Published online: 2019-09-25

Management of an intruded primary central incisor with a natural crown under general anesthesia

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ABSTRACT

Tooth intrusion is the most common trauma during early infancy. Primary maxillary central incisors are the most affected teeth. There are a few treatment approaches which depend upon the severity of the trauma, and the treatment must be managed professionally. In this case report, a 3-year-old girl with a history of trauma 40 days before referring to our pediatric clinic is presented. Deciduous maxillary right central incisor was intruded through labial and alveolar socket and completely covered with soft tissue. The intruded deciduous incisor tooth was surgically extracted and impression was taken under general anesthesia. The removable partial prosthesis was completed by using the patient's own extracted tooth. Using natural crown on removable prosthesis gives psychological satisfaction to the patient and his/her family, and can be better tolerated since its shape, size, and color are exactly in harmony.

Key words: Intruded teeth, primary incisors, trauma

INTRODUCTION

Most of the injuries at early ages happen due to falling off when the kids learn to walk or run, as there is lack of motor abilities at that age.[1] One of the most common traumatic injuries happening in preschool children or kids is intrusive luxation which causes displacement of the tooth in the alveolus.[2] Intrusive traumas are mostly experienced in the deciduous dentition with damage to anterior teeth; this kind of trauma is more common at age 1-3 years due to the high resilience and flexibility of the surrounding tissues around the deciduous teeth.[3] Preschool children have wide medullar spaced bones; this situation leads to luxation and intrusion injuries instead of structural fractures.[4]

The dentists should also avoid the permanent tooth disturbance in the anterior zone traumas since there is a probability of injuring the permanent teeth.[5-7] Deciduous teeth traumas may present with several visual signs: color change of crown, pulp obliteration, pulp necrosis, resorption of root, inflammatory resorption, ankylosis, gingival recession, permanent displacement of the deciduous tooth, and pulp necrosis/premature loss.[2,8] General anesthesia (GA) may be indicated for pediatric dental patients with extensive restorative treatment or difficult treatment plans, uncooperative behavior, severe anxiety or fear, physical or mental challenges, or for patients who are very young.[9]

In case of tooth loss at the anterior region, to prevent the esthetic, phonetic, and space maintenance problems, the extracted natural teeth have been used for building up fixed apparels as temporary prosthetic treatment of preschool kids.[10,11] In this case report, the management of an intruded deciduous maxillary right central incisor using its natural crown is presented.

CASE REPORT

A 3-year-old patient with no systemic problems had been brought to Sifa University, Pediatric Dentistry Clinic because of pain and swelling at the maxillary anterior incisor zone including the labial soft tissues.

How to cite this article: Altunsoy M, Bilgin MS. Management of an intruded primary central incisor with a natural crown under general anesthesia. Eur J Dent 2014;8:265-8.

DOI: 10.4103/1305-7456.130632

The history of the patient included a trauma caused by falling off while running 40 days before referring to our clinic. After the trauma, they had immediately visited a local dentist in their neighborhood. The dentist told them to wait due to the possibility of spontaneous eruption process. When the parents realized that there was no positive visual and feedback from their daughter, they decided to visit our clinic for examination and treatment. In the clinical examination, there was no negative sign for health and neurological symptoms. In her history, there were no extraoral injuries like nose or head trauma. During intraoral examination, we observed a swelling at the maxillary anterior region, exactly at deciduous maxillary right incisors + ridge zone and labial sulcus [Figure 1]. We found that the deciduous maxillary right central incisor was dislocated and intruded through labial sulcus soft tissue by observing the periapical radiograph [Figure 2a]. Due to the age of the patient, we decided to remove it under GA with the permission of the family, as there could be lack of cooperation from the patient.

An impression (3M ESPE AG, Dental Products, Seefeld, Germany) was taken during GA to build up a removable partial prosthesis for the patient. Then, the intruded deciduous incisor tooth was surgically extracted [Figure 2b], and soft tissue ruptures were reformed and sutures were placed with 3-0 black braided silk (Ethicon; Johnson and Johnson Ltd., Somerville, NJ, USA). Extra care was taken to avoid permanent teeth disturbance during surgery of the hard and soft tissues. Also, we gave post-extraction instructions to the patient's parents. Antibiotic was prescribed to the patient to avoid infection.

The crown of the extracted deciduous upper right central incisor was separated from the root. The pulp chamber of the tooth was cleaned and then stored in sterile saline solution until use. Before implementing the tooth to the removable appliance, flowable resin composite material (3M ESPE, St Paul, MN, USA) was placed into the crown in increments and cured. The removable partial prosthesis was completed by using the patient's own extracted tooth [Figure 3]. The patient was followed up at 3 months. Prophylaxis was done due to poor oral hygiene. Clinical and radiographic examinations [Figure 4] were undertaken and there was no problem found.

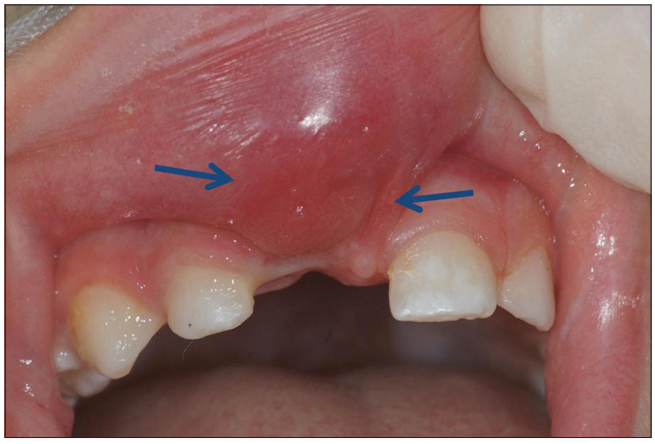

Figure 1: Intraoral view of swelling at the maxillary anterior region

DISCUSSION

Growing kids, in other words, preschool children, are much more vulnerable to fall; as a result, they face injuries and traumas due to lack of their neuromuscular coordination.[12] Most of the injuries in deciduous dentition are an intrusive luxation caused by face impact.[1,4] Gondim *et al*.[13] studied and followed up 16 patients with intrusion of the primary teeth, and 56.25% of the patients who suffered from tooth intrusion were males and in 91%, upper central incisors were the most intruded teeth. According to the histories taken from the patients who had intrusive luxation, the injuries were found to be due to fall during ordinary walking or running (62.5%) or during riding a bicycle or tricycle (12.5%). Generally, the anterior teeth, and mostly, the maxillary central incisors are affected because of their anatomical location, where they are directly exposed to any kind of physical trauma. This paper reports a 3-year-old female child who suffered from trauma to the primary central incisor and was misdirected about the treatment.

For the success of the treatment, in the diagnosis and treatment planning, expert's advice is very important.

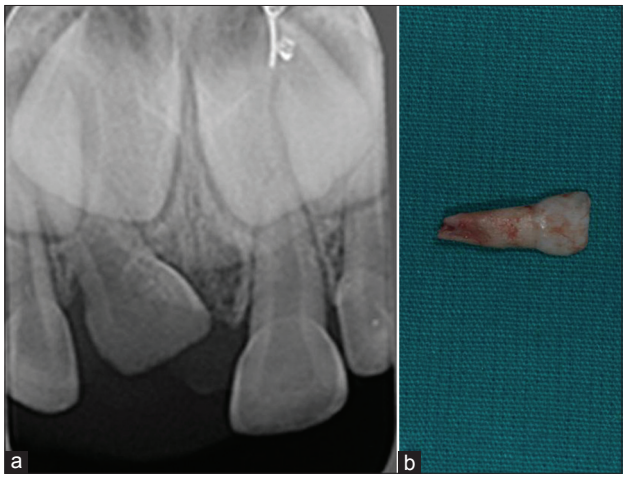

Figure 2: (a) Periapical radiograph showing severely intruded primary maxillary right incisor; (b) surgically extracted deciduous tooth

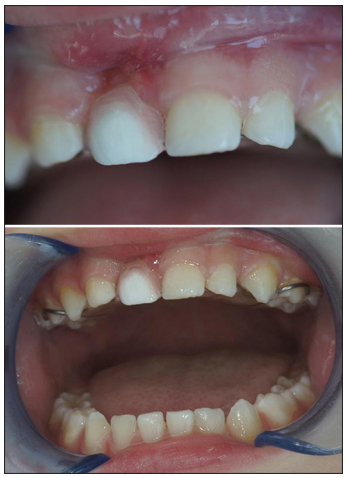

Figure 3: Intraoral view of the removable appliance with natural crown (1 week after surgery)

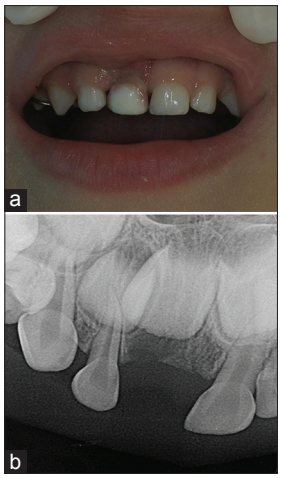

Figure 4: Intraoral view and periapical radiograph of the patient (3 months after surgery)

In situations of injuries and/or traumas including intrusive luxations, there are things to do in order. If the apex is displaced toward or through the labial bone plate, the tooth should be considered to be left in place for spontaneous repositioning and re-eruption. When the crown is completely intruded, the tooth rarely re-erupts and may become necrotic, indicating the need for extraction.[14-16] Also, if the apex is displaced through the tooth germ, tooth extraction is suggested to avoid possible damage to the permanent successor. Ankylosis should be suspected if visual signs of re-eruption are not present after 1–2 months, so extraction should be considered.[17] Also, a child with a thumb habit or swallowing disorder may apply force, avoiding the intruded tooth from re-erupting.[15,16] In the case presented here, the tooth was intruded through the labial of maxillary ridge and the root was displaced distally at an angle. With the impact force of trauma, intrusive tooth was completely embedded into the bone and the labial alveolar bone was broken. For this reason, it should have been considered for extraction immediately after the patient referred to the clinic.

In the case presented here, an impression was taken during GA to build up a removable partial prosthesis and the extraction was carried out immediately after the impression was taken. In normal conditions, for a better prosthesis and impression, the wound of extraction area should heal and soft tissue should be in final shape. Due to younger age of the patient and lack of cooperation from her, we did not take the risk of second GA only for impression.

In tooth losses, both esthetics and functions should be considered. Depending on the patient's age, the treatment approaches may vary.[11] That is why, the condition of the preschool patient was considered as an esthetic and functional problem in her developing dentition. As a consequence, to avoid bone loss of the alveolar process and as a temporary solution till final permanent treatment could be done, space management procedure with an esthetic concept was applied.

Anterior tooth loss results in difficulty in speech development, especially in a young child. It is also a setback for a child to have lost a tooth at an early age, and it may lead to the development of tongue habits. There are reports of many cases treated with fixed appliances in the literature.[10,16,18,19] While some of these cases were treated with esthetic fixed maintainers, others were treated with glass fiber reinforced cement to fix the patient's own tooth as a pontic which is the permanent central incisor. Despite the advantages of these fixed restorations in comparison to removable partial prosthesis, the fixed appliances have limiting effects on the maxillary growth in preschool growing kids.[20] The other reason for using removable esthetic partial prosthesis in this case was the crown lengths of the deciduous molars, for which occluso-cervically, the lengths were short; therefore, we were not able to prefabricate an anterior esthetic fixed space maintainer by molar bands.

Acrylic teeth can be used for building removable esthetic partial prosthesis after traumatic tooth loss in the anterior region, but they do not provide the contour or size that a natural tooth does.[16] Tannure *et al.* reported using patient's own tooth to make the patient feel comfortable about size, shape, and color.[21] For the reason mentioned earlier, we had to build a removable partial prosthesis with the patient's own tooth.

To conclude, we can say that using patient's own tooth instead of prefabricated teeth on a fixed appliance renders psychological satisfaction for the patient and his/her family, and can be better tolerated because of its shape, size, and color. These kinds of cases should be referred to an expert.

ACKNOWLEDGMENT

We thank all the family members of the patient for their kind cooperation and for allowing us to use her medical and dental information for the benefit of others.

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Quick Response Code:	Website: www.eurjdent.com
	Source of Support: Nil. Conflict of Interest: None declared