International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 4, April 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.4.2025.164

ORIGINAL RESEARCH

Awake Flexible Fiber Optic Guided Nasotracheal intubation for airway management in left lateral position or supine position: a randomised controlled clinical study in patients with predicted difficult intubation

[1]Aayushi Patel,[2]Sudhir Sachdev,[3]Gaurav Goyal,[4]Vijay Mathur,[5]Manan Patel

[1]Resident Doctor,Department of Anaesthesia[2]Professor, Department of Anaesthesia[3,]Professor and Head, Department of Cardiac Anaesthesia [4]Professor and Head, Department of Anaesthesia[5]Resident Doctor, Department of Medicine,Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan, India

Corresponding author
Manan Patel
Resident Doctor, Department of Medicine, Mahatma Gandhi Medical College and Hospital, Jaipur, Rajasthan, India

Received: 06 March, 2025 Accepted: 27 March, 2025 Published: 13 April, 2025

ABSTRACT

Aims and objectives: The present study was conducted to study ease of awake fibre optic guided nasotracheal intubation in left lateral position or supine position for airway management in patients with predicted difficult intubation. **Material and methods:** A Hospital based, Observational, Randomised study was conducted at OT Complex, Mahatama Gandhi Medical College & Hospital, Jaipur. Total 100 patients were involved. Group 1=supine position (50) and Group 2=lateral position (50).**Results:** Lateral position have got 14% first attempt, 70% in second attempt, 14% third attempt and 2% fourth attempt. While supine position did not get in first attempt after that 64% in second attempt, 30% third attempt and 6% fourth attempt. Post op complication was found 4% in supine postion and 2% in lateral position. Jaw thrust was found 16.3% in supine postion and 2% in lateral position. Converted to tracheostomy was found 4% in both groups.**Conclusion:** According to the results, compared to the supine position, performing fiberoptic intubation in the lateral position may have advantages such as a better glottis vision because tongue falls less frequently and a decreased requirement for a jaw thrust manoeuvre to assist with breathing. It is recommended that anesthesiologists occasionally do awake fiberoptic intubation in positions other than the supine position.

INTRODUCTION

The techniques for tracheal intubation used in anaesthesia care have swiftly changed since the advent of contemporary medical core surgical practice, and they are continually growing into novel modalities. It goes without saying that tracheal intubation is crucial for maintaining airway security.

In order to effectively treat critically sick patients, trauma patients, and anaesthesia for all operations and procedures carried out both inside and outside of the operating room, airway control is crucial. According to the patient's condition and the necessity of surgery, anesthesiologists select and use a variety of techniques, including the bag and mask methods, airways that are simply inserted into the oral or nasal cavity, supraglottic airway devices, oral or nasotracheal intubation, percutaneous dilated cricothyroidotomy, and tracheostomy.2. Orotracheal intubation or supraglottic airway devices are typically chosen among these techniques. For head and neck surgery, oral surgery, or to maintain the airway in a trauma patient while preventing further injury, nasotracheal intubation is attempted.

Facemask respiration and tracheal intubation may be challenging or impossible for patients with tumoral or inflammatory disease of the base of the tongue, epiglottis, or glottic aperture, as well as a history of previous surgery or radiation therapy. Due to the sometimes distinctnature of clinical indications and symptoms, these lesions may not be adequately

DOI: 10.69605/ijlbpr_14.4.2025.164

appreciated during a conventional preoperative airway examination.[1]

Awake fiberoptic intubation in conjunction with the suitable topical anaesthetic and sedation is the most effective strategy to maintain spontaneous respiration and airway reflexes while maintaining airway security in these circumstances.[2]Merely 1% of intubations are performed on awake patients, and the majority of these are related to head and neck procedures. Despite the introduction of new intubation tools, this percentage remains unchanged.[3]Because of its high safety profile, high success rate when performed by experienced practitioners, minimal incidence of complications, and, according to some data, excellent cardiovascular tolerance, this method is frequently utilised in algorithms and guidelines.[4]Ultrasonography and airway endoscopic evaluation may be used as part of a standard pre-anesthetic airway assessment to determine the best airway control approach, whether superglottic or invasive, awake or not.[5]Even though some reports suggest that most airway control fatalities could be prevented, there are still reservations about using awake intubation. These reservations can be attributed to a variety of factors, such as fear of failure, new devices that improve airway control, a lack of training, or the pressure of a busy operating room.[6]

Fiberoptic intubation (FOI) has become a widely used and acknowledged technique for maintaining airways in patients who are awake, sedated, or anaesthetized since it was first described in the late 1960s. FOI is especially beneficial for patients with known or suspected compromised airways, such as those with obesity, increased aspiration risk, cervical spine injury, limited mouth opening, or diminished neck movement. Additional benefits of FOI include less risks, such as tooth damage and oropharyngeal haemorrhage, and the possibility of double-lumen tube installation, which is best for patients undergoing thoracic surgery.[7]

One popular airway management technique for anaesthesia is nasotracheal intubation. It is simpler to attach and stabilise the endotracheal tube through the nasal pathway due to its smaller diameter than the oral canal because it is put into the trachea through the nasal cavity. Because it enhances eyesight and facilitates access for surgery, it is the method of choice for both anesthesiologists and surgeons performing head and neck surgeries, particularly oropharyngeal, dental, and maxillofacial surgeries.[8]

To lower the risk of aspiration in cases of oropharyngeal haemorrhage, or for airway management in certain patients with restricted posture, intubation is necessary in the lateral position.[9]Prior research has demonstrated that intubating patients in the lateral position is more challenging and time-consuming than in the supine position when using direct laryngoscopy, particularly in cases when there is an abrupt loss of airway patency.[10,11]These findings imply that a dependable technique for managing patients' airways when they are in the lateral position is still lacking.[12] The left lateral position prevents the laryngeal structure from collapsing, and this position is recommended in adult basic life support.[13] The laryngoscopic view worsened in lateral position in 35% patients as compared with the supine position when direct laryngoscopy was performed by a senior anaesthesiologist.[14]

Dose neck position during fiberoptic intubation promote early and simple visualisation of the vocal cords? is our study question?

This study examined trainees' use of flexible fibre optic guided nasotracheal intubation on patients in the lateral and supine positions in order to replicate this scenario.

MATERIALSANDMETHODS

Type of Study: Hospital based, Observational, Randomised

Place of Study: OT Complex, Mahatama Gandhi Medical College & Hospital, Jaipur

- Institute Ethics Committee approval was obtained be for start of study.
- Written and inform consent was obtained from all participants before enrolment into the study.

Sample size: 100 patients was included in our study

Inclusion criteria

1. ASA Grade 1 and 2
2. MPC Grade 2 or more plan for awake fiber optic
3. 20-60 years Age
4. Nack movement of 90 degree laterally , 45degree flexion and 230 degree extension

Exclusion criteria

1. Non consenting
2. BMI >35
3. Plan for elective pre op surgical tracheostomy
4. Cervical spine disease
5. Uncontrolled Hypertension
6. Cerebrovascular disease
7. Airway hyper reactivity
8. Patient non cooperative, patient unable to understand situation
9. Coagulopathy

Methodology

After getting clearance from Institute Ethics Committee and written informed consent, patients planned for fiberoptic intubation was included in this study

After doing all the required investigation, PAC was performed a day before the surgeryMethods for preparation for awake fiberoptioc intubation:

These are the different methods used, but not in all patients Limiting use of xylocain, below the toxicity level

- 2% viscous xylocane solution 10ml gargles for 3 mins and then swallow

DOI: 10.69605/ijlbpr_14.4.2025.164

- Nebulisation with 2% xylocane solution
- Transtracheal and superior laryngeal block under all aseptic precautions with 2% xylocane 2ml if possible
- Xylometazoline nasal drops to check the patency and nasal decongetion
- Gently insert the nasopharyngeal airway of appropriate size using gelly
- 10% lignocaine spray

After preparing the patient was shifted in operation theatre

- Gentle oral suction will be done
- ASA standard monitoring (At least 20 G size or more free flowing and patent cannula
- Dexmedetomidine 1mg/kg iv over 10 mins alonge with midazolam 0.03mg/kg sedation till patient achieve the Ramsay selection score of > 4 under monitoring

Statistical analysis

The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using IBM SPSS (SPSS Inc., IBM Corporation, NY, USA) Statistics Version 25 for Windows software program. Descriptive statistics included computation of percentages, means and standard deviations. The data were checked for normality before statistical analysis using Kolmogorov Simonov test. The unpaired t test (for quantitative data to compare two independent observations) was applied. The chi square test was used for qualitative data comparison of all clinical indicators. Level of significance was set at P≤0.05.

OBSERVATIONAL AND RESULTS

Group 1=supine position

Group 2=lateral position

Mean age for group 1 was 43.48 year and for group 2 was 44.72 year and showed no significant difference in between group1 and group 2.

In group 1,68% male and 32% female were included. And in group 2,68% male and 32% female were included. Comparison in between group 1 and group 2 not statistically significant.

In group 1 ASA I, ASA II and ASA III were included 58%, 40% and 2% and in group 2 ASA I, ASA II and ASA III were 52%, 40% and 8%. Comparison of ASA in both groups showed statistically non-significant result.

Mean RR was 13.44 in group 1 and 12.74 in group 2. Comparison of RR in both groups showed statistically non-significant result.

Mean PR was 81.9 in group 1 and 78.4 in group 2. Comparison of PR in both groups showed statistically non-significant result.

SBP was slight significantly higher in group 1 (128.96) than group 2 (124.92) at intubation time. Comparison of SBP in both groups showed statistically non-significant result.

DBP was slight significantly higher in group 1 (79.68) than group 2 (76.06) at intubation time. Comparison of DBP in both groups showed statistically non-significant result.

Table 1: TVVC(sec)wise comparison of the study

	Mean	Std. Deviation	P value
Group 1	101.56	25.390	0.06
Group 2	92.92	20.698	

Mean TVVC was 101.56 second in group 1 and 92.92 second in group 2. Comparison of TVVC in both groups showed statistically non-significant result.

Table 2: Ease of intubationwise comparison of the study

			Ease of intubation				Total
			1.00	2.00	3.00	4.00	
Groups	Group 1	N	0	32	15	3	50
		%	0.0%	64.0%	30.0%	6.0%	100.0%
	Group 2	N	7	35	7	1	50
		%	14.0%	70.0%	14.0%	2.0%	100.0%
Total		N	7	67	22	4	100
		%	7.0%	67.0%	22.0%	4.0%	100.0%

P value=0.001 (S)

Lateral position have got 14% first attempt, 70% in second attempt, 14% third attempt and 2% fourth attempt. While supine position did not get in first attempt after that 64% in second attempt, 30% third attempt and 6% fourth attempt.Comparison of ease of intubation in both groups showed statistically significant result.

Table 3: Change in SPO2wise comparison of the study

	Mean	Std. Deviation	P value
Group 1	4.42	2.195	0.21
Group 2	3.88	2.144	

Mean change in spo2 was 4.42% in group 1 and 3.88% in group 2. Comparison of change in spo2in both groups showed statistically non-significant result.

DOI: 10.69605/ijlbpr_14.4.2025.164

Table 4: Pogo scorewise comparison of the study

	Mean	Std. Deviation	P value
Group 1	75.39	11.569	0.26
Group 2	73.02	9.647	

Mean pogo score was 75.39 in group 1 and 73.02 in group 2. Comparison of pogo score in both groups showed statistically non-significant result.

Table 5: Injury to adjunct structurewise comparison of the study

			Injury to adjunct structure		Total
			nil	positive	
Groups	Group 1	N	47	3	50
		%	94.0%	6.0%	100.0%
	Group 2	N	48	2	50
		%	96.0%	4.0%	100.0%
Total		N	95	5	100
		%	95.0%	5.0%	100.0%

P value=0.64

Injury to adjunct structure was found 6% in supine position and 4% in lateral position. Comparison of Injury to adjunct structure in both groups showed statistically non-significant result.

Table 6: Post op complicationwise comparison of the study

			post op complication		Total
			nil	positive	
Groups	Group 1	N	48	2	50
		%	96.0%	4.0%	100.0%
	Group 2	N	49	1	50
		%	98.0%	2.0%	100.0%
Total		N	97	3	100
		%	97.0%	3.0%	100.0%

P value=0.55

Post op complication was found 4% in supine postion and 2% in lateral position. Comparison of post op complication in both groups showed statistically non-significant result.

Table 7: Jaw thrustwise comparison of the study

			Jaw thrust		Total
			no	yes	
Groups	Group 1	N	41	8	49
		%	83.7%	16.3%	100.0%
	Group 2	N	50	1	51
		%	98.0%	2.0%	100.0%
Total		N	91	9	100
		%	91.0%	9.0%	100.0%

P value=0.01 (S)

Jaw thrust was found 16.3% in supine postion and 2% in lateral position. Comparison of Jaw thrust in both groups showed statistically significant result.

Table 8: Converted to trachestomywise comparison of the study

			converted to tracheostomy		Total
			no	yes	
Groups	Group 1	N	48	2	50
		%	96.0%	4.0%	100.0%
	Group 2	N	48	2	50
		%	96.0%	4.0%	100.0%
Total		N	96	4	100
		%	96.0%	4.0%	100.0%

P value=0.96

Converted to tracheostomy was found 4% in both groups. Comparison of converted to tracheostomy in both groups showed statistically non-significant result.

DOI: 10.69605/ijlbpr_14.4.2025.164

DISCUSSION

The use of fiberoptic intubation technology has significantly reduced failure rates of intubation. Awake fiberoptic intubation is the safest approach in patients with anticipated difficult intubation, and the nasal route is the least discomforting approach in awake patients.

Fiberoptic intubation, while a valuable technique in difficult airway management, can present several challenges:

Anatomy Variability: Patients can have unpredictable airway anatomy variations, such as narrowed or distorted airways due to trauma, tumors, or previous surgeries.

Limited Visibility: The fiberoptic scope provides indirect visualization, which can be limited by secretions, blood, or fogging, impairing clear view of the airway structures.

Patient Cooperation: Patient cooperation is essential as the procedure may cause discomfort or gag reflex, especially in awake intubations.

Skill Requirement: Performing fiberoptic intubation requires specific training and expertise. Inexperienced operators may struggle with manipulating the scope and advancing the endotracheal tube.

Time Consuming: Fiberoptic intubation generally takes longer compared to direct laryngoscopy, which could be critical in emergency situations.

Equipment Issues: Malfunction of the fiberoptic scope or inadequate preparation of backup equipment can lead to procedure interruption or failure.

Complications: Potential complications include trauma to airway structures, hypoxia, and failed intubation necessitating alternative airway management.

Patient Condition: Patients with limited neck mobility, cervical spine injuries, or those in unstable medical conditions pose additional challenges.

Emergency Settings: Performing fiberoptic intubation in emergency situations adds complexity due to time constraints and urgency.

To mitigate these challenges, thorough patient assessment, preparation, and having a backup plan for alternative airway management are crucial. Additionally, ongoing training and proficiency in fiberoptic intubation techniques are essential for successful outcomes.

Intubation is considered a fundamental step in the management of airway, particularly when it is done in an unconventional position, such as the lateral position, or in patients with a restricted mouth opening or a restricted range of neck movement, as any deficiency in the airway management in these patients can lead to fatal outcomes. Recently, many researchers have developed methods, including the Fiberoptic bronchoscope and rigid Video Seylet, for airway management in unusual positions.

The lateral position decreases airway collapsibility in patients with obstructive sleep apnea (OSA),[15] making it easier to manage the airway in morbidly obese patients by maintaining airway patency.[16] The lateral decubitus position has been previously recommended in airway management to maintain airway patency and to decrease risk of aspiration.[17] It has also been used to relieve airway obstruction when it occurs in the supine position.[18] Although anesthetists rarely do endotracheal intubations in the lateral position, interest in this technique has been previously addressed in the literature,[19] as there is a daily risk of accidental extubation or urgent need to secure the airway in patients undergoing surgery in the lateral position, making it an important skill for an anesthesiologist to train for.[20]

Learning Curve of Fiberoptic Intubation

The ability of clinicians to use the FOB is directly proportional to the amount of experience they have using the device. The learning curve of has been studied by Johnson and Roberts.4 Objectives of the study were an intubation time of less than 2 minutes and greater than 90% success on the first attempt. The study demonstrated that the mean number of intubation attempts to accomplish these goals was 10. Erb and colleagues5 demonstrated that novice endoscopists could be successfully trained on both paryalyzed apneic patients as well as those who were spontaneously breathing.

Clinicians new to the technology should spend time in controlled situations while getting familiar with the FOB. This can be done on mannequins or airway simulators before moving onto patients with normal anatomy. Ovassapian and associates[21] showed that a stepwise learning orientation utilizing simulators provided more success in initial attempts at fiberoptic intubation than traditional teaching methods. In this way, the beginner can grow comfortable and optimistic with its use before utilizing it in the higher stress environment of a difficult airway. Becoming familiar with the orientation and proper manipulation of the FOB is imperative before using the device in a difficult airway patient during adverse conditions.

In Ababneh O et al study,[22] with a median age of 37 [IQR: 29–44] years, of which 47 (78.3%) were females, while 13 (21.7%) were males. They found a significant difference in systolic blood pressure and mean blood pressure baseline upon positioning just prior to the start of the procedure. In our study, Mean age for group 1 was 43.48 year and for group 2 was 44.72 year. In group 1, 68% male and 32% female were included. And in group 2, 68% male and 32% female were included. SBP was slight significantly higher in supine group (128.96) than lateral group

DOI: 10.69605/ijlbpr_14.4.2025.164

(124.92) at intubation time. DBP was slight significantly higher in supine group (79.68) than lateral group (76.06) at intubation time.

Although it is a known fact that lateral positionimproves the management of difficult airway, it is stillconsidered as an unorthodox way of managing theairway amongst anaesthesiologists. Once the airway patency is achieved, itwill be tempting to change the position to supine forsubsequent intubation attempt. This may worsen thepatency further or worsen the glottic view by tonguefall. In our study, lateral position have got 14% first attempt, 70% in second attempt, 14% third attempt and 2% fourth attempt. While supine position did not get in first attempt. Although direct laryngoscopy may be difficult in thelateral position, FOB-assisted airway managementwas found to be easier. The FOB-guided intubationin the semilateral position was found to improve theglottic view as compared with the supine positionwithout any assistance to displace the tongue.[23]the fibreoptic-guided intubation wasfound to have a higher first intubation success ratewhen performed in the lateral position.[24] The ease ofperforming FOB-guided intubation is attributed to thelateral displacement of tongue and secretions poolingin the dependent areas.The FOB-guided intubation in lateral positionis often preferred in situations where it will bedifficult to place the patient in the supine positionor supine position may result in significant risk ofbrain compression as in a case of absent occipitalbone.[25]

During esophagogastroduodenoscopy (EGD), sedated patients can maintain their airway without the need for a jaw thrust maneuver, and the vocal cords can usually be visualized.[26] Furthermore, the lateral or semilateral position provides a better glottis view without any assistance or need to displace the tongue.[27] In anesthetized patients in the supine position, the tongue or soft tissue of the throat can sag downward, which can obstruct the operator's view.[28] The lateral position structurally improves maintenance of the passive pharyngeal airway and is associated with a lower degree of upper airway obstruction compared with the supine position.[29] The jaw thrust maneuver can produce a significant sympathetic response, jaw pain,[30] patient discomfort, and bruising. It can also narrow the spinal canal, which may cause spinal cord injury in patients with cervical spine injury.[31] In our study, Jaw thrust was found 16.3%in supine postion and 2% in lateral position. Comparison of Jawthrust in both groups showed statistically significant result.

Wahdan A et al was concluded,[32] in laterally positioned patients, elective endotracheal intubation with Video styelet provides less intubation time; however, its use is accompanied by a significant increase in the hemodynamic response after intubation and an increased incidence of sore throat. In our study, SBP was slight significantly higher in supine group (128.96) than lateral group (124.92) at intubationtime. Comparison of SBP in both groups showed statistically non-significant result.DBP was slight significantly higher in group 1 (79.68) than group 2 (76.06) at intubationtime. Comparison of DBP in both groups showed statistically non-significant result. Also the post op complication was found 4% in supine postion and 2% in lateral position. Comparisonof post op complication in both groups showed statistically non-significant result.

Ababneh O et al was found that the lateral position requiredsignificantly less time to successfully secure the airway, with a mean of 188 s for endotrachea1 tube placement compared to a mean of 214.5 s in the supine position, makingthe difference 26.5 s between the two means.In our study, mean TVVC was 101.56 second in group supine position and 92.92 second in group lateral position. Though the time to view vocal cord (tvvc) has been observed statistically insignificant in our study, there was a marked difference of average 9 seconds in both the group.

Reducing intubation time is considered animportant aspect in advanced airway management, especially in patients with suspecteddifficult airways and difficult intubation who are at high risk for hypoxemia.[33]. The 2022ASA practice guidelines for the management of the difficult airway developed a difficultairway management approach that included awake airway management in patients withsuspected difficult intubation and difficult ventilation when they are at an increased riskof aspiration, as well for those at risk of rapid desaturation. They emphasized theawareness of the passage of time and limiting the number of attempts during difficult airway management.[34]The reduction in time needed to secure the airway may be due to the fact that thelateral position may decrease airway collapsibility and relieve airway obstruction whenit occurs in the supine position,[35] facilitating the management of the airway ofmorbidly obese patients by maintaining airway patency during the fiberoptic intubation procedure.[36]

In our study, post op complication was found 4% in supine postion and 2% in lateral position. Jaw thrust was found 16.3% in supine postion and 2% in lateral position. This may be due to the movement of the cuff and tube within the trachea during patient repositioning after intubation, which has been linked to postoperative sore throat.[37] This may be due to the fact that the lateral position helps to clear secretions away from sensitive midline structures of the airway, such as epiglottis and carina. Although a randomized controlled trial in patients without known or predicted difficult airway revealed that turning from the supine to the left-lateral position hinders the laryngoscopic view,[38] and seemed inappropriate in such patients, another study clarified that the lateral position decreases the collapsibility of the passive pharynx in patients with obstructive sleep apnea.[39]Thelateral position in obstructive sleep apnea during anesthesiainduction would be a better choice for patientswith difficult mask ventilation and for difficult

DOI: 10.69605/ijlbpr_14.4.2025.164

laryngoscopy. A postoperative interview revealed thatthe supine position caused airway obstruction duringsleep, but not while awake. During the preoperative anesthesiaround, the patient was placed in the supine positionwithout respiratory distress. Therefore, we wereunaware of the risk of difficult intubation in the supineposition.

Awake intubation might have been an alternative strategy for airway management in this patient. The 2020 practice guidelines for difficult airway management recommend awake intubation in patients with suspected difficult laryngoscopy combined with (1) suspected difficult ventilation with face mask/supraglottic airway, (2) significantly increased risk of aspiration, (3) increased risk of rapid desaturation, or (4) suspected difficult emergency invasive airway.[40]

Intubation of patients in the left lateral position may have benefits. First, in patients undergoing surgery in the lateral position (e.g., endoscopic retrograde cholangiopancreatography), there is no need to reposition the patient after induction of general anesthesia, which may decrease the incidence of complications such as nerve injury, cervical spine injury, and accidental dislodgement of the endotracheal tube. Moving the patient may also cause loss of airway patency, change in endotracheal cuff pressure, tracheal mucosal damage, and microaspiration.[41] Second, this could be an alternative airway access in unavoidable circumstances, such as penetrating wounds at the back or cervical spine, in which the patient could not be positioned in the supine position.[42]

Evidence suggests that endotracheal intubation vialightwand-guided intubation or intubating laryngeal maskairway is the reliable approaches for airway managementin an emergency situation of sudden accidental loss ofairway in patients in the lateral position,[43] but thereis a risk associated with esophageal intubation. Studiesshowed that esophageal intubation occurs in 5% of casesundergoing endotracheal intubation via the intubatinglaryngeal mask airway, and 2.5%, 7.5%, and 7.5% of casesundergoing endotracheal intubation via lightwand-guidedintubation in a supine, left lateral, and right lateral position,respectively.[44] In contrast, the flexible fiberopticbronchoscope provided an excellent view of the glottisand the trachea, and had a low probability of esophagealintubation.[45]

This study had several limitations. They excluded patients with anatomical or pathological abnormalities that led to the inability to perform nasal fiberoptic intubation. Furthermore, the small sample size may have undermined the external validity of a study. Moreover, the anesthesiologists performing the procedure were experienced in fiberoptic intubation techniques, so the results may not apply to resident physicians and anesthesiologists who are not experienced in fiberoptic intubation.

CONCLUSION

We propose that the lateral position may be the preferred posture for FOB-guided intubation, particularly in cases of significant airway obstruction where tongue displacement is not possible through other channels. During awake fiberoptic intubation, patients can select the posture that is most comfortable for them due to the applicability of intubation in lateral position.

According to the results, compared to the supine position, performing fiberoptic intubation in the lateral position may have advantages such as a better glottis vision because tongue falls less frequently and a decreased requirement for a jaw thrust manoeuvre to assist with breathing. It is recommended that anesthesiologists occasionally do awake fiberoptic intubation in positions other than the supine position.

REFERENCES

1. Lundstrøm LH, Rosenstock CV, Wetterslev J, et al. The DIFFMASK score for predicting difficult facemask ventilation: a cohort study of 46,804 patients. Anaesthesia. 2019;74:1267−76.TagedEnd
2. Apfelbaum JL, Hagberg CA, Caplan RA, et al. Practice Guidelines for Management of the Difficult Airway: An Updated Report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology. 2013;118:251−70.
3. El-Boghdadly K, Onwochei DN, Cuddihy J, et al. A prospective cohort study of awake fibreoptic intubation practice at a tertiary centre. Anaesthesia. 2017;72:694−703
4. Moorthy SS, Gupta S, Laurent B, et al. Management of airway in patients with laryngeal tumours. J Clin Anesth. 2005;17:604−9.
5. Rosenblatt W, Ianus AI, Sukhupragarn W, et al. Preoperative Endoscopic Airway Examination (PEAE) provides superior airway information and may reduce the use of unnecessary awake intubation. Anesth Analg. 2011;112:602−7.
6. Cook TM, Woodall N, Frerk C. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1: anaesthesia. Br J Anaesth. 2011; 106:617−31
7. Collins SR, Blank RS. Fiberoptic intubation: An overview and update. Respir Care 2014;59:865-78
8. Prasanna D, Bhat S. Nasotracheal intubation: an overview. J Maxillofac Oral Surg 2014; 13: 366-72
9. Prasad MK, Sinha AK, Bhadani UK, Chabra B, Rani K, Srivastava B. Management of difficult airway in penetrating cervical spine injury. Indian J Anaesth 2010;54:59-61
10. McCaul CL, Harney D, Ryan M, Moran C, Kavanagh BP, Boylan JF. Airway management in the lateral position: A randomized controlled trial. Anesth Analg 2005;101:1221-5
11. Khan MF, Khan FA, Minai FN. Airway management and hemodynamic response to laryngoscopy and intubation in supine and left lateral positions. Middle East J Anaesthesiol 2010;20:795-802
12. Emergency Cardiac Care Committee and Subcommittees, American Heart Association. Guidelines for cardiopulmonary resuscitation and

DOI: 10.69605/ijlbpr_14.4.2025.164

emergency cardiac care, II: Adult basic life support. JAMA 1992;268:2184-98
13. Morris IR. Fibreoptic intubation. Can J Anaesth 1994;41:996-1008.
14. McCaul CL, Harney D, Ryan M, Moran C, Kavanagh BP, Boylan JF. Airway management in the lateral position: A randomized controlled trial. Anesth Analg 2005;101:1221-5.
15. Isono S., Tanaka A., Nishino T. Lateral position decreases collapsibility of the passive pharynx in patients with obstructive sleep apnea. Anesthesiology. 2002;97:780–785
16. Arai Y.P., Fukunaga K., Hirota S., Fujimoto S. The effects of chin lift and jaw thrust while in the lateral position on stridor score in anesthetized children with adenotonsillar hypertrophy. Anesth. Analg. 2004;99:1638–1641
17. Link M.S., Berkow L.C., Kudenchuk P.J., Halperin H.R., Hess E.P., Moitra V.K., Neumar R.W., O'Neil B.J., Paxton J.H., Silvers S.M., et al. Part 7: Adult Advanced Cardiovascular Life Support: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2015;132:S444–S464
18. Chow L. Principles and Practice of Anesthesia for Thoracic Surgery. Springer; New York, NY, USA: 2019. Anesthesia for patients with mediastinal masses; pp. 251–263.
19. Nathanson M.H., Gajraj N.M., Newson C.D. Tracheal intubation in a manikin: Comparison of supine and left lateral positions. Br. J. Anaesth. 1994;73:690–691
20. Li H., Wang W., Lu Y.P., Wang Y., Chen L.H., Lei L.P., Fang X.M. Evaluation of Endotracheal Intubation with a Flexible Fiberoptic Bronchoscope in Lateral Patient Positioning: A Prospective Randomized Controlled Trial. Chin. Med. J. 2016;129:2045–2049
21. Ovassapian A, Dykes M, Golmon M. A training programme for fiberoptic nasotracheal intubation. Use of model and live patients. Anaesthesia 1983;38:795–798
22. Ababneh O, Bsisu I, El-Share' AI, Alrabayah M, Qudaisat I, Alghanem S, Khreesha Adachi YU, Satomoto M, Higuchi H. Fiberoptic orotracheal intubation in the left semilateral position. Anesth Analg 2002;94:477-8.
23. Li H, Wang W, Lu YP, Wang Y, Chen LH, Lei LP, et al. Evaluation of endotracheal intubation with a flexible fiberoptic bronchoscope in lateral patient positioning: A prospective randomized controlled trial. Chin Med J 2016;129:2045-9
24. Goyal K, Rath GP, Chowdhury T, Mahajan C. Boneless occiput and awake fibreoptic intubation in lateral position. Indian J Anaesth 2010;54:265-6
25. Lee SH, Park YK, Cho SM. Technical skills and training of upper gastrointestinal endoscopy for new beginners. World J Gastroenterol. 2015;21(3):759–85
26. Adachi YU, Satomoto M, Higuchi H. Tracheal intubation in the lateral position. Anesth Analg. 2004;99(3):95
27. Li H, Wang W, Lu YP. Evaluation of endotracheal intubation with a flexible fiberoptic bronchoscope in lateral patient positioning: a prospective randomized controlled trial. Chin Med J (Engl). 2016;129(17):2045–9
28. Litman RS, Wake N, Chan LM. Effect of lateral positioning on upper airway size and morphology in sedated children. Anesthesiology. 2005;103(3):484–8.
29. Brimacombe J, Holyoake L, Keller C. Pharyngolaryngeal, neck, and jaw discomfort after anesthesia with the face mask and laryngeal mask airway at high and low cuff volumes in males and females. Anesthesiology. 2000;93(1):26–31
30. Park SJ, Kim BS, Jee DL. Jaw-thrust induces sympathetic responses during induction of general anesthesia. Korean J Anesthesiol. 2013;65(2):127–31
31. Wahdan A, El-Refai NAR, Omar SH, Abdel Moneem SA, Mohamed MM, Hussien MM. Endotracheal intubation in patients undergoing open abdominal surgery in the lateral position: a comparison between the intubating video stylet and fiberoptic intubating bronchoscopy. Korean J Anesthesiol. 2021;74(3):234-241
32. Gopinath B, Sachdeva S, Kumar A, Kumar G. Advancing emergency airway management by reducing intubation time at a high-volume academic emergency department. BMJ Open Qual. 2021 Jul;10(Suppl 1):e001448
33. Apfelbaum JL, Hagberg CA, Connis RT, Abdelmalak BB, Agarkar M, Dutton RP, Fiadjoe JE, Greif R, Klock PA, Mercier D, Myatra SN, O'Sullivan EP, Rosenblatt WH, Sorbello M, Tung A. 2022 American Society of Anesthesiologists Practice Guidelines for Management of the Difficult Airway. Anesthesiology. 2022;136(1):31-81
34. Isono S, Tanaka A, Nishino T. Lateral position decreases collapsibility of the passive pharynx in patients with obstructive sleep apnea. Anesthesiology. 2002;97(4):780-5
35. Arai YP, Fukunaga K, Hirota S, Fujimoto S. The effects of chin lift and jaw thrust while in the lateral position on stridor score in anesthetized children with adenotonsillar hypertrophy. Anesth Analg. 2004;99(6):1638-1641
36. McHardy FE., Chung F. Postoperative sore throat: Cause, prevention and treatment. Anaesthesia. 1999;54:444–453
37. McCaul CL, Harney D, Ryan M, Moran C, Kavanagh BP, Boylan JF. Airway management in the lateral position: a randomized controlled trial. Anesth Analg. 2005;101:1221–5
38. Isono S, Tanaka A, Nishino T. Lateral position decreases collapsibility of the passive pharynx in patients with obstructive sleep apnea. Anesthesiology. 2002;97:780–5
39. Apfelbaum JL, Hagberg CA, Connis RT, Abdelmalak BB, Agarkar M, Dutton RP, et al. 2022 American Society of Anesthesiologists practice guidelines for management of the difficult airway. Anesthesiology. 2022;136:31–81
40. Athiraman U, Gupta R, Singh G. Endotracheal cuff pressure changes with change in position in neurosurgical patients. Int J Crit Illn Inj Sci. 2015;5(4):237–41
41. Prasad MK, Sinha AK, Bhadani UK. Management of difficult airway in penetrating cervical spine injury. Indian J Anaesth. 2010;54(1):59–61
42. Panwar M, Bharadwaj A, Chauhan G, Kalita D. Intubating laryngeal mask airway as an independent ventilatory and intubation device. A comparison between supine, right lateral and left lateral. Korean J
43. Anesthesiol 2013;65:306-11

DOI: 10.69605/ijlbpr_14.4.2025.164

44. Catheline JM, Capelluto E, Gaillard JL, Turner R, Champault G. Thromboembolism prophylaxis and incidence of thromboembolic complications after laparoscopic surgery. Int J Surg Investig 2000;2:41-7

45. Kamolpornwijit W, Iamtrirat P, Phupong V. Cardiac and hemodynamic changes during carbon dioxide pneumoperitoneum for laparoscopic gynecologic surgery in Rajavithi Hospital. J Med Assoc Thai 2008;91:603-7