INTRAVERSION INJURY OF DECIDUOUS TOOTH SEQUELING
ECTOPIC Eruption OF A PERMANENT SUCCESSOR

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ABSTRACT:
Intrusive luxation of primary teeth carries a high risk of damage to underlying permanent tooth germs. Ectopic eruption of permanent incisors is an unusual outcome of traumatic injury to their predecessors. In this case report, we describe the multidisciplinary management of the consequences of a primary tooth intrusion that led to severe impaction of the permanent left central incisor in a vertical position at the level of the labial sulcus.

Key words: Intrusive luxation, Ectopic eruption, Permanent Successor.

INTRODUCTION
Preschool-age children lack the psycho-motor skills needed to perform precise and safe movements and, as a result, they are susceptible to falls and other injuries.1,2 According to the literature, 15%–30% of children suffer traumatic injuries to primary teeth.3–5 In contrast to the hard-tissue injuries that are more commonly seen in permanent dentition, luxation injuries predominate in the primary dentition.6,7 The larger bone marrow space resulting in high elasticity of alveolar bone surrounding the primary teeth has been cited as the reason for this.8

Intrusive luxations constitute 4.4%–22% of traumatic injuries in primary dentition.9,10,11 In the case of an intruded primary tooth, developmental disturbances of the successor permanent tooth can occur as a result of the close proximity of the developing permanent tooth germ to the primary root apex.6 With an overall prevalence of 41%,11 these developmental disturbances include white or yellow-brown enamel discoloration with or without enamel hypoplasia, crown–root dilaceration, odontoma, root duplication or angulation, arrest of root development, germ sequestration and eruption disturbances.12-14 Ectopic eruption of a permanent incisor may result from traumatic injury to its predecessor.15 The condition is caused by the physical displacement of the permanent germ, the lack of eruption guidance by the prematurely lost primary incisor or both.15 In this case report, we describe the management of a permanent central incisor that was erupting ectopically because of prior intrusive luxation of the corresponding primary tooth.

CASE REPORT
A healthy 9-year-old boy was referred to the pediatric dentistry clinic with the chief complaint of unerupted maxillary right central incisor. Reportedly, at 4 or 5 years of age he had experienced a fall that caused severe intrusion of his primary right central incisor and premature loss of the tooth 1 month later.

Intraoral examination revealed the absence of the maxillary right central incisor within the dental arch, along with slight closure of the eruption space caused by displacement of the neighbouring incisors (fig 1 & 2). The central incisor could only be visualized in the radiograph. Trauma had caused displacement of the tooth to a position at the level of the labial sulcus, forcing the incisor to erupt towards laterally
out of its position in the arch and impacted due to lack of space. Stretching of the upper lip also revealed a bulge where the tooth was palpable.

Following orthodontic consultation, an initial treatment plan was formulated to regain the approximately 3 mm of space lost as a result of displacement of the neighbouring incisors and to move the right central incisor to a normal position. An impression of the maxillary arch was taken to permit fabrication of an appliance with finger spring for regaining space, and a palatal hook. The patient was prescribed antibiotics and anti-inflammatory drugs. A chlorhexidine mouth rinse was recommended, oral hygiene motivation was provided and another visit was scheduled. At the next appointment, the tooth was exposed surgically and an orthodontic bracket was bonded to the labial surface of the incisor (Fig. 3). After fitting the removable appliance with a hook on the midpalatal region and a finger spring engaged on the right lateral incisor to regain the lost space, (Fig. 4) extrusive orthodontic movement of the right central incisor was initiated by securing an elastic band between the bracket and the palatal hook of the removable appliance. The patient was instructed in the use of the appliance and how to change the elastic and was scheduled for weekly follow-up visits.

Two months later, the lost space had been completely recovered and the tooth was repositioned in its place (Fig. 5) and natural eruption process started and the case is in follow up. Regular follow-up visits over the subsequent 6 months were uneventful.

**Discussion**

Intrusion injuries to primary teeth present the highest risk of damage to permanent tooth germs. Intrusive-type injuries to primary incisors most commonly take place between 1 and 3 years of age. Several reports have shown that the younger the child at the time of the intrusion injury, the more severe the induced sequelae to the successor tooth. Despite the occurrence of severe ectopic eruption in the present case, developmental disturbances such as discoloration, hypoplasia, crown or root dilaceration or root angulation were not observed in the affected permanent incisor. Because the trauma had occurred at a relatively later age, the effect on the permanent successor tooth may have been limited to alteration of the eruption pathway.

Many studies have reported intrusive luxation to be the most frequent cause of developmental disturbances in permanent teeth. The intimate relation between the primary incisors and their successors explains the disruptive effect of intrusion injuries on permanent teeth, one of which is the disturbance of eruption. Children with a history of trauma experience a higher percentage of malpositioned incisors compared with those without trauma. This case presents a similar outcome, except that the severity of impact caused the successor to erupt in a highly unusual pattern without any crown–root or root dilaceration.

Considering the position of the ectopically erupted incisor and the insufficient arch length, it seemed difficult to bring the maxillary central incisor into the dental arch. However, regaining sufficient space and ensuring sufficient traction in the right direction allowed us to move the ectopically erupted tooth into the correct position. Eventually, functional and esthetic problems were solved when the central incisor was positioned in the arch.

When abnormally positioned ectopically erupted incisors are moved into the arch, discrepancies are often observed between the gingival levels of the affected and neighbouring teeth. Clinical experience has shown that light forces are more effective than strong ones in moving ectopically erupted teeth and achieving a good gingival position. Following fixed orthodontic therapy, the gingiva of the central incisor was brought close to the level of that of the adjacent central incisor, thus eliminating the need for gingival plastic surgery.

**REFERENCES**


**Figure 1** Preoperative photograph.

**Figure 2** Preoperative radiograph.

**Figure 3** Surgically exposed right maxillary central incisor with bonded bracket.

**Figure 4** Insertion of appliance for lateral incisor distalization and engaging elastic on central incisor.

**Figure 5** Post operative photograph showing eruption of central incisor in position.