS: Intubation Difficulty Scale

complexity of tracheal intubation,<sup>[6]</sup> was also significantly less in Airtraq group (mean 0.23 ± 0.49) compared to Macintosh group (1.85 ± 1.97) (P = 0.001). The duration of laryngoscopy and intubation was less in Airtraq, but the time for intubation after the glottic view was significantly longer in Airtraq.

There was one incidence of lip trauma in both the Airtraq group and Macintosh group.

### Discussion

Laryngoscopy and intubation can elicit a sympathoadrenal response leading to hypertension, tachycardia, and arrhythmia which can be deleterious in patients with



**Figure 1: Algorithm of the study**

ischemic heart disease and low cardiac reserve.<sup>[3]</sup> This response is caused by the stretching of the oropharyngeal tissue in an effort to align the oropharyngeal-laryngeal axis for intubation.<sup>[8]</sup> Sympathoadrenal response is more due to laryngoscopy than passing ETT through the cords.<sup>[9]</sup> The stress response is directly dependent on the force and duration of laryngoscopy.<sup>[3]</sup>

Video laryngoscopes do not need traction on the oropharynx to get a good glottic view. Hence, the hemodynamic



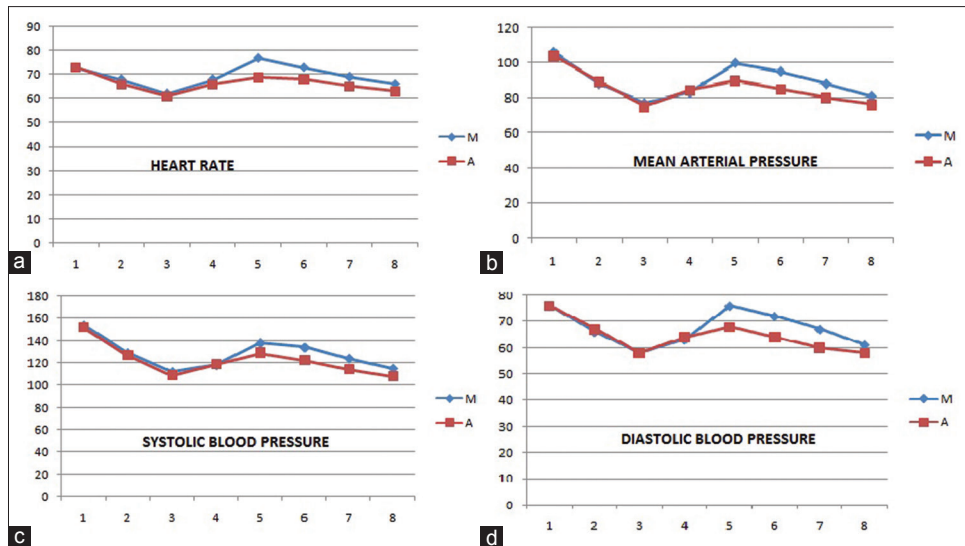


Figure 2: Graph representing and comparing the mean of (a) heart rate, (b) mean arterial pressure, (c) systolic blood pressure, and (d) diastolic blood pressure between the “Macintosh” and “Airtraq” groups during the time frames of the study (T1-T8)

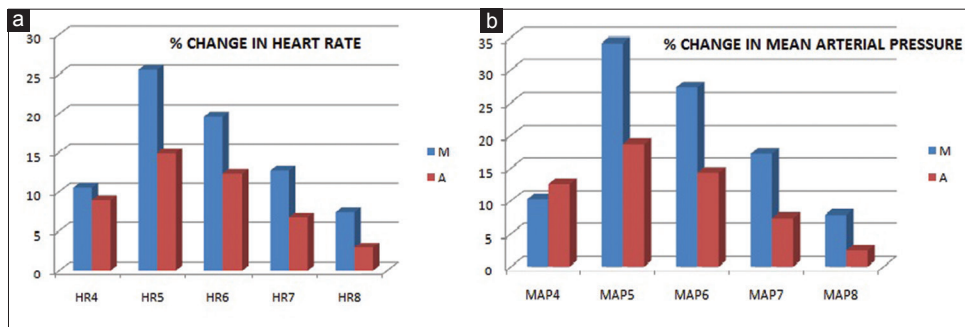


Figure 3: Bar diagram comparing the mean percentage change in (a) heart rate and (b) mean arterial pressure between “Macintosh” and “Airtraq” groups after intubation (T4-T8)

response to laryngoscopy and intubation should ideally be less compared to conventional Macintosh laryngoscope. There are limited studies in cardiac surgery comparing the hemodynamic response between video laryngoscopes with the routine Macintosh laryngoscope.<sup>[1,5,7,10-13]</sup> Contrary to the hypothesis, some of the studies could not prove a clinically significant difference in hemodynamic stress responses between the two groups.<sup>[1,5,7,10,11]</sup>

Airtraq® SP optical laryngoscope is a channeled video laryngoscope that has been developed to facilitate tracheal intubation in patients with normal or difficult airway.<sup>[7,14,15]</sup> It is an anatomically shaped laryngoscope with two separate channels: the optical channel that contains a high-definition optical system and the guiding channel that holds the ETT and guides it through the vocal cords [Figure 4]. The blade contains a battery-powered light source at the end. A combination of lenses and prisms transmits the image of the glottis, surrounding tissue, and the ETT to the proximal end. The resulting glottic view is provided without an alignment of the oral, pharyngeal, and tracheal axes. Hence, the traction on the mandible and force applied during laryngoscopy are expected to be less therefore

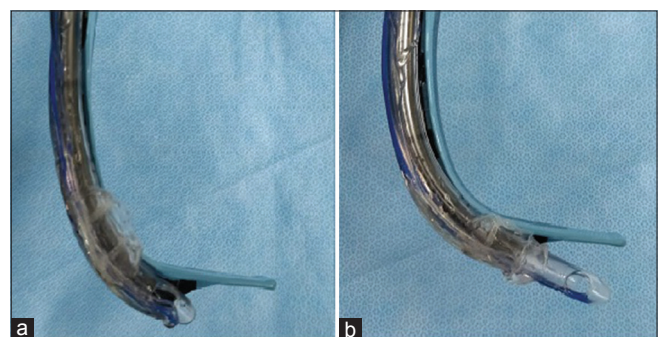
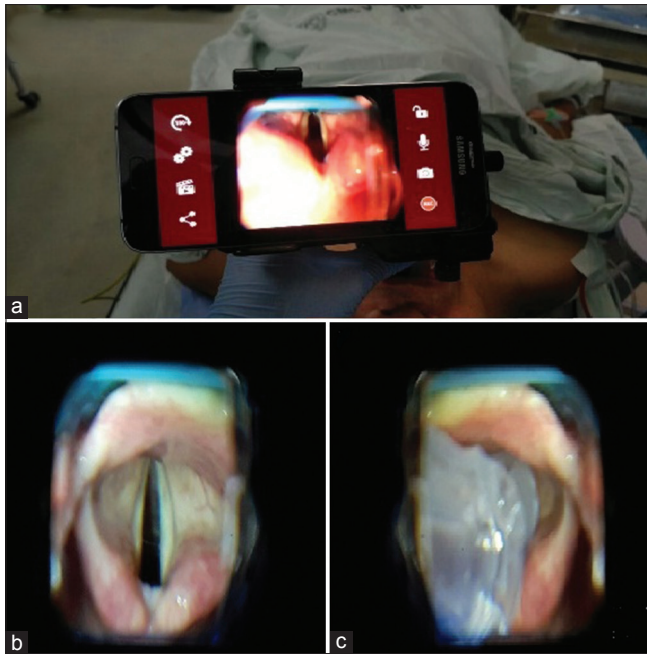


Figure 4: Insertion of the endotracheal tube into the channel (a) Correct and (b) Incorrect

causing less trauma.<sup>[16-18]</sup> The device can be completed with a wireless clip-on camera for external broadcast and teaching purposes. Now, it comes with a universal smartphone adaptor and the mobile app is compatible with both iPhone and Android making video intubation easier. The app is free on internet to download [Figure 5].

In our study, we found that the hemodynamic response that is usually seen 1–2 min after intubation was significantly more in Macintosh in terms of percentage



**Figure 5: Glottic view and intubation using Airtraq (a and b), glottic view using smartphone app, (c) passing of endotracheal tube into the glottis**

rise in both MAP and heart rate from the preintubation values. Hence, the requirement of additional dose of fentanyl to attenuate this response was also higher in this group though not statistically significant. This was consistent with the findings of Maharaj *et al.*<sup>[17,18]</sup> and Gavrilovska-Brzanov *et al.*<sup>[7]</sup> Similar findings were seen in a meta-analysis by Lu *et al.*<sup>[16]</sup> However, in studies done by Tempe *et al.*<sup>[5]</sup> and Kanchi *et al.*<sup>[1]</sup> which compared Macintosh to other videolaryngoscopes, they did not find a significant difference in hemodynamic response to intubation. This can be explained by the fact that Airtraq has an exaggerated curvature of the blade and an internal arrangement of optical components, which provides a high-quality view of the glottis without the need for alignment of the oral, pharyngeal, and tracheal axes. Therefore, there is application of less force during laryngoscopy, less external laryngeal manipulations, and less maneuvers to facilitate intubation. The duration of laryngoscopy to get the best glottic view was also found to be significantly less in the Airtraq group ( $P = 0.001$ ) which may also have contributed to lesser hemodynamic response.

In majority of the studies comparing video laryngoscope with Macintosh in cardiac surgical patients those with Mallampati score  $>2$  have been excluded.<sup>[1,4]</sup> But in our study, we have included patients who had Mallampati score 3. In all the 10 patients with Mallampati score of 3 in Airtraq group, the Cormack–Lehane scale was 1. In fact, all the 35 patients in Airtraq group had a Cormack–Lehane grade of 1. The IDS in Airtraq group was significantly lower compared to Macintosh group ( $p=0.001$ ) which is similar to the finding of Lu *et al.*<sup>[16]</sup> and Hosalli *et al.*<sup>[19]</sup>

The two major factors that determine the ease of intubation are the adequacy of laryngeal view obtained and the ease of maneuvering ETT inside the glottic opening even after a proper visualization. Despite getting an excellent glottic view, the time for manipulation of ETT to the trachea was significantly longer in Airtraq group compared to Macintosh. Manipulation of the ETT through the glottic opening without hitting the anterior commissure was difficult. ETT was also noted to be hitching on right arytenoid. In the first situation, changing the head position to neutral from sniffing position or withdrawing the laryngoscope back allowed easy passage. For the second problem, moving the Airtraq laryngoscope to the left allowed easy passage of ETT to the trachea. The investigators have significant experience with Macintosh laryngoscope while Airtraq was a new intubation device in the department. Even though the investigators completed 20 intubations before participating in the study, they may still be within the learning curve. A study by Schälte *et al.*<sup>[13]</sup> reported that a few patients required repeated attempts for intubation attributable to contamination of the optical system. But since hemodynamic response is found to be greater for laryngoscopy than for intubation, this did not translate into a greater stress response as noted in our study. The increased time for intubation despite a good glottic view may also be attributable to the fact that Airtraq requires a greater hand–eye coordination which comes with experience. Being a channeled device, the direction of ETT cannot be easily manipulated by the operator, hence alignment of Airtraq tip in front of the glottis is essential for successful intubation. We have used the regular Size 3, Blue (A-511) blade meant for use with ETT 7–8.5, in our study. Furthermore, it was found that unless lubricated it was difficult to slide 8 or 8.5 size tube through the channel increasing the time to intubation.

There was a case of lip trauma in Airtraq group. Anesthetist focusing on the screen may have resulted in the lip being caught between the blade and the teeth. The exaggerated curve and the larger anteroposterior diameter can make intraoral insertion a little difficult, especially if mouth opening is less. The recommended position of tube is within the channel or else introduction into the mouth can be difficult [Figure 4a].

Limitations of our study are that we did not monitor the depth of anesthesia before intubation, though we ensured a MAC of 1. In addition, the intubating anesthetist could not be blinded to the laryngoscope being used. We cannot extrapolate our data to difficult airway cases and those with Mallampatti Score of 4. Due to lack of any scoring for indirect laryngoscopy, we had used Cormack–Lehane scoring which is ideally described for direct laryngoscopy. Use of Airtraq requires skill and experience. Hence, its use by nonexperienced users remains notional. The price of Airtraq like all other video laryngoscopes is significantly higher than the Macintosh and needs to be taken into consideration.

## Conclusion

In our study, it was confirmed that Airtraq intubations resulted in a significantly lesser hemodynamic response and greater ease of intubation compared to Macintosh intubations because of a lower IDS and a shorter laryngoscopy time. Thus, we conclude that Airtraq video laryngoscope is a superior option to Macintosh in patients with ischemic heart disease planned for CABG surgery in experienced hands. Further studies are required to prove its efficacy and safety in difficult airway scenarios.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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