

Comparison of the insertion of LMA classic™ by the standard insertion technique Vs the 90-degree rotational technique - A prospective randomised comparative study

Subha Teresa Jose Vazhakalayil^{1*}, Payal Gursahani², Sonalika Tudimilla³

¹Assistant Professor, ²Post Graduate Resident(JRII), ³Post Graduate Resident(JRI), Department of Anaesthesia, D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune, INDIA.

Email: dr.subhajose@gmail.com, gursahanipayal@hotmail.com, sona3668@hotmail.com

Abstract

Background and Aims: The Laryngeal Mask Airway has become an integral component of anaesthesia practice, airway management and management of the difficult airway. The standard insertion technique of the LMA as described by Dr. Archie Brain has found to have a varying degree of successful insertion on the first attempt. An alternative to the standard technique of insertion is the insertion of the LMA by the 90 degree rotational technique. The rotational technique has been proposed to improve the success rate of insertion of the LMA and decrease the time taken for its insertion. The objective of our study was to compare the success rate, number of attempts, time taken, haemodynamic changes and post-operative complications between the insertion of the LMA by the standard technique vs the 90 degree rotational technique. **Methods:** 78 patients were divided into 2 equal groups – In group ST the LMA was inserted by Standard Technique and in Group RT the LMA was inserted by the 90 degree Rotational Technique. **Results:** The number of attempts taken was higher in the standard technique as compared to the 90 degree rotational technique, but this difference was not statistically significant (5 multiple attempts vs 2 multiple attempts, $P = 0.45$), the mean time taken to insert the LMA was significantly shorter with rotational technique (25.26 by ST vs 3.63 by RT, $P < 0.0001$), the success rate was higher by the rotational technique but this was not statistically significant (97.44% by ST vs 100% by RT, $P = 0.93$). The incidence of blood staining is higher in patients with the standard technique as compared to the rotational technique. (7 in ST vs 2 in RT, $P = 0.025$). No significant difference between the hemodynamic changes was seen. **Conclusion:** The rotational technique provided faster insertion of the LMA. Thus, it may be considered as an alternative to the standard technique for insertion.

Key Word: LMA.

*Address for Correspondence:

Dr. Subha Teresa Jose Vazhakalayil, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune, Maharashtra, INDIA.

Email: dr.subhajose@gmail.com

Received Date: 30/10/2019 Revised Date: 02/12/2019 Accepted Date: 14/01/2020

DOI: <https://doi.org/10.26611/10151314>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
17 January 2020

INTRODUCTION

The LMA Classic™ was introduced into clinical practice in 1988.¹ The LMA has an established role in modern anaesthetic practice. It is used to maintain the airway in elective short surgical procedures with spontaneous ventilation as well as in controlled ventilation.² The practice guidelines for management of the difficult airway by ASA also emphasize the role of supraglottic airway devices and recommends to always consider its use in the management of difficult airway.³ Positioning of the LMA is of utmost importance. If the LMA is not inserted correctly, problems such as anaesthetic gas leakage, obstruction and gastric insufflation may occur.⁴ There are

How to cite this article: Subha Teresa Jose Vazhakalayil, Payal Gursahani, Sonalika Tudimilla. Comparison of the insertion of LMA classic™ by the standard insertion technique Vs the 90-degree rotational technique - A prospective randomised comparative study. *MedPulse International Journal of Anesthesiology*. January 2020; 13(1): 17-21. <http://medpulse.in/Anesthesiology/index.php>

various methods of LMA insertion. The most commonly used is the index finger insertion technique (standard technique) as described by Dr. Archie Brain. Various other techniques have also been described of which the 90 degree rotation technique is found to have a good success rate. The 90° rotation technique was first described by Hwang *et al.* and involves the following steps: the entire cuff of the LMA is inserted inside the mouth, rotated counter-clockwise through 90° and advanced until the resistance of the hypopharynx is felt ⁵. The use of this method is known to increase the success rate of insertion and decrease the incidence of blood staining of the LMA and sore throat compared to standard technique. The purpose of this study was to compare the clinical efficacy of the rotational technique vs the standard technique for inserting the LMA ClassicTM.

MATERIALS AND METHODS

After obtaining approval from the ethical committee board of Dr. D. Y. Patil Medical university, we included 78 patients in prospective randomised controlled study. All these patients were undergoing general anaesthesia. These patients were divided into two random groups equally. Inclusion criteria for the study was fulfilled which included patient age between 18-60 years, ASA-I-II fit patients and for short surgical procedure of less than 1 hr requiring general anaesthesia. Exclusion criteria for the study were patients with BMI>30, anticipated difficult intubation, and Mouth opening less than 2 fingers. After confirming NBM status, standard monitors like ECG, Pulse oximeter, NIBP were attached. Preoxygenation was done with 100% oxygen for 3 minutes. Patient was premedicated with Inj. Glycopyrrolate 0.004 mg/kg, Inj. Midazolam 0.05 mg/kg and Inj. Fentanyl 2mcg/kg intravenously 10 minutes prior to induction. Anaesthesia

was induced with Inj. Propofol 2mg/kg. Loss of eyelash reflex and apnoea was taken as end point of induction. After ensuring proper jaw relaxation LMA classic was inserted either by standard technique or rotation technique by randomisation. The correct size of LMA was selected according to weight of the patient. The cuff was deflated and posterior part of the LMA will be lubricated with water soluble jelly. In the standard technique group, LMA was held like a pen and inserted along the palatopharyngeal curve using the index finger until definite resistance was felt. In the rotation technique, the cuff was inserted into the mouth and rotated counter clockwise or clockwise through 90 degree until the resistance of hypopharynx was felt. The cuff was inflated and effective airway was assessed by looking at the capnograph trace, adequate chest expansion and available leak with peak airway pressure of less than 15 cm H₂O.

In both the groups, 2 attempts of 90 seconds each was allowed. If both the attempts failed, patient was either mask ventilated or intubated and excluded from the study.

We studied the following aspects during LMA insertion:

1. The number of attempts for successful insertion of LMA was noted.
2. The time taken to insert the LMA: The time between the insertion of LMA into the mouth to correct placement of the LMA and inflation of the cuff.
3. The haemodynamic parameters will be recorded Heart Rate (HR), Systolic blood pressure (SBP), Diastolic Blood Pressure (DBP) and mean arterial pressure (MAP).
4. Complications such as sore throat, trauma, blood staining of LMA.

RESULTS

A total of 78 patients were considered for the study, 39 each in standard and 90 degree rotational technique respectively. The two groups were similar with respect to age and gender. Most of the patients were between 30 and 40 years of age. (Table 1 and 2).

Table 1: Age distribution

	Standard technique	Rotation technique
Mean age	34.10	39.10
St dev	12.86	12.11
P Value	0.08	
Inference	No significant difference in the mean age of the patients	

Table 2: Sex distribution

	Standard technique	Rotation technique
Males	23	19
Females	16	20

The number of attempts taken for successful insertion of Laryngeal Mask Airway was more in standard technique when compared to 90 degree rotational technique. Five patients in the standard technique group required two attempts whereas in 90 degree rotational technique group, 3 patients required 2 attempts for successful insertion (Table 3)

Table 3: Comparison of no. of attempts required

	Standard technique	Rotation technique
Multiple attempts	5	3
P value	0.45	
Inference	No significant difference in the no. of patients who needed multiple attempts	

The time taken for successful insertion of classic laryngeal mask airway by rotation technique was 16.5 ± 3.5 seconds whereas in the standard technique it was $25.2 \text{ seconds} \pm 5.37$. There is significant statistical difference between both the groups. (Table 4)

Table 4: Mean time taken to insert LMA

	Standard technique	Rotation technique
Mean time taken	25.26	16.56
St dev	5.37	3.63
P value	<0.0001	
Inference	Mean time taken to insert the LMA was significantly shorter with rotation technique	

The success rate of insertion of LMA by the Rotational technique was (100%) as compared to the Standard technique 97.44%. This was not statistically significant. (Table 5)

Table 5: Success rate comparison

	Standard technique	Rotation technique
Success rate	97.44%	100%
P value	0.93	

The change in haemodynamic parameters like heart rate, systolic blood pressure, diastolic blood pressure and mean arterial pressure in both groups were statistically comparable (Table 6,7,8,9).

Table 6: Comparison of mean heart rate

	Standard technique		Rotation technique		P value	Inference
Heart rate	Mean	St dev	Mean	St dev		
Baseline	80.79	9.07	82.79	14.23	0.46	No significant difference
30s before LMA insertion	83.79	9.43	87.13	15.20	0.25	No significant difference
30s after LMA insertion	85.36	9.98	87.87	14.75	0.38	No significant difference
1 min after LMA insertion	82.08	10.14	84.64	13.71	0.35	No significant difference
2 min after LMA insertion	78.41	10.79	81.03	12.30	0.32	No significant difference

Table 7: Comparison of SBP

	Standard technique		Rotation technique		P value	Inference
SBP	Mean	St dev	Mean	St dev		
Baseline	119.79	11.39	114.82	12.32	0.068	No significant difference
30s before LMA insertion	121.56	11.52	114.67	14.75	0.024	SBP in patients with rotation technique was significantly lower
30s after LMA insertion	118.46	10.04	112.31	14.19	0.030	SBP in patients with rotation technique was significantly lower
1 min after LMA insertion	114.95	9.96	108.74	13.39	0.023	SBP in patients with rotation technique was significantly lower
2 min after LMA insertion	112.64	9.96	104.49	11.46	0.001	SBP in patients with rotation technique was significantly lower

Table 8: Comparison of DBP

	Standard technique		Rotation technique		P value	Inference
DBP	Mean	St dev	Mean	St dev		
Baseline	72.77	7.04	76.21	9.11	0.07	No significant difference
30s before LMA insertion	73.79	7.48	75.82	11.47	0.36	No significant difference
30s after LMA insertion	71.64	6.99	73.69	10.89	0.33	No significant difference
1 min after LMA insertion	69.77	7.16	70.87	10.12	0.58	No significant difference
2 min after LMA insertion	67.33	7.70	68.38	9.58	0.59	No significant difference

Table 9: Comparison of Mean of MAP

	Standard technique		Rotation technique			
MAP	Mean	St dev	Mean	St dev	P value	Inference
Baseline	87.49	6.60	88.46	8.99	0.59	No significant difference
30s before LMA insertion	88.72	7.13	88.49	12.12	0.92	No significant difference
30s after LMA insertion	86.38	6.88	86.62	10.98	0.91	No significant difference
1 min after LMA insertion	84.54	6.76	83.98	10.43	0.78	No significant difference
2 min after LMA insertion	82.77	7.55	81.58	9.75	0.55	No significant difference

Complications such as blood staining was seen in both techniques but it was significantly higher in the Standard Technique. Post operative sore throat was seen in both the techniques but comparable. (Table 10 and 11)

Table 10: Incidence of blood staining

	Standard technique	Rotation technique
Blood staining	7	2
P value	0.025	
Inference	Significantly greater no. of patients experienced blood staining with standard technique	

Table 11: Incidence of sore throat

	Standard technique	Rotation technique
Sore throat	1	1
Inference	No difference in the no. of patients who experienced sore throat	

DISCUSSION

In our study, we have seen that number of attempts taken for the insertion of the classic LMA was less in the rotational technique. P Raghavan *et al*⁶ and Hwang *et al*⁵ also observed that multiple attempts were required in the standard technique for LMA insertion, in their studies respectively. Causes for multiple attempts can be due to folding of the cuff over itself and impaction at the posterior end of the mouth.⁷ In our study we have concluded that time taken for the insertion of classic LMA was lesser with the rotational technique when compared to the standard technique of insertion. Narasimhanmk *et al*⁸ also concluded that time taken for proSeal LMA was shorter with rotational technique than standard technique. Jin Ha Park *et al*⁹ and Young Tae Jeon *et al*¹⁰ also had similar results in their respective studies. Jung Won Hwang *et al*¹¹ found that insertion time did not depend on the insertion technique. The changes in hemodynamic parameters like heart rate and mean arterial pressure remained comparable with both the insertion techniques¹³. Jung-won Hwang *et al*¹¹ concluded in their study that mean arterial pressure significantly increased with standard technique of LMA insertion. In our study blood staining of the LMA and post operative sore throat was more with the standard technique. Similar findings were also seen in studies by Nalini *et al*¹², Narasimhanmk *et al*⁸. Juan-won Hwang¹¹ *et al* respectively. Complications like blood staining of the Lma and sore

throat can be due mucosal trauma which can occur during digital manipulation of Lma.

CONCLUSION

In this study we can conclude that 90 degree Rotational Technique is a better alternative to Standard Technique as it can be inserted faster and there are lesser complications such as blood staining and sore throat.

REFERENCES

1. Tim Cook, Howes Ben. Supraglottic airway devices: recent advances. Continuing Education in Anaesthesia Critical Care and Pain 2011; Vol 11, Issue 2: 56-61
2. Zia A, Chaudhry T, Hussain R, Ghalani T. A comparison of airway maintenance by cuffed oropharyngeal airway (COPA) and laryngeal mask airway (LMA) in spontaneously breathing adult patients. Ann KE Med Coll, 2005;11:279-81
3. Apfelbaum JL, Hagberg CA, Caplan RA, *et al*. Practice guidelines for management of the difficult airway: an updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology. 2013;118:251-70
4. Kumar D, Khan M, Ishaq M. Rotational vs. standard smooth laryngeal mask airway insertion in adults. J Coll Physicians Surg Pak. 2012;22:275-9
5. Hwang JW, Park HP, Lim YJ, Do SH, Lee SC, Jeon YT. Comparison of two insertion techniques of ProSeal laryngeal mask airway: standard versus 90-degree rotation. Anesthesiology. 2009;110:905-7.
6. P Raghavan, Mithun Raju P., Arnold Plazid T. Comparison of two insertion techniques of classic

- laryngeal mask airway: standard versus 90 degree rotation. *Int. J Res Med Sci.* 2017 Feb; 5 (2):420-423.
7. Brimacombe J, Berry A. Insertion of the Laryngeal Mask Airway- A Prospective Study of four techniques. *Anaesth Intensive Care* 1993;21:89-92
 8. Narasimhanmk *et al.* Comparison of Standard Brain Technique and 90 degree Rotational Technique of Proseal LMA Insertion in Adults. *JMSCR*; Vol 6, Issue 01: 31858-31864
 9. Jin ha Park *et al.* Standard versus Rotation Technique for Insertion of Supraglottic Airway Devices: Systematic Review and Meta-Analysis. *Yonsei Med J* 2016 Jul;57(4):987-997
 10. Young-Tae Jeon *et al.* Insertion of the ProSeal laryngeal mask airway is more successful with the 90 rotation technique. *J Can Anesth* (2010) 57:211-215.
 11. Jung-won Hwang *et al.* Comparison of Two Insertion Techniques of ProSeal™ Laryngeal Mask Airway. *Anaesthesiology* 2009; 110:905-7
 12. Kadirehally Bheemanna Nalini *et al.* Comparison of three insertion techniques of ProSeal mask airway: A randomized clinical trial. *JOACP* 2016; 32:510-4.
 13. Evans NR, Gardner SV, James MF *et al.* The proseal laryngeal mask: Results of a descriptive trial with experience of 300 cases. *Br J Anaesth* 2002;88:534-9.

Source of Support: None Declared
Conflict of Interest: None Declared

