Use of laryngeal mask airway in the management of difficult airway during thyroidectomy

Abdullahi Mustapha Miko M, Dalhat Salahu, Usman Mohammed Bello

Aminu Kano Teaching Hospital, Bayero University, Kano, Nigeria

Abstract

Patients with difficult airway may be encountered either predictably or not. The Laryngeal Mask Airway (LMA) has increasingly become an option for airway management including patients with airway difficulty. We report the case of a middle-aged man who had thyroidectomy and whose anticipated difficult airway was managed with the classic LMA.

Introduction

The introduction of the Laryngeal Mask Airway (LMA) into modern day anaesthesia practice in 1988 represents a major advancement in airway management.[1] When correctly inserted into the pharynx and its cuff inflated, it directs air into the trachea and avoids insufflation of the stomach.[2] It also allows for minimal positive pressure ventilation and was in fact initially designed for use in the theatre for elective ventilation. The LMA has now come into use as part of the airway devices used in the emergency management of difficult airway.[3] It is therefore necessary for anaesthetists to get availed with the skill of use of this life saving device.

Case Report

Our patient is a 63 years-old man who was rescheduled for thyroidectomy on account of failed intubation two months earlier. He presented to the surgical out patient department of our hospital with a 10 years history of an anterior neck swelling, the swelling had been progressively increasing in size. There was no associated pain, difficulty in swallowing, difficulty in breathing or change in voice. He had no thyrotoxic symptoms. Neck examination revealed a huge anterior neck swelling moving with swallowing but not with protrusion of the tongue. There was retrosternal extension of the swelling and no cervical lymphadenopathy. A diagnosis of giant goiter was made and he was scheduled for subtotal thyroidectomy. Neck X-ray showed soft tissue swelling on the anterior neck with no calcification (Figure 1). There was associate tracheal deviation to the left (Figure 2). Neck ultrasound also showed retrosternal extension with benign features. A Computer Tomographic (CT) scan of the neck could not be done due to financial constraints.

Pre-anaesthesia review revealed a middle aged man who was re-booked for thyroidectomy having had a failed intubation two months earlier. Airway assessment from previous anaesthesia chart showed good mouth opening and neck movement though Mallampati was 3. Intubation aides available to the anaesthetist was a Macintosh laryngoscope and a stylet with no bougie. The patient was overweight, with a BMI of 28.9, and he had no co-morbidities. Chest and cardiovascular examinations were normal with a blood pressure of 130/80mmHg. Airway assessment revealed a short neck with good neck movement. Mallampati was 3, the inter incisor gap was 5cm and sternomental distance was 14cm. Full blood count, urea electrolyte and creatinine and thyroid function tests were within normal limits.

The first time the surgery was scheduled, attempts at laryngoscopy and intubation were unsuccessful and the patient was woken up after 3 attempts at intubation with no delay in recovery or sequalae.

In the operating suite, a cockpit drill was done checking for oxygen supply, anaesthesia equipments and resuscitative gadgets, baseline vital signs taken were pulse rate, non-invasive blood pressure, oxygen saturation and were within normal limits. An intravenous access was secured with a size 16 gauge cannula and 0.9% saline infusion running. With anticipation of difficulty with intubation, the alternative airway management plan was to intubate using a McCoy laryngoscope or a fiberoptic bronchoscope. Premedication was with 0.2mg of glycopylorrate and 30mg of pentazocine, he was preoxygenated with 100% oxygen for 3 minutes with a tight fitting facemask. Induction of anaesthesia was with a sleeping dose of sodium thiopentone (500mg) followed with 100mg of suxamethonium to aid intubation. Laryngoscopy with a McCoy laryngoscope was difficult as only the tip of the epiglottis was visible and attempts at intubating with a size 7.5mm endotracheal tube was unsuccessful. Fiberoptic bronchoscopy was then employed after a second dose of 50mg suxamethonium preceded by 0.2mg glycopylorrateto try and secure the airway, anaesthesia was deepened with 2% halothane in 100% oxygen via facemask, this also proved difficult as there was an inability to visualize the larynx. After suctioning of the oropharynx, a size 5 classic LMA was passed with ease to maintain the airway. The patient was allowed to resume spontaneous respiration and anaesthesia was maintained with 1–2% of isoflurane in 100% oxygen. Intra operative monitoring included pulse rate, blood pressure, oxygen saturation, and ECG. Surgery was started and completed without any critical incident. Recovery from anaesthesia was uneventful.

Discussion

The laryngeal mask airway is a novel supraglottic airway device developed by Dr Archie Brain in 1981. It is considered to be midway in design, function and invasiveness when compared with the facemask or oropharyngeal airway and the endotracheal tube. It is designed with a wide bore airway tube and a distal mask equipped with an inflatable cuff, which provides a seal around the larynx.[1]

The LMA is easy to use and quick to insert into the hypopharynx.[1] Despite its availability in this subregion, Onyekwulu and Nwosu[4] in Nigeria reported a high rate of apathy towards its use amongst anaesthesia providers with only 11.7% of their

Correspondence: Dr Dalhat Salahu, Department of Anaesthesia, Aminu Kano Teaching Hospital, Kano, Nigeria.
Tel.: +2348035878256
Email: dalhatusalahu@gmail.com

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respondents using it regularly despite its availability. The LMA classic which is reusable (Figure 3A) was the first commercially produced silicone prototype[5] and it is the most commonly used in this environment.[4] Other variants that came after it in order to fulfil other specific clinical needs include LMA Fast trach intubating LMA (Figure 3B), LMA unique- disposable (Figure 3C), LMA i-gel - a soft gel-like non inflatable cuff (Figure 3D), LMA flexible-reinforced, LMA proSeal–aids gastric suctioning and LMA supreme- similar to proSeal but with an in-built bite block mouth.[5]

Though the LMA cuffs forms a seal around the laryngeal inlet, they do not commonly protect against regurgitation and aspiration, consequently limiting their use to elective and selected fasted emergencies.[6] The size of LMA range from 1 for neonates to size 4 and 5 for adults. Successful insertion of LMA in the hypopharynx requires adequate mouth opening. The appropriate sized LMA should be selected and airway reflexes obtunded. Insertion is easier following propofol induction than sodium thiopentone because propofol causes better suppression of laryngeal reflexes.[7,8]

The inability to adequately manage the airway still remains an important factor in anaesthesia related morbidity and mortality.[9] The use of LMA when an unanticipated difficult airway is encountered provides a sure alternative for the anaesthetist. Thyroid surgery is commonly performed with endotracheal intubation to secure the airway, however in this patient there was a clear case of anticipated difficulty with airway management because of a previous history of failed intubation in the previous surgery, as the airway handler had the requisite experience. We therefore got ready a McCoy laryngoscope and fiberoptic bronchoscope, we however still found both difficult to use in securing the airway in this patient as the larynx could not be visualized. This is despite the experience and proficiency in its use by the anaesthetist. Adequate ventilation and oxygenation was achieved after placement of the LMA in the patient and vital signs remained stable throughout the procedure. The case presented here illustrates the use of LMA for securing airway in an emergency situation when difficult airway is encountered.

Fiberoptic intubation is the current gold standard for the management of difficult airway. This could nevertheless fail in some circumstances as a result of inability to visualize the larynx, inability to advance the tube over the fiberscope or inability to direct the tube towards the larynx.[10] This difficulty was similarly encountered in a case reported by Wulf L *et al.*[10] where their attempt at awake fiberoptic intubation failed in a patient with a neck mass as a result of the inability to advance the tube over the fiberoptic bronchoscope.

The successful use of the LMA when an unanticipated difficult airway is encountered was similarly reported by Nwasor and Lawal[1] in their study. Parmet *et al.*[11] reported a success rate of 94% when the LMA is used as a rescue airway.

Figure 1. Neck X-ray (lateral).

Figure 2. Chest X-ray (AP).

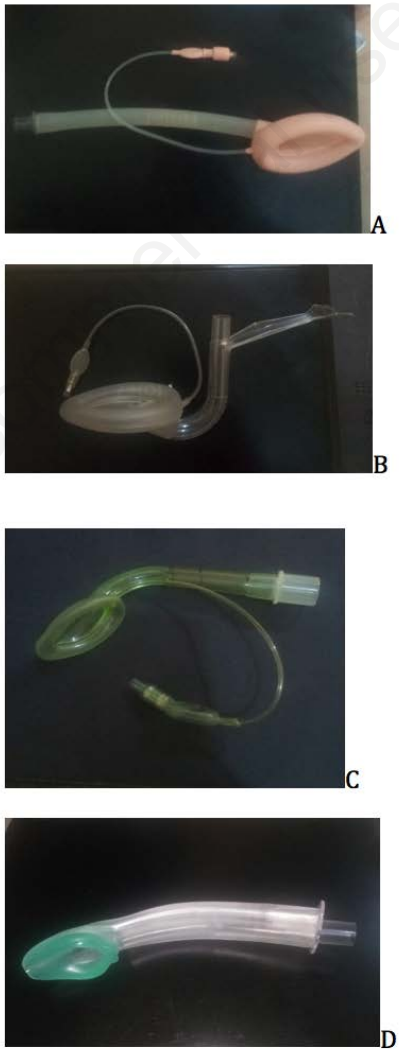

Figure 3. A) Classic LMA. B) Fast trach LMA. C) Unique LMA. D) I-Gel.

Conclusions

We conclude that when a difficult airway is encountered, the LMA serves as a rescue airway thus helps in preventing disastrous outcomes. The LMA should therefore be made available in the theatre at all times.

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