

Be Qui Vive: Unravel the Mystery of Undiagnosed for Better Prognosis

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ABSTRACT

Foreign bodies may access the oral cavity by trauma or iatrogenically. Iatrogenic foreign bodies that are frequently encountered include amalgam, obturation materials, shattered equipment, needles, broken teeth, and so on. Impaction of a tooth or bone fragment in the soft tissues is one type of dental trauma. When foreign bodies are found in the teeth, it's a highly grave scenario that requires prompt diagnosis. Thorough case histories, clinical assessments, and radiographic analyses are required to draw conclusions regarding the type, dimensions, location, and challenge of the foreign body retrieval. Due to the well-known tendency of children to put foreign objects in their mouths, it is more frequently observed in them. From time to time, children get strange items lodged in their teeth, which they are afraid to tell their parents about. These foreign objects might store possible infections, which could eventually result in a painful condition. This paper discusses the presence of unusual foreign bodies—a broken pencil and tooth fragment—and their management.

Keywords: Dental trauma, Foreign bodies, Impaction, Vigilant.

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INTRODUCTION

Traumatic or iatrogenic injuries have the potential to introduce or deposit foreign bodies within the body. Most foreign bodies can undergo distant embolization and result in severe bleeding, septicemia, or the formation of an abscess.¹ In the oral cavity, foreign substances and tissue reactions to foreign elements are frequently seen. The more prevalent iatrogenic lesions are oil granulomas, tattoos of mucosal amalgam and graphite, apical deposition of endodontic materials, and dental materials and devices introduced traumatically.² Children may sustain injuries to their hard and soft tissues because of their habit of putting objects in their mouths, which can become a serious source of infection. One of the more difficult aspects of pediatric dentistry is extracting foreign items from the oral cavity of young patients. Three intriguing cases of foreign substances in the oral cavity are presented in this research.

Recent research in the dental literature has brought attention to the issue of unfulfilled requirements for treatment and insufficient emergency care for severe dental injuries. It also shows that these patients can occasionally appear late for care, which raises concerns about how these injuries should be managed. It might not be immediately noticeable that a tooth fragment is embedded in the lip or other soft tissues until a child complains of discomfort afterward. This case study emphasizes how important it is to properly investigate and explore soft tissues, even when cases are presented later than expected. It also highlights the need of educating primary healthcare personnel on the appropriate management and referral of orofacial injuries, since improper handling of these injuries during their acute phase might have a negative impact on their future care.³

Numerous things can lead to traumas, including falls, violence, vehicle crashes, sports-related incidents, workplace accidents, and others. Falling is the most common event in relation to these causes.⁴⁻⁶ A vital aspect of the comprehensive practice of dentistry is the accurate identification and treatment of dental injuries. Due to the patient's and their family's emotional and physical involvement, proper first care is essential for patients

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experiencing oral trauma, especially in children and adolescents.⁷ This is especially true if the patient has temporary deviation from their physical appearance due to the maxillary anterior dentition involvement. The status of the supporting structures from the impacted teeth, as well as the position, impact force, and direction of the causative agent, all influence the likelihood of dental trauma. Numerous studies have indicated that traumas to the incisors are more common in childhood and adolescence.⁸ Depending on the patient's age and sex, this occurrence might vary from 10 to 20%.⁹⁻¹¹ The short labial lip and greater overjet, which insufficiently shield these teeth, are the causes of the maxillary incisors' higher sensitivity. These risk factors, which can vary from concussion to tooth loss, should be considered when determining the degree of severity and frequency of these traumas.⁵ When there is trauma, the incisors are frequently the source of soft tissue lacerations. Teeth that are broken or missing should need greater care when soft tissue is injured. A straightforward soft tissue radiograph aids in the identification of embedded tooth fragments in cases where bleeding and laceration complicate the clinical evaluation. Prioritizing the

prompt attendance of patients experiencing oral trauma is vital because it may be linked to facial fractures and the presence of a tooth fragment in afflicted peripheral tissues.

CASE DESCRIPTION

Three anomalous cases that remained undiagnosed were referred to the Department of Pedodontics and Preventive Dentistry, Indira Gandhi Government Dental College, Jammu and are described below.

Case I

An 11-year-old girl with history of trauma was referred from a primary health center to the department with diagnosis of Ellis class III fracture wrt 11 and nonhealing lower lip with associated pain, swelling, and abscess since past 1 month (Fig. 1). There was pus discharge from the lower lip and patient complained of severe pain. The clinical features of the tooth were as follows: grade I mobility and tenderness on percussion wrt 11. The patient was put on antibiotics, analgesics, and anti-inflammatory drugs. After proper history taking and evaluation, investigations were carried out and the intraoral periapical radiograph (IOPAR) of 11 revealed Ellis class III fracture (Fig. 2) and IOPAR of lip revealed broken tooth fragment in the lower lip (Fig. 3). The fragment was surgically



Fig. 1: Preoperative showing swelling in lower lip and fractured 11

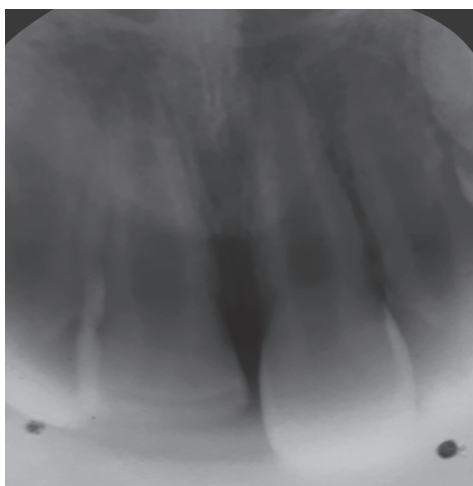


Fig. 2: Preoperative IOPAR wrt 11

retrieved, and sutures placed (Figs 4A to D). Obturation of 11 was done (Fig. 5), the tooth fragment was reattached (Fig. 6), and patient was kept on follow-up.

Case II

A 3-year-old girl with chief complaint of pain and swelling in right back region of lower jaw (Fig. 7), discharge from the right ear, and difficulty in mouth opening since past 2.5 months reported to the department. The patient had visited several health centers and private practitioners with the same complaint but there was no relief. On extraoral examination, swelling at the preauricular region, firm on palpation, was present. Intraorally, a swelling, firm on palpation, was present in the right back region at the pterygomandibular area. The mouth opening was reduced. After advising an orthopantomogram (OPG), the radiograph revealed a rectangular radiopacity behind molars (Fig. 8). After exploration of area under local anesthesia, a rectangular pencil head approximately 7 × 16 mm along with few specks of the same was removed (Figs 9 to 11). The area was curetted and sutured. The patient was kept on follow-up. The swelling subsequently subsided and mouth opening was restored to normal (Figs 12 and 13).

Case III

A 12-year-old boy with history of trauma due to fall from height was referred to the department by primary healthcare center, Rajouri. On examination, avulsed 43 and 44; grade II mobile 31, 32, 41, and 42; and a fractured buccal plate on palpation with respect to 43 and 44 were noticed (Figs 14A to C). An OPG and computed tomography (CT) scan were advised, and they revealed a bony fragment with respect to 43 and 44 (Fig. 15). Computed tomography scan revealed the fractured buccal cortical plate wrt 43 and 44 (Fig. 16). Under local anesthesia, the area was explored, and large bony fragment was removed (Figs 17A to C). The retrieved bone fragment was approximately 21 × 15 mm in size (Fig. 18). Lower arch bar fixation was done for stability (Fig. 19). After some days, there was continuous bleeding from the same area. After proper exploration, liver clot of size 10 × 26 mm was found and removed (Fig. 20). Patient was kept on follow-up. Arch bar was removed, and patient kept on follow-up (Figs 21A to C).

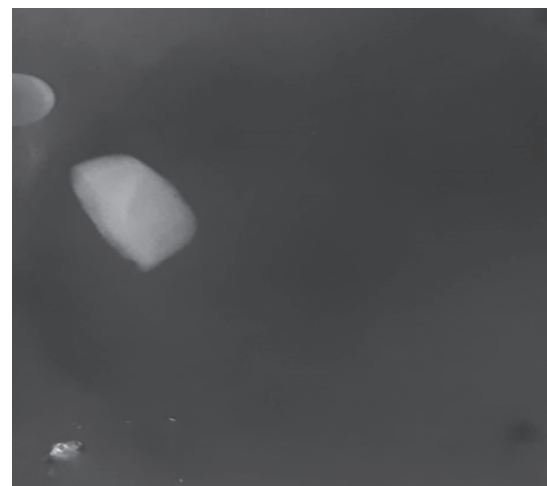


Fig. 3: Intraoral periapical radiograph of lower lip showing tooth fragment

DISCUSSION

Soft tissue injuries and traumatic dental injuries are often associated. A survey found that lip lacerations were present in 62.8% of patients with oral injuries treated in a hospital emergency room.¹² The direction of impact determines the sort of injury, the teeth indirectly cause to the lips. If the impact is along the incisors' long axis, vertical lip laceration may occur, and the incisal edge penetrates through the entire thickness of the lip. When the incisal edge strikes an impacting object, the crown will fracture.¹³ The clinician should be cautious that the tooth fragments may have become dislodged into the soft tissues if a fractured incisor is also followed by edema and bleeding in the soft tissues, especially in the lip.¹⁴ Soft tissue radiography and a clinical assessment of the laceration are necessary in order to rule out the possibility in such cases.^{13,14} The right patient initial attendance, especially for children and adolescents, is crucial due to the numerous emotional elements linked with children. Primary healthcare practitioners sometimes fail to notice fragments during emergency management. Negative consequences may result from failing to carefully check for missing tooth structure at the time of treatment.¹⁵ As foreign entities, tooth pieces implanted in soft tissues may cause the suture line to break down, a chronic infection and discharge to persist, and disfiguring fibrosis.¹² It is generally known that the orbicularis' contraction causes the little tooth fragments that are stuck in the lower lip to move continually and may be transferred to locations that are rather far from the spot where the lip was punctured.¹⁶ The worst side effect is aspiration of these foreign materials, which can lead to a persistent infection of the airways and eventual death. Therefore, locating and extracting the lodged tooth fragment requires a thorough radiological assessment of the soft tissue structures.^{16,17} A thorough case history and careful clinical and radiographic examination are

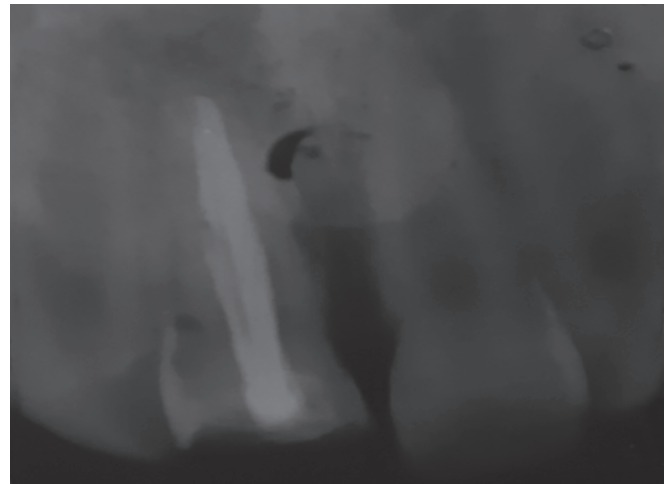
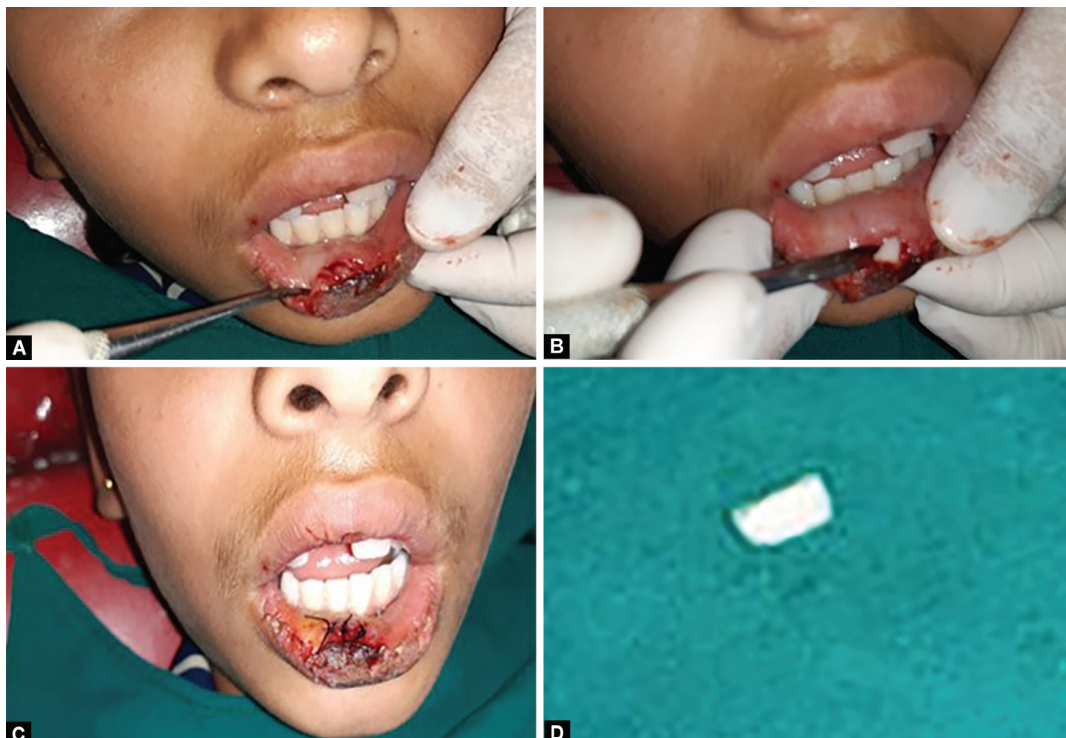


Fig. 5: Postoperative IOPAR showing obturated 11



Fig. 6: Reattached tooth fragment



Figs 4A to D: (A) Exploration of lower lip; (B) Retrieval of tooth fragment; (C) Sutures in place; (D) Retrieved tooth fragment

required in situations when oral trauma occurs concurrently with soft tissue diseases.¹⁸ In addition, further diagnostic tests should be carried out if the plain radiographs do not reveal

inclusion, ingestion, or aspiration of these particles.¹⁹ With low exposure intraoral radiography, soft tissue injuries that may have embedded tooth pieces or other foreign objects may be properly



Fig. 7: Preoperative photograph showing swelling on right side of face

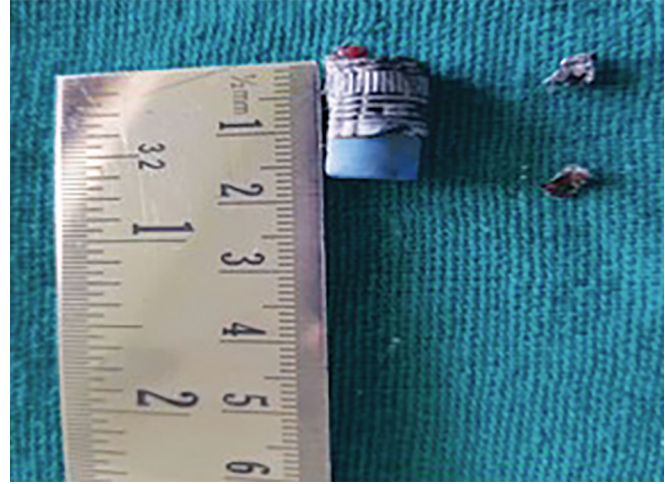


Fig. 10: Retrieved pencil head

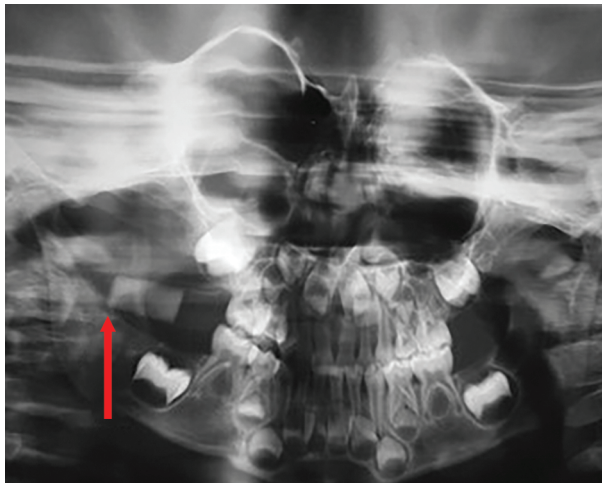


Fig. 8: Orthopantomogram showing radiopaque rectangular object behind molars



Fig. 11: Postoperative: sutures in place

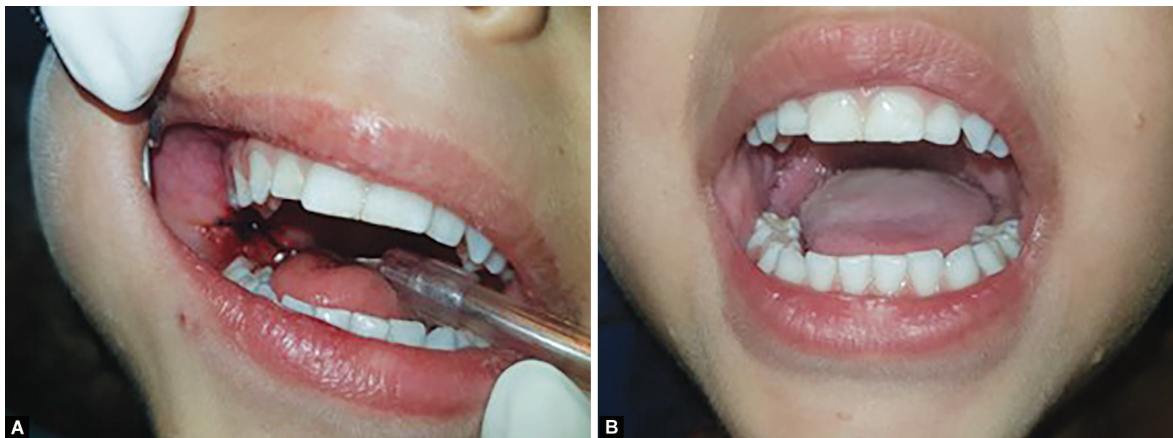


Figs 9A and B: (A) Exploration done under local anesthesia; (B) Object retrieved and sutures placed

examined. Always assess the possible advantages against the risk of radiation exposure. As a result, in accordance with the as low as reasonably achievable (ALARA) principle, the physician must employ the least amount of radiography exposure feasible. It is morally advised to administer intraoral radiographs if the clinically more severe dental damage is anticipated because they need a very minimal radiation dosage when done properly and with quality X-ray equipment. Any suspected foreign item in the soft tissues can be found using intraoral films inserted between the mucosal surface of the lip and the teeth. An intraoral radiograph of soft tissue lip was necessary in the case I since the tooth fragment was absent clinically. However, to localize foreign objects in soft tissues if conventional radiography is insufficient, CT or ultrasound should be utilized. However, the results of the thorough history collection and clinical examination should be used to choose the best radiographs to take.²⁰ The teeth concerned underwent root canal therapy following a complete clinical and radiological assessment. In patients with mature



Fig. 13: One-month follow-up



Figs 12A and B: (A) Mouth opening: before; (B) Mouth opening: after



Figs 14A to C: Preoperative photographs showing initial bridling done: (A) Figure depicting avulsed 43 and 44 with buccal plate fracture; (B) Figure depicting the soft tissue lip injury; (C) Figure depicting the initial bridling done

apex, root canal therapy is advised, while pulp capping is also an option, according to the guidelines issued by the International Association of Dental Traumatology (IADT). If there is a tooth fragment, it can be fixed to the tooth, or the cracked crown can be repaired using other recognized restorative materials.²¹ In our case, the fragment was reattached, and patient was kept on follow-up.²²

Self-inflicted oral injuries can occur accidentally, on purpose, or because of a bizarre habit. The fingernail of the patient or a foreign object that often harms the teeth or gingival tissue is what usually causes these wounds. Self-harming behaviors range in severity from minor nail biting to severe self-mutilation.²³⁻²⁶ As far as the authors are aware, no one has yet described the current case where the soft tissue injury was caused by using a pencil. These cases provide another opportunity to emphasize the importance of a complete history that reveals the more intricate details of etiology. A comprehensive case history and

good radiographic interpretation may lead to a sound treatment plan. According to reports, numerous foreign objects, such as pencil leads,²⁷ darning needles,²⁸ metal screws,²⁹ beads,³⁰ and stapler pins,³¹ have been discovered in the pulp chamber and root canals. Grossman and Heaton³² reported discovering toothpicks, brads, adsorbent points, indelible ink pencil tips, and even a tomato seed in the anterior teeth root canals left exposed for drainage. Toida et al. reported the discovery in an unerupted supernumerary tooth of a plastic chopstick in the premaxillary area of a 12-year-old Japanese child.³³ Zillich and Pickens³⁴ and Turner³⁵ reported that food obstructions in the root canals of incisors undergoing endodontic treatment were removed using hat pins and dressmaker pins, which later fractured inside the root canals of those teeth. If the foreign body is radiopaque, a radiograph could be helpful in the diagnosing process. Hunter and Taljanovic¹ listed vertex occlusal views, parallax views, stereoradiography, triangulation techniques, and tomography as some of the many radiographic techniques that should be employed to locate a radiopaque foreign item. The degree to which foreign entities are apparent on plain radiographs depends on the proximity to the tissue in which they are implanted and their inherent radiodensity. Various materials have varying propensities to attenuate X-rays. All metallic objects, including most animal bones and foreign materials made of glass, appear opaque on radiographs unless they are made of aluminum.

The sort of foreign object causing the wound will determine the patient's clinical course; inert materials such as steel and glass are unlikely to cause enough inflammation to necessitate removal. However, since organic foreign elements often result in infections, the development of an abscess, and the formation of a fistula, it is vital that they be removed. In our case, among the

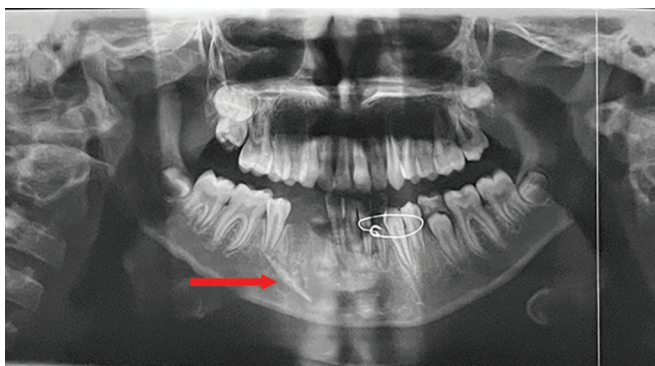


Fig. 15: Orthopantomogram showing bone fragment and avulsed wrt 43 and 44

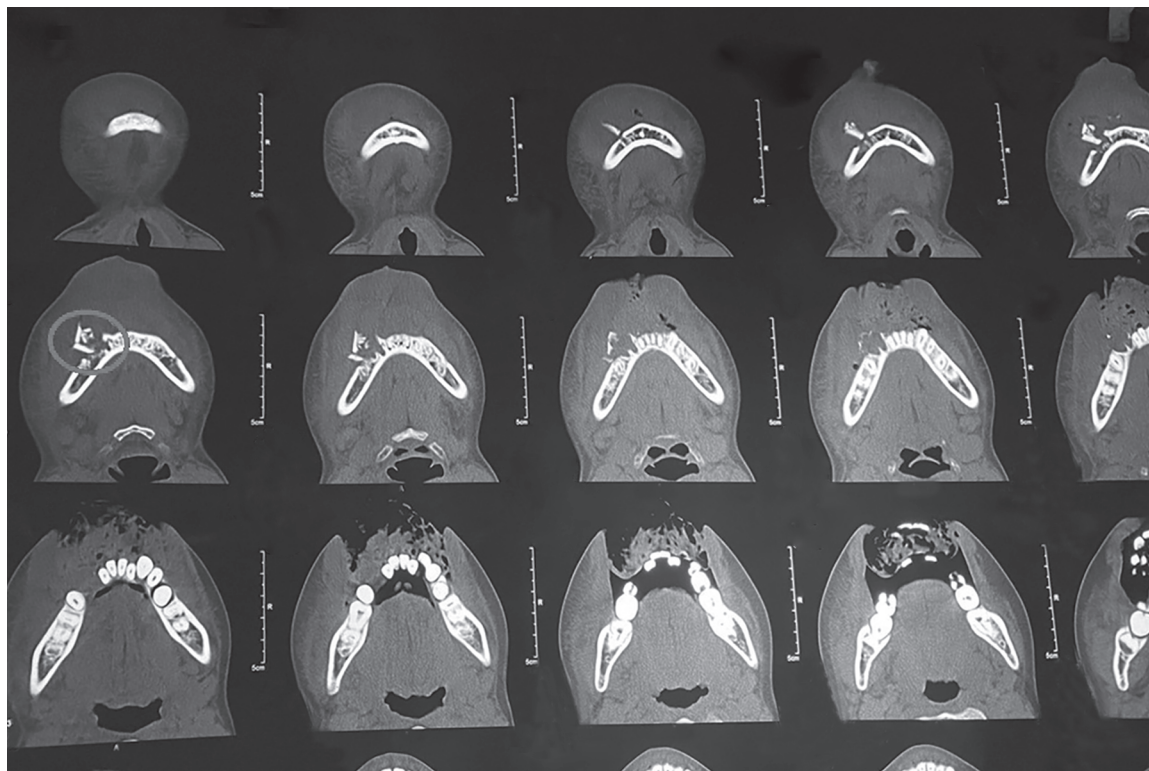
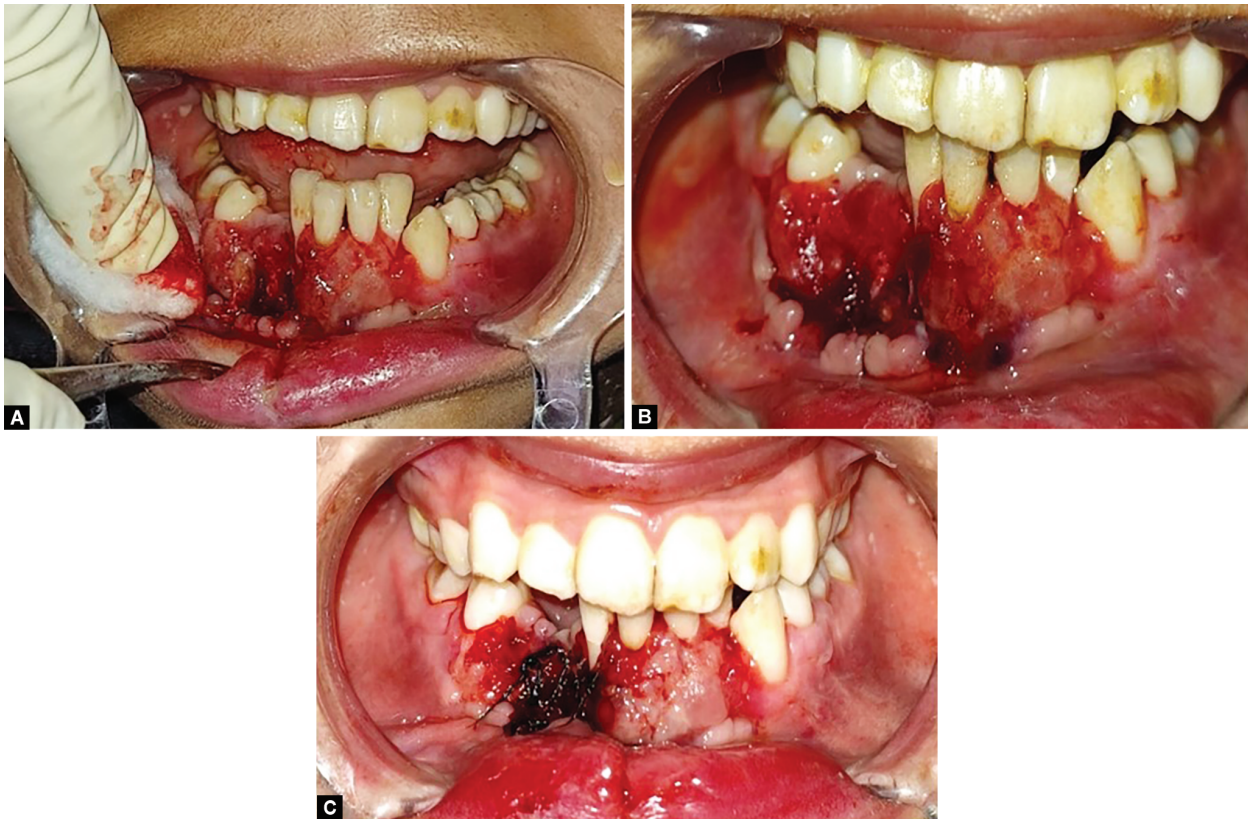


Fig. 16: Computed tomography scan showing displaced right-side buccal fragment wrt 43 and 44



Figs 17A to C: (A) Exploration under local anesthesia; (B) Retrieval of bone fragment; (C) Placement of sutures

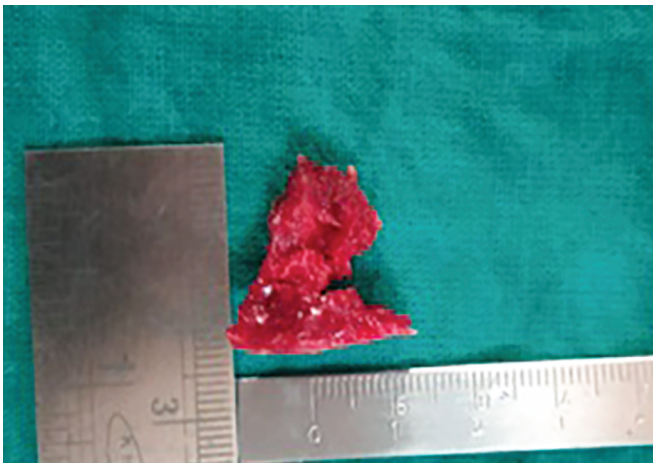


Fig. 18: Retrieved bone fragment

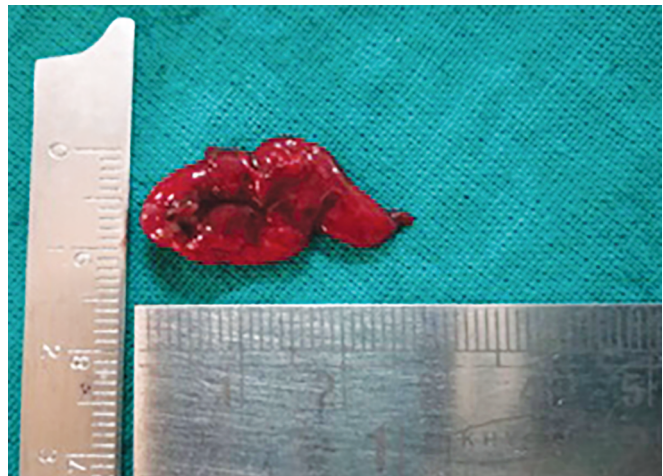


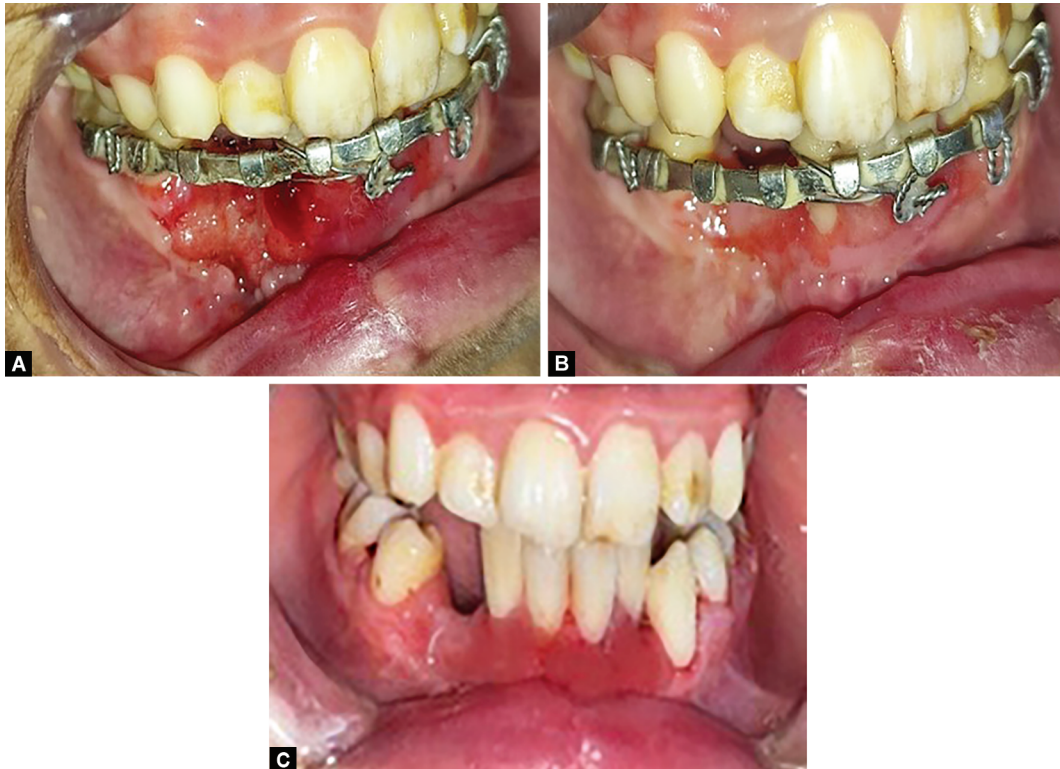
Fig. 20: Liver clot



Fig. 19: Lower arch bar in place

several foreign bodies was a pencil head that required immediate removal to provide the appropriate therapy. The radiograph showed a rectangular radiopacity behind the molars, and a pencil head measuring about 7 × 16 mm along with a few specks of the same was removed. After curetting, the region was sutured. The patient was kept on follow-up.

Another typical condition is the impaction of a foreign body in the jaw itself due to facial trauma. Possible foreign bodies in the collision include teeth or pieces of bone. An OPG and CT scan were recommended for our case III, and the results showed a bone fragment. Approximately, 21 × 15 mm bone fragment was removed, and the lower arch bar was fixed for stability.



Figs 21A to C: (A) One-week follow-up; (B) 21-days follow-up; (C) 3-months follow-up

CONCLUSION

Serious repercussions may arise from the patient's ignorance of the location of the fractured fragment and the trauma care unit's carelessness during the first emergency treatment. It is important to adhere to a methodical trauma care strategy to prevent any unfavorable outcomes. The accurate assessment of these patients' medical, radiological, and anamnesis histories is significant. Particularly when dental traumas coexisted with facial injuries, it may be necessary to thoroughly examine the surrounding soft tissue as well as the hard tissue (tooth and bone), even if the emergency care provider sutured and treated the patient. To accurately elicit the patient's signs and symptoms, a clinician must use caution. Even more crucial is a proper interpretation of these. Accurate diagnosis and prevention involve both clinical experience and theoretical knowledge. Above all, though, it is crucial to consider every scenario that can accompany the patient's symptoms and indicators before disclosing information to them to prevent needless emotional and psychological distress. When there is an orofacial injury, equal importance must be given to examining the soft and hard tissues. Nevertheless, a thorough case history, along with a clinical and radiographic examination, is necessary to confirm the existence of any missed dental fragment.

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