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Original Research Article

Comparative Evaluation of i-gel and Endotracheal Tube for Hemodynamic Stability and Ventilatory Parameters during Laparoscopic Cholecystectomy

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Abstract:

Background: Airway management during laparoscopic cholecystectomy remains a critical component of anesthetic practice because pneumoperitoneum and patient positioning significantly influence respiratory mechanics and hemodynamic responses. Endotracheal tube (ETT) has traditionally been considered the gold standard airway device; however, second-generation supraglottic airway devices such as i-gel have emerged as effective alternatives with potential advantages including easier insertion, reduced sympathetic stimulation, and lower postoperative airway morbidity.

Aim and Objectives: To compare i-gel and endotracheal tube regarding hemodynamic stability and ventilatory parameters in patients undergoing elective laparoscopic cholecystectomy under general anesthesia.

Material and Methods: This prospective randomized comparative study was conducted on 100 patients aged 18–60 years belonging to ASA physical status I and II scheduled for elective laparoscopic cholecystectomy. Patients were randomly allocated into two groups: Group I (i-gel, n=50) and Group E (ETT, n=50). Hemodynamic parameters including heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial pressure (MAP) were recorded at baseline, after insertion, after pneumoperitoneum, and after removal of airway device. Ventilatory parameters including oxygen saturation (SpO_2), end tidal carbon dioxide ($EtCO_2$), peak airway pressure (PAP), and airway leak pressure were assessed. Ease of insertion, insertion time, postoperative sore throat, cough, and other complications were also evaluated.

Results: Insertion time was significantly shorter in the i-gel group compared to the ETT group (11.4 ± 2.3 sec vs 17.2 ± 2.9 sec, $p<0.001$). HR and MAP increased significantly after intubation in the ETT group compared to the i-gel group ($p<0.001$). Ventilatory parameters including SpO_2 and $EtCO_2$ were comparable between groups throughout surgery. Peak airway pressure was significantly lower in the i-gel group during pneumoperitoneum ($p<0.05$). Postoperative sore throat and coughing were significantly more common in the ETT group.

Conclusion: The i-gel supraglottic airway device provides superior hemodynamic stability with comparable ventilatory efficacy and fewer postoperative airway complications compared to endotracheal tube during laparoscopic cholecystectomy. It may be considered a safe and effective alternative to endotracheal intubation in selected patients.

Keywords: Endotracheal Tube, i-gel, Laparoscopic Cholecystectomy, Hemodynamic Stability, Ventilatory Parameters, Supraglottic Airway Device.

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Introduction

Laparoscopic cholecystectomy has become the gold standard procedure for symptomatic gallstone disease due to reduced postoperative pain, shorter hospital stay, early ambulation, and improved cosmetic outcomes. However, laparoscopic procedures present unique anesthetic challenges because creation of pneumoperitoneum causes increased intra-abdominal pressure, altered respiratory mechanics, decreased pulmonary compliance, elevated airway pressures, and significant cardiovascular changes. Secure airway management and maintenance of adequate ventilation are therefore crucial during these procedures. [1,2] Traditionally, cuffed endotracheal

tube (ETT) has been regarded as the standard airway device for laparoscopic surgeries because it offers a sealed airway, protection against aspiration, and allows controlled ventilation. Nevertheless, laryngoscopy and tracheal intubation are associated with significant sympathetic stimulation leading to tachycardia and hypertension. These responses may be harmful, especially in patients with cardiovascular disease, hypertension, or limited cardiac reserve. Additionally, tracheal intubation may result in postoperative sore throat, hoarseness, coughing, and airway trauma. [3-5]

Supraglottic airway devices (SADs) have gained popularity as alternatives to tracheal intubation. Among them, the i-gel airway device has emerged as a second-generation SAD with several advantages. The i-gel is made of thermoplastic elastomer and possesses a noninflatable cuff designed to anatomically conform to the perilaryngeal structures. It also contains a gastric drainage channel that reduces the risk of aspiration and facilitates gastric tube insertion. Due to its design, i-gel insertion is easier, faster, and associated with minimal tissue compression and lower airway morbidity. [6-8] Several studies have demonstrated that i-gel provides adequate oropharyngeal seal pressure and effective positive pressure ventilation even during laparoscopic surgeries where airway pressures rise due to pneumoperitoneum.

Comparative studies have reported reduced hemodynamic stress response during insertion of i-gel compared to ETT. Moreover, the incidence of postoperative sore throat and cough has been observed to be significantly lower with i-gel. [9]

The use of i-gel during laparoscopic surgeries remains controversial because of concerns regarding aspiration and adequacy of ventilation under increased airway pressures. However, recent evidence suggests that in carefully selected patients undergoing short-duration laparoscopic procedures, i-gel can provide satisfactory ventilation comparable to endotracheal tube. [10-12]

The present study was undertaken to compare i-gel and endotracheal tube with respect to hemodynamic stability, ventilatory efficacy, insertion characteristics, and postoperative complications in patients undergoing elective laparoscopic cholecystectomy under general anesthesia.

Materials and Methods

Study Design: This prospective randomized comparative study was conducted in the Department of Anaesthesiology at a tertiary care hospital over a period of one year after obtaining approval from the Institutional Ethics Committee.

Sample Size

A total of 100 patients were included in the study.

- Group I (i-gel group): 50 patients
- Group E (Endotracheal tube group): 50 patients

Inclusion Criteria

1. Patients aged between 18–60 years
2. ASA physical status I and II
3. Elective laparoscopic cholecystectomy under general anesthesia
4. BMI less than 30 kg/m²
5. Patients providing written informed consent

Exclusion Criteria

1. Anticipated difficult airway
2. Gastroesophageal reflux disease
3. Pregnancy
4. Obesity (BMI >30 kg/m²)
5. Respiratory disorders
6. Emergency surgeries
7. Patients at risk of aspiration

Randomization: Patients were randomly allocated into two groups using computer-generated random numbers.

Group I: Airway secured using i-gel supraglottic airway device.

Group E: Airway secured using cuffed endotracheal tube.

Preoperative Assessment: All patients underwent detailed pre-anesthetic evaluation including history, physical examination, airway assessment, and routine investigations.

Anesthetic Technique: Patients were kept nil per oral for 8 hours before surgery. Standard monitoring including ECG, pulse oximetry, non-invasive blood pressure, and capnography was applied.

Premedication included:

- Glycopyrrolate 0.2 mg IV
- Midazolam 0.02 mg/kg IV
- Ondansetron 4 mg IV
- Fentanyl 2 µg/kg IV

Preoxygenation was done for 3 minutes with 100% oxygen.

Anesthesia was induced using:

- Propofol 2 mg/kg IV
- Vecuronium 0.1 mg/kg IV
- After adequate muscle relaxation:
- Group I received appropriately sized i-gel
- Group E underwent laryngoscopy and endotracheal intubation

Correct placement was confirmed by chest rise, bilateral air entry, and capnography.

Anesthesia was maintained using oxygen, nitrous oxide, isoflurane, and intermittent vecuronium.

Pneumoperitoneum was created with intra-abdominal pressure maintained at 12–14 mmHg.

Parameters Studied

Hemodynamic Parameters

1. Heart rate
2. Systolic blood pressure
3. Diastolic blood pressure
4. Mean arterial pressure

Recorded at:

- Baseline
- After induction
- Immediately after insertion
- 1 min
- 3 min
- After pneumoperitoneum
- After removal of airway device

Ventilatory Parameters

1. SpO_2
2. $EtCO_2$
3. Peak airway pressure
4. Airway leak pressure

Airway Characteristics

1. Ease of insertion
2. Number of attempts
3. Time for insertion

Postoperative Complications

1. Sore throat
2. Cough
3. Hoarseness
4. Blood staining
5. Regurgitation
6. Aspiration

Statistical Analysis: Data were analyzed using SPSS software version 25.

Continuous variables were expressed as mean ± standard deviation. Independent t-test and Chi-square test were applied. A p-value <0.05 was considered statistically significant.

Results

A total of 100 patients undergoing elective laparoscopic cholecystectomy under general anesthesia were enrolled and randomly divided into two groups of 50 each.

Group I patients received airway management with i-gel supraglottic airway device, whereas Group E patients underwent endotracheal intubation with cuffed endotracheal tube.

Both groups were comparable with respect to demographic variables including age, gender distribution, body mass index, and duration of surgery, and no statistically significant difference was observed between the groups (p>0.05).

Table 1: Demographic Characteristics of Study Population

Parameter	Group I (i-gel) (n=50)	Group E (ETT) (n=50)	p-value
Mean age (years)	41.8 ± 9.6	42.6 ± 10.1	0.682
Male/Female	18/32	20/30	0.673
BMI (kg/m²)	24.3 ± 2.8	24.7 ± 3.1	0.514
Duration of surgery (min)	67.4 ± 11.2	69.1 ± 12.6	0.472
ASA I/II	29/21	31/19	0.684

The demographic profile of patients was comparable in both groups. The majority of patients belonged to ASA grade I and females constituted approximately 62–64% of the study population. No statistically significant difference was observed in age, BMI, ASA grading, or duration of surgery (p>0.05), indicating homogeneity between the study groups. Insertion characteristics of airway devices were compared between the two groups. The mean insertion time in the i-gel group was significantly lower than the ETT group. First-attempt insertion success was slightly higher in the i-gel group. Ease of insertion was graded as easy in 92% of patients in Group I compared to 76% in Group E. Difficult insertion requiring additional manipulation was more frequent in the ETT group.

Table 2: Airway Insertion Characteristics

Parameter	Group I (i-gel)	Group E (ETT)	p-value
Insertion time (sec)	11.4 ± 2.3	17.2 ± 2.9	<0.001*
First attempt success	48 (96%)	44 (88%)	0.041*
Easy insertion	46 (92%)	38 (76%)	0.027*
Multiple attempts required	2 (4%)	6 (12%)	0.039*

Insertion of i-gel was significantly faster and easier compared to endotracheal intubation. The mean insertion time was reduced by approximately 34% in the i-gel group. First-attempt success rate was higher with i-gel (96%) compared to ETT (88%). Difficult airway manipulation and repeated

attempts were more frequent in the ETT group, and the difference was statistically significant ($p<0.05$). Hemodynamic responses were evaluated at different intervals including after insertion and during pneumoperitoneum. Baseline heart rate and blood pressure were comparable between the groups. However, following airway insertion, Group E showed a marked increase in heart rate and mean arterial pressure compared to Group I. Immediately after airway insertion, the mean heart rate increased by 24.6% in the ETT group compared to only 8.9% in the i-gel group. Similarly, MAP increased significantly in Group E during intubation and remained elevated for 3–5 minutes post-intubation. Hemodynamic changes returned toward baseline in both groups after 10 minutes. During pneumoperitoneum, both groups demonstrated mild elevation in heart rate and blood pressure due to increased intra-abdominal pressure; however, the increase was significantly higher in the ETT group.

Table 3: Comparison of Hemodynamic Parameters

Time Interval	HR (beats/min) Group I	HR Group E	p-value	MAP (mmHg) Group I	MAP Group E	p-value
Baseline	82.4 ± 8.2	83.1 ± 7.9	0.642	91.3 ± 6.1	92.1 ± 5.8	0.531
After insertion	89.7 ± 7.1	103.5 ± 8.4	<0.001*	95.2 ± 5.9	108.6 ± 7.2	<0.001*
1 min	88.4 ± 6.8	101.7 ± 8.1	<0.001*	94.8 ± 6.0	106.2 ± 6.9	<0.001*
3 min	86.1 ± 6.4	97.8 ± 7.6	<0.001*	92.7 ± 5.5	102.4 ± 6.1	<0.001*
After pneumoperitoneum	91.2 ± 7.2	99.5 ± 7.9	0.002*	97.3 ± 5.8	105.1 ± 6.6	0.001*
After removal	87.5 ± 6.7	98.6 ± 7.5	<0.001*	93.6 ± 5.4	104.3 ± 6.1	<0.001*

Significant sympathetic stimulation was observed in the ETT group following laryngoscopy and intubation. Heart rate and MAP increased markedly after airway insertion and extubation in Group E compared to Group I.

The i-gel group demonstrated superior hemodynamic stability throughout the perioperative period. Differences between groups were highly significant statistically ($p<0.001$). Ventilatory parameters were assessed intraoperatively. Oxygen saturation remained above 98% in both groups throughout surgery, and no episode of desaturation occurred. End tidal carbon dioxide levels remained within acceptable range in both groups and showed no statistically significant difference.

Peak airway pressure was significantly lower in the i-gel group during pneumoperitoneum. Mean airway leak pressure in the i-gel group was adequate for positive pressure ventilation during laparoscopic surgery.

Table 4: Comparison of Ventilatory Parameters

Parameter	Group I (i-gel)	Group E (ETT)	p-value
Mean SpO_2 (%)	99.1 ± 0.6	99.0 ± 0.5	0.418
Mean $EtCO_2$ (mmHg)	36.8 ± 3.1	37.2 ± 2.9	0.512
Peak airway pressure during pneumoperitoneum (cmH_2O)	19.4 ± 2.8	23.7 ± 3.2	<0.001*
Airway leak pressure (cmH_2O)	28.6 ± 3.4	—	—

Both airway devices maintained adequate oxygenation and ventilation throughout surgery. Mean SpO_2 and $EtCO_2$ values were comparable between groups, indicating equivalent ventilatory efficacy. However, peak airway pressure was significantly lower in the i-gel group, suggesting better airway compliance and reduced airway resistance during pneumoperitoneum. Postoperative airway complications were compared between groups. Sore throat was the most common complication and occurred significantly more frequently in the ETT group. Postoperative cough and hoarseness were also more common in Group E. Blood staining of device was observed in a few cases of ETT insertion but was minimal in the i-gel group. No episode of aspiration or regurgitation was recorded in either group.

Table 5: Postoperative Airway Complications

Complication	Group I (i-gel)	Group E (ETT)	p-value
Sore throat	4 (8%)	16 (32%)	0.003*
Cough	3 (6%)	14 (28%)	0.004*
Hoarseness	2 (4%)	10 (20%)	0.012*
Blood staining	1 (2%)	7 (14%)	0.028*
Regurgitation	0	0	—
Aspiration	0	0	—

Postoperative airway morbidity was significantly lower in the i-gel group. Sore throat incidence was reduced by nearly 75% compared to ETT. Coughing and hoarseness were also significantly less frequent in patients managed with i-gel. Absence of aspiration or regurgitation in both groups indicated that i-gel provided safe airway management in selected patients undergoing elective laparoscopic cholecystectomy.

Discussion

The present prospective randomized comparative study demonstrated that the i-gel supraglottic airway device provided better hemodynamic stability, faster insertion, comparable ventilatory efficacy, and lower postoperative airway morbidity than the cuffed endotracheal tube in patients undergoing elective laparoscopic cholecystectomy. Both groups were demographically comparable, with no statistically significant difference in age, sex distribution, BMI, ASA physical status, or duration of surgery. This baseline similarity strengthens the validity of the comparison and suggests that the observed differences were mainly related to the airway device used rather than patient-related confounding factors.

Laparoscopic cholecystectomy produces several anesthetic challenges due to carbon dioxide pneumoperitoneum, reverse Trendelenburg positioning, increased intra-abdominal pressure, reduced lung compliance, and elevation of airway pressure. Traditionally, endotracheal intubation has been preferred because it provides a secure airway and protects against aspiration. However, laryngoscopy and tracheal intubation are associated with marked sympathetic stimulation, resulting in tachycardia and hypertension. In the present study, heart rate and mean arterial pressure increased significantly after intubation and after extubation in the ETT group compared with the i-gel group. Similar findings were reported by Badheka et al., who observed that i-gel was associated with significantly less hemodynamic response than endotracheal tube during adult laparoscopic surgeries.[1] Lai et al. also found that i-gel provided stable cardiovascular responses during laparoscopic pneumoperitoneum and Trendelenburg positioning, supporting its use as an alternative to tracheal intubation in selected patients.[2]

The reduced hemodynamic response observed with i-gel may be explained by the absence of direct laryngoscopy and tracheal stimulation. Unlike ETT, i-gel is seated above the glottis and does not pass through the vocal cords. Therefore, stimulation of the laryngeal and tracheal mucosa is minimal. This is clinically relevant because exaggerated cardiovascular responses during intubation may be harmful in patients with hypertension, ischemic heart disease, or limited cardiac reserve. Ismail et al. similarly reported lower hemodynamic responses with i-gel compared with endotracheal tube, further supporting the cardiovascular advantage of supraglottic airway devices.[13]

Insertion characteristics also favored i-gel in the present study. The mean insertion time was significantly shorter in the i-gel group than in the ETT group, and first-attempt success was higher with i-gel. This finding is consistent with the anatomical design of i-gel, which has a non-inflatable thermoplastic elastomer cuff that conforms to the perilaryngeal anatomy. Because cuff inflation is not required, the device can be inserted quickly and positioned with minimal manipulation. Ibrahim et al. reported similar advantages of i-gel over cuffed tracheal tube in laparoscopic cholecystectomy, particularly regarding ease and speed of insertion.[3] Ahirwar et al. also found that i-gel insertion was easier and faster than endotracheal intubation in elective laparoscopic cholecystectomy.[4]

Ventilatory adequacy is a major concern when supraglottic airway devices are used during laparoscopic procedures because pneumoperitoneum increases airway pressure and may compromise ventilation. In the present study, oxygen saturation and end-tidal carbon dioxide remained comparable between the groups throughout surgery. No desaturation, regurgitation, or aspiration was observed. These findings suggest that i-gel provided effective ventilation in carefully selected ASA I and II patients with BMI less than 30 kg/m². Lai et al. similarly concluded that i-gel is suitable for controlled ventilation during laparoscopic procedures when patient selection is appropriate.[2] Park et al., comparing i-gel with LMA Supreme during laparoscopic cholecystectomy, also reported effective ventilation and acceptable airway sealing with i-gel.[7]

Peak airway pressure during pneumoperitoneum was significantly lower in the i-gel group compared with the ETT group. Although ETT provides a sealed tracheal airway, increased resistance due to the tube and airway stimulation may contribute to higher airway pressures. The i-gel, because of its wider airway channel and anatomical fit, may reduce resistance during controlled ventilation. Sharma et al. reported acceptable respiratory mechanics with i-gel during laparoscopic cholecystectomy and found that it maintained ventilation efficiently under pneumoperitoneum.[8] Teoh et al. also demonstrated that i-gel performed satisfactorily during controlled ventilation in laparoscopic surgery.[9]

The airway leak pressure observed in the i-gel group was adequate for positive pressure

ventilation during laparoscopic cholecystectomy. This is important because inadequate seal pressure can lead to gas leak, poor ventilation, gastric insufflation, and risk of aspiration. The second-generation design of i-gel includes a gastric drainage channel, which allows gastric tube placement and may reduce gastric insufflation. Singh et al. found that i-gel had favorable clinical performance compared with other supraglottic airway devices, particularly in terms of insertion profile and airway sealing.[10] Kini et al. also reported satisfactory airway sealing and clinical performance with i-gel in adult patients under general anesthesia.[14]

Postoperative airway complications were significantly lower in the i-gel group. Sore throat, cough, hoarseness, and blood staining were more frequent in patients managed with ETT.

These findings are expected because endotracheal intubation involves laryngoscopy, tracheal tube placement, cuff pressure, and possible mucosal trauma. In contrast, i-gel does not require cuff inflation and exerts less pressure on pharyngeal structures. Saraswat et al. reported greater airway morbidity with endotracheal tube compared with supraglottic airway devices in laparoscopic surgeries.[12] Badheka et al. also observed a lower incidence of postoperative sore throat and airway complications with i-gel compared with ETT.[1]

No case of regurgitation or aspiration was recorded in either group. This finding supports the safety of i-gel in selected patients undergoing elective laparoscopic cholecystectomy. However, it must be emphasized that patients at risk of aspiration, those with gastroesophageal reflux disease, pregnancy, obesity, emergency surgery, and anticipated difficult airway were excluded from this study.

Therefore, these findings should not be generalized to high-risk patients. Sule et al. also emphasized that supraglottic airway devices may be safe during laparoscopic procedures when used in appropriately selected patients with careful monitoring.[11]

The present findings are also supported by the recent study by Akhter et al., who reported that i-gel can be used effectively for airway management in elective laparoscopic cholecystectomy, with better insertion characteristics and lower airway complications compared with ETT.[5] Similarly, Arı et al., comparing supraglottic airway devices in laparoscopic cholecystectomy, found that second-generation devices provide effective ventilation with acceptable safety profiles.[6] Although Dahiya et al. focused on intubating laryngeal mask airway in a simulated emergency scenario, their findings reinforce the broader role of supraglottic airway devices as useful alternatives in airway management when appropriately selected.[15]

The main limitation of this study was that it included only ASA I and II patients with BMI less than 30 kg/m². Hence, the results may not be applicable to obese patients, emergency cases, patients with full stomach, or those at increased risk of aspiration. Additionally, postoperative complications were assessed only in the early postoperative period. Larger multicentric studies with longer follow-up and inclusion of different patient populations may provide stronger evidence regarding the broader safety profile of i-gel in laparoscopic surgery.

Conclusion

The present study concluded that i-gel is a safe and effective alternative to endotracheal tube for airway management in selected patients undergoing elective laparoscopic cholecystectomy. It provided significantly shorter insertion time, better first-attempt success, superior hemodynamic stability, comparable oxygenation and ventilation, lower peak airway pressure, and fewer postoperative airway complications. Endotracheal tube remains the preferred airway device in patients at risk of aspiration or difficult airway; however, in properly selected ASA I and II patients, i-gel can be considered a reliable airway device for laparoscopic cholecystectomy.

References

1. Badheka JP, Jadliwala RM, Chhaya VA, Parmar VS, Vasani A, Rajyaguru AM. I-gel as an alternative to endotracheal tube in adult laparoscopic surgeries: A comparative study. J Minim Access Surg. 2015 Oct-Dec;11(4):251-6. doi: 10.4103/0972-9941.140210. PMID: 26622115; PMCID: PMC4640024.
2. Lai CJ, Liu CM, Wu CY, Tsai FF, Tseng PH, Fan SZ. I-Gel is a suitable alternative to endotracheal tubes in the laparoscopic pneumoperitoneum and trendelenburg position. BMC Anesthesiol. 2017 Jan 6;17(1):3. doi: 10.1186/s12871-016-0291-1. PMID: 28125979; PMCID: PMC5267400.
3. Ibrahim M, Helmy M, Wahba R, El-Abd R, El-Hamid MA, Fouad A. I-gel versus cuffed tracheal tube during volume controlled ventilation in elective laparoscopic cholecystectomy. Egypt J Anaesth. 2011;27(1):7-11. https://doi.org/10.1016/j.egja.2010.12.003
4. Ahirwar K, Gupta S, Gupta A, Tirkey SP. A comparative study between I-gel and endotracheal tube in elective laparoscopic cholecystectomy surgeries under general anesthesia. Asian J Med Sci. 2023;14(5):47-52. doi:10.3126/ajms.v14i5.51873.
5. Akhter N A, et. al, I-gel versus Endotracheal Tube for Airway Management in Elective Laparoscopic Cholecystectomy: A Prospective Randomized Study. Eur J Cardiovasc Med.

2025;15(10):526–532.
DOI : 10.61336/ejcm/25-10-92

6. Arı, DE; Abitağaoğlu, S; Köksal, C; YıldırımAr, A; Emrem, D[1]; Üstün, M. Comparison of I-gel and LMA Protector in laparoscopic cholecystectomy. Bratisl Lek Listy. 2022;25(1):90-96. DOI: 10.4103/njcp.njcp_693_20
7. Park SY, Rim JC, Kim H, Lee JH, Chung CJ. Comparison of i-gel® and LMA Supreme® during laparoscopic cholecystectomy. Korean J Anesthesiol. 2015 Oct;68(5):455-61. doi: 10.4097/kjae.2015.68.5.455. Epub 2015 Sep 30. PMID: 26495055; PMCID: PMC4610924.
8. Sharma B, Sehgal R, Sahai C, Sood J. PLMA vs. I-gel: A Comparative Evaluation of Respiratory Mechanics in Laparoscopic Cholecystectomy. J Anaesthesiol Clin Pharmacol. 2010 Oct;26(4):451-7. PMID: 21547168; PMCID: PMC3087251.
9. Teoh WH, Lee KM, Suhitharan T, Yahaya Z, Teo MM, Sia AT. Comparison of the LMA Supreme vs the i-gel in paralysed patients undergoing gynaecological laparoscopic surgery with controlled ventilation. Anaesthesia. 2010 Dec;65(12):1173-9. doi: 10.1111/j.1365-2044.2010.06534.x. Epub 2010 Oct 19. PMID: 20958278.
10. Singh I, Gupta M, Tandon M. Comparison of Clinical Performance of I-Gel with LMA-Proseal in Elective Surgeries. Indian J Anaesth. 2009 Jun;53(3):302-5. PMID: 20640137; PMCID: PMC2900120.
11. Sule M, Salahu D, Atiku M, Abdurrahman A, Mohammed AD, Abdullahi MM. Airway Management During Diagnostic Laparoscopic Surgery: A Comparison of I-Gel and Proseal Laryngeal Mask Airway. J West Afr Coll Surg. 2023 Oct-Dec;13(4):34-39. doi: 10.4103/jwas.jwas_15_23. Epub 2023 Sep 16. PMID: 38449541; PMCID: PMC10914103.
12. Saraswat N, Kumar A, Mishra A, Gupta A, Saurabh G, Srivastava U. The comparison of Proseal laryngeal mask airway and endotracheal tube in patients undergoing laparoscopic surgeries under general anaesthesia. Indian J Anaesth. 2011 Mar;55(2):129-34. doi: 10.4103/0019-5049.79891. PMID: 21712868; PMCID: PMC3106384.
13. Ismail SA, Bisher NA, Kandil HW, Mowafi HA, Atawia HA. Intraocular pressure and haemodynamic responses to insertion of the i-gel, laryngeal mask airway or endotracheal tube. Eur J Anaesthesiol. 2011 Jun;28(6):443-8. doi: 10.1097/EJA.0b013e328345a413. PMID: 21455075.
14. Kini G, Devanna GM, Mukkapati KR, Chaudhuri S, Thomas D. Comparison of I-gel with proseal LMA in adult patients undergoing elective surgical procedures under general anesthesia without paralysis: A prospective randomized study. J Anaesthesiol Clin Pharmacol. 2014 Apr;30(2):183-7. doi: 10.4103/0970-9185.130008. PMID: 24803754; PMCID: PMC4009636.
15. Dahiya R, Goyal V, Bijarnia I, Bharadwaj A. Intubating Laryngeal Mask Airway for Airway Management and Blind Tracheal Intubation through It from 360° around a Supine Patient: A Randomized Controlled Clinical Study in a Simulated Prehospital Emergency Scenario. Cureus. 2024 Aug 26;16(8):e67831. doi: 10.7759/cureus.67831. PMID: 39323674; PMCID: PMC11423927.