

## Comparison of Efficacy Between Awake Fibre Optic vs Awake Video Laryngoscopic Tracheal Intubation in Patient with Anticipated Difficult Airway in Tertiary Care Centre

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### Abstract:

**Background:** Securing the airway is a critical responsibility of the anesthesiologist, particularly in patients with an anticipated difficult airway. Awake tracheal intubation allows maintenance of spontaneous respiration and provides an additional margin of safety during difficult airway management. Awake fibreoptic intubation (AFOI) has traditionally been regarded as the gold standard; however, it requires considerable expertise, patient cooperation, and careful airway preparation. Awake video laryngoscopy (AVL) has emerged as an alternative technique because of its ease of use, improved glottic visualization, and increasing availability. The present study was undertaken to compare the efficacy, safety, and practical usefulness of awake fibreoptic and awake video laryngoscopic tracheal intubation in adult patients with anticipated difficult airways.

**Methods:** This quasi-experimental study was conducted in the Department of Anaesthesiology at a tertiary care centre over a period of 18 months. A total of 70 adult patients with anticipated difficult airways undergoing elective surgery under general anaesthesia were included. Patients were randomly allocated into two equal groups of 35 each. Group A underwent awake fibreoptic intubation, while Group B underwent awake video laryngoscopic intubation. The primary outcome was time required for successful tracheal intubation. Secondary outcomes included first-attempt success rate, number of intubation attempts, Cormack–Lehane grade, oxygen desaturation, and intubation-related complications. Data were analysed using appropriate statistical tests, with  $p < 0.05$  considered statistically significant. The study was conducted after Institutional Ethics Committee approval and written informed consent.

**Results:** The median time required for successful tracheal intubation was significantly shorter in Group B than Group A, at 84 [70–105] seconds versus 112 [95–140] seconds, respectively ( $p = 0.001$ ). First-attempt success was higher with video laryngoscopy than fibreoptic intubation (88.6% vs. 80.0%), although the difference was not statistically significant ( $p = 0.32$ ). The mean number of attempts was also lower in Group B ( $1.11 \pm 0.32$  vs.  $1.23 \pm 0.50$ ;  $p = 0.26$ ). Grade I Cormack–Lehane views were significantly more frequent in Group B (45.7% vs. 20.0%;  $p = 0.02$ ), whereas Grade III views were significantly more common in Group A (34.3% vs. 11.4%;  $p = 0.02$ ). Oxygen desaturation occurred in 5.7% of Group B compared with 11.4% of Group A ( $p = 0.39$ ). Intubation-related complications were also less frequent in Group B, although differences were not statistically significant.

**Conclusion:** Awake video laryngoscopic intubation was a safe and effective alternative to awake fibreoptic intubation in appropriately selected adult patients with anticipated difficult airways. It provided significantly shorter intubation time and better glottic visualization, with favourable trends in first-attempt success, number of attempts, oxygenation, and procedure-related complications. These findings support the use of awake video laryngoscopy as an effective technique for anticipated difficult airway management, while technique selection should remain individualized according to patient characteristics, available equipment, and operator expertise.

**Keywords:** Awake intubation; difficult airway; fibreoptic intubation; video laryngoscopy; tracheal intubation; airway management; anaesthesia.

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## Introduction

Securing the airway is one of the most important responsibilities of an anesthesiologist. Failure to maintain a clear and adequately protected airway can result in serious complications, including hypoxia, pulmonary aspiration, neurological injury, and even death [1]. Difficult tracheal intubation remains an important cause of anesthesia-related complications and may result in adverse events during induction of general anesthesia. In patients with an anticipated difficult airway, awake tracheal intubation is often preferred because spontaneous respiration is maintained throughout the procedure, thereby providing an additional margin of safety when intubation becomes difficult or unsuccessful [2].

Awake Fibreoptic Intubation (AFOI) has traditionally been regarded as the gold standard technique for management of the anticipated difficult airway. It involves the use of a flexible fibreoptic scope to visualize the airway and guide the endotracheal tube into the trachea through either the oral or nasal route while allowing the patient to maintain spontaneous breathing [1]. AFOI has been successfully utilized in various difficult airway situations, including limited mouth opening, cervical spine instability or immobilization, and facial trauma. However, the technique has several limitations [3]. It requires considerable expertise and training, adequate patient cooperation, and meticulous preparation of the airway. Furthermore, blood, secretions, airway swelling, or distorted airway anatomy may obscure the fibreoptic view and make successful intubation more challenging [2].

Awake video laryngoscopy (AVL) has emerged as a useful alternative to awake fibreoptic intubation in patients with anticipated difficult airways [4]. Video laryngoscopes, including the McGrath MAC, GlideScope, and C-MAC, utilize a small camera to provide visualization of the airway and vocal cords. Compared with conventional direct laryngoscopy, these devices frequently provide improved visualization of the glottis and may facilitate intubation in patients with difficult airway anatomy. Another important advantage of AVL is that it is generally easier to learn and perform than fibreoptic intubation and requires less specialized training [3]. Because of its relative ease of use and increasing availability, video laryngoscopy is becoming an increasingly popular option for awake tracheal intubation [5].

Recent studies have demonstrated that awake video laryngoscopy is an effective alternative to fibreoptic intubation for management of difficult airways. A systematic review and meta-analysis by Merola reported that videolaryngoscopy and fibreoptic bronchoscopy had similar overall success rates for

awake tracheal intubation, while videolaryngoscopy was associated with a shorter intubation time [6]. Similarly, Kamga reported that Airtraq videolaryngoscopy allowed faster tracheal intubation than flexible fibreoptic bronchoscopy in patients with anticipated difficult airways [7]. Although fibreoptic intubation demonstrated a slightly higher success rate with the initially assigned technique, the shorter intubation time associated with videolaryngoscopy may provide practical clinical benefits. These findings suggest that AVL is a safe and effective option for awake tracheal intubation, while the selection between AVL and fibreoptic intubation should be guided by individual airway characteristics and clinician experience.

Both awake fibreoptic intubation and awake video laryngoscopy are effective techniques for managing difficult airways in patients with conditions such as head and neck diseases, obesity, cervical spine problems, and abnormal airway anatomy [1]. However, the choice of technique may depend on clinician experience, equipment availability, and familiarity with the particular device. Current airway management guidelines recommend selecting the most appropriate technique according to the patient's airway characteristics, anticipated difficulties, available resources, and operator skills [8]. Therefore, rather than universally favoring one technique, an individualized approach to awake intubation is recommended to achieve safe and successful airway management.

Although research evaluating awake intubation techniques has increased in recent years, relatively few large prospective studies have directly compared awake fibreoptic intubation and awake video laryngoscopic intubation using standardized methods. This limitation is particularly relevant in tertiary care hospitals in developing countries. Furthermore, several clinically important outcomes, including time required for successful intubation, number of intubation attempts, episodes of oxygen desaturation, quality of laryngeal view, and operator satisfaction, have not been adequately compared in many studies. Therefore, further research is required to clarify the strengths and limitations of both techniques and determine their suitability in different clinical situations.

The present study was conducted to compare awake fibreoptic intubation and awake video laryngoscopic intubation in adult patients with anticipated difficult airways. This prospective study was carried out in a tertiary care hospital to assess the effectiveness, safety, and practical usefulness of both techniques. By evaluating procedural performance and patient outcomes, the study aims to provide clinically relevant evidence to assist anesthesiologists in

selecting the most appropriate technique for safe and effective management of anticipated difficult airways.

### Material and Methods

The present quasi-experimental study was conducted in the Department of Anaesthesiology at a tertiary care centre over a period of 18 months. The study population comprised adult patients of either sex, posted for elective surgical procedures under general anaesthesia, who were identified to have an anticipated difficult airway and were admitted to the male and female surgical wards of the hospital. A total of 70 patients were included in the study using a convenience sampling method. All eligible patients who met the inclusion criteria during the study period were enrolled.

The selected sample was randomly allocated into two equal groups:

- **Group A (n = 35):** Awake fibre-optic intubation group
- **Group B (n = 35):** Awake video laryngoscopic intubation group

Randomization was done using an appropriate randomization technique. The sample size was calculated using the formula:  $N = 2S^2(Z_1 + Z_2)^2 / (M_1 - M_2)^2$

Based on previous studies, the calculated minimum sample size was 30 per group. After adding 10% for possible dropouts and non-response, the final sample size was rounded off to 35 patients per group, making a total sample size of 70 patients.

### Inclusion Criteria:

1. Patients aged more than 18 years.
2. Patients with anticipated difficult airway as evidenced by:
  - Mouth opening less than three finger breadths
  - Mallampati grade III or IV
  - Increased El-Ganzouri risk index
  - Reduced thyromental distance
  - Restricted neck movement
  - History of difficult intubation

### Exclusion Criteria

1. Patients unwilling to participate in the study.
2. Patients with deranged coagulation profile.
3. Patients belonging to ASA physical status class IV or above.
4. Patients with ischemic heart disease.
5. Pregnant patients.
6. Patients aged less than 18 years.

**Preoperative Assessment:** All patients underwent a detailed pre-anaesthetic evaluation one day prior to surgery. Airway assessment was performed using the Mallampati classification, inter-incisor distance,

thyromental distance, neck mobility, and El-Ganzouri risk index.

**Procedure:** Upon arrival in the operating room, standard monitors including electrocardiography, non-invasive blood pressure, and pulse oximetry were attached. A 20-gauge intravenous cannula was secured, and baseline vital parameters were recorded.

Patients were allocated to one of the two study groups based on randomization.

In Group A, tracheal intubation was performed using awake fibre-optic bronchoscopy. In Group B, tracheal intubation was performed using awake video laryngoscopy.

The time taken for successful tracheal intubation, number of attempts, Cormack–Lehane grade, incidence of esophageal intubation, and occurrence of oxygen desaturation ( $SpO_2 < 90\%$ ) were recorded.

**Intraoperative Management:** Anaesthesia was maintained with oxygen (40%), air (60%), and sevoflurane at 1 minimum alveolar concentration (MAC). Hemodynamic parameters were monitored at regular intervals. Additional doses of fentanyl were administered as required to maintain adequate analgesia.

**Postoperative Management:** At the completion of surgery, sevoflurane was discontinued and neuromuscular blockade was reversed. Patients were extubated after fulfilling standard extubation criteria. Time to extubation, eye opening, and response to verbal commands were recorded.

Patients were transferred to the post-anaesthesia care unit (PACU), where oxygen was administered via face mask at 6 L/min. Pain was assessed using a visual analogue scale (VAS), and sedation was evaluated using a four-point sedation scale at admission and at 2, 4, and 6 hours postoperatively. The incidence of postoperative nausea and vomiting was recorded, and intravenous ondansetron (4 mg) was administered when required.

**Ethical Considerations:** The study was conducted after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from all patients prior to enrolment. Patient confidentiality was maintained throughout the study.

**Statistical Analysis:** Data were entered into Microsoft Excel and analysed using GraphPad Prism version 5. Quantitative variables were expressed as mean and standard deviation or median and interquartile range as appropriate. Qualitative variables were expressed as frequency and percentage. The Z-test and Mann–Whitney U test were used for comparison between groups. A p-

value of less than 0.05 was considered statistically significant.

## Results

### Time to Successful Tracheal Intubation:

The time required for successful tracheal intubation is presented in Table 10. The median intubation time

was significantly longer in Group A compared with Group B (112 [95–140] seconds vs. 84 [70–105] seconds;  $p = 0.001$ ). This finding indicates that awake video laryngoscopic intubation enabled a faster successful intubation than awake fiberoptic intubation in the present study.

**Table 1: Comparison of time to successful tracheal intubation between the two groups.**

| Group                        | Median Time (seconds) [IQR] | p-value |
|------------------------------|-----------------------------|---------|
| Group A (Fibreoptic)         | 112 [95–140]                |         |
| Group B (Video Laryngoscopy) | 84 [70–105]                 | 0.001   |

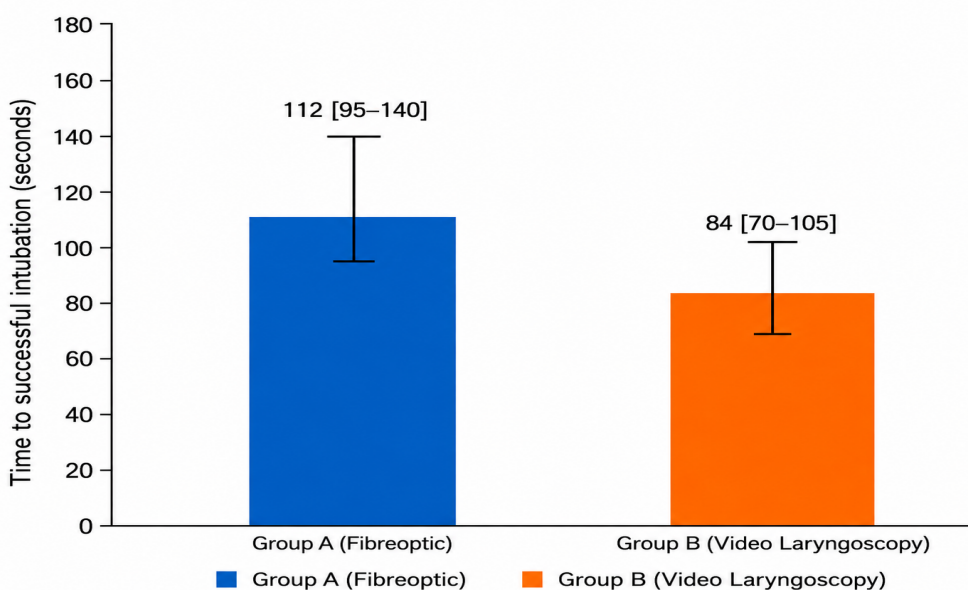


**Figure 1: Comparison of time to successful tracheal intubation between the two groups.**

**First-Attempt Success Rate and Number of Intubation Attempts:** The intubation success profile is shown in Tables 11 and 12. The first-attempt success rate was higher in Group B than in Group A (88.6% vs. 80.0%), although the difference was not statistically significant ( $p = 0.32$ ). Similarly, the mean number of intubations attempts per patient

was lower in Group B than in Group A ( $1.11 \pm 0.32$  vs.  $1.23 \pm 0.50$ ), but this difference was also not statistically significant ( $p = 0.26$ ). These findings suggest a trend toward easier intubation with awake video laryngoscopy, although statistical significance was not reached.

**Table 2: Comparison of first-attempt success rate between the two groups.**

| Group   | First Attempt Success n (%) | p-value |
|---------|-----------------------------|---------|
| Group A | 28 (80.0)                   |         |
| Group B | 31 (88.6)                   | 0.32    |

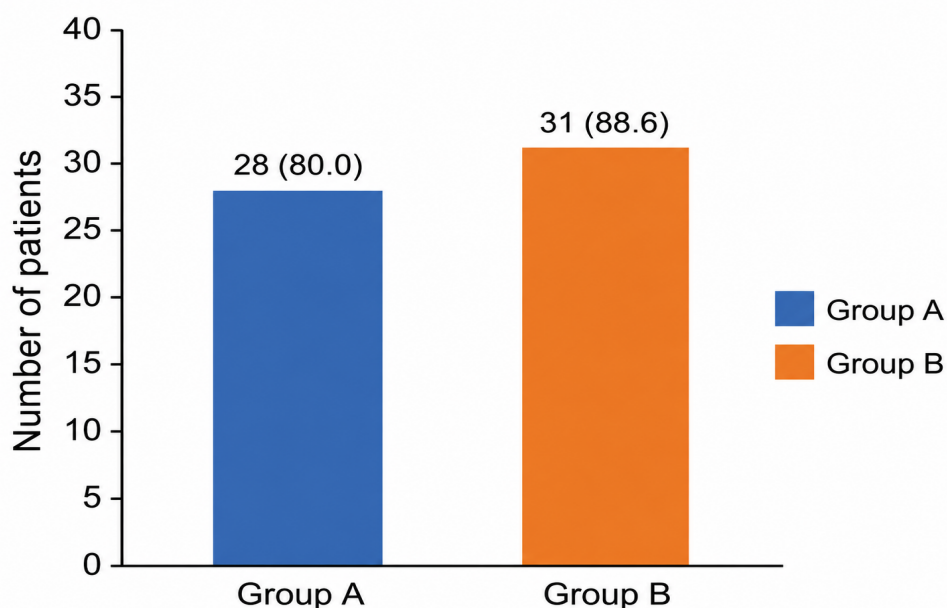


Figure 2: Comparison of first-attempt success rate between the two groups.

Table 3: Comparison of the total number of intubation attempts per patient between the two groups.

| Group   | Mean Attempts $\pm$ SD | p-value |
|---------|------------------------|---------|
| Group A | 1.23 $\pm$ 0.50        |         |
| Group B | 1.11 $\pm$ 0.32        | 0.26    |

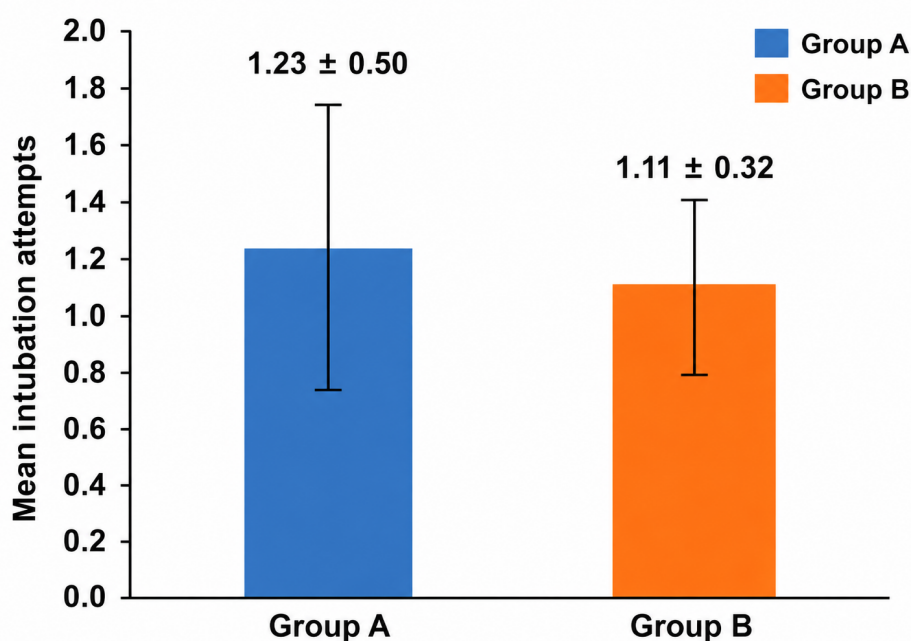


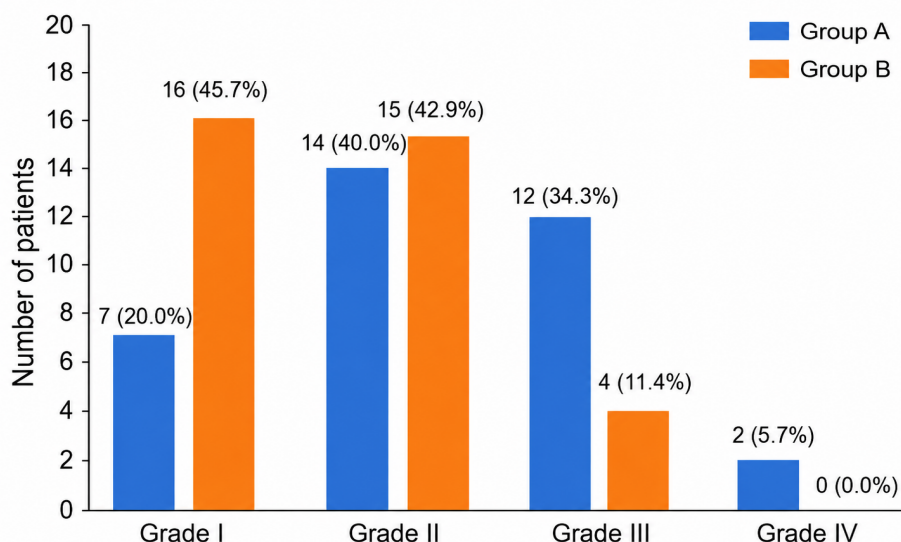
Figure 3: Comparison of the total number of intubation attempts per patient between the two groups.

**Cormack–Lehane Grading:** The laryngoscopic view obtained during intubation is summarized in Table 14. Group B demonstrated a more favourable Cormack–Lehane grading compared with Group A. Grade I view was observed significantly more often in Group B than in Group A (45.7% vs. 20.0%;  $p = 0.02$ ), while Grade III view was significantly more

common in Group A than in Group B (34.3% vs. 11.4%;  $p = 0.02$ ). No statistically significant differences were noted for Grade II or Grade IV views. These findings suggest that awake video laryngoscopy provided superior glottic visualization compared with awake fiberoptic intubation.

**Table 4: Distribution of Cormack–Lehane grades among the study participants between the two groups.**

| CL Grade  | Group A n (%) | Group B n (%) | p-value |
|-----------|---------------|---------------|---------|
| Grade I   | 7 (20.0)      | 16 (45.7)     | 0.02    |
| Grade II  | 14 (40.0)     | 15 (42.9)     | 0.81    |
| Grade III | 12 (34.3)     | 4 (11.4)      | 0.02    |
| Grade IV  | 2 (5.7)       | 0 (0.0)       | 0.15    |

**Figure 4: Distribution of Cormack–Lehane grades among the study participants between the two groups.**

**Oxygenation Outcomes During Intubation:** The oxygenation outcomes during intubation are presented in Tables 15 and 16. As shown in Table 15, oxygen desaturation ( $\text{SpO}_2 < 90\%$ ) occurred in 4 patients (11.4%) in Group A and 2 patients (5.7%) in Group B; however, this difference was not statistically significant ( $p = 0.39$ ). Table 16 shows that the mean lowest recorded oxygen saturation was

$91.8 \pm 4.3\%$  in Group A and  $93.6 \pm 3.2\%$  in Group B. Although Group B maintained a slightly higher oxygen saturation, the difference did not reach statistical significance ( $p = 0.06$ ). Overall, oxygenation was maintained in most patients in both groups, with a trend toward better oxygenation in the awake video laryngoscopy group.

**Table 5: Comparison of the incidence of oxygen desaturation ( $\text{SpO}_2 < 90\%$ ) between the two groups.**

| Outcome                  | Group A n (%) | Group B n (%) | p-value |
|--------------------------|---------------|---------------|---------|
| $\text{SpO}_2 \geq 90\%$ | 31 (88.6)     | 33 (94.3)     |         |
| $\text{SpO}_2 < 90\%$    | 4 (11.4)      | 2 (5.7)       | 0.39    |

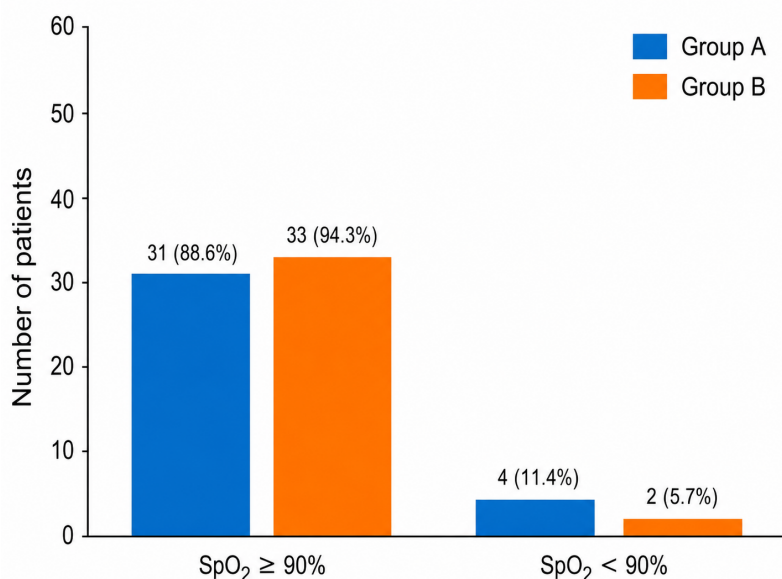


**Figure 5: Comparison of the incidence of oxygen desaturation (SpO<sub>2</sub> < 90%) between the two groups.**

**Intubation-Related Complications:** The intubation-related complications are shown in Table 17. Airway trauma, excessive coughing or gagging, and hemodynamic instability were observed more frequently in Group A than in Group B; however, none of these differences were statistically

significant ( $p = 0.23$ ,  $p = 0.29$ , and  $p = 0.64$ , respectively). Overall, both techniques were associated with a low incidence of complications, with a tendency toward fewer adverse events in the awake video laryngoscopy group.

**Table 6: Comparison of intubation-related complications between the two groups.**

| Complication               | Group A n (%) | Group B n (%) | p-value |
|----------------------------|---------------|---------------|---------|
| Airway trauma              | 5 (14.3)      | 2 (5.7)       | 0.23    |
| Excessive coughing/gagging | 6 (17.1)      | 3 (8.6)       | 0.29    |
| Hemodynamic instability    | 3 (8.6)       | 2 (5.7)       | 0.64    |

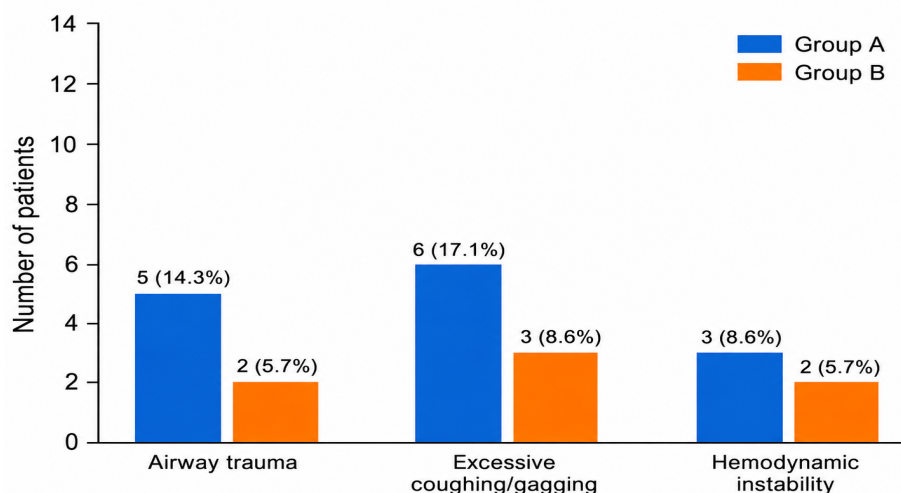


**Figure 6: Comparison of intubation-related complications between the two groups.**

## Discussion

Based on the findings, awake video laryngoscopy appears to be a reliable and efficient alternative to awake fiberoptic intubation for the management of anticipated difficult airways in appropriately selected patients.

A notable strength of the present study was the similarity of the two groups at baseline. There were no significant differences between the groups with respect to age, sex distribution, or ASA physical status. Similarly, preoperative airway assessment findings, including Mallampati grade, mouth opening, thyromental distance, neck mobility, and

El-Ganzouri risk index, were comparable in both groups.

This baseline comparability is important because it minimizes the possibility that differences in study outcomes were influenced by variations in patient characteristics [1]. As a result, the observed differences are more likely to reflect the effects of the intubation technique itself rather than underlying differences between the study populations. Since airway anatomy and patient-related factors can have a significant impact on the ease and success of awake intubation, ensuring similar baseline characteristics strengthens the validity of the study findings.

One of the key findings of the present study was that the time required to achieve successful tracheal intubation was significantly shorter in the awake video laryngoscopy group compared with the awake fibreoptic intubation group. This observation is in agreement with the findings of previous studies. Merola et al., in their systematic review and meta-analysis of randomized controlled trials, reported that videolaryngoscopy reduced intubation time when compared with fibreoptic bronchoscopy during awake tracheal intubation, while maintaining similar overall success rates. Likewise, Kamga et al. found that Airtraq videolaryngoscopy enabled faster intubation than flexible fibreoptic bronchoscopy in patients with anticipated difficult airways [1].

The reduced intubation time associated with videolaryngoscopy in the present study may be related to the ease of use of the device and the clear view of the glottic structures provided by the video screen. This allows quicker identification of the airway and facilitates tube placement [6]. In contrast, fibreoptic intubation requires careful navigation of the bronchoscope through the airway and may become more challenging in the presence of secretions or blood [7]. Furthermore, the technique is highly dependent on operator skill and experience, which can increase the time required to complete the procedure.

Although the first-attempt success rate and the number of intubation attempts were not significantly different between the two groups, both parameters showed a favourable trend toward awake video laryngoscopy. Similar findings have been reported in previous studies. Merola et al. found no significant difference in first-attempt success rates between videolaryngoscopy and fibreoptic bronchoscopy during awake tracheal intubation, indicating that both techniques are highly effective when performed in appropriately selected patients [6]. On the other hand, Guo et al. reported a higher first-attempt success rate and shorter intubation time with videolaryngoscopy compared with flexible fibreoptic bronchoscopy in patients undergoing intubation with cervical spine immobilization, while

the incidence of complications was comparable between the two techniques.

The absence of a statistically significant difference in the present study may be related to the relatively small sample size, which could have limited the ability to detect differences between the groups. Nevertheless, the higher first-attempt success rate and fewer intubation attempts observed with videolaryngoscopy suggest that it may offer certain practical advantages during awake intubation [9].

An important finding of the present study was the significantly better Cormack–Lehane grading observed in the awake video laryngoscopy group. Patients in Group B had a higher proportion of Grade I views and fewer Grade III views than those in Group A, indicating superior visualization of the glottic structures [9]. Improved laryngeal visualization may have contributed to the shorter intubation time and higher first-attempt success rate observed with videolaryngoscopy in this study.

These findings are consistent with previous reports in the literature. Stroumpoulis et al. demonstrated that videolaryngoscopy improved laryngeal exposure in patients with anticipated difficult airways, resulting in a greater number of Cormack–Lehane Grade I and II views and fewer Grade III and IV views compared with conventional laryngoscopy. Similarly, Guo et al. reported better first-attempt success and shorter intubation times with videolaryngoscopy than with flexible fibreoptic bronchoscopy in patients with cervical spine immobilization [4]. Their findings suggest that enhanced visualization of the airway provided by videolaryngoscopy can facilitate tracheal intubation, particularly in anatomically difficult airways.

The oxygenation outcomes in the present study were also slightly better in the awake video laryngoscopy group, although the differences did not reach statistical significance. Episodes of oxygen desaturation below 90% were less common among patients undergoing video laryngoscopic intubation, and the lowest oxygen saturation recorded during the procedure was also higher in this group. Similar findings have been reported in previous studies. Merola et al. observed a lower incidence of oxygen desaturation during awake intubation with videolaryngoscopy compared with fibreoptic bronchoscopy [6]. The improved oxygenation seen with videolaryngoscopy may be related to the shorter time required to secure the airway and the reduced need for prolonged airway manipulation.

Esophageal intubation was a rare event in the present study. It was observed in only one patient in the awake fibreoptic intubation group, while no such episode occurred in the awake video laryngoscopy group [1]. Other adverse events, including airway trauma, excessive coughing or gagging, and

hemodynamic instability, were also observed slightly more frequently in the fiberoptic group; however, these differences were not statistically significant [6].

These findings are consistent with previous studies that have demonstrated a comparable safety profile for both techniques when performed by trained operators using adequate airway topicalization and patient preparation. Merola et al. reported no significant differences between videolaryngoscopy and fiberoptic bronchoscopy with regard to failed intubation, postoperative sore throat, or hoarseness [9]. Similarly, Guo et al. found that the incidence of tissue injury and sore throat was comparable between the two techniques in patients with simulated difficult airways created by cervical immobilization.

The marginally higher frequency of minor complications observed in the fiberoptic group may be explained by the longer duration of airway manipulation and the greater technical complexity associated with fiberoptic bronchoscopy.

The findings of the present study have important practical implications for the management of anticipated difficult airways in tertiary care settings. Awake fiberoptic intubation has traditionally been considered the gold standard technique and continues to play a crucial role in situations involving severe airway abnormalities, markedly restricted mouth opening, or cases where the flexibility of a bronchoscope is particularly beneficial [1]. Despite this, awake video laryngoscopy has emerged as an attractive alternative because of several practical advantages. In addition, the technique is generally easier to learn and perform, making it more accessible to clinicians with different levels of airway management experience.

The Difficult Airway Society guidelines recommend awake tracheal intubation in patients with predictors of a difficult airway and recognize both videolaryngoscopy and fiberoptic bronchoscopy as appropriate techniques when accompanied by proper patient preparation, adequate oxygenation, effective airway topicalization, and operator training [3]. Against this background, the results of the present study add to the growing body of evidence supporting awake video laryngoscopy as an effective and safe first-line option for anticipated difficult airway management.

S.S. Wahba et al. (2012) Comparative study of awake endotracheal intubation with Glidescope video laryngoscope versus flexible fiber optic bronchoscope in patients with traumatic cervical spine injury. Fifty patients undergoing post traumatic cervical spine fixation under general anesthesia were randomly allocated to two groups in

a prospective, controlled non-blinded study. All patients were premedicated with glycopyrrolate 0.2 mg iv and midazolam 1 mg iv that be repeated up to 0.05 mg/kg followed with a bolus dose of remifentanyl 1.5 µg/kg then a continuous remifentanyl infusion of 0.15 µg/kg/min for 3 min before procedure(15). Each patient underwent a wake endotracheal intubation with either GVL (G group) or FOB (F group) with manual in line stabilization (MILS). Intubating time, intubating attempts, hear rate (HR), mean arterial pressure (MAP), oxygen desaturation ( $SO_2 < 90\%$ ), sore throat, patient satisfaction and postintubation neurological outcome were recorded. The GVL is a safe surrogate for FOB during awake intubation for post traumatic cervical spine fixation. [10]

Based on the results of the present study, awake video laryngoscopic intubation appears to be at least as effective as awake fiberoptic intubation in patients with an anticipated difficult airway. In addition, video laryngoscopy was associated with a significantly shorter intubation time and better glottic visualization. It also demonstrated favourable trends with regard to ease of intubation and maintenance of oxygenation during the procedure.

The findings of the present study should be interpreted while considering its design and setting. As this was a single-centre quasi-experimental study with a relatively small sample size, the study may not have had sufficient power to detect statistically significant differences for some of the secondary outcome measures.

## Conclusion

Based on the results of the present study, awake video laryngoscopic intubation can be considered a safe and effective alternative to awake fiberoptic intubation in adult patients with an anticipated difficult airway. Both techniques were successful in securing the airway and were associated with a low rate of complications. However, awake video laryngoscopy was associated with a significantly shorter intubation time and provided better glottic visualization compared with awake fiberoptic intubation.

In addition, awake video laryngoscopy showed favourable trends with respect to first-attempt intubation success, the number of intubation attempts required, maintenance of oxygen saturation, and the occurrence of procedure-related adverse events. These findings suggest that video laryngoscopy may offer practical advantages in the management of anticipated difficult airways and can be used effectively as a primary intubation technique in appropriately selected patients.

## References

1. Ahmad I, El-Boghdadly K, Bhagrath R, Hodzovic I, McNarry AF, Mir F, et al. Difficult Airway Society guidelines for awake tracheal intubation (ATI) in adults. *Anaesthesia*. 2020;75(4):509-28.
2. Joffe AM, Aziz MF, Posner KL, Duggan LV, Mincer SL, Domino KB. Management of difficult tracheal intubation: a closed claims analysis. *Anesthesiology*. 2019;131(4):818-29.
3. Law JA, Thana A, Milne AD. The incidence of awake tracheal intubation in anesthetic practice is decreasing: a historical cohort study of the years 2014-2020 at a single tertiary care institution. *Can J Anaesth*. 2023;70(1):69-78.
4. Stroumpoulis K, Pagoulitou A, Violari M, Ikononou I, Kalantzi N, Kastrinaki K, et al. Videolaryngoscopy in the management of the difficult airway: a comparison with the Macintosh blade. *Eur J Anaesthesiol*. 2009;26(3):218-22.
5. de Carvalho CC, da Silva DM, Lemos VM, Dos Santos TGB, Agra IC, Pinto GM, et al. Videolaryngoscopy vs. direct Macintosh laryngoscopy in tracheal intubation in adults: a ranking systematic review and network meta-analysis. *Anaesthesia*. 2022;77(3):326-38.
6. Merola R, Vargas M, Marra A, Buonanno P, Coviello A, Servillo G, et al. Videolaryngoscopy versus fiberoptic bronchoscopy for awake tracheal intubation: a systematic review and meta-analysis of randomized controlled trials. *J Clin Med*. 2024;13(11):3186.
7. Kanga H, Frugier A, Boutros M, Bourges J, Doublet T, Parienti JJ. Flexible nasal bronchoscopy vs. Airtraq videolaryngoscopy for awake tracheal intubation: a randomised controlled non-inferiority study. *Anaesthesia*. 2023;78(8):963-9.
8. 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(1):31-81.
9. Guo N, Wen X, Wang X, Yang J, Zhou H, Guo J, et al. Comparison of outcomes between video laryngoscopy and flexible fiberoptic bronchoscopy for endotracheal intubation in adults with cervical neck immobilization: a systematic review and meta-analysis of randomized controlled trials. *PLoS One*. 2024;19(11):e0313280.
10. Aziz MF, Dillman D, Fu R, Brambrink AM. Comparative effectiveness of the C-MAC video laryngoscope versus direct laryngoscopy in the setting of the predicted difficult airway. *Anesthesiology*. 2012;116(3):629-36.