IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 10 Ver. 2 (October. 2018), PP 38-42
www.iosrjournals.org

Foreign Bodies in Maxillofacial Trauma– 4 Case reports

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Abstract: *Foreign bodies in the maxillofacial region are common following trauma, but sometimes theymay be overlooked causing harm to the patient. Approximately one-third of all foreign bodies are initially missed and an undiagnosed foreign body within the soft tissue may result in chronic persistent infection, pus discharge and disfiguring fibrosis. Impalement injury of oral cavity due to a sharp objects are also not uncommon and should be taken seriously since they may turn out to be life threatening. Preoperative clinical and radiographic assessment, along with a good understanding of the nature of injury as well as the size, shape, location and composition of the foreign body will provide the surgeon with better diagnosis toidentify and retrieve the foreign materials completely.This article brings out four cases of foreign bodies in orofacial region following trauma anddiscussthesurgical approachwe usedto retrieve them.*

Keywords*: Foreign body,maxillofacialtrauma, impalement injury, tooth fractures*

Date of Submission: 28-09-2018 Date of acceptance: 13-10-2018

I. Introduction

Foreign bodies in the maxillofacial region are common following trauma, and oral and maxillofacial surgeons are often called upon to retrieve these embedded object[1]. In medical terms, a foreign body is something that is in the body but doesn't belong there[2]. Foreign objects which includes displaced tooth or its fragments may get embedded into deeper facial tissues following trauma such as road traffic accidents, falls, assault or self-inflicted injuries. These objects can become a potent source of pain and infection and their retrieval may be quite challenging depending on many factors such as the size,shape,location and composition of the object together with its relation to the surrounding anatomical structures. Preoperative clinical assessment and imaging, along with a good understanding of the nature of injury will provide the surgeon with better diagnosis to identify and completely retrieve the foreign materials[3]. Superficial foreign bodies can sometimes be palpated or visualized but deeper foreign bodies require additional investigationsto localize[1,4]. Impalement injury of oral cavity due to a sharp objects are also not uncommon and should be taken seriously since they may turn out to be life threatening.The aim of this paper is to bring out four cases of foreign body in the orofacial region following trauma and discuss ourapproach in the face of these events.

II. Case Reports

Case 1

A 24 year old male reported to the department after sustaining a road traffic accident three days back (Fig.1A). Examination revealed multiple facial bone fractures includingLefort II and displaced fractures involving symphysis and right body of mandible causing significant occlusal derangement. The mandibular right canine was found missing on clinical examination. Axial view and 3D reconstruction computed tomography (CT) scan of the maxillofacial region confirmed the fractures and showed displaced mandibular canine into the right submandibular space (Fig.1B, 1C &1D). The site was surgically explored under general anesthesia via submandibular approach to locate and remove the foreign body in toto (Fig 2A & 2B). The mandibular fracture was then reduced and fixed with reconstruction plates (Fig. 2C). The surgical site was cleaned and wound was closed in layers.

Case 2

A 9 year old boy reported with a history of trauma to upper lip while playing with household broom made of coconut leaf midrib. As the child complained of severe pain, the parents suspected entrapment of a midrib fragment within the lip. On Inspection, there was a small puncture wound above the upper labial frenum without any bleeding, but upon palpation of upper labial mucosa a hard, mobile object approximately 3cm long within the lip was felt, indicating foreign body similar to a twig (Fig. 3A). As radiograph revealed no relevant findings suggesting presence of radiolucent object, it was decided to surgically explore the area and retrieve the

foreign body under local anesthesia. A small linear incision was placed on upper labial mucosa after localizing the foreign body by palpation (Fig. 3B). The leaf midrib was visualized on dissecting the submucosa of lip (Fig. 3C). The foreign body was then carefully pulled out after enlarging the incision (Fig. 3D). The site was cleaned and irrigated to remove any debris prior to suturing of wound.

Case 3

A 70 year old man with psychiatric disorder was brought to the emergency room after impalement injury of oral cavity due to tooth brush. This destitutewas reported to have a masochistic habit of frequently placing tooth brush inside his mouth. Whilst an exact history could not be established, it appeared that he fell down with toothbrush inside. On examination he was edentulous and the head of the toothbrush was embedded in the soft tissue just anterior to the right pterygomandibular raphe. There was no bleeding. The bristles and some of the shaft of the brush were well buried into the pterygomandibular space palpable from the mucosal side (Fig. 4A). The bristle end was identified facing towards the cheek. Even though nerve injury couldn't be assessed as the patient wasunamenable, he was withdrawing to painful stimuli indicating intact inferior alveolar and lingual nerve. After localization of the tooth brush within the pterygomandibular space it was decided to remove the tooth brush under local anesthesia. Wound was widened distally and laterally to reduce possible iatrogenic injury to the lingual or inferior alveolar nerve. Once the bristles where visualized the tooth brush was slowly and carefully teased out of the pterygomandibular space (Fig. 4B& 4C). The site was inspected for remaining debris before closure. The patient was kept under observation and discharged the next day.

Case 4

A 21-year-old male was referred to our department with swelling and tenderness in his lower lip after he fell and struck his mouthon the floor a week back. Clinical examination revealed pus discharge and hard mass on the mucosal surface of the lower lip and crown fracture of the upper right incisor (Fig. 5A). Soft tissue radiograph showed radiopaque flecks within lip suggesting entrapped tooth fragments (Fig. 5B). The wound was explored and the tooth fragments removed under local anesthesia (Fig. 5C). Radiograph was taken prior to suturing of wound to ascertain complete removal of the foreign body.

III. Discussion

Foreign bodies can occur as a result of traumatic or iatrogenic injuries.Objects likegrit particles, wooden pieces, glass, metals or even displaced tooth and its fragments may get embedded deep in facial tissues presenting a challenge to the maxillofacial surgeon, but sometimes they may be overlooked causing harm to the patient. Approximately one-third of all foreign bodies are initiallymissed[5].The mechanism of injury as well as the size, shape, location and composition of the foreign body will influence its evaluation and removal. Inert objects such as metal or glass pose a lower risk of infection than organic matter[4].

Stabilization with evaluation and maintenance of the airway, followed by hemodynamic control and neurologic evaluation must be done prior to surgical exploration[6].All patients with significant puncture wounds should get tetanus toxoid and antibiotic prophylaxis. As penetrating wounds can damage nerves or blood vessel, accurate localization of the foreign body before removal is essential. Superficial foreign bodies can sometimes be palpated or visualized but deeper foreign bodies may require additionalmethods to localize[4]. Imaging methods for locating foreign bodies includes plain radiographs, computerized tomography, magnetic resonance imaging, and ultrasound[1]. Blind exploration is often time consuming and sometimes futile. Injecting saline under pressure may drive contaminants further into tissue and should be avoided.Imaging of the region postoperatively is desirable as it will ascertain complete removal of foreign body.Tetanus toxoid and antibiotics were prescribed for our cases prior to procedure.

Displacement of teeth into surrounding tissues following trauma iscommon. Patient presenting with facial trauma may be distracted by other injuries, and a missing tooth may be presumed to be avulsed during the accident. There are case reports describing displacement of the teeth into the maxillary sinus, submandibular space, lateral pharyngeal space, nasal cavity, and soft tissues of cheek or lip following trauma[7–12]. An undiagnosed avulsed tooth embedded into the soft tissue may result in foreign body reaction such as chronic persistent infection, pus discharge and disfiguring fibrosis[13]. In our first case patient was unware of the missing tooth till the clinical examination.

Tooth brush impalement injury are very rare and mostly occurs in unattended children or psychiatricpatients. Most common sites of injury are gingivobuccal sulcus, buccal fat pad, softpalate, anterior faucial pillar and pharynx[14,15]. Cautious planning prior to surgical exploration under general anesthesia is advocated in these cases because impalement of objects in medial aspect of ramus could be life threatening as the penetrating object could pass beyond parapharyngeal space to injure carotid vessels.Potentially serious sequelae following such an injury include deep neck abscess, widespread emphysema, internal carotid thrombosis and stroke[16].

The upper incisors, particularly when fractured, are quite often the cause of laceration of soft tissue at the time of trauma. When soft tissue is lacerated, attention should be paid to fractured or missingteeth.A simple

soft tissue radiograph helps in the detection of included tooth fragments[12]. Potential complications include infection as the oral flora contains many virulent microorganisms[9]. In our case, pus was present around the tooth fragments at the time of the initial examination. The presence of a foreign body should be considered in any wound that continues to have purulent drainageor when purulent drainage from an abscess yields sterile cultures[17].This case series emphasizes the need for adequate preoperative clinical, radiographic assessment and intraoperative exploration of wounds to identify and localize foreign bodies.

IV. Conclusion

There is no ideal procedure for removal of foreign bodies. The surgeons can choose the treatment appropriate for each case. Imaging is not necessary if the foreign body is adequately visible for removal but immediate removal of any intraoral foreign body must be deferred and proper investigations done whenever soft tissue penetration adjacent to vital structures is suspected.

V. Figures

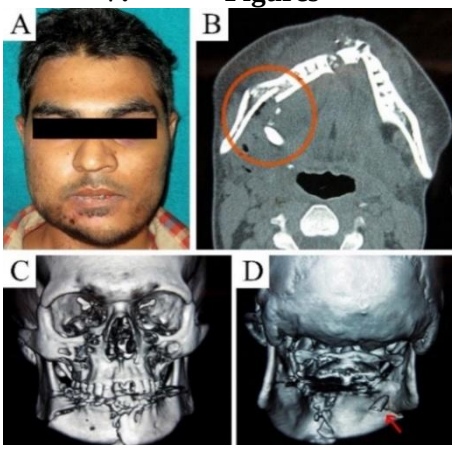

Fig. 1 Preoperative photograph showing (A) Frontal view of the patient (B) Axial view of CT scan showing mandible fracture and displaced mandibular canine in the submandibular space (C) Anterior view of 3D CT showing Lefort II and mandibular fractures (D) Posterior view of 3D CT showing mandibular fractures and displaced right canine in relation to the mandibular body.

Fig. 2 Intra operative photograph showing (A) Exploration and retrieval of displaced canine via submandibular approach (B) Retrieved mandibular right canine (C) Reduction and fixation of mandibular fractures.

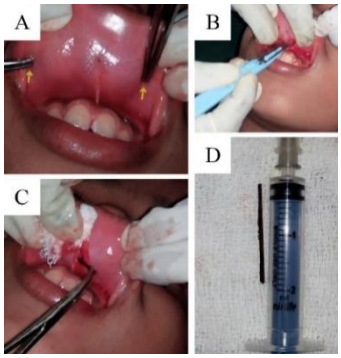

Fig. 3 (A) Puncture wound above the labial frenum and palpable length of foreign body (B) Incision for surgical exploration (C) Foreign body visualized (D) Retrieved Midrib of Coconut leaf.

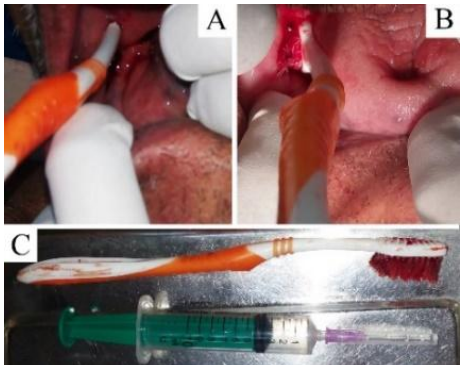

Fig. 4 (A) Impaled tooth brush into the right pterygomandibular space (B) Foreign body removal (D) Retrieved tooth brush.

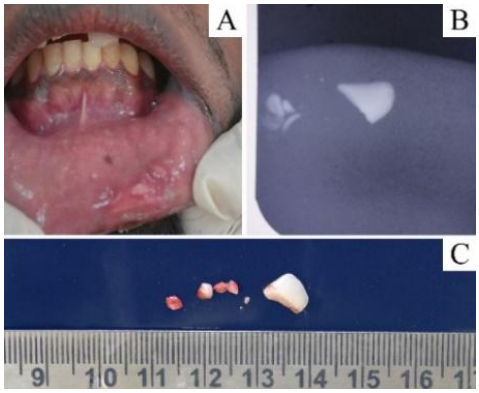

Fig.5 (A) Injury of lower lip (B) Radiograph showing tooth fragments within the lip (D) Retrieved tooth fragments.

VI. Acknowledgments

Dr. Ravindran Nair K S, Professor and Head, Department of Oral & Maxillofacial Surgery as well as staffs and house surgeons of the department are gratefully acknowledged.

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Mithilesh KV, "Foreign Bodies in Maxillofacial Trauma– 4 Case reports"IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 10, 2018, pp 38-42.