



## Case Report

### Impacted tooth brush in retromolar area: a practical management of difficult airway

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#### Abstract

Proper airway management is an important skill for an Anaesthesiologist. This case report deals with airway management performed in a forty five years lady, with impacted tooth brush in the retromolar region on the right side. She was intubated and the foreign body was removed surgically without any peri-operative complications. This case report discusses the complications and management of oropharyngeal injuries by stick-like foreign bodies such as a toothbrush or a chopstick. The article also focuses on basic airway management and some tracheal intubation techniques that may be performed to solve a difficult airway.

**Keywords:** Difficult airway management; impacted tooth brush; Retromolar region.

#### Article History

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#### Introduction

In recent years, due to development of newer airway devices, better techniques and continuous monitoring, practice of airway management has become more advanced and safer. Majority of these devices have been included in American society of Anaesthesiologists' difficult airway management algorithm. Management of the difficult airway remains one of the most relevant and challenging tasks for an Anaesthesiologist. For a successful manoeuvre, it is essential to have good knowledge of anatomy of upper airway passages, availability of necessary equipments, have technical expertise, and awareness of the complications of laryngoscopy, intubation and extubation. Patient safety depends on the practical management, keeping in mind each of these aspects. In the present case the toothbrush got impacted in the retromolar trigone, which is at the crossroads of the oropharynx, nasopharynx, buccinator space, floor of the mouth and the parapharyngeal space.

#### Case report

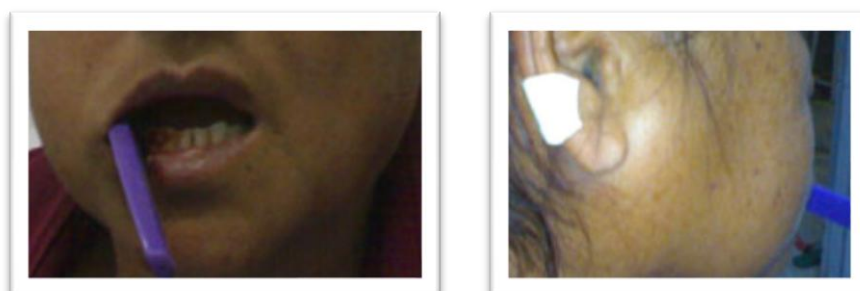


Figure 1: Impacted tooth brush (Anteroposterior and Lateral view)

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A forty five years lady presented in emergency department with history of fall in the bathroom with tooth brush in the mouth, followed by impacted tooth brush in the retromolar region on the right side. A known hypertensive, not fully control as taking medication irregularly, was planned for exploration & removal of tooth brush under general anaesthesia.

On examination her vital signs were stable. Blood pressure was 170/96 mm of Hg. Her respiratory and cardiac examinations were normal. The toothbrush did not appear to be pulsating. She was shifted immediately to the operation theatre and a quick airway assessment was done. Mouth opening and neck mobility were restricted due to pain. Intravenous cannulation was done with 18 gauge cannula. Injection glycopyrrolate 0.2mg was given.

The protruding handle of tooth brush outside of oral cavity was making mask ventilation impossible. To ease mask ventilation, the handle of tooth brush was cut off carefully by using rib cutter .After preoxygenation and induction with propofol 120 mg, mask ventilation was checked. As mask ventilation was possible, nasal intubation was done to facilitate the surgical procedure with reinforced endotracheal tube 6.5 after giving 100 mg intravenous suxamethonium. Pethine 45 mg I.V. was given for analgesia. Anaesthesia was maintained with isoflurane and nitrous oxide. Vecuronium was used as muscle relaxant.

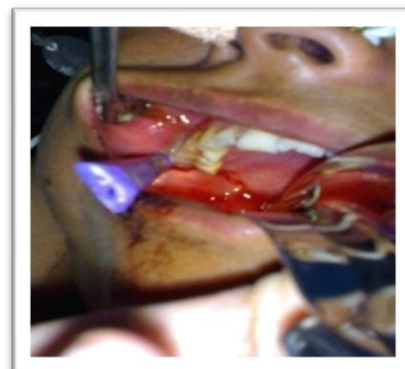
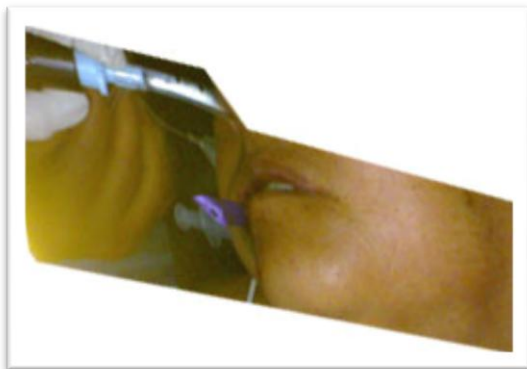


Figure 2(A) showing trachea intubated via nasan route. Figure 2(B) showing head (with bristle) completely pierced in retromolar area

After exploration of the wound, the tooth brush was removed from the right retromolar area without any complication. Hemostasis was secured and wound was closed. Intra-operative and postoperative periods were normal.

### Discussion

Airway management is a vital skill in the practice of anaesthesia and intensive care. One third of airway related complications resulting to brain damage or death occur due failure of maintaining patent airway on time. The maxilla-facial trauma usually disrupts the normal anatomy which is further compounded by bleeding and edema in the walls of oral cavity and oropharynx often makes mask ventilation and intubation difficult. Artificial airway inserted through the nose or mouth may be the only way to create an air passage in such cases. Trying airway insertion in awake or lightly anaesthetized patient may cause cough or even lead to laryngeal spasm and trying in fully anaesthetized patient, may lead to condition of cannot ventilate -cannot intubate.

In the present case, mask ventilation was impossible due to handle of tooth brush protruding outside oral cavity. As mouth opening was restricted, difficult intubation was anticipated. So to ease mask ventilation, handle of tooth brush was cutcautiously with rib cutter. Following proper steps of general anaesthesia, laryngoscopy was done and endotracheal tube was introduced and secured.

Smitha Mariyam Thomas et al reported a similar case where a four years child got accidental hit while brushing his teeth and the tooth brush get impacted in retromolar area.<sup>1</sup>Sagar S et al also reported case of a ten year old boy with oropharyngeal injury caused by a toothbrush which penetrated the parapharyngeal space.<sup>2</sup> In both cases, tooth brush was removed surgically without any intraoperative or postoperative complications.

Sasaki T et al reported the case of a ten year-old girl with pharyngeal injury caused by a toothbrush, the snapped head of which lodged in her upper oropharyngeal wall pulsating in synchrony with internal carotid artery pulsations. <sup>3</sup>Oropharyngeal impalement is a potentially lifethreatening injury, though attention to

airway obstruction and active haemorrhage take initial priority. Thrombosis of the internal carotid artery is a potential risk, especially in injuries of the peritonsillar region but even in innocent looking oropharyngeal injury. Such patients typically have a delayed onset of symptoms, sometimes more than 24 hours; so close observation is warranted.<sup>4</sup> Apparently a minor injury of the oropharynx developed into a life-threatening thrombus stretching from the internal carotid artery in the peritonsillar region to the brain as reported by Bar et al.<sup>5</sup>

Loh KS and Irish JC observed that complications related to intubation and other airway procedures can have significant risks on morbidity and mortality in similar type of cases.<sup>6</sup> So awareness of potential "difficult" airway and employing appropriate techniques to maintain airway in time and prevent complications related to airway management can minimize morbidity and mortality.

Difficult airway is defined as the clinical situation in which a conventionally trained anesthesiologist experiences difficulty with face mask ventilation of the upper airway, difficulty with tracheal intubation, or both. Difficult laryngoscopy stated it is not possible to visualize any portion of the vocal cords after multiple attempts at conventional laryngoscopy. Difficult tracheal intubation defined as tracheal intubation requires multiple attempts, in the presence or absence of tracheal pathology. Failed intubation defined as failure to place endotracheal tube into the trachea after multiple intubation attempts.<sup>7</sup>

With multiple intubation attempts, the incidence of airway trauma and oedema can increase and may ultimately create a critical airway event such as "cannot mask ventilate - cannot intubate" (CMVCI). If CMVCI occurs, rapid intervention using a supraglottic ventilation device is usually effective in restoring ventilation and oxygenation.<sup>8</sup>

Wilson W observed that a comprehensive airway examination incorporates both quantitative and qualitative tests that together may increase the probability of predicting difficult intubation.<sup>9</sup> Mallampati S developed "6-D" method of airway assessment.<sup>10</sup> He examined the airway for six separate signs that can be associated with difficult intubation: (a) disproportion, (b) distortion, (c) decreased thyro-mental distance, (d) decreased inter-incisor gap, (e) decreased range of motion, and (f) dental overbite.

The challenge in performing an endotracheal intubation arises mainly from difficulty in visualising the vocal cords. Numerous airway devices and equipments have been developed to overcome these obstacles, such as the fiberoptic bronchoscope, which enable indirect visualisation of the vocal cords. Supraglottic devices such as the laryngeal mask airway or combitube (oesophageal-tracheal twin lumen airway device) can be inserted blindly even without visualizing the vocal cord by any means. Among the devices and techniques enlisted below, the chosen technique and device depends upon case, specific needs, preferences, skills, and clinical constraints.

**Table-1 Techniques for Difficult Airway Management<sup>7</sup>**

<b>Techniques for Difficult Intubation</b>	<b>Techniques for Difficult Ventilation</b>
Awake intubation	Intratracheal jet stylet
Blind Intubation	Invasive airway access
Fiberoptic intubation	Supraglottic airway
Intubating stylet or tube-changer	Oral and nasopharyngeal airway
Supra glottic airway as an intubating conduit	Rigid ventilating bronchoscope
Laryngoscope blades of varying design and size	Two person mask ventilation
Light band	
Videolaryngoscope	

This table displays commonly cited techniques. It is not a comprehensive list. The order of presentation is alphabetical and does not imply preference for a given technique or sequence of use. Combinations of techniques may be used. The techniques chosen by the practitioner in a particular case will depend on specific needs, preferences, skills, and clinical constraints.

The final option is creating a surgical airway via cricothyrotomy or tracheostomy, establishing direct access to the trachea. Percutaneous dilatational tracheostomy is the most commonly performed tracheostomy technique. Translaryngeal tracheostomy is considered to be safe and cost effective, and can be performed at the bed side. Surgical tracheostomy is more invasive and can be performed only in an elective manner in a sterile environment.

## Conclusion

Anticipation and preparation for difficult airway are the most crucial steps. Relatively simple devices and techniques can solve most of the airway problems. But clinical judgment is very important. Airway management techniques are greatly depended upon individual case, anatomical variations, urgency to maintain airway, environment, devices available and technical expertise. Successful airway management requires combinations of devices and technical skills.

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