

## Management of a Traumatically Intruded Maxillary Incisor: A Case Report with Long-term Follow-up

Tomio Soga<sup>1)</sup>, Toshiro Wakeyama<sup>2)</sup>, and Mitsutaka Kimura<sup>3)</sup>

<sup>1)</sup>*Soga Dental Clinic*

<sup>2)</sup>*Wakeyama Dental Clinic*

<sup>3)</sup>*Department of Pediatric Dentistry, Kyushu Dental College*

**Abstract:** The traumatic injuries of the young permanent teeth are common in childhood. Since the root development is not completed, the management of such cases requires special care. The trauma occurs most commonly in the permanent incisors, resulting in interrupting the radicular development and open apices. In these cases, treatment is aimed at promoting the completion of apical closure, followed by complete filling of the root canal upon the loss of the pulp vitality. Here we report a juvenile child with traumatically intruded maxillary incisor. Initial treatment included the active repositioning of the tooth. However, the follow-up of the patient demonstrated the loss of pulp vitality. Therefore, we treated with a strategy for aiming the root formation. Proper filling up of the root canal followed by the dentine barrier formation by calcium hydroxide and crown restoration were performed. Long-term follow-up of the patient showed excellent prognosis without any discomfort in the daily life as well as any abnormalities in clinical examination and radiographic assessments.

### Introduction

The children at the stage of primary dentition suffer commonly traumatic injuries to the maxillofacial area including teeth <sup>1)</sup>. Among these types of injuries, intrusive luxation of a maxillary permanent incisor is the most frequent <sup>2)</sup>. Although intrusion of a maxillary incisor produces severe damage to the tooth, periodontal and pulpal tissues, the prognosis is usually good in a young permanent tooth with incomplete root formation due to its high vitality. Here we report the treatment and follow-up of a child patient with traumatically intruded maxillary incisor.

### Case Report

The patient was admitted into a local dental clinic due to severe trauma to the face. Initial diagnosis showed the intrusion of the upper incisor and some bleeding from the gingival tissues. The patient was otherwise healthy with proper nutrition status. Examination of the face and intra-oral cavity demonstrated slight lacerations on the face and peri-oral region and lateral displacement and intrusion of maxillary incisor. Radiographic assessment revealed enlarged pulp cavity with strong radiolucency, supporting the clinical diagnosis of intrusion of the maxillary incisor with incomplete root development. After the oral cavity and injured area were washed and disinfected, the maxillary incisor was immediately repositioned to the correct location, and fixed by several wire splints. X-ray displayed incomplete root formation of the tooth.

The patient was regularly followed up for a long period. The x-ray showed no abnormalities two months after removal of the splint fixation. The patient had no discomfort in the daily life. However, electric pulp testing demonstrated negative response during follow-up. Taking into consideration of the high vitality of the young tooth root, thus possibility of the root elongation, pulpotomy was performed by calcium hydroxide application.

Although discoloration of the incisor was noticed at half year after the trauma, no trouble regarding with the tooth function was revealed. Because all observations demonstrated the loss of pulp vitality, the root was again disinfected and filled up by iodoform treatment and condensed gutta-percha with sealer. After plugging the root canal, temporary crown restoration by using resin was made. Although long-term follow-up of then patient, the structure

of peri-apical and periodontal tissues was normal without bone resorption. The patient also did not have any discomfort in the daily and no clinical symptoms as well as masticatory or occlusive disturbance were revealed.

### Discussion

Traumatic injuries to young permanent teeth are commonly observed in childhood <sup>1)</sup>. The majority of these incidents occur before the completion of root formation. In this case, the pulp exposes to inflammation and necrosis as a consequence of the trauma, and development and maturation of the pulp stop, resulting in a necrotic incisor with open apex and fragile root walls. However, it is also known that Hertwig's root sheath may remain intact, and under proper conditions, can be ready to resume its function, once the reservoir of infection has been removed from the canal system <sup>3)</sup>.

Here we report a case without apical proper root-end completion following trauma and subsequent appropriate endodontic treatment. Although the pulp lost its vitality, and apical root formation has not been completed, proper development of the periodontal tissues occurred, and ankylosis and resorption were not observed. Long-term follow-up of the patient showed no discomfort in the daily life.

### References

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