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Original Research Article.

To Compare the Performance of Three Airway Devices, The Easytube, The Esophageal-Tracheal Combitube and The Laryngeal Tube-S

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ABSTRACT

Background: The success of airway management depends on patient factors as well as the skills of the anaesthesiologist. Securing and managing the airway is quintessential and perhaps the most critical aspect in practice of anaesthesiology. The aim of this study to evaluate the comparison of the performance of three airway devices, the EasyTube, the Esophageal-Tracheal Combitube and the Laryngeal Tube-S.

Materials & Methods: A prospective randomized controlled study done on 60 patients undergoing elective surgery under general anaesthesia in the department of Anaesthesia and Critical care, Ananta institute of Medical Sciences and research centre, Rajsamand, Rajasthan, India. They were randomly allocated to the following three groups using computer generated random table;

Group ETC (n=20): Patients whose airway was managed using Esophagealtracheal combitube.

Group EzT (n=20): Patients whose airway was managed using Easy Tube.

Group LTS (n=20): Patients whose airway was managed using Laryngeal tube suction.

Upon completion of the patient's surgery, the airway device was examined for any evidence of blood. Additionally, all patients were interviewed at 2 and 24 hours postoperatively in order to assess for the presence of sore throat, hoarseness, and dysphagia using a 4-point Likert scale.

Results: When compared, use of Combitube, EasyTube and Laryngeal Tube Suction was associated with statistically similar intraoperative airway pressures, dynamic compliance, airway resistance, SpO_2, and $EtCO_2$ ($p>0.05$). The heart rate and blood pressure increases following their placement were transient and similar ($p>0.05$). Combitube and EasyTube resulted in significantly higher incidence of mucosal trauma detected by presence of blood on the device after its removal and an insignificant increase in incidence of postoperative sore throat ($p>0.05$). Combitube placement resulted in significantly higher incidence of postoperative dysphagia as compared to easy tube and laryngeal tube suction($p<0.05$). But the nature of all these complaints was mild and no active intervention was required in any case.

Conclusion: To conclude, based on our observations, if and when Combitube, EasyTube or Laryngeal Tube Suction is used for emergency airway management, it can be continued for conduct of general anaesthesia in surgeries of moderate duration.

Keywords: Combitube, EasyTube, Laryngeal Tube Suction, General Anesthesia, Ventilators.

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INTRODUCTION

The greatest responsibility of the anaesthesiologist during general anaesthesia is to ensure adequate gas exchange throughout surgery. It becomes imperative to keep the airway patent and secured at all times so as to ensure adequate ventilation. Securing and managing the airway is quintessential and perhaps the most critical aspect in practice of anaesthesiology. The success of airway management depends on patient factors as well as the skills of the anaesthesiologist.

The common ways to maintain airway patency and thus ensure gas exchange include using a face mask (mask ventilation) or a supraglottic airway or a tube which is passed to a point below the vocal cords (endotracheal intubation), to deliver fresh gases including oxygen.[1]

Endotracheal intubation is considered to be the gold standard in maintenance of airway.[2,3] The tracheal cuff seals the airway effectively and thereby offers protection against aspiration of the

gastric contents. Also, the endotracheal tube allows efficient controlled ventilation.[4]

However, a failure to intubate results in a potentially catastrophic situation especially if accompanied by a failure to ventilate also - the 'cannot ventilate, cannot intubate' (CVCI) scenario. This situation may be tough to handle even for the most experienced and skilled anaesthesiologist. Supraglottic airway devices (e.g. laryngeal mask airway, laryngeal tube) and oesophageal-tracheal devices offer alternatives for successful airway maintenance during failure of intubation. The oesophageal-tracheal devices are named so because they provide effective ventilation whether they are positioned in the trachea or in the oesophagus.[1]Oesophageal-tracheal Combitube and the recently introduced Easytube are two such prototype devices.

A newer oesophageal-tracheal airway device viz., EasyTube, having similar utilities as that of Combitube and approved by United States Food and Drug Administration, has been marketed in India recently. Similar to the Combitube, its conventional usage results in an oesophageal placement, and effective ventilation is possible by both, oesophageal as well as tracheal placement. This device allows tracheal suctioning as well as passage of a fibreoptic bronchoscope thus circumventing certain disadvantages associated with the Combitube. The EasyTube has also been evaluated for airway management and ventilation during general anaesthesia[4,5] and has been compared with Combitube for the same.[6]

The Laryngeal Tube Suction® (LTS; VBM Medizintechnik; King Systems, Noblesville, IN) is another supralaryngeal airway device designed to provide an effective seal, similar to the ETC, while providing some advantages. The device consists of an airway tube with a small cuff attached at the tip (distal cuff) and a larger balloon cuff at the middle part of the tube (proximal cuff) (Figs). The cuffs are inflated through a single pilot tube and balloon, through which cuff pressure can be monitored. There are three black lines on the tube near a standard 15-mm connector, which indicate adequate depth of insertion when aligned with the teeth. However, there are no reports comparing the use of Combitube, EasyTube and Laryngeal tube suction during general anaesthesia. The aim of this study to evaluate the comparison of the performance of three airway devices, the EasyTube, the Esophageal-Tracheal Combitube and the Laryngeal Tube-S.

MATERIALS & METHODS

A prospective randomized controlled study done on 60 patients undergoing elective surgery under general anaesthesia in the department of Anaesthesia and Critical care, Ananta institute of Medical Sciences and research centre, Rajsamand, Rajasthan, India.

Inclusion Criteria

Patients aged between 18 to 80 years, having ASA class I and II, Mallampati Class I and II, and BMI <35 kg/m2, undergoing elective surgery under general Anaesthesia with controlled ventilation.

Exclusion Criteria

1. ASA Class III-V
2. Mallampati Class III or IV
3. Patients undergoing emergency surgery
4. BMI>35 kg/m2,
5. Patients with history of gastroesophageal reflux.
6. Low pulmonary compliance or high pulmonary resistance, pharyngeal or laryngeal pathology, or a known history of difficult intubation.

Study Groups: 60 patients undergoing elective surgery under general anaesthesia were randomly allocated to the following three groups using computer generated random table;

Group ETC (n=20): Patients whose airway was managed using Esophageal tracheal combitube.

Group EzT (n=20): Patients whose airway was managed using Easy Tube.

Group LTS (n=20): Patients whose airway was managed using Laryngeal tube suction.

Methodology: After securing intravenous access, all the patients were taken to the operating room. Standard ASA monitors including blood pressure (BP) cuff, EKG, and pulse oximeter were applied. Baseline vital signs were obtained and general anesthesia was induced with 1.5-2 mg/kg propofol. After assuring adequate mask ventilation, muscle relaxation was achieved with either succinylcholine 1 mg/kg. Patient parameters were recorded included heart rate, non-invasive BP, respiratory rate, peripheral oxygen saturation, end-tidal carbon dioxide concentration, tidal volume, and airway peak pressures. Parameters were recorded at baseline, prior to device insertion, at 1, 2, 3, 4, 5, 10 and 15 minutes after insertion, and at extubation. Before induction, all patients undergone preoxygenation with 8 L of oxygen for 3 minutes by face mask as preparation for device insertion. The designated device was inserted by an anesthesiologist trained in the usage the device. In the event of difficulty with device insertion, manoeuvres were performed as per the instruction of device manufacturer. The time taken to insert the device was recorded in each instance in all the groups. The size of the device chosen was based on manufacturer recommendations. The cuffs of all the devices were initially inflated by recommended manufacturer volumes and then set to an intra cuff pressure of 60 cm H2O, using a cuff pressure gauge (Kings Systems, Noblesville, IN, USA). When using either the 37 French or 41 French ETC, 40-85 cc of air was used to inflate the #1 proximal cuffs and 10 cc of air was used to inflate the #2 distal cuffs. These volumes were titrated until a seal is achieved using the minimal leakage technique, ensuring it did not exceed 12 cc and 15 cc, respectively, in the #2 distal cuff of the 37 French ETC and 41 French ETC. Ease of insertion was determined by using a 4-point Likert scale (1=very easy, 2=easy, 3=difficult, 4=very difficult). After insertion, all devices were connected to a closed-circuit breathing system. If placement was deemed unsatisfactory the placement were reattempted. After 3 failed attempts, no further attempts at supralaryngeal device placement were made, the airway was secured in another manner, and these patients were excluded from the data analysis.

After successful placement, the airway leak pressure was assessed by closing the circuit to 40 cm H2O allowing fresh gas flow to build airway pressure. The pressure at which an audible leak occurred was then recorded. For the LTS and EzT, the airway leak was assessed after cuff pressures were reduced to 60 cm H2O using the dedicated gauge. The anatomic placement of these airway devices was assessed by fiberoptic examination of the glottis in relation to the shaft of the airway device and the view was graded based on a standardized 4-point scoring system of whether the entire glottis was visible and if the epiglottis obscured

the view (1 = glottis completely visible, 2 = glottis partially visible, 3 = glottis partially covered by epiglottis, 4 = only epiglottis visible). Upon completion of the patient's surgery, the airway device was examined for any evidence of blood. Additionally, all patients were interviewed at 2 and 24 hours postoperatively in order to assess for the presence of sore throat, hoarseness, and dysphagia using a 4-point Likert scale (1=normal, 2=mild, 3=moderate, 4=severe).

Statistical Analysis

Inter group comparison of quantitative data was done using analysis of variance (ANOVA) or repeated measure ANOVA as appropriate. For comparison of qualitative data, Chi square test was used. Bonferroni correction was applied for multiple comparisons. P value of < 0.05 was considered statistically significant.

Table 1: Baseline characteristics

Parameters	Group ETC (n = 20)	Group EzT (n = 20)	Group LTS (n = 20)	p value
Age (yrs)	34.64±10.22	34.66±10.59	34.40±10.67	0.182
Height (cm)	161.17±5.43	159.33±5.84	160.74±5.09	0.078
Gender (M:F)	12 : 8	12 : 8	12 : 8	1.00
Weight (kg)	55.23±4.53	55.36±4.23	54.43±4.72	0.429
TMD	7.54±0.50	7.49±0.50	7.50±0.50	0.048
ASA physical status (I:II)	16:4	15:5	17:3	1.00
MMP class (I:II:III:IV)	11:9:0:0	11:19:0:0	10:10:0:0	1.00
Neck circumferences	33.43±1.71	34.86±1.68	33.68±1.70	0.095
Mouth opening	3±0	3±0	3±0	1.00

Table 2: Parameters related to placement of the airway device

Parameters related to placement	Group ETC (n= 20)	Group EzT (n = 20)	Group LTS (n = 20)	p value
Number of attempts for insertion (1:2:3)	20:0:0	20:0:0	20:0:0	
Ease of placement (easy: difficult)	20:0	17:3	20:0	1.000
Time for effective placement (sec)	48.66±7.25 (36-60)	49.23±7.39 (36-62)	48.71±7.12 (36-60)	0.340
Airway leak	36.24±2.84 (32-42)	37.45±2.91 (33-42)	36.74±2.99 (32-42)	0.225

Table 3: Complications related to airway device

Complications	Group ETC (n = 20)	Group EzT (n = 20)	Group LTS (n = 20)
Presence of blood on device after removal			
Absent	6 (30%)	3 (15%)	20 (100%)
Present	14 (70%)	17 (85%)	-
THROAT PAIN			
2 hr			
Mild	12 (60%)	13 (65%)	13 (65%)
Moderate	4 (20%)	5 (25%)	5 (25%)
Normal	0 (0%)	0 (0%)	0 (0%)
Severe	4 (20%)	2 (10.00%)	2 (10.00%)
4 hr			
Mild	4 (20%)	5 (25%)	5 (25%)
Moderate	4 (20%)	2 (10.00%)	2 (10.00%)
Normal	12 (60%)	13 (65%)	13 (65%)
Severe	0 (0%)	0 (0.0%)	0 (0.0%)
DYSPHAGIA			
2 hr			
Mild	6 (30%)	7 (35%)	7 (35%)
Moderate	2 (10%)	0 (0%)	0 (0%)
Normal	9 (45%)	13 (65%)	13 (65%)
Severe	3 (15%)	0 (0%)	0 (0%)
4 hr			
Mild	-	-	-
Moderate	-	-	-
Normal	20 (100%)	20 (100%)	20 (100%)
Severe	-	-	-
HOARSENESS			
2 hr			
Mild	-	-	-
Moderate	-	-	-
Normal	20 (100%)	20 (100%)	20 (100%)
Severe	-	-	-
4 hr			
Mild	-	-	-
Moderate	-	-	-
Normal	20 (100%)	20 (100%)	20 (100%)
Severe	-	-	-

RESULTS

Our study showed that the mean age, height as well as gender distribution were statistically similar amongst the three groups (p>0.05). Distribution of ASA physical status grades, the various grades of MMP classification and duration of surgery were statistically similar amongst all the three groups (p>0.05). All the patients in the three groups were MMP class I or II and no patient in any group was found to be in class III or IV. Thyromental distance, mouth opening and neck circumference was statistically similar among the three groups. (Table 1)

Amongst each group device was placed in single attempt in all patients. The ease of placement of the airway device using a laryngoscope was assessed as being either "easy" or "difficult." The incidence of easy or difficult placements was statistically similar between group ETC and group LTS (p>0.05). However, there were significantly higher numbers of difficult placements in group EzT as compared to group ETC as well as group LTS (p<0.05). The mean time for effective placement of the airway device was longer in group EzT(49.23±7.39) compared to group ETC and LTS(48.66±7.25 &48.71±7.12) (p>0.05). (Table 2)

Presence of blood on the airway device after its removal, was significantly greater in group EzTvs group LTS and also in group ETC vs group LTS (p<0.05). However, it was statistically similar between group EzT and group C (p>0.05). Throat pain at 2 hour duration in group ETC was mild in 60% patients, moderate in 20% and severe in 20%.In group EzT and group LTS throat pain at 2 hour duration was mild in 65% ,moderate in 25% severe in 10% .

Intensity of Throat pain at 4-hour duration in group ETC was normal in 60%patients, mild in 20% and moderate in 20%. In group EzT and group LTS throat pain at 4hour duration was normal in 65%, mild in 25% moderate in 10%.

Intensity of dysphagia at 2-hour duration in group ETC was normal in 45%, mild in 30% patients, moderate in 15% severe in 10%. In group EzT and group LTS dysphagia at 2hour duration was normal in 65%, mild in 35%. At 4 hours dysphagia was normal in 100% patients in group ETC, group EzT and group LTS. Hoarseness at 2 hour and 4 hours was normal in 100% patients in group ETC, group EzT and group LTS. (table 3)

DISCUSSION

Demographic variables and Mallampati scores were similar in all the groups. Insertion time was shortest in the LMA group (15 seconds vs 25 seconds for both endotracheal tube and Combitube). The trachea was intubated without difficulty in all patients. The LMA was easily inserted without resistance in 68%, with slight resistance in 24% patients. One patient required two trials for insertion. In 8% patients, the LMA could not be placed at all; these patients required tracheal intubation and were excluded from the study. The Combitube was inserted in 48% without resistance, in 36% with slight resistance, and in 16% with moderate resistance. Our results compiled with Gaitini et al.[7]

Hemodynamic parameters were observed before and after device insertion of device and also during extubation. In the middle of the surgery, the pharyngeal balloon was deflated and a laryngoscope was inserted between the Combitube and the tongue, and an attempt was made to view the glottic structures. The Cormack-Lehane score was used to evaluate the glottic opening. This assessment was done in all patients of the control group and in ten patients of the emergency group. All the patients enrolled in the study were 18-65 years of age and had normal airways. Mean anaesthesia time was 92±25 minutes. In both the groups, Combitube insertion was easy by direct laryngoscopy as well as by blind technique. In 18 patients, a leak was detected with the initial 50 ml of air in the pharyngeal balloon which disappeared after increasing the volume of the pharyngeal balloon in eight patients. In two patients, no air leak was observed with the initial 50 ml of air and the best seal was obtained with 40 ml (females, height 150 cm). In the other patients, a complete seal was achieved with the 50 ml initial volume. This air leak never compromised the quality of ventilation. Hemodynamic parameters during insertion and extubation were similar to the baseline value. In all patients, ventilation was easy. The maximum peak inspiratory airway pressure ranged from 15 to 30 cmH_2O. Pulse oximetry readings were ≥98% throughout and the $EtCO_2$ values with mechanical ventilation was 30±2 mm Hg and with spontaneous ventilation it was 38±6 mm Hg. The Cormack-Lehane score evaluated intraoperatively after deflation of the pharyngeal cuff and insertion of the laryngoscope was 1 or 2.

Tracheal intubation however, was not performed in any case. There was no nausea, vomiting, cough or airway irritation upon removal of the Combitube at the end of surgery. There were no postoperative pharyngeal symptoms or dysphagia.

There was no trace of methylene blue in the hypopharynx before insertion of the Combitube, during laryngoscopy and after its removal in all patients.

Oczenski et al[8] compared the Combitube with endotracheal tube and the LMA for device related complications. Seventy-five patients, aged 20-65 years with ASA physical status I to III undergoing elective urological and gynaecological surgical procedures lasting 1 to 2 hours were randomly allocated to one of the three groups (n=25 each). While the endotracheal tube was inserted with the help of a laryngoscope, LMA and Combitube were inserted blindly in the respective groups. The sizes of the devices used were: Combitube 37 Fr SA, endotracheal tube 7.5 mm ID in women and 8.5 mm ID in men and PLMA size 3 and 4 as appropriate.

Insertion conditions of the Combitube or LMA were graded as excellent (no resistance to insertion), good (slight resistance to insertion), poor (moderate resistance to insertion) or impossible. If insertion was not possible, tracheal intubation was performed. Postoperative sore throat, dysphagia and hoarseness were graded as mild, moderate or severe. In the Combitube group, the Combitube was inserted in 12 patients without resistance (48%); in 9 patients with slight resistance (36%); and in 4 patients (16%) with moderate resistance. The Combitube was in oesophageal position in all patients. Two patients required two attempts and one patient required three attempts for successful insertion. In the tracheal tube group, 15 patients were classified as grade I, 9 patients as grade II and 1 patient as grade III according to the criteria of Cormack and Lehane. Tracheal intubation was possible in all patients without difficulty. In the LMA group, the LMA was easily inserted without resistance in 17 patients (68%) and with slight resistance in 6 patients (24%). One patient required two trials for successful insertion. In two patients, the LMA could not be placed correctly, requiring tracheal intubation and these two patients were excluded from the study. Sore throat (48%), dysphagia (68%) and haematoma (36%) occurred more often in the Combitube group than in the other groups, while hoarseness

(44%) was more common in the tracheal tube group. In two patients of the Combitube group, sore throat was severe and in three patients, dysphagia was severe. None of the patients in the tracheal tube or LMA groups suffered from severe sore throat or dysphagia.

In five patients (20%) of the Combitube group, dysphagia lasted between 12 and 24 hours, and in eight patients (32%) it lasted more than 24 hours. In contrast, dysphagia lasted longer than 24 hours in only one patient (4%) in each of the LMA and tracheal tube groups.

Mercer and Gabbott[9] tried to study the influence of neck position on ventilation using the Combitube. The aim of the study was to assess the ease of lung ventilation using the Combitube with cervical spine immobilised in a rigid collar. A total of 40 ASA physical status I and II patients with no history of cervical spine disease posted for elective surgeries were included. Combitube was inserted blindly in first 20 patients and the pharyngeal cuff was inflated with the recommended 85 ml of air and the distal cuff with 12 ml of air. However, having noticed a high rate of upper airway trauma caused, in the next 20 patients the Combitube was inserted with the aid of a laryngoscope and the pharyngeal cuff was inflated with titrated volume of air until there was no leak or until a subjective sensation of increased resistance to further cuff inflation was felt.

Ventilation was assessed in each patient with the patient's head on a pillow in the classic 'sniffing the morning air' position and then, with the pillow removed and the cervical spine immobilised with the rigid cervical collar. In both positions, changes in bilateral chest movement, bilateral chest auscultation, and pulse oximetry reading, expired tidal volume, the audible airway inspiratory leak and auscultation over the epigastrium was assessed. After the observations were complete, the Combitube was removed and checked for presence of blood. The cervical collar was removed and the pillow replaced. A standard tracheal tube or LMA was then inserted to continue general anaesthesia. In all patients, the Combitube was correctly positioned in the oesophagus. In both positions, bilateral chest movements were visible, bilateral auscultation over chest was positive, expired tidal volume was greater than 7 ml/kg, and SpO_2 was above 96%. An audible leak was present in 21 patients, four with neck positioned on a pillow, six with cervical collar in place, and in eleven patients leak occurred in both neck positions. However, the presence of a leak did not hinder lung ventilation in any patient. They made a secondary observation that airway trauma was reduced when a laryngoscope was used for insertion of the Combitube and also when the volume of air for inflation of pharyngeal cuff was titrated to air leak. The study therefore concluded that ventilation using the Combitube is unaffected by immobilisation of the cervical spine.

However, this study did not assess the ease of insertion of the Combitube in patients with a rigid cervical collar in-situ.

Even though almost all anaesthesiologists are aware that Combitube is a recommended alternative airway device during CVCI situations, very few have the experience to use it. Bishop and Kharasch[10] carried out a study to see if anaesthesiologists and anaesthesiology residents who had no prior clinical experience with Combitube, could actually place it correctly. Physicians were instructed to attempt a blind insertion first, and then to use a laryngoscope if the blind attempt had failed. The decision to use laryngoscope was made only if resistance to intubation was met repeatedly. Intubations were rated as 'first pass,' 'requiring multiple blind attempts,' 'requiring laryngoscope,' or 'failed.' Successful placement of the Combitube in the oesophagus was possible in 15 of the 16 (94%) cases. In 1 patient, the tube could not be placed in the oesophagus even using a laryngoscope, and no attempt was made to place it in the trachea. First pass blind insertion into the oesophagus was possible in 38%, multiple blind insertions in 25% and laryngoscope was required in 31% before successful placement was possible.

The use of laryngoscope increased the chances of successful placement from 62.5% (blind insertions) to 93.75%. In all patients in whom the Combitube was placed, ventilation was easily established, with the exception of one patient who developed severe bronchospasm. It was concluded that the Combitube can be placed by anaesthesiologists with relatively little formal training.

Besides these trials evaluating Combitube in operating room environment for various outcome measures, there are several case reports citing the successful use of Combitube during anaesthesia.[11-15]

Lorenz and colleagues[5] suggested that EasyTube is comparable to endotracheal tube in terms of efficacy and safety, and is suitable for airway management during elective surgery of modest duration.

Cavus et al[4] Successful insertion of the EasyTube, PLMA, LTS II, and endotracheal tube after the first attempt was achieved in 41%, 68%, 82% and 68% patients respectively. This was significantly longer with EasyTube (median time 56 sec) than with other devices (median times of 25, 24, and 20 seconds with PLMA, LTS II and endotracheal tube respectively). Subjective assessment of postoperative airway morbidity including sore throat, hoarseness and dysphagia at 24 hours was comparable between groups ($p>0.05$).

However, coughing was significantly greater with use of LTS II (10/21 patients). The SpO_2 and heart rate did not show any significant rise at 0 minute, 5 minutes and 10 minutes following device insertion as compared to basal values within each group. The mean arterial pressure was significantly lower as compared to baseline value within each group ($p<0.05$). There was no significant difference between the groups with regards to these hemodynamic variables.

Brimacombe and colleagues[16] studied 120 patients and reported that the success rate for the insertion of the laryngeal tube at the first attempt was similar to that for the ProSeal, but the success rate after three attempts was lower for the laryngeal tube (55 of 60 patients) than for the ProSeal (all 60 patients). The leak pressure was similar, but the expiratory tidal volume was lower, and the end-tidal carbon dioxide concentration was higher, for the laryngeal tube. More adjustments of the device position, inspiratory oxygen concentration and respiratory rate, were required for the laryngeal tube. The incidence of postoperative complications was similar. Cook and colleagues[17] reported that the success rate of insertion within two attempts was similar between the laryngeal tube and ProSeal, but insertion of the laryngeal tube took longer. The leak pressure and the number of adjustments of position were similar, but the peak airway pressure was higher for the laryngeal tube. In addition, airway patency was better with the ProSeal. From these results, it appears that the

laryngeal tube is less effective than the ProSeal during controlled ventilation under general anaesthesia. There are only a few reports of the efficacy of the laryngeal tube during spontaneous ventilation. Miller and colleagues[18] assessed the efficacy of a prototype laryngeal tube and had to abandon its use in 25 of 27 occasions. Figueredo and colleagues[19] studied 35 patients and reported that insertion of a prototype laryngeal tube was successful at the first attempt in only 18 patients (51%). These reports could simply indicate that the laryngeal tube is not useful during spontaneous breathing, but other interpretations may be made.

CONCLUSION

To conclude, based on our observations, if and when Combitube, EasyTube or Laryngeal Tube Suction is used for emergency airway management, it can be continued for conduct of general anaesthesia in surgeries of moderate duration.

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