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Case Report

Traumatic displacement of a permanent maxillary incisor into the nasal cavity: A case report

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ABSTRACT

Intrusive injuries are common in primary dentition, however, only a limited number of cases have been reported involving permanent teeth. The present report describes a case of severe intrusion involving a maxillary central incisor wherein the tooth was displaced beyond the apical level of the adjacent teeth, into the nasal cavity. Without adequate clinical and radiographic examination, such cases tend to be misdiagnosed as avulsion and may present with numerous complications at a later stage. The present case report highlights the importance of a meticulous clinical examination, thorough radiographic evaluation, and appropriate surgical technique for the diagnosis and management of severely intruded permanent anterior teeth.

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1. Introduction

Traumatic injuries of the teeth and other structures in the oral cavity result from sports, accidents or medical conditions such as epilepsy. Dento-alveolar injuries including crown/root fracture, subluxation, avulsion, and concussion can be seen in traumatic etiology.¹ Intrusive luxation is defined as the dislocation of the tooth deeper into the alveolar bone through the fractured socket along the axis of the tooth. It usually occurs in relation to the maxillary anterior teeth and has been one of the most serious dental injuries with its diagnosis and management posing several difficulties.

Earlier reports on series of dentoalveolar traumas have reported that intrusions constitute only about 3% of all injuries.^{2,3} While luxation and avulsion injuries are straightforward in their management, intrusion can pose a bigger challenge. Intrusion to the point of displacement into

the nasal cavity or maxillary sinus can further complicate matters by resulting in infections and the development of an oro-nasal fistula.⁴ While a majority of such cases have been reported in primary dentition, very few sporadic case reports pertaining to their occurrence in permanent dentition are available.

In the absence of appropriate radiographic investigations, such intrusions can be easily missed by the clinician as the tooth may appear to be avulsed or missing from the oral cavity resulting in further complications.^{4,5} Identification and prompt management are key in preventing complications for the patient. Because of the paucity of reported cases, there is yet only a limited amount of information about severe intrusions in permanent teeth available in the literature. Herein, we present a case of a maxillary central incisor traumatically intruding into the nasal cavity, emphasizing its diagnostic and management aspects.

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2. Case Report

A 23-year-old male complained of a missing upper front tooth and discomfort in the left nostril for a month. A history of falling in a playground followed by bleeding from the mouth was elicited. At the time of the incident, the patient was prescribed antibiotics by a medical practitioner following which he became asymptomatic for two weeks until he started feeling mild discomfort. There was no associated swelling, pain or pus discharge in the area. The patient's medical history was unremarkable and he was not under any medications when he reported to our institute.

On intraoral examination, it was observed that the left maxillary central incisor was missing (Figure 1 A). A fistula was noted in the labial vestibule in the mucogingival junctional region of the maxillary left central incisor. A polypoid structure measuring 3 x 4mm in size was noted in the left nostril on clinical examination (Figure 1 B).

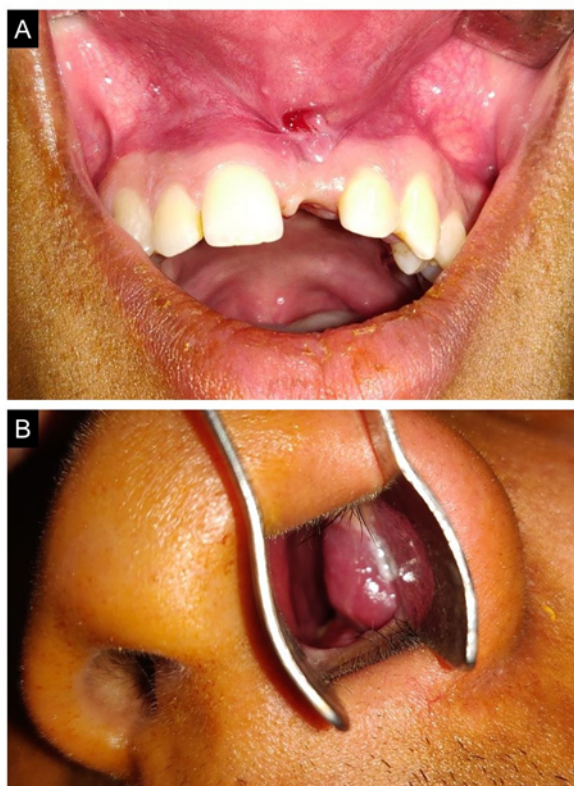


Fig. 1: A): Apparently missing maxillary left central incisor on intraoral examination; B): Polypoid structure in the nasal cavity

An occlusal radiograph revealed that the maxillary left central incisor was intruded verticopalatally (Figure 2 A). Cone beam computed tomography (CBCT) revealed a hyperdense structure in the nasal cavity, constituting the intruded incisor's apical part (Figure 2 B and 2C). It was then discerned that the clinically missing maxillary left central incisor was actually severely intruded into the nasal cavity.

Retrieval of the displaced tooth was planned under local anesthesia. Scrubbing and draping were performed as per standard surgical protocols. Local anesthesia was given by bilateral infraorbital nerve block and nasopalatine nerve block techniques. A crevicular incision was taken from the right maxillary lateral incisor to the left maxillary canine region and releasing incisions were made distal to the respective teeth. A full-thickness mucoperiosteal flap including the fistula was raised (Figure 3 A). Communication with the nasal cavity was evident.

Exploration through communication to retrieve the tooth was done by means of mosquito forceps and a periosteal elevator (Figure 3 B). The tooth was retrieved through the vestibular incision made on the oral side (Figure 3 C-E). Irrigation was done with 1% povidone-iodine. Hemostasis was achieved and layer-wise closure of the wound was done. The patient was prescribed oral antibiotics (Augmentin 625mg and Metronidazole 400mg), Analgesic (Diclofenac 50mg, Paracetamol 325mg, and Serratiopeptidase), and a proton pump inhibitor (Pantoprazole 40mg). Recovery was uneventful after three months (Figure 3 F). A prosthodontic replacement was recommended for the patient after a thorough assessment of the periodontal and bone status.

3. Discussion

While intrusive injuries are fairly common in deciduous dentition, they account for only about 2% of trauma affecting permanent teeth.⁶ Even in the few cases affecting permanent teeth, they have been reported to occur in adolescents. This is attributable to the fact that the vestibular bone is yet in the developmental stage and is, therefore, relatively thinner which allowed the apices of the primary teeth to trudge through without much resistance.⁴ On the other hand, with constant membranous ossification of the maxilla, the bone becomes more compact making it much more resistant to such injuries. Considering these facts, the present case of intrusion occurring in a 23-year-old male was quite unusual.

The anterior dentoalveolar portion of the maxilla is more prone to traumatic injuries owing to the pliable bone in this region that favors intrusion of the short-rooted primary incisors having only a single root. The maxillary central incisor is involved in 80% of the intrusive injuries which was also involved in the present case.⁴ The intrusion of the tooth beyond 6 mm such that it comes to lie above the apex of its adjacent tooth classifies it as 'severe intrusion'.^{5,7} The injury has clinical implications owing to its occurrence in an area of high aesthetic significance. Severely intruded permanent teeth with closed apices are inevitably associated with pulp necrosis.⁸

Such cases can be misdiagnosed as avulsion without appropriate radiographic investigations.⁵ Careful examination of the floor of the nostrils can reveal crucial diagnostic clues in such cases of intrusion into

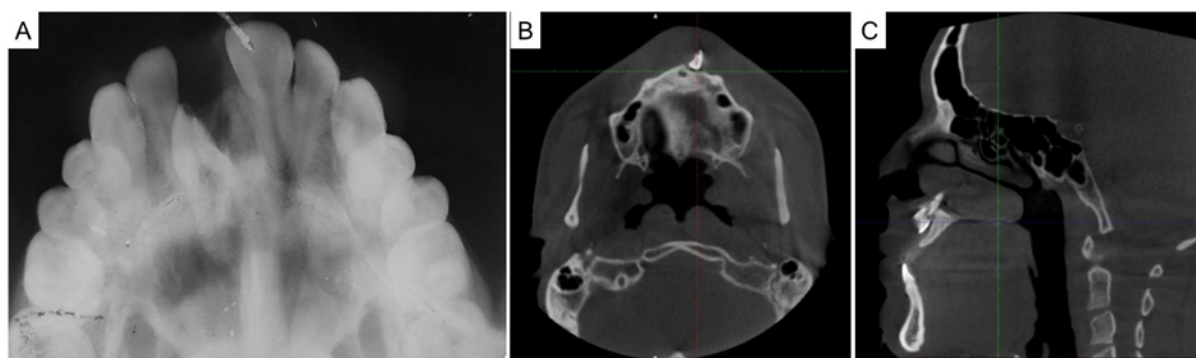


Fig. 2: A): Occlusal radiographic showing verticopalatally impacted maxillary left central incisor. Cone beam computed tomography scans in B): Axial view and C): Sagittal view showing hyperdense structure extending to the nasal cavity

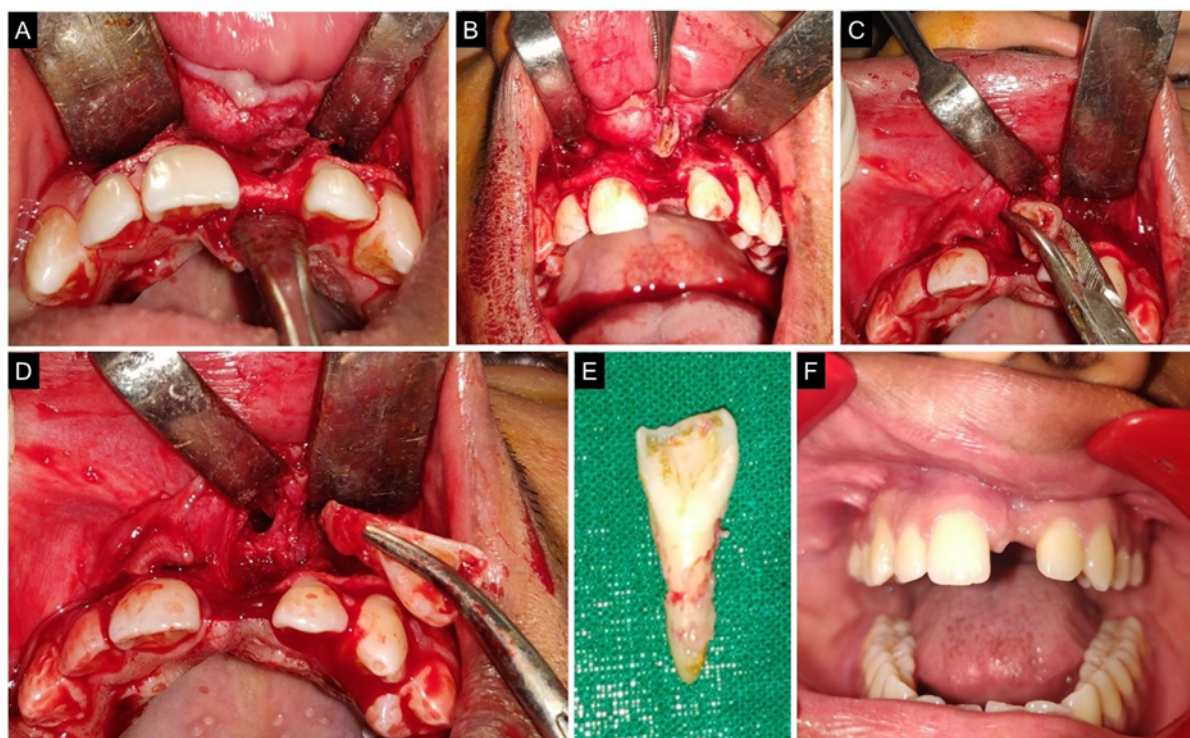


Fig. 3: A): Crevicular and vestibular incisions followed by flap reflection; B) Exposure of the crown of the intruded incisor; C) and D): Retrieval of the incisor by mosquito forceps; E): The extracted incisor; F): Adequate healing after three-month follow-up

the nasal cavity. Complications such as root resorption, ankylosis, and periodontal bone loss can occur when the diagnosis is delayed. The possibility of developing further complications pertaining to the nasal cavity including obstruction, congestion, pain, epistaxis, perforation, fistula formation, and osteomyelitis also cannot be overlooked. Therefore, prompt diagnosis and management of such cases are paramount to minimizing the damage, improving the prognosis, and maintaining the patient's quality of life at an optimal level.

Radiographic assessment of the condition should be carried out generously by using standard periapical,

occlusal, and panoramic imaging techniques. Andreasen reported that sufficient radiographic investigations in such cases increase the probability of making a correct diagnosis from 10% to 91%. However, the two-dimensional plain films may superimpose other structures present in the area, making it difficult to actually assess the true position, spatial orientation, and extent of the intrusion of the tooth. CBCT can provide information about the extent of the fracture and intruded tooth in the coronal, axial as well as sagittal planes, thus, making it an indispensable tool in the diagnosis and treatment planning of severely intruded teeth as compared to conventional radiographs.

The current strategies for the management of severely intruded teeth include passive repositioning, surgical repositioning or removal, and active traction by orthodontic techniques.⁶ In the present case, given the fact that the intrusion was much more severe, passive repositioning was not possible. Surgical removal of the incisor through oral vestibular incisions was deemed most appropriate to avoid the risk of dislodging the tooth into the respiratory tract. Nevertheless, a multi-disciplinary treatment approach has to be adopted with the panel comprising an oral radiologist, surgeon, periodontist, and prosthodontist to re-establish the form, aesthetics, and function.

4. Conclusion

Clinicians must suspect a severely intruded tooth, although rare in permanent dentition, in case of a tooth missing due to a history of maxillofacial trauma. The present case report highlights the importance of a meticulous clinical examination, thorough radiographic evaluation, and appropriate surgical technique for the diagnosis and management of severely intruded permanent anterior teeth.

5. Source of Funding

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6. Conflict of Interest

None.

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