

Impacted Toothbrush in the Oropharynx: An Anesthetic Challenge

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Abstract

Airway management can be challenging in patients with impacted oropharyngeal foreign bodies, especially those with the shafts of the foreign bodies protruding from the mouth. Difficulties may be encountered in airway assessment, mask ventilation, laryngoscopy, and intubation. This may be compounded by the potential for airway obstruction and injury to adjacent neurovascular structures. We report the case of a 20-year-old lady who came to the emergency department with a toothbrush impacted in the oropharynx with its handle protruding out of the mouth. The anesthetic management followed to successfully intubate the patient and retrieve the foreign body has been discussed.

Key words: Airway management, difficult intubation, oropharyngeal foreign body, trismus

INTRODUCTION

The introduction of safer anesthetic agents, advanced airway devices, and sophisticated techniques have made anesthetic management simpler in recent years. However, management of a difficult airway still remains one of the most daunting tasks for the anesthesiologist.

Anesthesia for the removal of impacted oropharyngeal foreign bodies has not been so widely discussed in the literature. We detail the anesthetic challenges faced by us to secure the airway in a patient with an impacted toothbrush in the oropharynx.

CASE REPORT

We report the case of a 20-year-old lady who slipped and fell while brushing her teeth. The head of the toothbrush got impacted in the oral cavity with its handle protruding out of the mouth [Figures 1-3]. Any manipulation of the toothbrush was painful and hence exploration and removal of the foreign body was planned under general anesthesia. A swelling was seen in the preauricular area, which was confirmed by the presence of toothbrush bristles on the anteroposterior (A-P) and lateral head and neck X-rays [Figure 4].

Preoperative airway assessment could not be done as the patient could not open her mouth due to pain. In the operation theatre, routine monitoring with electrocardiography (ECG), noninvasive

blood pressure (NIBP), and pulse oximetry [peripheral capillary oxygen saturation (SpO_2)] were done. An oxygen mask was placed adjacent to the patient's face. The patient was premedicated with midazolam 1 mg, glycopyrrolate 0.2 mg, and fentanyl 2 μ g/kg intravenously (IV). Anesthesia was induced with propofol 2 mg/kg IV. Once the patient was asleep, the toothbrush handle was cut with the help of a bone cutter near the lips but about 2 cm still remained outside the mouth [Figure 5]. The mask was then placed over the patient's face with the remaining toothbrush fragment extending into the mask.

After ensuring adequacy of mask ventilation, muscle relaxation was achieved with atracurium (0.5 mg/kg) IV. A nasal Ring, Adair, and Elwyn (RAE) tube (7-mm internal diameter) was introduced through the left nostril. The laryngoscope was then introduced in the mouth by the side of the cut toothbrush handle and a Cormack-Lehane grade 2 view of the larynx was visualized. The distal end of the RAE tube was guided into the larynx with the help of Magill forceps and a throat pack was put [Figure 6].

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How to cite this article: Gupta S, Nayar R, Rani R, Sastry UR, Kartha A. Impacted toothbrush in the oropharynx: An anesthetic challenge. *Karnataka Anaesth J* 2015;1:134-6.

Access this article online

Quick Response Code:



Website:
www.karnatakaanaesthj.org

DOI:
10.4103/2394-6954.173535

Surgical exploration revealed that the toothbrush head had pierced the buccal mucosa and got lodged in the masseter muscle. Retrieval of the toothbrush was uncomplicated and the wound was sutured. Intraoperatively, the patient's vitals were stable throughout.

At the end of surgery, the throat pack was removed, the neuromuscular block was reversed with neostigmine 0.05 mg/kg IV and glycopyrrolate 0.01 mg/kg IV, and the patient was extubated. The rest of the recovery was uneventful.

DISCUSSION

Penetrating oropharyngeal injuries can be caused by trauma or can be iatrogenic. Traumatic injuries are more common in children and are mostly caused by a fall while holding a pointed object such as a pen, metal stick, toothbrush, or fork in the mouth.^[1] Iatrogenic injuries due to a broken surgical instrument following a dental procedure or a broken needle in the pterygomandibular space following an inferior alveolar block are reported.^[2-4]

Accidental impaction of foreign body in the oral or pharyngeal areas has the potential to injure the nearby structures, especially adjacent vessels and nerves.^[4] The proximity of a foreign body impacted in the lateral pharyngeal wall or in the retropharyngeal space to the internal carotid artery (ICA) has the potential to cause catastrophic hemorrhage during its manipulation.^[1,5] Neurological damage with irritability, drowsiness, seizures, and stroke can occur following ICA damage.^[6]

Imaging in the form of head and neck radiographs and or computed tomography (CT) scan should be performed prior to manipulation of the foreign body to know its precise location and relation to the nearby critical structures.^[7] In our patient, there was a possibility of damage to the parotid duct, facial nerve, superficial temporal artery and vein, and the temporomandibular joint; however, surgical exploration revealed that none of these structures were injured.

Airway assessment may be difficult in patients with impacted oropharyngeal foreign bodies as the mouth opening can be restricted due to anxiety and pain.^[5] There may be drooling of saliva and or bleeding from the mouth.^[1,8] A full stomach may increase the risk of aspiration during induction of anesthesia and warrant a rapid sequence induction.^[1,5]



Figure 1: Swelling in the preauricular area with the toothbrush handle protruding from the mouth



Figure 2: Impacted toothbrush with handle protruding out of the mouth



Figure 3: Difficulty in mask ventilation with foreign body *in situ*

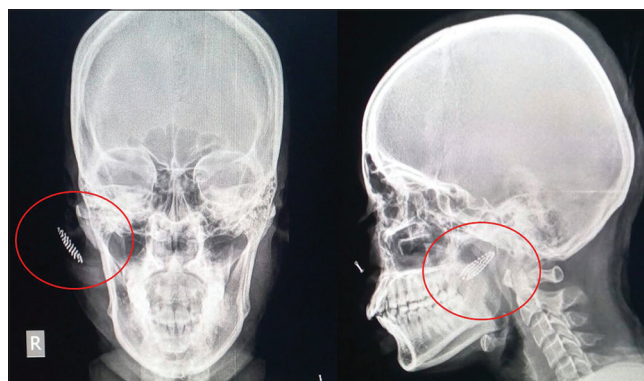


Figure 4: Anteroposterior (A-P) and lateral x-rays of the head showing the toothbrush bristles in the preauricular area



Figure 5: Toothbrush fragment left after cutting a part of the toothbrush handle

A foreign body protruding from the mouth may cause difficulties in mask ventilation, laryngoscopy, and intubation. Painful facial swelling associated with limited mouth opening may further complicate airway management. The impaction of a foreign body may induce an inflammatory reaction, resulting in abscess formation with features such as pain, swelling, and trismus.^[2,9]

Various techniques have been reported to secure the airway in patients with impacted oropharyngeal foreign bodies. Saricicek *et al.* intubated a 3-year-old child with an umbrella wire embedded in the palate to the posterior wall of the nasopharynx with GlideScope video laryngoscope.^[10] Fiberoptic intubation was used in patients who had associated trismus.^[8,9] Concern about the inability to secure the airway in their patient prompted Paterson *et al.* to use ketamine alone to intubate the child with a toothbrush impaled in the lateral pharyngeal wall.^[5]

Incollingo *et al.* reported airway management in a bleeding child with a penetrating pharyngeal wall foreign body injury with a pen where they sedated the patient and cut the pen to facilitate placement of the face mask and then did a rapid sequence induction to anesthetize the patient.^[1] As our patient was extremely anxious, we first induced anesthesia by administering propofol IV and then cut the toothbrush handle.

Airway compromise during foreign body manipulation due to hemorrhage or accidental slipping is a possibility. Ideally, all impacted foreign bodies should be removed in a controlled environment where appropriate equipment and personnel are available to manage such complications. In our patient, it was impossible to place the face mask as the toothbrush handle was protruding out of the mouth and so, we first induced anesthesia, cut the handle, and then placed the face mask over the cut toothbrush edge. This enabled us to successfully secure the patient's airway. Innovative modifications in the anesthesia technique, individualized to the patient, can help to manage a difficult airway effectively.

CONCLUSION

A difficult airway due to an impacted oropharyngeal foreign body may pose a challenge to the anesthetist. Removal should be attempted in a controlled environment such as the operation



Figure 6: Successful nasotracheal intubation

theater. An appropriate plan for securing the airway and managing anticipated complications can help to anesthetize such patients safely.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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