

PROSEAL LARYNGEAL MASK AIRWAY IN GASTROINTESTINAL SURGERIESSridhar C. B¹, Navaneetha Krishnan²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: Pro Seal laryngeal mask airway (PLMA) is a new development among supraglottic airway management devices. The modified cuff and drain tube in PLMA makes it a better device over classic Laryngeal mask airway (LMA). This retrospective study was done to know the effectiveness of PLMA in gastrointestinal surgeries. Thirty adult patients of ASA I, II or III who underwent gastrointestinal surgery under general anesthesia with PLMA were reviewed. The following parameters were reviewed: hemodynamic response, ventilatory parameters, ease of gastric tube placement and adverse effects. PLMA was inserted in the first attempt in 28 out of 30 patients. The change in heart rate was 4.9%; mean increase in systolic and diastolic blood pressure after insertion of PLMA was 2% and 1.49% respectively. 100% success was achieved in Ryle's tube insertion. These parameters are comparatively low when compared with previous studies. This shows PLMA is a less invasive alternative to traditional endotracheal intubation.

KEYWORDS: Pro Seal laryngeal mask airway, endotracheal tube, gastrointestinal surgeries.

INTRODUCTION: Airway management is one of the vital skills used in anesthesia, trauma and critical care practice. The LMA fills a niche between the traditional face mask and tracheal tube in terms of both anatomical position and degree of invasiveness especially in difficult airway. It is simple to insert and plays a vital role in the management of difficult airway. However the LMA classic had some drawbacks like:

- 1) It does not protect the lungs from aspiration of regurgitated stomach contents
- 2) Its high airway pressure could not be declined. PLMA has modified cuff and drain tube. The unique, new double cuff provides twice the seal pressure of LMA classic. The open drain tube facilitates an escape for any inadvertently inspired gas leak, thus preventing gastric insufficiency. The drain tube provides a bypass channel for regurgitated gastric contents.

MATERIALS METHOD: A retrospective study was conducted on 30 adult patients belonging to either sex of grade 1, 2 and 3 who underwent gastrointestinal surgeries under general anesthesia with PLMA. Twenty five patients underwent laparoscopic appendicectomy and five patients underwent truncal vagotomy.

All patients were premedicated with diazepam 0.25mg/kg orally the previous night and on the day of surgery injection of diazepam 0.1mg/kg by intramuscular route, 45 minutes before induction of anesthesia.

Patients were pre-oxygenated with 100% oxygen for 5 minutes and induced with 2.5mg% thiopentone sodium at 5 mg/kg following succinyl chloride 2 mg/kg intravenously. They were ventilated with 100% oxygen and PLMA were placed.

Anesthesia was maintained with 65% nitrous oxide and 35% oxygen. Analgesia with narcotics and trace amount of volatile anesthetic agents for controlled ventilation were facilitated by injection of Atracurium.

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The following observations were reviewed:

1. Number of attempts in securing the airway was noted and ease of Ryle's tube placement through the drain tube.
2. The hemodynamic responses with parameters like systolic, diastolic blood pressure, heart rate, spo2 and mean arterial blood pressure before induction of anesthesia was taken as baseline values. The observations made after achieving patent airway which were recorded every 15 minutes for next 10 hours were noted.

RESULTS:

1. Ease of insertion: In the present study PLMA was inserted in 28 out of 30 patients in first attempt.
2. Change in heart rate: Table 1 shows the variations in heart rate at various intervals. The percentage increase in heart rate immediately following PLMA insertion was 4.9%.

Sl. No.	Time of Monitoring	No. of Patients	Standard Deviation	Mean
1	Pre-induction	30	9.5	96
2	Immediately after insertion of PLMA	30	10.11	100
3	After 3 minutes	30	10.3	101
4	After 6 minutes	30	10.2	98
5	After 15 minutes	30	7.4	96.4
6	After 30 minutes	30	8.9	89.6
7	After 60 minutes	30	6.4	90.06
The mean heart rate change at various intervals				

1. Changes in systolic blood pressure: the mean systolic blood pressure in the PLMA group increased to 102.76 immediately after insertion of tube from base line value of 100.06. An increase of 2% recorded in the study is minimal. as against the results laryngeal mask airway(8.6%) by Blade et al(1989).(e)
2. Changes in diastolic blood pressure: The blood pressure following PLMA insertion increased to 68 from baseline value of 67.1 that is 1.49%.
3. Changes in mean arterial pressure: The mean arterial pressure increased to 78.08 following PLMA insertion from the baseline value of 76 that is 2.7%. The results go well with the observations made by Wood and Forest (1994). They observed mean arterial pressure increased to be 9% following LMA.

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Sl. No.	Time of Monitoring	Mean Arterial pressure		diastolic blood pressure		systolic blood pressure	
		Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean
1	Pre-induction	7.24	76	6.1	67.6	8.6	100.06
2	Immediately after insertion of PLMA	6.7	78.08	7.27	68.3	9.6	102.76
3	After 3 minutes	7.02	76.63	7.3	68.06	8.75	101
4	After 6 minutes	6.91	77.6	7.4	66.16	7.73	102.3
5	After 15 minutes	5.09	80	5.18	70.06	7.64	106.3
6	After 30 minutes	4.3	82	5.16	71.13	7.81	107.3
7	After 60 minutes	4.01	82	4.42	70.53	6.7	107.6
The blood pressure at various intervals							

1. Ease of Ryle's tube placement: there was a 100% success in the placement of 12 or 14 size Ryle's tube in all 30 patients. In the present study about 4-30ml with an average of 1.75 ml was collected from drain tube.

DISCUSSION: PLMA is a new development among supraglottic airway management devices. The modified cuff and drain tube in PLMA makes it a better device over classic LMA. In our study we noted that PLMA is an easy procedure to insert. Davis et al in his study observed that LMA insertion at first attempt was successful in most of the patients.¹

Also it is less time consuming. The result goes well with the observations of Reinhart and Simmon (1994).² This proved PLMA is an easy procedure and requires more less skill and efficiency.

The percentage increase in heart rate immediately following PLMA insertion was 4.9%. This results compare well with the finding of Wood and Forrest (1994)³ which showed that changes in cardiovascular parameters following LMA was minimal. Hence LMA could be used in patients when hemodynamic response is undesirable.

The increase in systolic, diastolic and mean arterial pressure in our study was 2%, 1.49% and 2.7% respectively. This fluctuation is minimal. In the study done by Wilson mean maximum increase in systolic arterial pressure was 22.9% for laryngeal mask insertion.⁴ Similar observations were noted in Braude's study, which showed an attenuated pressor response to LMA.⁵

In certain patients the pressor response may be harmful. PLMA allows positive pressure ventilation without the need for laryngoscopy which may produce a pressor response. Hence it is a good device in these patients.

Ryle's tube placement was successful in all 30 patients. It matches well with observations made by Brain (2000),⁶ Brimecorube and Kellar (2000).⁷

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CONCLUSION: The hemodynamic parameters observed in this study show that the PLMA is a good airway instrument. Its ability to give higher seal at lower mucosal pressure facilitate safe ventilation.

The unique open tube drain tube of PLMA allows fluid and gases to escape reducing risk of gastric insufficiency. It also gives access to esophagus allowing blind insertion of oro-gastric tube in any position of the patient.

Hence it can be concluded that PLMA is a good option in gastrointestinal surgery because of its easy insertion, less invasive, lesser hemodynamic alteration and fewer complication.

REFERENCES:

1. Davies PRF, Tighe SQM, Greenslade GL, Evans GH. Laryngeal mask airway and tracheal tube insertion by unskilled personnel. The Lancet, Volume 336, Issue 8721, Pages 977 - 979, 20 October 1990.
2. Reinhart DJ, Simmons G. Comparison of placement of the laryngeal mask airway with endotracheal tube by paramedics and respiratory therapists. Ann Emerg Med. 1994 Aug; 24 (2):260-3.
3. Wood ML, Forrest ET. The hemodynamic response to the insertion of the laryngeal mask airway: a comparison with laryngoscopy and tracheal intubation. Acta Anaesthesiol Scand. 1994 Jul; 38 (5):510-3.
4. Wilson JG, Fell D, Robinson SL, Smith G. Cardiovascular responses to insertion of laryngeal mask airway. Anaesthesia 1992; 47: 300.
5. Braude N, Clements EAF, Hodges UM and Andrews BP. The pressor response and laryngeal mask airway insertion. Anaesthesia 1989; 44: 551- 4.
6. Brain AI, Verghese C, Strube PJ. The LMA 'ProSeal' Da laryngeal mask with an Oesophageal vent. Br J Anaesth 2000; 84: 650±4.
7. Brimacombe J, Keller C. The Pro Seal laryngeal mask airway: A randomized, crossover study with the standard laryngeal mask airway in paralyzed, anesthetized patients. Anesthesiology 2000; 93: 104±9.

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