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CASE STUDY

SURGICAL MANAGEMENT OF SEVERELY INTRUDED (TYPE III) MAXILLARY PRIMARY INCISOR

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ABSTRACT

Intrusive luxation is defined as dislocation of tooth into the alveolar process that causes damage to pulp and surrounding structures of tooth. As a consequence of this type of injury, maximum damage occurs to the pulp and all the supporting structures. This case report presents the case of surgical removal of a severely intruded Type III maxillary primary lateral incisor due to trauma. A 5-year-old boy was referred to the clinic 1 day after a fall. Clinical and radiographic examinations suggested severe Type III intrusive luxation of the right primary lateral incisor. The intruded tooth was removed surgically under local anesthesia after a follow-up period of 2 months. Antibiotic therapy was initiated at the time of surgery and maintained for 5 days. The postoperative healing was uncomplicated, with both clinical and radiographic success after 3 months of follow up.

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INTRODUCTION

Traumatic intrusion is a type of injury where the tooth is axially displaced into the alveolus (Georgios Tsilingaridis *et al*., 2011). Intrusion injuries mostly seen in the primary dentition are related to damage to the primary anterior teeth in 4% to 22% of cases (Shanmugam *et al*., 2011). Due to high resilience and flexibility of the supporting structures around the primary teeth, these types of injuries mostly occur in 1-3 years of children (Diab and Elbadrawy, 2000). The complications related to intruded teeth are inflammatory root resorption, pulpal necrosis, ankylosis, pulp calcification, etc. So while managing such cases the main focus should be either elimination or at least reducing the above mentioned complications. The final outcome of the treatment depends mainly on the extent of injury, the quality and timeliness of initial care, and the follow-up evaluation. Long-term successful outcome of such case depends on critical evaluation and regular follow-up (Andreasen and Andreasen, 2000). Literature reviews showed that there is 100 % incidence of pulp necrosis, 70% incidence of external root resorption, 31% incidence of marginal bone loss and 3% incidence of ankylosis in intrusive luxated permanent teeth with closed apices (Andreasen, 1999). But these findings are not related to intruded primary teeth which only show pulpal necrosis (Oulis *et al*., 1996). Recommended treatments of traumatic dental injuries consist of minimizing the possible consequences of damage to the primary tooth and prevent the developmental disorders of permanent tooth bud. The permanent tooth germ is separated from the periapical region of the primary tooth by a hard tissue barrier that is less than 3-mm thick and may consist of only fibrous connective tissue. Hence developmental sequelae to permanent teeth are found in 12–53% of the permanent successors of primary teeth that sustained traumatic injuries (Lilian de Fa´tima Guedes de Amorim *et al*., 2011). There are certain factors that determine severity of intrusion injury, such as the amount of root resorption of the intruded primary tooth, age at the time of the accident, the developmental stage of the permanent tooth bud and the type and extent of the traumatic lesion (Smith and Rapp, 1980). Depending on the magnitude of the impact, the injury can be divided into three types: Type I, less than 50% of the crown is intruded; Type II, more than 50% of the crown is intruded; and Type III, the entire crown is intruded (Shanmugam *et al*., 2011). There are certain chances that intruded tooth may cause developmental disturbances in succedaneous teeth, due to the anatomic proximity between the roots of the primary teeth and their permanent succedaneous tooth, so, the dentist must also be aware of the possible injury to the developing permanent teeth, before starting treatment of intruded primary tooth (Diab and Elbadrawy, 2000). The American Academy of Pediatric Dentistry (AAPD) recommendation for managing the intruded primary incisors is either extraction or waiting for spontaneous re-eruption, depending on the severity of intrusion. . This case report describes successful management of severe Type III

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intrusive luxation of maxillary primary lateral incisor by its surgical removal from the alveolar socket.

Case Report

A 5 year old male patient was referred to the Department of Pedodontics and Preventive Dentistry, Govt. Dental College and Hospital, Ahmedabad with a lacerated injury on the right corner of upper lip.(Fig.1) Reportedly he had fallen down from the steps of his school and injured himself on the right cheek region as well as one of his tooth. The child was immediately taken to a nearby hospital where the possibility of trauma to the cranial structures and neck was eliminated. Tetanus toxoid injection was then given to the patient. The doctor found his tooth missing in the region of trauma after which he was sent to our department on the next day. An intraoral examination revealed a missing right primary lateral incisor and bleeding from the socket of tooth. (Fig.2) The adjacent teeth were free from any clinical symptoms. A panoramic radiograph showed that the tooth was completely intruded into the alveolar socket (Fig.9). The socket which was covered with blood clot was cleaned with Normal Saline and Betadine; no foreign body was found to be entrapped in the socket and the surrounding soft tissue. The treatment plan comprised prescribing antibiotics (Syrup Amoxicillin 250 mg TDS) and analgesics (Syrup Ibuprofen 100 mg and Paracetamol 162.5 mg in combination TDS) and a mouth rinse containing 0.12% chlorhexidine gluconate for 5 days and following the patient until the possible re-eruption of the tooth by itself. Proper oral hygiene instructions were also given to the patient. Evidence of gingival healing was observed 2 months later but with no exposure of the tooth in the oral cavity, hence its surgical management was planned. Informed consent was taken from the parents and after complete blood investigations, surgical exposure of the socket was done under local anesthesia. (Fig.3). Semilunar incision was given with no.15 surgical blade and an envelope flap was raised. After locating crown of the tooth, the tooth was surgically removed with the help of an artery forceps (Fig.4) after which sutures were taken to close the alveolar socket (Fig.7). Antibiotics (Syrup Amoxicillin 250 mg TDS) and analgesics (Syrup Ibuprofen 100 mg and Paracetamol 162.5 mg in combination TDS) were prescribed as per AAPD guidelines and the patient was recalled after 1 week for removal of sutures. The patient was asymptomatic and the healing was uneventful (Fig. 8). The alveolar mucosa appeared normal with no damage to the alveolar socket. There was no damage to the tooth bud of permanent lateral incisor as confirmed by orthopantamograph (Fig 10).

Figure 1. Pre-operative Photograph of patient [Extra oral view]

Figure 2. Pre-operative Photograph of Patient [intra oral view] showing severely intruded Type III primary lateral incisor

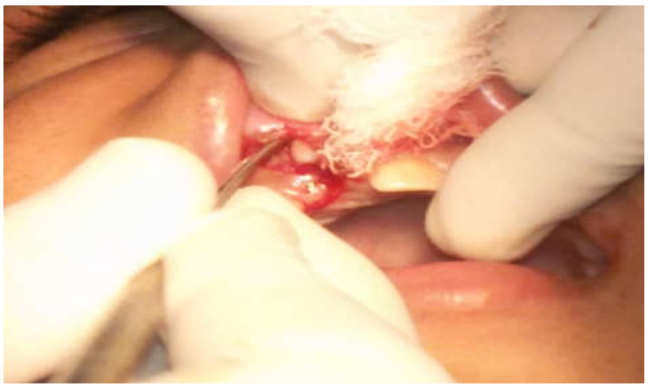

Figure 3. Surgical exposure of the socket was done under local anesthesia

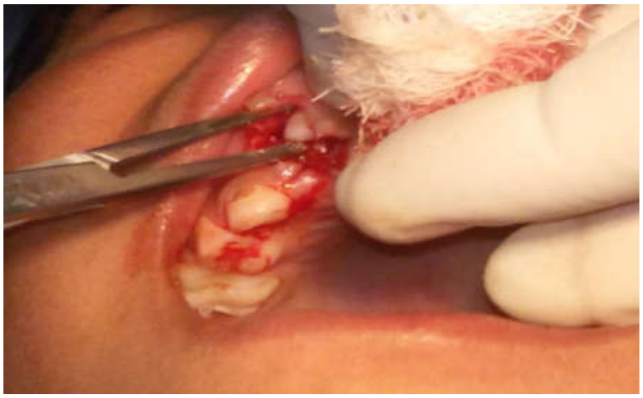

Figure 4. Surgical Removal of Intruded tooth with the help of an artery forcep

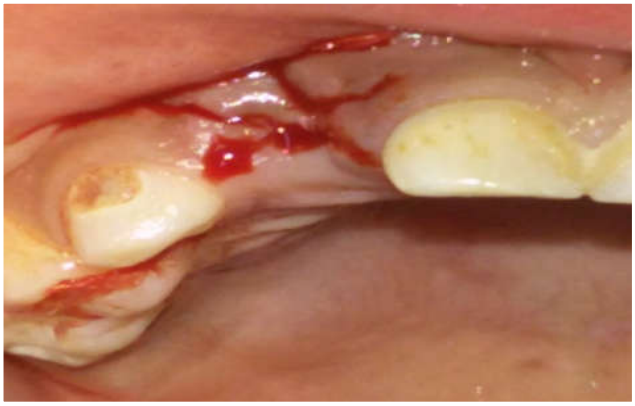

Figure 5. Extraction Socket after Removal of Tooth

Figure 6. Surgically Extracted Intruded Primary Lateral Incisor

Figure 7. Interrupted Suture taken after removal of Tooth

Figure 8. Post-operative intraoral photograph showing satisfactory Healing

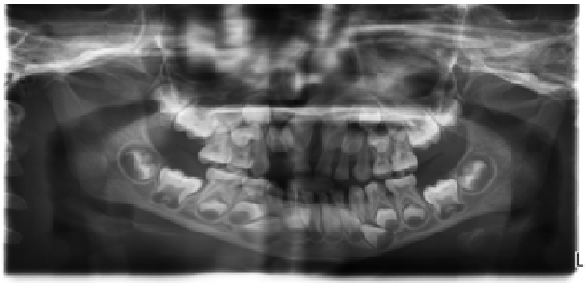

Figure 9. Pre-operative panoramic radiograph showed that the tooth was severely intruded [Type III] into the alveolar socket

Figure 10. Post-operative panoramic radiograph showed normal alveolar mucosa and there was no damage to Permanent tooth bud

DISCUSSION

The most commonly recommended treatment for intrusion in primary teeth is to allow the intruded tooth to re-erupt, provided it is positioned labially away from the developing permanent tooth bud. Hence, in our case, it was decided to retain the tooth initially. According to the literature, the average time for spontaneous re-eruption is 3 months. During this period, endodontic procedure is almost impossible (Andreasen and Ravn, 1971). Andreason stated that pulp necrosis is highly associated with moderate or severe intrusion (Type II and Type III). Destruction of pulpal tissue might result in inflammation of periapical tissue. In certain cases where hypoplasia of the permanent teeth occurs due to long-term acute infection that becomes a chronic abscess, it can generate purulent exudate in the periapical region (Andreasen, 1994). Study of Diab and Elbadrawy showed that, 20% to 22% of intruded primary incisors did not re-erupt in proper position, or failed to re-erupt. During spontaneous re-eruption, ingress of bacteria through the gingival sulcus may cause gingival redness, swelling, bleeding and pain. Therefore, surgical repositioning was considered rather than spontaneous re-eruption and extraction. Saporowski *et al* also proposed this technique for intruded primary teeth. In addition, this treatment plan prevents the aesthetic problems and alteration in occlusion. Andreason recognized the higher rate of pulp necrosis in 4–6 year olds due to the narrow apex and the non-resiliency of alveolar bone as compared to 2–3 year olds (Andreasen, 1994). Intrusion of tooth due to trauma may result in pulp necrosis, internal or external root resorption, ankylosis and obliteration of the pulp canal (Andreasen and Ravn, 1971). This has been reported as common sequels ranging from 14% to 53% of the intruded cases. Immediate pulpectomy and thereafter placement of calcium hydroxide as an intracanal dressing was done in order to avoid these unwanted sequelae (Soporowski *et al*., 1994). Management of intruded primary tooth poses fewer problems as compared to that of permanent tooth since it is not necessary to conserve the primary tooth. But in similar cases, chances of damage to the erupting permanent tooth should be considered. In our case, the intruded primary tooth was far away from the permanent tooth bud, hence there were least chances that it could be damaged. In our case, the tooth was intruded through the labial side of the maxillary ridge along with displacement of the root distally at an angle. With the impact force of trauma, the intruded tooth was completely embedded into the bone and the labial alveolar bone was broken. For this reason, it was decided to extract the intruded tooth. The chances of the tooth being re-erupted of its own are very less as the primary tooth does not show any active eruption just like its permanent counterpart (Diab and Elbadrawy, 2000). Surgical removal is the other treatment option employed in such cases. After that the patient is kept on regular follow –up to observe the erupting permanent tooth, which upon eruption is tested for vitality status. According to the literature, it is also required to examine the amount of soft tissue and hard tissue healing.

Conclusion

Surgical removal of intruded primary teeth is the treatment of choice as long as there is no damage to the erupting permanent tooth bud beneath it and the removal is done with due intra - operative precautions and as a traumatically as possible followed by antibiotic administration. However, long-term follow-up studies have to be undertaken to confirm the success

of other treatment modalities in case of intrusive luxation of primary teeth.

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