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Determining the Influence of Gastric Tube Placement in Upholding Correct Position of LMA Blockbuster throughout surgery: A Prospective Randomized Controlled Trial

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ABSTRACT

Background and Aims: The LMA Blockbuster, with its unique 95° angulated airway tube, integrated bite block and gastric port, offers improved ease of insertion and higher sealing pressures. Despite correct placement, supraglottic airway devices may dislodge during surgery, especially when patient position changes or pneumoperitoneum is induced. This study assessed whether gastric tube insertion through the LMA Blockbuster's gastric port maintains its position throughout surgery. **Methods**: In this prospective randomized controlled trial, 60 ASA I–II patients aged 20–70 years undergoing elective procedures under general anaesthesia were randomly assigned into two groups. In Group A (n=30), a lubricated gastric tube was inserted via the LMA Blockbuster's gastric channel after placement; in Group B (n=30), no gastric tube was inserted. Placement stability was assessed by comparing fibreoptic bronchoscope (FOB) scores immediately after insertion and at the end of surgery. Secondary outcomes included gastric tube insertion success rate and post-insertion complications. **Results**: FOB score changed at the end of surgery when compared to baseline FOB score in 35% patients of Group B and 10% of Group A patients. Gastric tube insertion was successful in all Group A patients, with most insertions (90%) completed in a single attempt without resistance. Postoperative sore throat and vomiting incidence were similar between groups and mild in nature. **Conclusion**: Gastric tube placement via the LMA Blockbuster significantly reduces intraoperative displacement, as reflected in more stable FOB scores. This may be especially beneficial in surgeries with high risk of device displacement, such as laparoscopic procedures.

Keywords: *Laryngeal mask airway, Blockbuster LMA, gastric tube, fibreoptic bronchoscope, supraglottic airway, airway stability.*

INTRODUCTION

Airway management is a cornerstone skill for anaesthesiologists. Supraglottic airway devices (SADs) have gained increasing importance as a bridge between face mask ventilation and endotracheal intubation in both elective and emergency settings. Since its introduction by Dr. Archie Brain in 1981, the LMA has undergone numerous modifications.

LMA Blockbuster incorporates features such as a soft silicone body, 95° airway angulation, high sealing pressures (around 30 cmH_2O), and a gastric access port. These design features facilitate ease of insertion, reduce airway trauma, and enable adjunct procedures such as gastric tube placement.

One persistent limitation with SADs is the potential for intraoperative displacement, particularly during surgeries requiring patient repositioning, transfer, or pneumoperitoneum.[1,2]

This study investigates whether inserting a gastric tube through the Blockbuster LMA's gastric port helps in holding the device in correct position throughout surgery.

Methods

This prospective, randomized study was conducted in 60 patients scheduled for elective surgery under general anaesthesia at tertiary healthcare centre. Study was approved by the institutional ethics committee (Approval No. 317/FM/IEC) and registered with the clinical trial registry (CTRI ID: NCT06103968). Written informed consent was obtained from all the participants.

Sixty patients of either gender, aged between 20-70 years, belonging to American Society of Anesthesiologist (ASA) physical status I-II, undergoing elective laparoscopic cholecystectomy under general anaesthesia were included. Patients with oral cavity pathology, mouth opening <2.5 cm, body mass index >30 kg/m^2, increased risk of aspiration, bleeding disorder, pregnancy, lack of consent to participate were excluded from the study.

Study participants were randomly allocated into **Group A (**Gastric tube inserted via gastric port post-LMA placement) and **Group B (**No gastric tube inserted). Randomization was done by using a sealed envelope method that contained code numbers to either of the two groups.

All patients underwent standardized anaesthetic induction comprising Premedication with IV Glycopyrrolate 0.005 mg/kg, Midazolam 0.03 mg/kg, Dexamethasone 0.1 mg/kg and Fentanyl 2 µg/kg. Induction was done with Propofol 2 mg/kg, 2% sevoflurane and vecuronium 0.1 mg/kg. LMA Blockbuster was inserted per manufacturer's weight-based size recommendations. Ventilation was labelled as adequate after confirming bilateral equal air entry, no audible leak, tidal volume ≥7–8 mL/kg, and square-wave $ETCO_2$. In Group A, a well-lubricated gastric tube was inserted via the gastric channel post-placement. FOB scores were recorded at baseline (immediately post-insertion) and at the end of surgery (before removal of LMA). FOB score was graded on scale of 1-4 as follows: 1: vocal cords fully visible; 2: vocal cords partially visible or and arytenoids visible; 3: only epiglottis visible; 4: no laryngeal structure visible.

Ease of gastric tube placement were graded as follows: 1: single attempt (easy); 2: >1 attempt (difficult); 3: impossible.
After the end of surgery, FOB score was noted, residual neuromuscular blockade was reversed, LMA Blockbuster was removed and the presence of any blood staining was noted. Incidence of sore throat was noted at 1 and 24 h, on 4 point scale: 0: no sore throat; 1: mild sore throat; 2: moderate sore throat; 3: severe pain or discomfort. Incidence of vomiting was assessed using 5-point scale: 0: no nausea and vomiting; 1: mild degree nausea; 2: moderate degree nausea and vomiting; 3: frequent vomiting; 4: continuous vomiting.

Data were analysed using SPSS. Categorical variables were compared using Chi-square test. Normally distributed quantitative parameters were presented as mean and compared using an independent sample *t*-test. Non-normally distributed quantitative parameters were presented as median and interquartile range and analysed using Mann-Whitney U test. $P<0.05$ was considered statistically significant.

Results

All sixty patients completed the study. Groups were comparable in demographic characteristics and baseline airway assessment. In Group A, 3 out of 30 patients (10%) showed change in FOB score intraoperatively. In Group B, 11 out of 30 patients (35%) showed FOB score change from baseline scores. (Figure 1)

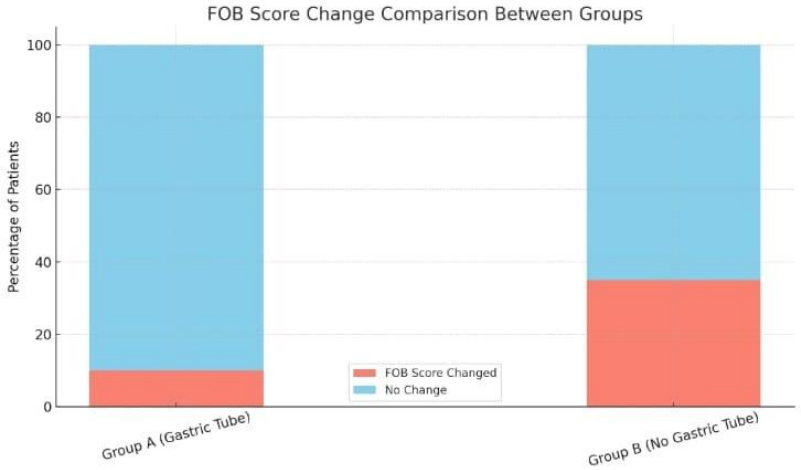

Figure 1: FOB Score Change Comparison

A one-tailed two-proportion z-test indicated that the change rate in FOB Score in group B was significantly higher than in group A (z= -2.44, p= 0.0073). Fisher's exact test provided consistent results (one-tailed p=0.0152). The absolute difference in proportions was -26.7% (95% CI: -47.0% to -6.4%), confirming that group B has significantly greater rate of changes compared with the group A.

Gastric Tube Insertion rate was 90% on first attempt without resistance; all insertions ultimately successful. Mild sore throat was observed in both Group A (20%) and Group B (23%) which was not statistically significant. Mild nausea and vomiting was observed in Group A (10%) and Group B (13%) which was not statistically significant. No severe complications or blood-stained devices observed.

Discussion

Securing airway in patients requiring mechanical ventilation during general anaesthesia can be done either by endotracheal tube intubation or supraglottic airway device. Endotracheal tube insertion is considered as gold standard; however it requires expertise in laryngoscopy and intubation. Current standard practice in anaesthesia promotes use of high seal supraglottic airway devices over endotracheal tube insertion for day care surgeries because of its less invasive nature with better patient compliance.[3] Newer generation supraglottic devices like LMA blockbuster offer high seal pressure however devices may dislodge from its position particularly in procedures where pneumoperitoneum or frequent need of patient repositioning is required.[1,4] Our findings indicate that gastric tube placement through the LMA Blockbuster's gastric port reduces the incidence of intraoperative displacement. This finding was based on comparing POGO scores using fibreoptic device at the start and end of surgery. The mechanism likely relates to the gastric tube serving as an additional stabilizing structure, preventing subtle shifts in the LMA position.

A key limitation of this study is the relatively small sample size, which may limit the generalization of these findings. In addition, other potential factors such as patient characteristics, operator variability were not controlled. Larger, multi-centre trials are warranted to confirm these results.

Conclusion

Gastric tube placement via the LMA Blockbuster significantly reduces intraoperative displacement, which is reflected in more stable FOB scores. This may be especially recommended in surgeries with high risk of device displacement, such as laparoscopic procedures and when patient position is changed intraoperatively.

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