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ORIGINAL ARTICLE

Effectiveness of left nasal nasogastric tube placement with right head-tilt in anesthetized patients: a randomized controlled trial

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ABSTRACT

BACKGROUND: Patients undergoing general anesthesia frequently encounter difficulties when the conventional nasogastric tube (NGT) is placed, resulting in low success rates. This study investigates a novel, free-hand, and blind technique aimed at enhancing the first-attempt success rate without the need for any medium.

METHODS: One hundred and thirty-two eligible patients were randomly allocated to either the experimental group or the control group. In the experimental group, patients' heads were turned 45-90° to the right while in the supine position, and the NGT was inserted vertically through the left nasal cavity. In the control group, patients remained in a neutral supine position. All other procedures were the same between the two groups.

RESULTS: The experimental group had a significantly higher one-time success rate than the control group, 82.54% (52/63) *versus* 67.18% (43/64) (relative risk = 2.309; 95% CI: 1.003–5.315; P=0.046). There was no significant difference in complications (15.87% *versus* 28.13%; P=0.096) or in the time taken for placement and changes in vital signs between the groups.

CONCLUSIONS: Placing the NGT through the left nasal cavity with the head turned right in supine patients under general anesthesia significantly improves the one-time success rate without increasing complications.

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KEY WORDS: General anesthesia; Intratracheal intubation; Gastrointestinal intubation; Supine position.

Preoperative indwelling of the nasogastric tube (NGT) is one of the commonly employed techniques in surgery,[1] and it is predominantly utilized for gastrointestinal decompression or for providing nutritional support through nasogastric feeding via the gastric tube to maintain the integrity of intestinal mucosal cells and their functions and prevent intestinal infections caused by bacterial imbalance, which plays an extremely vital role in physical rehabilitation. Traditional preoperative indwelling of the NGT usually involves catheterization when the patient

is awake, and the placement of the gastric tube in awake patients generates relatively intense stimulation to the nasal cavity, throat, and esophagus. Mechanical stimulation brought about by the use of the gastric tube, as well as chemical stimulation caused by the application of paraffin oil, will exert an influence on the receptors of the posterior pharyngeal wall of the patient, subsequently leading to nausea or vomiting symptoms, resulting in psychological and physical tension for the patient. At this time, when the gastric tube is placed for the patient, due to the sensitivity to stimulation, there is a laryngeal nerve distribution under the glottic fissure. Gastric tube stimulation causes axial membrane pain and discomfort in the nose, pharynx, and laryngeal reflex during intubation will lead to hemodynamic changes, such as an increase in heart rate and blood pressure.[2] Therefore, it is currently advocated that NGT placement in surgical patients is selected after general anesthesia (GA) endotracheal intubation to allow the patient's consciousness to disappear and the muscles to relax when the catheter is placed,[1] minimizing the relevant adverse stimuli and stress responses to the patient.[3]

Insertion of NGT in anesthetized, paralyzed, or comatose patients can present certain difficulties, and failure rates of NGT insertion in the conventional position, that is, in the neutral position of the head, have been reported to be as high as 50% after anesthesia with endotracheal intubation.[4, 5] There are numerous reasons for the failure of NGT placement, but it is mainly reflected in the following aspects.

Firstly, the texture of the gastric tube affects the success rate of one-time intubation to a certain extent. If the texture is overly hard, it is prone to damaging the esophageal mucosa and throat tissue during insertion, increasing the risk of bleeding and infection; if the texture is overly soft, after entering the human body, the gastric tube is tangled and entwined in the oropharynx due to the softening caused by the increase in temperature, making it difficult or even impossible to place the gastric tube. Coiling, kinking, or knotting of NGTs is the loss of stiffness due to elevated body temperature, and memory effects can also lead to subsequent failure.[6, 7] Once kinked, NGTs are subsequently more likely to kink in the same location, while the most common sites of impaction in NGTs are the piriformis sinus and arytenoid cartilage. The higher the number of repeated NGT placements, the higher the incidence of complications such as nasal mucosa, pharyngeal bleeding, and gastric tube entanglement. Even serious complications of esophageal perforation due to the insertion of gastric tubes have been reported.[8]

Secondly, the anatomical structure undergoes changes after general anesthesia. The esophagus is located behind the trachea, and after the insertion of the trachea, it will cause some compression on the esophageal wall, resulting in the narrowing of the esophageal lumen, which is the narrowest place during gastric tube intubation, which will lead to the inability to successfully complete the delivery of the gastric tube to the esophageal site and increase the difficulty of catheterization.[9] In addition, when the patient lies supine, the tongue will fall slightly backward, which is difficult to avoid even in the supine position with a pillow, which will further increase the difficulty of catheterization.

Thirdly, in GA patients with muscle relaxation, the pharyngeal angle becomes smaller, the posterior pharyngeal wall is in contact with the piriformis recess, and when NGT catheterization reaches the pharyngeal position, the success rate of catheterization with a slight elevation of the patient's head is lower than that of the pillow supine position. This is mainly due to the fact that after head anteversion, the curvature of the tracheal and laryngeal junction increases significantly, which will produce some compression on the esophagus and posterior tracheal wall, coupled with the hardness of the gastric tube material used that makes gastric tube insertion more difficult due to the increase and softening of body temperature. In order to improve the success rate of catheterization, a large number of researchers have attempted to catheterize GA patients in various manners, including using frozen gastric tubes, slit endotracheal tubes, thyroid cartilage lifting, ureteral guide wires as guides, head flexion, cervical lateral pressure, video laryngoscopes, bronchoscopes, and other techniques, but these methods have defects such as gastric tube folding and mucosal bleeding in practical operation.[10, 11]

Based on the above research status, we expect to find a free-hand, blind, media-independent NGT placement technique to achieve improved patient comfort, no increase in the economic burden of patients, no impact on other medical operations, and can be completed by a single person, in order to achieve improved success rate of catheterization and fewer complications. In previous clinical practice, we found that the method of placing NGT in the left nasal cavity can improve the success rate of gastric tube placement. In order to verify the effectiveness and safety of this method, a prospective randomized controlled trial was conducted to compare the effects of the two catheterization techniques on the success rate of NGT placement and complications in patients with GA endotracheal intubation, providing a new direction and basis for medical staff to improve the success rate of intraoperative NGT placement.

Materials and methods

Ethics and registration

Ethical approval for this study (Colun Review No.(357)2022) was provided by Ethics Committee of the Second Affiliated Hospital of Chongqing Medical University, Chongqing, China (Prof. Wang Dagang) on 30 June 2022. The trial was registered with the Chinese Clinical Trial Center. Trials Registry under the number ChiCTR 2400087081 and registry URL https://www.chictr.org.cn/index.htm.

Study design/institution

This study was a parallel, single-blind, randomized controlled trial conducted in the operating room of a tertiary grade A comprehensive hospital in Chongqing, China, from March 1st, 2023, to October 31st, 2023. The study participants were surgical patients requiring preoperative NGT placement during the study period. The inclusion criteria for participants were: 1) patients with endotracheal intubation through the mouth; 2) no previous nasal surgery; 3) normal gastric, esophageal and pharyngeal anatomy; 4) age ≥18 years; 5) informed consent. The exclusion criteria were: 1) skull fractures; 2) coagulation disorders; 3) esophageal stenosis; 4) pharynx, esophagus, and mediastinum tumors; 5) history of head and neck radiotherapy; 6) nasal deformities; 7) thyroid disease; 8) gastrointestinal bleeding. The removing criteria were: 1) surgery canceled temporarily; 2) failure to perform tube placement according to the planned position; 3) incomplete data collection.

Sample size

Based on a 1:1 parallel controlled study design, this research estimated the sample size using the PASS 11.0 software. According to the preliminary test results, the one-time success rate of NGT insertion in the supine position with the head in a neutral position was 57.14%, while the one-time success rate of NGT insertion through the left nostril with the head tilted 45° to the right was 90.91%. With a set test level of α=0.05 and a test power of 1-0.01=0.99, the minimum required sample size for each group was calculated to be 55 cases. Considering a 20% loss to follow-up rate, the total sample size required for this study was 66 cases per group, totaling 132 patients.

Investigational instrument

Disposable silicone nasogastric tube (5.3*1000 mm, F16, Nantong Sanli Medical Instruments Co., Ltd., Nantong, Jiangsu, China), medical paraffin oil cotton balls (small size, Henan Yadu Industrial Co., Ltd., Changyuan, Henan, China), disposable external drainage bags (1000 mL, Henan Yadu Industrial Co., Ltd.), gastric tube fixation bow-shaped adhesive tape, stethoscopes (insertable dual-purpose Type A, Yuyue, Jiangsu Yuyue Medical Equipment Co. Ltd., Yancheng, Jiangsu, China), and disposable sterile syringes (20 mL, Shandong Weigao Group Medical Polymer Products Co., Ltd., Weihai, Shandong, China) were used.

Detailed implementation plan

Pre-intervention quality control

All included participants received intravenous midazolam 0.04-0.06 mg/kg, propofol 1-2 mg/kg, sufentanil 0.4-0.6 ug/kg, and rocuronium bromide 0.6 mg/kg for GA induction. Female

patients used endotracheal intubation with an inner diameter of 6.5 mm, while male or female patients weighing over 80 kg used an inner diameter of 7.0 mm. Sevoflurane was used to maintain anesthesia, and the end-tidal concentration was confirmed to be 1 to 1.5 minimum alveolar concentrations before any NGT tube insertion to maintain the depth of anesthesia.

Implementation plan

All cases used 100cm NGT tubes and were operated by two experienced nurses (with a work experience of ≥10 years), all of NGTs diameter was the same. One nurse soaked two cotton swabs in normal saline and gently inserted them into the patient's nostril to check for patency before intubation. The NGT was lubricated with paraffin oil before intubation. Depending on the group, the NGT was inserted after endotracheal intubation and tracheal tube fixation. The other nurse recorded various indicators. In the control group, patients were placed in a supine position with their heads in a neutral position, selecting the left nostril. The left hand held the gastric tube, and the right hand inserted the tip of the gastric tube vertically into the nostril. In the experimental group, patients were placed in a supine position with their heads tilted 45-90° to the right, and the remaining techniques were the same as in the control group. The length of gastric tube insertion was estimated by measuring the distance from the patient's nose to the earlobe and then to the xiphoid process. Successful intubation was confirmed by aspiration of gastric contents or auscultation of air-passing sounds in the upper abdomen. If any NGT insertion method failed, esophageal advancement was performed under direct vision with the assistance of a visual laryngoscope and oval forceps until successful insertion.

Evaluation indicators

Primary outcome

• One-time success rate of NGT insertion (%): number of successful first-time intubations / total number of intubations * 100%;

• time required for successful NGT insertion (min): timing began after lubrication with paraffin oil and preparation for intubation, and ended upon successful insertion and fixation of the gastric tube.

Secondary outcome

• Incidence of complications during NGT insertion: total number of cases with nasopharyngeal bleeding, gastric tube kinking, and entanglement/total number of intubations * 100%;

• vital signs before and after intubation in both groups: including heart rate (P), blood oxygen saturation (SpO_2), arterial blood pressure: systolic/diastolic blood pressure.

Implementation of blinding

Throughout the process, the subjects were under GA and were unaware of the method of NGT placement used. The operators could not be blinded, and the results were directly judged by the implementers.

Statistical analysis

All data were entered into the Excel database of the 2016 version of Office software, and SPSS 25.0 was used for statistical analysis. Continuous variables that conformed to a normal distribution were expressed as mean and standard deviation. Independent sample *t*-tests were used for comparisons between groups, and paired sample *t*-tests were used for comparisons within groups. Count data were expressed as frequency and percentage and Chi-square Tests were used for comparisons between groups. The test level was set at $\alpha=0.05$, and $P<0.05$ was considered statistically significant.

Results

Research flowchart of the two groups

A total of 132 subjects were included, with five cases excluded due to reasons such as temporary surgery cancellation (two cases), failure to implement as planned (two cases), and incomplete data collection (one case). Finally, 127 cases were included in the analysis, as shown in Figure 1.

General information of the two groups

The general information of the two groups, including age, gender, type of surgery, endotrache-

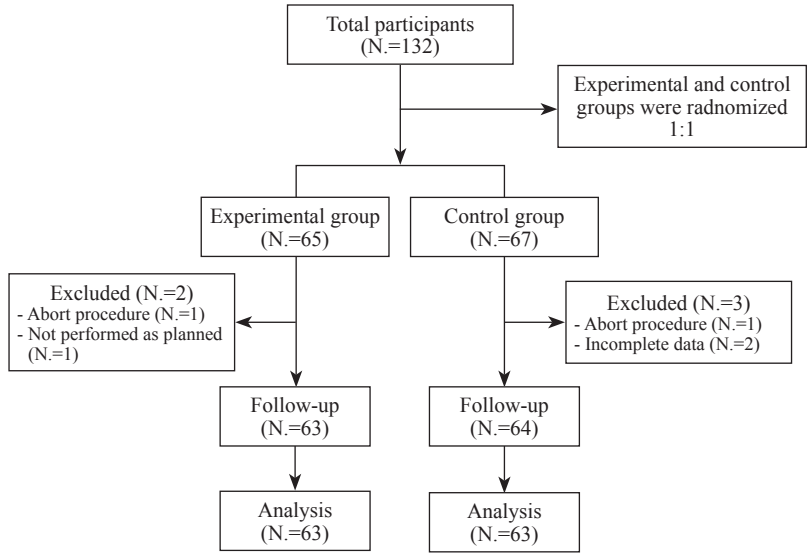

Figure 1.—CONSORT flow chart of patient enrolment, group allocation, follow-up, and data analysis.

TABLE I.—*Patient characteristics (N.=127).*

Categories	Control group (N.=64)	Experimental group (N.=63)	Statistic (c^2/T)	P value
Gender				
Male	44 (68.75%)	34 (53.96%)	2.927	0.087
Female	20 (31.25%)	29 (46.03%)		
Age, years	60.70±12.50	56.60±13.11	1.804	0.074
Type of surgery				
Craniocerebral surgery	13 (20.31%)	16 (25.40%)	1.538	0.674
Lung surgery	5 (7.81%)	4 (6.35%)		
Hepatobiliary surgery	24 (37.50%)	27 (42.86%)		
Gastrointestinal surgery	22 (34.38%)	16 (25.40%)		
Model of endotracheal tube	6.80±0.25	6.63±0.89	1.470	0.143
Endotracheal intubation depth	23.15±1.10	23.23±1.41	-0.400	0.690
Depth of nasogastric tube insertion	55.39±11.17	55.16±8.37	0.132	0.895
BMI	23.18±3.13	22.54±3.03	0.845	0.125
ASA Classification				
II	20 (31.25%)	23 (36.51%)	0.609	0.716
III	41 (64.06%)	36 (57.14%)		
IV	3 (4.69%)	4 (6.35%)		

Data presented as mean±SD or as number (percentage).

al tube size, endotracheal tube depth, NGT placement depth, and ASA classification, is presented in Table I.

One-time success rate of NGT placement in the two groups

In the experimental group, 52 cases (82.54%) were successful, and 11 cases (17.46%) failed. In the control group, 43 cases (67.19%) were successful, and 21 cases (32.81%) failed (Table II).

Time consumed for NGT placement in the experimental and control groups

This study compared the time consumed by patients in the experimental and control groups for NGT placement. The results are presented in Table III.

Complications during catheterization in the two groups

In the experimental group, 10 patients (15.87%) experienced complications, including three cases

of nasopharyngeal mucosal bleeding (4.76%), two cases of gastric tube kinking (3.17%), and five cases of gastric tube coiling (7.94%). In the control group, 18 patients (28.13%) experienced complications, including four cases of nasopharyngeal mucosal bleeding (6.25%), six cases of gastric tube kinking (9.38%), and eight cases of gastric tube coiling (12.5%) (Table IV, V, VI).

Discussion

It is feasible to insert NGT through the left nostril with the head tilted to the right in GA patients with tracheal intubation

The traditional preoperative placement of NGT is usually performed when the patient is awake, but this technique causes strong stimulation to the nasopharyngeal region and esophagus, leading to nausea, vomiting, and even hemodynamic changes. However, placing NGT after GA can reduce related adverse stimulation and stress reactions in patients.[12] The conventional NGT placement method involves lifting the patient's head to make the mandible close to the sternal manubrium when inserting the NGT into the throat. However, the tracheal catheter in GA patients adheres closely to the posterior wall of the throat and epiglottis, making intubation more difficult,[13] which greatly reduces the success rate of intubation. In recent years, the use of auxiliary tools for NGT placement after general anesthesia has been frequently applied in clinical practice,[13-16] such as the application of a video laryngoscope in NGT placement.[17] The success rate of using a video laryngoscope to place NGT during GA surgery can reach 100%, while reducing throat, esophageal mucosa injury, bleeding, and related complications. This method allows direct NGT placement, reducing patient discomfort.[18] However, there are certain limitations to placing NGT under direct laryngoscope visualization. After general anesthesia induction, patients have no spontaneous breathing, and the placement of NGT requires experienced anesthesiologists. However, in practical work, there are two scenarios: one is that after tracheal intubation by the anesthesiologist, performing NGT placement under a video laryngoscope can cause secondary injury to the patient, and it is difficult for the laryngoscope to re-enter the mouth;[10] the other is that placing NGT during tracheal intubation requires two people to cooperate, but due to the different contents of anesthesia and nursing work, they

TABLE II.—*Comparison of NGT placement at one time between the experimental group and the control group.*

Group	Failure	Success	χ^2	P value	RR	95% CI
Experimental group	11 (17.46%)	52 (82.54%)	3.970	0.046	2.309	1.003-5.315
Control group	21 (32.81%)	43 (67.19%)				

Data presented as mean±SD.

TABLE III.—*Comparison of nasogastric tube placement time between experimental group and control group.*

Group	N.	Time (min)	*Z*	P value
Experimental group	63	4.00 (3.00, 5.00)	-0.105	0.917
Control group	64	4.00 (2.00, 6.00)		

Data presented as median (interquartile range).

TABLE IV.—*Comparison of complications between experimental group and control group.*

Group	N.	Nasopharyngeal mucosal hemorrhage	Folding of gastric tube	Gastric tube coiling	Total complications
Experimental group	63	3 (4.76%)	2 (3.17%)	5 (7.94%)	10 (15.87%)
Control group	64	4 (6.25%)	6 (9.38%)	8 (12.5%)	18 (28.13%)
χ^2		-	-	1.046	2.773
P value		0.705*	0.154*	0.306	0.096
RR		0.651	0.289	0.542	0.482
95% CI		0.138-3.061	0.056-1.504	0.166-1.774	0.202-1.149

*Fisher's Exact Test.

TABLE V.—*Comparison of heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP) and oxygen saturation (SpO_2) before and after NGT implantation between the two groups.*

Variable	Experimental group (N.=63)	Control group (N.=64)	*t*	P value	95% CI
Vital signs before catheterization					
HR (bpm)	70.48±12.16	72.11±12.48	0.747	0.457	-2.695-5.961
SBP (mmHg)	117.25±19.97	120.83±22.08	0.956	0.341	-3.823-10.971
DBP (mmHg)	65.06±10.89	69.44±13.86	1.976	0.053	0.007-8.755
SpO_2 (%)	99.97±0.18	100.00±0.00	1.426	0.153	0.013-0.076
Vital signs after catheterization					
HR (bpm)	70.95±12.44	71.55±13.59	0.257	0.798	-3.982-5.171
SBP (mmHg)	121.92±22.76	124.89±23.04	0.731	0.466	-5.074-11.014
DBP (mmHg)	67.32±10.70	68.56±12.38	0.606	0.546	-2.823-5.313
SpO_2 (%)	99.95±0.22	100.00±0.00	1.761	0.083	0.006-0.102

TABLE VI.—*Comparison of heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP) and oxygen saturation (SpO_2) before and after NGT implantation in the experimental group.*

Variable	Before NGT insertion	After NGT insertion	*t*	P value	95% CI
HR (bpm)	70.48±12.16	70.95±12.44	-0.609	0.545	-2.040-1.087
SBP (mmHg)	117.25±19.97	121.92±22.76	-1.976	0.053	-9.388-0.055
NBP (mmHg)	65.06±10.89	67.32±10.70	-1.983	0.052	-4.526-0.018
SpO_2 (%)	99.97±0.18	99.95±0.22	1.000	0.321	0.016-0.048

are unlikely to complete the task simultaneously. Most NGT placement procedures are performed after tracheal intubation and fixation. Therefore, in this study, after tracheal intubation, the NGT was inserted through the left nostril with the head tilted to the right, which did not affect the anesthesia procedure. Gray's Anatomy[19] points out that the esophagus is essentially vertical but has two slight bends. Its starting end is located in the median plane, slightly deviating to the left and reaching the base of the neck. Then it gradually turns to the right near the fifth thoracic vertebra and returns to the median plane. Inserting NGT through the left nostril is less affected by the cuff inflation of the external catheter of tracheal intubation at the base of the neck and does not interfere with the placement of the gastric tube. Anatomically, the esophagus is located behind the trachea and separated by the epiglottic cartilage.[20] The esophagus is a muscular organ. When the patient is intubated, the tube adheres closely to the posterior wall of the throat and epiglottis, compressing the posterior esophagus. In GA patients in the supine position, the inserted gastric tube tends to coil and kink at the left and right piriform fossae, as shown in Figure 2. When the patient's head is tilted to the right at 45-90°, the

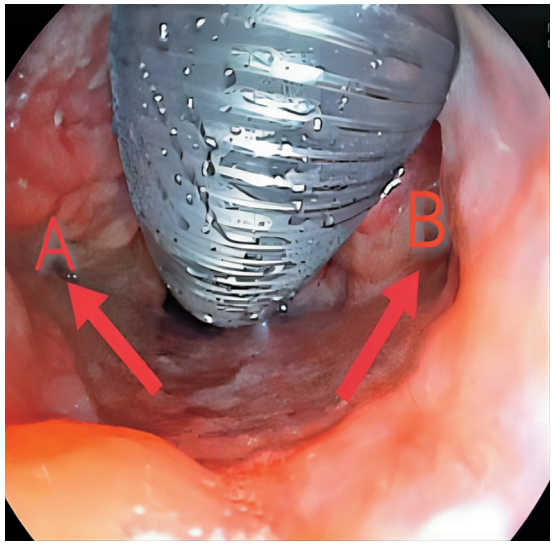

Figure 2.—Anatomy of the throat in the supine position in intubated patients.

right piriform sinus is compressed by the tracheal catheter, exposing the left piriform sinus. When NGT is placed in this position, it can smoothly enter the esophagus through the left piriform sinus, successfully placing the NGT, as shown in Figure 3. Additionally, in practical operations, after anesthetizing the patient, anesthesiologists

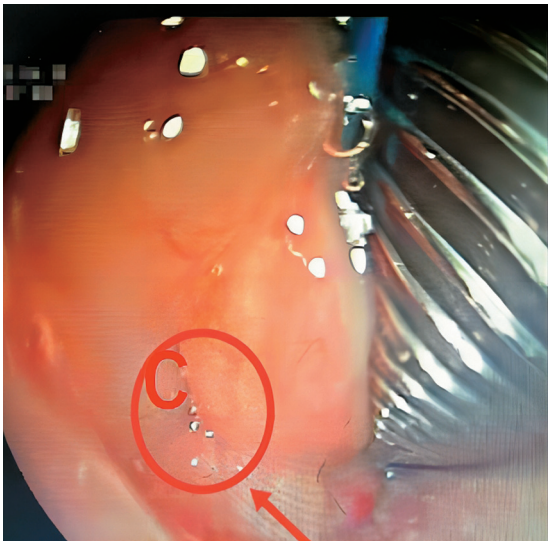

Figure 3.—Anatomy of the head of the intubated patient deviating to the right throat.

tend to habitually fix the tracheal catheter on the right side of the patient's mouth for subsequent medical procedures. Therefore, the choice of inserting NGT through the left nostril with the head tilted to the right in this study does not interfere with airway management.

The technique of inserting NGT through the left nostril with the patient lying flat without a pillow and the head tilted to the right is effective

This study employed the method of inserting NGT through the left nostril with the patient lying flat without a pillow and the head tilted to the right. Compared with the control group, the one-time success rate of the experimental group was 82.54%, significantly higher than that of the control group, with a statistically significant difference (P=0.046), and the success rate was 2.309 times higher than that of the control group (RR=2.309, 95% CI: 1.003-5.315). This suggests that using this method for blind intubation in general anesthesia patients without the aid of other auxiliary equipment can significantly improve the success rate of intubation. A prospective randomized controlled trial by Ankur Sharma[21] found that using the bubble technique to insert NGT in GA patients increased its accuracy and effectiveness, but this method is complex and poorly acceptable. However, the method used in this study is simple and does not require any auxiliary equipment. Through Table III, we found that the median NGT intubation operation time in both the experimental and control groups was four minutes. Although there was no statistically significant difference in intubation time between the experimental group and the control group, this method can still successfully insert NGT into the correct position accurately and quickly compared to the control group. Some studies have found that[21-23] shortening the time for NGT placement in patients can effectively reduce complications such as nasal and pharyngeal mucosal bleeding, pharyngeal hyperemia, alleviate patients' suffering, save surgical time, facilitate smooth surgery, and accelerate patients' postoperative recovery.

Inserting NGT through the left nostril with the patient lying flat without a pillow and the head tilted to the right is safe

To improve the success rate of intubation, numerous researchers have attempted various methods for GA patients, including frozen gastric tubes, slit endotracheal intubation, thyroid cartilage elevation, ureteral guidewire as a guide, head flexion, neck lateral compression, visual laryngoscopy, fiberoptic bronchoscopy, and other techniques.[11, 12] However, Shunsuke Saima's report 24 indicated that although the success rate of NGT insertion using auxiliary devices was higher than that of blind intubation, the incidence of subsequent complications (mucosal bleeding) was significantly higher than that of blind intubation. From Table IV, we can see those 10 (15.87%) patients in the experimental group and 18 (28.13%) patients in the control group developed complications, but the difference in complications between the two groups was not statistically significant (P>0.05, 95% CI: 0.202-1.149), indicating that this method does not increase complications related to nasal and pharyngeal mucosal bleeding in patients. At the same time, we compared the HR, SBP, DBP, and SpO_2 between the experimental and control groups before and after NGT placement, and found that the differences were also not statistically significant (P>0.05, 95% CI: -2.695-5.961 / -3.823-10.971 / 0.007-8.755 / 0.013-0.076 / -3.982-5.171 /

-3.982-5.171 / -2.823-5.313 / 0.006-0.102). The comparison of P, SBP, DBP, and SpO_2 within the experimental group before and after NGT placement also showed no statistically significant differences (P>0.05, 95% CI: -2.040-1.087 / -9.388-0.055 / -4.526-0.018 / 0.016-0.048), as shown in Table V and VI. This indicates that compared with traditional NGT intubation techniques, the new technique does not alter the patient's vital signs during intubation, proving that the method of inserting NGT through the left nostril with the head tilted to the right is a safe manual blind intubation technique.

Advantages and limitations of the study

The placement of NGT for GA patients during surgery is a routine operation in the operating room. This study adopted the method of tilting the head to the right and inserting the NGT through the left nostril. Without increasing staff or auxiliary instruments, the NGT placement for patients with tracheal intubation not only improved the one-time success rate of tube placement but also ensured patient comfort while not affecting other medical procedures. This provides a new option for techniques to insert NGT for patients and is worthy of promotion among patients with tracheal intubation under GA. Additionally, this study employed a single-blind randomized controlled trial, avoiding selection bias and confounding factors in the research, ensuring the objectivity of the results and the rigor of the conclusions. However, this study also has some limitations. It is a single-center study with a small sample size, which may limit the extrapolation of the study conclusions.

Conclusions

In conclusion, this success rate is significantly higher than the traditional supine position with the head in a neutral position, and it did not increase the incidence of complications. The feasibility, effectiveness, and safety of this method have been strongly verified. Therefore, the NGT placement technique using a supine position with the head tilted to the right at 45-90° and a vertical approach through the left nostril for GA tracheal intubation patients has clinical promotion value.

What is known

• Patients under general anesthesia often face challenges with conventional NGT placement, leading to low success rates.

What is new

• To provide new ideas for NGT placement technique in patients with endotracheal intubation under GA.

• As a supplementary technique for the number of NGT placements in patients with endotracheal intubation under GA, this method can be adopted to increase the selectivity of catheterization and improve the success rate of catheterization when conventional methods fail.

• Guide the practice of medical staff in operating room and provide new ideas for clinical practice.

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Conflicts of interest
The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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