

# Use of Proseal LMA in a Patient of Fracture Cervical Vertebra Presenting for Non Spinal Surgery - Are We Justified?

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## ABSTRACT

**Introduction:** Airway management in a patient of cervical spine injury is an audacious but a rewarding task. The key to successful management of these patients is attention to head positioning and stabilization during initial evaluation and airway management in order to avoid secondary neurological insult.

**Case report:** Successful placement of proseal LMA was achieved in a single attempt, with bilateral adequate and equal air entry. MILS was maintained throughout bag mask ventilation and LMA placement. There is considerable evidence that mask ventilation causes significant movement of cervical axis and occiput. This makes airway management in fracture of C2 vertebra a dangerous task. Cervical spine immobilization is the standard of care until spinal injury is excluded.

**Conclusion:** Awareness and adequate use of individualized airway management procedures according to the urgency of the situation and skills of the anaesthetist are the key to success in patients of cervical spine injury.

**Keywords:** Cervical Spine Injury, Manual in Line Stabilization, Proseal LMA

## INTRODUCTION

Airway management in a patient of cervical spine injury is an audacious but a rewarding task. The key to successful management of these patients is attention to head positioning and stabilization during initial evaluation and airway management in order to avoid secondary neurological insult. Development of individualized airway plan and systemic approach is necessary in patients of cervical vertebra fractures in order to circumvent the risk of sudden airway obstruction. Airway management in these patients may be required as an emergency or electively on OT table in case general anaesthesia is planned for non spinal surgeries such as in our case. Here is a case report of patient with fracture 2<sup>nd</sup> cervical vertebra, presently operated for fracture upper end of shaft humerus. To the best of our knowledge and an extensive search of literature such a 'successful first time attempt' of proseal LMA with Manual In Line Stabilization (MILS) in a patient of fracture of Cervical vertebra has rarely been reported.

The majority of cervical spinal motion during direct laryngoscopy occurs at craniocervical junction at level of fourth cervical vertebra and above. The typical 'sniffing the morning air' position that we use as a standard, flexes the lower cervical spine (C2, C3, C4) and simultaneous extension of occiput occurs on atlas.

## CASE REPORT

A 13 year old male patient presented in the emergency of PGIMS Rohtak with multiple trauma including fracture of C2 vertebra, fracture of upper end of shaft of humerus and femur. He was planned for an elective surgery for fracture upper end of humerus. When presented in the PAC, he had a cervical collar in place and was lying on a stretcher, fully conscious and oriented. There was no H/O chronic illness, dyspnea or any H/O headache, loss of consciousness or vomiting. X ray spine (Figure 4) showed fracture of C2 vertebra (both pedicles). CT head and neck showed nothing significant. Rest of haemogram and LFTS, KFTS were normal. We planned for awake fiberoptic intubation with 'Manual in line stabilization' but our patient was quite anxious and non cooperative. We planned for proseal LMA. Emergency cart was kept ready in case an inadvertent situation arises.

Tab Rantac (150 mg) and tab anxix (0.25 mg) given on the morning of surgery. On table oall routine monitors including NIBP, ECG, HR, SPO2 and ETCO2 were attached. We did not opt for arterial BP monitoring as expected case duration was 45 mints. No other special monitoring done. Inj. Glyco (0.2 mg), inj. Midazolam (1.5 mg), inj fentanyl 80 mg given. Induction started with inj propofol (2 mg/kg). After application of adequate MILS, with an assistant on side of table (Figure 1) and supporting the mastoid and occiput with both hands, satisfactory bag mask ventilation was achieved. Inj. Propofol 50 mg repeated and proseal LMA (size 3) inserted with use of a guide (Figure 2,3). Successful placement was achieved in a single attempt, with bilateral adequate and equal air entry. MILS was maintained throughout bag mask ventilation and LMA placement. Cervical collar was removed for the procedure (Figure 3). Neck stabilization during surgery was achieved with a neck collar and use of adhesive tapes. Surgery proceeded. Minimal movement of cervical spine was ensured throughout the procedure. Patient remained stable intra and postoperatively.

## DISCUSSION

The two most important points of interest are-  
Use of Manual In Line Stabilization (MILS)

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**Figure-1:** Manual in line stabilization during mouth opening after removal of cervical collar; **Figure-2:** Manual in line stabilization maintained during lma insertion



**Figure-3:** Limited movements allowed during insertion of LMA; **Figure-4:** X ray cervical spine (LAT View) showing fracture at C2 vertebra

Use of an unconventional airway devise (LMA)

In addition to the usual intubation procedures (laryngoscopy, intubation), even mask ventilation is not innocent. There is considerable evidence that mask ventilation causes significant movement of cervical axis and occiput. This makes airway management in fracture of C2 vertebra a dangerous task. Cervical spine immobilization is the standard of care until spinal injury is excluded.<sup>1</sup> Two main methods are use of cervical collars and MILS. It has been seen that cervical collar reduced interincisor distance and have made intubation difficult due to limited mouth opening. MILS has shown to decrease the glottic view, decreased laryngeal visualization and hinders intubation. But in comparison to the use of collars for immobilization, glottis view is better with MILS.<sup>2,3</sup>

For airway maintenance, use of direct laryngoscopy causes greatest movement of cervical spine although has advantage of good experience and quick performance. Awake fiberoptic intubation seems to be a definitive alternative choice but needs experience and may cause increased intracranial pressure and airway obstruction due to bleeding and edema. Also

our patient was too anxious to cooperate.<sup>4</sup> We used proseal LMA without guide. It can be inserted easily in a neutral position and therefore is quite attractive to use in patients of cervical spine fractures, where flexion or extension might jeopardize the situation. The risk of aspiration is reduced due to presence of gastric drainage tube. The proseal LMA has a deeper bowl for mask with an additional dorsal cuff. Due to these minor but highly significant modifications, the airway sealing pressure attained is about 10 cm H<sub>2</sub>O higher than classical LMA.<sup>5</sup>

We do admit certain pitholes. We could have considered to use intubating LMA as it has more acute angulation for easy placement in cervical spine injury. Monitoring could have been more invasive (ABP) in case emergency situation (haemodynamic instability) arises. Video laryngoscopy could be rescue choice but we donot have this luxury in our department at present.

## CONCLUSION

Cervical spine injury is a potentially challenging airway and attention to head positioning and adequate immobilization is important. Awareness and adequate use of individualized airway management procedures according to the urgency of the situation and skills of the anaesthetist are the key to success.

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