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Case Report

Anaesthesia Section

Anaesthetic Management of Pyelolithotomy Patient with Restricted Mouth Opening due to Previous Mandibular Surgery- A Case Report

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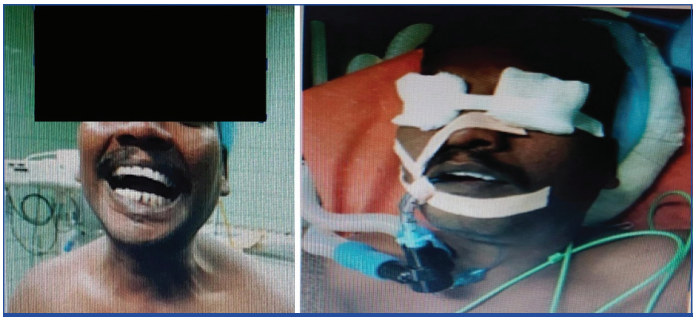
ABSTRACT

Anaesthetic management of a patient with compromised kidney function, who had restricted mouth opening due to previous surgery for mandibular fracture requiring general anaesthesia, is a challenge for anaesthesiologists. This is a case report of a 45-year-old male patient with renal calculus who underwent left pyelolithotomy surgery under general anaesthesia at our institution. He was admitted with left loin pain of two weeks' duration. Airway control was difficult due to limited mouth opening resulting from mandibular fracture four months prior, for which he underwent open reduction and internal fixation at a different hospital. We anticipated difficulty in securing the airway due to mandibular plate fixation. The airway was secured with orotracheal intubation using a levitan optical stylet under airway block. This case report highlights the importance of optical stylet in the plan B of managing a difficult airway, when a fiberoptic bronchoscope is not available in a critical situation.

Keywords: Body mass index, Bronchoscopes, Intratracheal, Intubation, Oxygen saturation

CASE REPORT

A 45-year-old male patient weighing 65 kg was admitted with a complaint of left loin pain lasting two weeks. Four months prior, the patient sustained a facial/jaw injury in a road accident and underwent open reduction and internal plating for mandibular fracture at a dental college hospital. The patient had restricted mouth opening [see Table/Figures 1 and 2] and no other comorbidities. During this admission, the patient was diagnosed with a left renal calculus, which was confirmed by urologists. The patient was scheduled for left-side pyelolithotomy. His respiratory, cardiac, and renal parameters were normal according to his chest X-ray, electrocardiogram (ECG), echocardiogram (ECHO), and biochemical reports. His blood pressure was 120/80 mmHg, SPO2 was 98%, his height was 160 cm, weight was 65 kg, and his body mass index (BMI) was 25.4. Airway examination showed a Mallampatti class 4, an inter-incisor distance of only 2 cm (restricted mouth opening), but normal neck movements.



[Table/Fig-1,2]: Restricted mouth opening; Postintubation using Leviton -optical stylet. (Images from left to right)

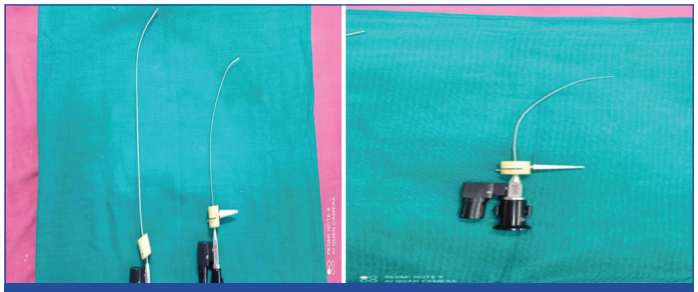
Blood investigation: Complete blood count, renal function test, and blood sugar were within normal limits, and a lateral view of the facial bones showed plating for mandibular fracture. The patient was assessed as ASA PS II (tobacco chewer, difficult airway). Due to anticipated difficult intubation, awake intubation under airway block using a levitan optical stylet or fiberoptic bronchoscope was planned. The patient was informed about the procedure, including airway block and intubation, and obtained consent. On the day of surgery, the patient received injection glycopyrrolate 0.2 mg one hour prior to surgery and was then shifted to the operating room. An intravenous (i.v.) line was secured using an 18 gauge cannula, and the oral cavity was anesthetized with a 4% lignocaine gargle. The patient was connected to a multi-parameter monitor for non-invasive blood pressure, electrocardiogram (ECG), and oxygen saturation (SPO2). The patient was premedicated with injection midazolam 1 mg i.v. and injection fentanyl 100 mcg i.v. The anesthesia workstation was checked, and a difficult airway cart was kept ready, which included a laryngoscope with different size blades, McCoy blade, intubation bougies, levitan optical stylet, fiberoptic bronchoscope, and equipment for surgical airway including percutaneous cricothyrotomy kit.

Airway block: A superior laryngeal nerve block was given just inferior to the greater cornua of the hyoid bone and superior to the thyroid cartilage by injecting 2 mL of 2% lignocaine on both sides. A trans-tracheal block was given through the cricothyroid membrane with 3 mL of 2% lignocaine after getting a give-way and confirming the position by aspirating air from the trachea. The patient had a cough while receiving the injection, which helped to spread the local anesthetic drug in the larynx and trachea. A levitan optical stylet was kept ready with an 8 mm ID PVC cuffed endotracheal tube, which was railroaded onto it. Injection midazolam 1 mg and injection fentanyl 50 mcg were given. The patient was preoxygenated with 100% O2 for five minutes. Then, with the help of a conventional laryngoscope, tongue lateralization was performed. The levitan optical stylet was introduced, and the tip was placed behind the epiglottis. Viewing through the eyepiece, the glottic inlet was seen, and the optical stylet with the endotracheal tube was introduced into the trachea under visual guidance. The tracheal rings were seen, and the carina was identified. Continuous insufflations of oxygen at 5 l/min were given through the oxygen port. Under vision, the endotracheal tube was pushed downwards into the trachea, and then the optical stylet was removed. The endotracheal tube was fixed at 21 cm at the right-side angle of the mouth. An ETCO2 monitor was connected, and an oro-pharyngeal temperature probe was also inserted. Induction was performed with injection propofol 100 mg, followed by injection vecuronium 6 mg i.v. General anesthesia was maintained with N2O and O2 at a 2:1 ratio with desflurane 3-5%. The patient was positioned for the surgical procedure (pyelolithotomy), and the placement of the endotracheal tube was again confirmed. The duration of the procedure was three and a half hours. Intraoperatively, injection fentanyl 20 mcg and injection vecuronium 1 mg were repeated twice. The patient

received injection ondansetron 4 mg and injection dexamethasone 8 mg i.v. At the end of surgery, the patient was reversed with injection neostigmine 2.5 mg and injection glycopyrrolate 0.4 mg. Extubation was performed after adequate oropharyngeal suctioning and after adequate recovery of reflexes and muscle power. Post-extubation oxygenation with 100% O2 for five minutes was performed. The patient was observed on room air for about 10 minutes and was then shifted to the recovery room. After half an hour, the patient was shifted to the postoperative ward.

DISCUSSION

Numerous case reports and experiences of airway management in patients with limited mouth opening have been published in various journals. However, most of these cases are managed with fiberoptic-guided (FOB) orotracheal or nasotracheal intubation, retrograde guidewire-assisted fiberoptic nasal intubation, and blind nasal intubation [1,2]. Tracheostomy is also reported as a life-saving measure in patients with associated neurological or neuromuscular diseases. Nowadays, blind nasal intubation is not commonly practiced due to the availability of various sophisticated airway gadgets. If mouth opening is adequate, supraglottic intubating airway devices can be used, and FOB is reserved for patients with limited mouth opening and a deviated trachea due to various pathologies or trauma. However, FOB usage requires skill and training to handle it effectively. Tracheostomy is an invasive technique that can be performed either as a planned procedure if all other non-invasive options are not feasible or as a life-saving emergency. We kept all necessary equipment, including FOB and tracheotomy sets, in the difficult airway cart. For this patient, the levitan optical stylet was chosen as a device to aid intubation to combat the difficult airway due to limited mouth opening. The levitan FPS is a rigid optical device and a wonderful alternative option in a patient with restricted mouth opening. The length of this optical stylet is 30cm, 5mm in diameter, and the distal shaft of the stylet is malleable. It has a port for oxygen resource and a portable light source [3-5]. It can be used as an independent device or along with a direct laryngoscope to aid orotracheal intubation. Its main advantage is a very high first-pass success rate, and its distal end being malleable can be manipulated according to the airway curvature [Table/Fig-3,4]. Sahu S et al., [6] used a light wand for emergency intubation to secure the airway in patients with facial trauma [6]. Rhee KY et al. recommended the use of a lighted stylet for both oral and nasal intubation in difficult airway situations [7]. Gaszynski compared the levitan FPS with the Lary-Flex video laryngoscope for ease of intubation in morbidly obese patients and found that both devices improved laryngeal visualization [8]. However, the levitan FPS optical stylet had a better laryngeal view compared to the eary-Flex video laryngoscope, and the latter produced less cardiovascular response to intubation [8,9]. light wandintubation was found to be cost-effective, easy to use, and easy to maintain compared to other devices for difficult intubation [10]. Additionally, compared to the routine Macintosh laryngoscope, the optical stylet was clinically beneficial in improving the intubating conditions in patients with cervical spondylosis [11].



[Table/Fig-3,4]: Leviton-optical stylet-two sizes (Adult & Paediatric). (Images from left to right)

CONCLUSION(S)

While the fiber optic bronchoscope is considered the gold standard for difficult airway management, the malleable optical stylet is a cost-effective and useful alternative for securing the airway in conditions such as restricted mouth opening and emergency intubation situations. This simple and user-friendly device also has the provision to oxygenate the patient during the intubation procedure and minimize aerosol exposure if suitably protected (when done under a camera-assisted technique) in patients with restricted mouth opening.

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