

Combined use of stylet and introducer tool in Proseal™ laryngeal mask aids insertion in halo frame immobilized patient

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Citation

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Abstract

Successful insertion of Proseal™ laryngeal mask airway requires placement of patient's head and neck in a 'sniffing' position which is not attainable in patients with halo frame. We attempted to see if shaping the Proseal™ laryngeal mask airway into a 'C' aids its insertion in a patient with halo frame.

A 55 year-old male patient, with halo frame cervical spine immobilization, required general anaesthesia for open reduction of # right tibia. Proseal™ laryngeal mask airway insertion failed despite two attempts by an experienced anaesthetist. It was now decided to shape the Proseal™ laryngeal mask airway into a 'C' shape by using a combination of metal introducer tool and a large Portex stylet in the drain tube

Shaping the PLMA into a 'C' shape helped in its easy insertion and successful placement in <10 seconds in patient with cervical spine immobilization.

INTRODUCTION

Successful insertion of Proseal™ laryngeal mask airway (PLMA) requires placement of patient's head and neck in a 'sniffing' position¹. Unfortunately this position is not attainable in patients with halo frame for immobilization of cervical spine. We recently had a patient with multiple trauma needing open reduction of the # right tibia. Patient had also sustained # C2 which had been immobilized with a halo frame. Insertion of PLMA failed despite two attempts by an experienced anaesthetist with and without the aid of an introducer tool. However, PLMA placement turned out to be easy by contouring it into a C-shape configuration with the help of stylet placed in the drain tube.

CASE REPORT

A 55 year-old, ASA grade II male patient [approximate weight 70 kg] with multiple fractures, was posted for elective open reduction of # right tibia. The patient had been put on a halo frame for # C2. The patient requested for all procedures to be done under general anaesthesia. Except for a mild chronic obstructive pulmonary disease [COPD], the patient had no other medical disease. All investigations were within acceptable limits.

The patient was premedicated with inj pethidine 50 mg and

inj ondansetron 4 mg administered intramuscularly 30 min before induction of anaesthesia.

Following 3 min preoxygenation, anaesthesia was induced with propofol 120 mg and fentanyl 75 µg intravenously. After ascertaining easy mask ventilation, neuromuscular blockade was achieved with suxamethonium 50 mg administered intravenously. Keeping in view the difficult tracheal intubation and the possible need for a higher ventilatory pressure in a patient of COPD, PLMA was selected as the airway device for this patient. After adequate relaxation, #4 PLMA was introduced but failed to be correctly placed. A second attempt with the introducer tool resulted in PLMA placement with some difficulty. A high peak inflation pressure of 28 cmH₂O was noted with a tidal volume of 550ml. High inflation pressure and failure to pass a nasogastric tube via the drain tube suggested folding back of the PLMA tip.

It was reasoned that folding back of the PLMA probably occurred as the PLMA tip met the posterior pharyngeal wall at 90° or <90°. To overcome this problem, a well lubricated large Portex™ stylet was introduced via the drain tube till its distal end and a C-shaped configuration of the PLMA was made [Figure 1].

Figure 1

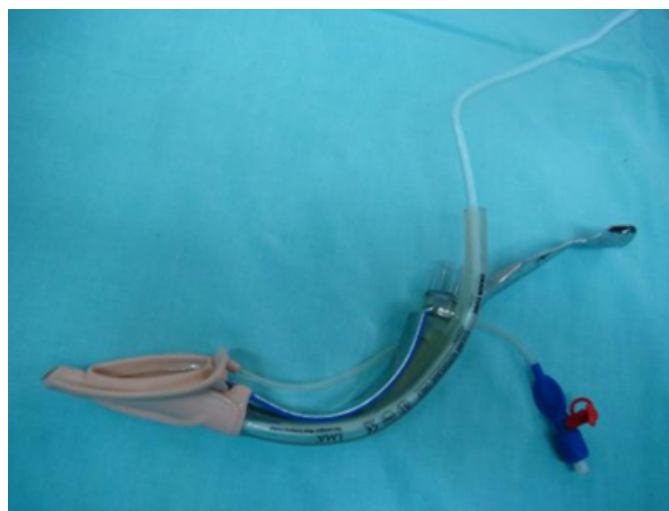
Figure 1: Gentle C shape curvature of the PLMA aided by the stylet and introducer tool.



Withdrawal of the stylet by 4-5 cm restored the PLMA shape to original [Figure 2].

Figure 2

Figure 2: Distal end of the PLMA restored to original shape after withdrawing the stylet by 4-5 cm.



With the stylet and introducer in place, the reconfigured PLMA was easily introduced (Figure 3).

Figure 3

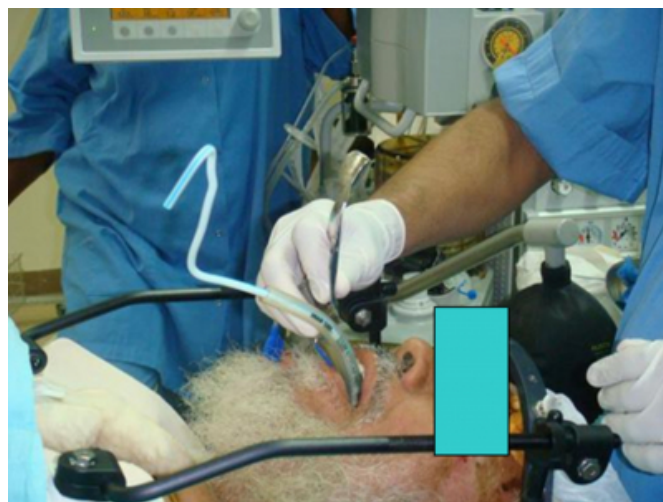
Figure 3: Introduction of the preformed PLMA aided by introducer tool and stylet in the patient with halo frame.



As soon as the device negotiated the oropharyngeal curve, and before going any further, the stylet was withdrawn by about 4-5 cm (Figure 4) and the device was smoothly placed.

Figure 4

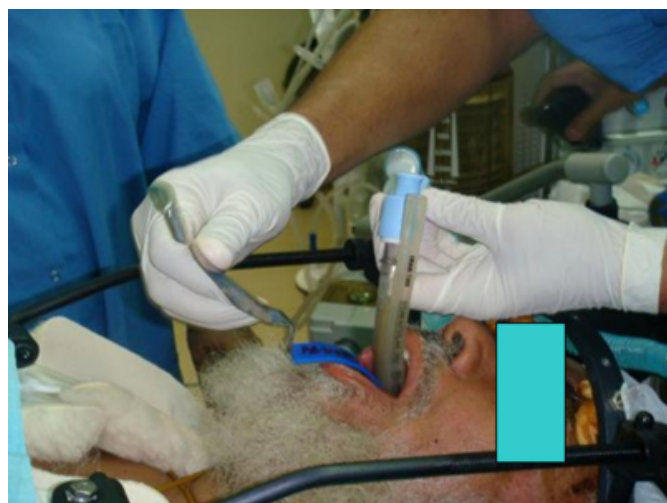
Figure 4: Final stage of PLMA insertion after withdrawing the stylet by 4-5 cm.



Both the stylet and the introducer tool were now removed (Figure 5) and cuff inflated with 20 ml air.

Figure 5

Figure 5: Removal of introducer tool after successful PLMA placement.



Good ventilation was recorded as evidenced by chest auscultation, capnographic tracing and a low inflation pressure of 21 cmH₂O. Adequate patency of drain tube was ascertained by the easy passage of a nasogastric tube.

Throughout the procedure heart rate, mean arterial pressure and oxygen saturation ranged between 74 – 81/min, 88 – 97 mmHg, and 97-98% respectively. Time to insert the PLMA with the aid of introducer and the stylet was <10 seconds.

Patient's consent to publish his photograph has been obtained and uploaded along with this article.

DISCUSSION

In addition to the conventional digital and introducer tool techniques, several other methods have been used to facilitate insertion of the PLMA. These include railroading PLMA over gum elastic bougie^{2,3} or the flexible fiberscope⁴, and gastric tube⁵ or suction catheter⁶ guided insertion of the PLMA. In the present case, after the initial failure of PLMA placement with digital and introducer tool techniques, the above mentioned techniques were considered but not applied. The disadvantage of the gum elastic bougie is that it is rigid and requires laryngoscope guidance which would have been difficult in this case. Suction catheter and gastric tube are soft and may have failed to guide the PLMA around the oropharynx held fixed in the halo frame.

Furthermore, successful use of the above techniques has not been reported in patients with halo frame immobilization of the head and neck.

Using our technique, we could curve the distal portion of the PLMA. By passing a well lubricated stylet into the drain tube, we could shape the PLMA into a gentle C-shape and yet restore its shape by withdrawing the stylet by 4-5 cm (Figures 1 and 2). The distal curvature extending up to the mask tip made the negotiation of the oropharyngeal curvature easier in an otherwise fixed head and neck position. Furthermore, keeping the distal end of the stylet till the tip of the drain tube prevented the folding back of the PLMA as it met the posterior pharyngeal wall. Withdrawing the stylet by approximately 4-5 cm after negotiating the oropharyngeal curve, restored the original shape of the device without impeding progress of the tip of the PLMA towards the upper oesophageal opening as confirmed by smooth passage of the nasogastric tube subsequently.

In conclusion, a premounted PLMA with introducer tool and lubricated stylet facilitates its easy placement in patients whose head and neck has been immobilized in a halo frame.

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