

# Innovative Lighted Stylet: An Edge Over Conventional Lighted Stylet For Intubation Using Preformed (Rae) Nasal Endotracheal Tube

M Jain, A Gupta, M Garg, B Rastogi, H chauhan

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## Abstract

Nasal intubation is an obvious choice for temporomandibular joint (TMJ) ankylosis surgery (Fig.1)

1

. Adequate surgical access and better fixation makes RAE (Ring-Adair-Elwin) nasal tube a preferred choice

2

. Conventional lighted stylet does not support RAE intubation due to short length of its stylet (Fig.2). Our innovative lighted stylet can easily help in RAE tube insertion in these cases (Fig.3)

3

. It is simple to make and can be easily assembled from materials commonly available in the operating room.

3

Work Attributed To –Department Of Anesthesiology & Critical Care , Subharti Medical College, Meerut ,U.P.,India

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## CASE REPORT

A 22 year old female patient was admitted to our hospital with temporomandibular joint (TMJ) ankylosis and posted for gap arthroplasty (Fig.1). Preoperative investigations revealed haemoglobin 11.3 gm%, total leucocyte count (TLC) 9500/ cmm, differential leucocyte count (DLC) P82 L17 E1, blood sugar 110g%, blood urea 35mg/dl, electrocardiogram and chest x-ray were normal. During preanaesthetic check up, her blood pressure was 114/70 mm Hg, pulse rate 84/min and weighed 52 kg. Mallampatti (MP) grading could not be assessed as she barely had any mouth opening. She was accepted for anaesthesia under ASA grade I with anticipated difficult airway. On the day of surgery, patient was premedicated with inj. glycopyrrolate 0.2 mg i.v., inj. midazolam 2.0 mg i.v., and inj. butorphanol 2.0 mg i.v. For securing airway, awake nasotracheal intubation with RAE (Ring-Adair-Elwin) nasal tube was planned with innovative lighted stylet , as conventional lighted stylet had

failed to reach the tip of RAE tube (Fig.2, Fig.3). The patient was thus prepared for awake nasal intubation. After explaining procedure to the patient, upper airway was anaesthetized using 10% xylocaine spray. Bilateral superior laryngeal nerve block and intratracheal instillation of xylocaine was done for anaesthetizing the lower airway. After proper lubrication, a RAE tube with innovative lighted stylet was put through right nostril and using light glow as guide, we succeeded in performing nasotracheal intubation in first attempt. Confirmation of correct tube placement was done by auscultation of bilateral breath sounds and using a capnograph. Inj. propofol 2.0mg/kg i.v. was given to induce anaesthesia and maintained using inj. vecuronium bromide 0.08mg/kg, oxygen, nitrous oxide and isoflurane. At the end of surgery, the patient was extubated after reversal using inj. neostigmine 2.5 mg and inj. glycopyrrolate 0.4 mg i.v. Postoperative period remained uneventful.

**Figure 1**

Fig.1: Orthopantomogram (panorex view) showing TMJ ankylosis



**Figure 2**

Fig.2: Conventional lighted stylet failed to reach at the end of RAE tube



**Figure 3**

Fig.3: Innovative lighted stylet reaching at the end of RAE tube



**DISCUSSION**

Difficult airway is always a challenge for the anesthesiologist. To overcome these difficulties, various

gadgets and equipments have been developed and same trend will continue in future also.

Our patient had TMJ ankylosis because of which she had no mouth opening which made direct laryngoscopy unfeasible. Hence, the options left with us for securing airway included fiberoptic bronchoscopy (FOB), blind nasal intubation, tracheostomy, and intubation using lighted stylet.

Although FOB is a gold standard for securing airway in these patients, but this instrument was not available in our institution. Lighted stylet intubation is especially useful in situations where FOB is unavailable or difficult to perform because of secretions or blood in airway or when patient's head cannot be flexed or extended <sup>456</sup> .

Compared with blind nasal intubation, nasal intubation with lighted stylet has been shown to require less time and fewer attempts <sup>78</sup> . Blind intubation has got high failure rates and there are also high chances of airway trauma <sup>9</sup> .

Although tracheostomy was a feasible option, but considering the postoperative morbidity <sup>10</sup> associated with this technique, this option was kept only for emergent situation.

Lighted stylet aided intubation was chosen as technique of choice. This technique uses a bright glow which guides the tube into trachea and can be used for nasal or oral intubation in patients whose larynx cannot be visualised by direct laryngoscopy <sup>8111213</sup> .

Preformed tube (RAE) was chosen to secure airway over conventional endotracheal tube as it is non kinkable, does not come into the surgical field and has better fixation which reduces the risk of unintended extubation <sup>2</sup> .

However, when conventional light wand was inserted into RAE tube, it could not reach the tip of tube because of its short length (Fig.2). Hence, we used our innovative lighted stylet which reached the tip of RAE tube (Fig.3) and were able to intubate the patient without encountering any difficulty. This innovative lighted stylet is very easy to make and is much economical than conventional light wand <sup>3</sup> . It can be prepared very easily even at remote places as it requires materials which are readily available in operating room such as Ryle's tube or suction catheter, laryngoscope bulb, electrical wires and 3.0 volt power source <sup>3</sup> .

To conclude, intubation of trachea using lighted stylet is

easy, safe, effective and rapid alternative method of airway management. Our innovative lighted stylet has an added advantage that it can be used to intubate trachea with RAE tube where conventional lighted stylet fails.

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**Author Information**

**Manish Jain, MD**

Associate Prof. in Anaesthesiology & Critical care Deptt in NSCB Subharti Medical College, Meerut (UP).India.

**Amit Gupta, DNB**

Assistant Prof. in Anaesthesiology & Critical care Deptt in NSCB Subharti Medical College, Meerut (UP).India.

**Munish Garg, MD**

Assistant Prof. in Anaesthesiology & Critical care Deptt in NSCB Subharti Medical College, Meerut (UP).India.

**Bhavna Rastogi, MD**

Assistant Prof. in Anaesthesiology & Critical care Deptt in NSCB Subharti Medical College, Meerut (UP).India.

**Himanshu chauhan, MD**

Assistant Prof. in Anaesthesiology & Critical care Deptt in NSCB Subharti Medical College, Meerut (UP).India.