Complete intrusion of maxillary permanent central incisors

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Orthodontic extrusion can be time consuming and has a long retention period, making cooperation a critical factor. On the other hand, it has also been shown that surgical techniques may be useful to extrude and save the root. Surgical methods need at least 3 week for root stabilization in new position. This is a case report of a surgical method to treat intruded teeth.
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INTRODUCTION

Traumatic intrusion of a permanent tooth is a rare, but serious injury. Intrusive luxation has been defined as displacement of the tooth deeper into the alveolar bone.[1-3] Intrusive luxation is uncommon and occurs in only 3% of all mechanical injuries to the permanent dentition.

Treatment options include allowing the tooth to re-erupt spontaneously, surgical repositioning and fixation immediately, or orthodontic forced eruption.[4,5] Pulpal necrosis, periapical inflamation, external root resorption, ankylosis, pulpal canal obliteration (PCO) were all mentioned as sequelae following intrusion.[1]

With increased stages of root development (closing apices), pulpal necrosis is especially frequent. The most significant prognostic factor appears to be the stage of root development at the time of injury.[4]

CASE REPORT

A healthy 13 year old boy was brought to the Department of Pediatric Dentistry and Orthodontics, Dental School, Marmara University by his parents.

He had fallen down at the swimming pool in the morning and he came in the afternoon. The intraoral and radiographic examinations revealed an intrusive luxation of his right and left maxillary central incisors (Figure 1). The right central incisor was intruded by two-thirds of the clinical crown length with the incisal third exposed. The left central incisor was completely intruded (Figure 2). The periodontal space around the intruded teeth was diminished, but no pulpal pathosis and no root or bone fracture was noted. Radiographic examination revealed that the roots were fully devoleped (Figure 3).

Figure 1. Intraoral view of the patient.

Figure 2. Completely intruded maxillary central incisors.

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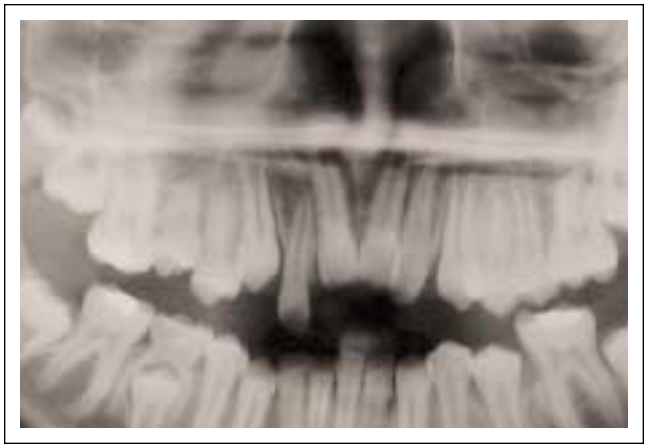

Figure 3. Panoramic radiograph confirming presence of intruded maxillary central incisors.

Figure 4. Teeth were splinted with orthodontic brackets and wire and interdental sutures were used.

Figure 5. Panoramic radiograph with splints.

Figure 6. Facial appearance of the patient after one week.

The teeth was anesthetized using a local anasthetic solution. Luxation and extrusion of the intruded teeth were performed with elevators. Teeth were repositioned surgically and splinted with wire and interdental sutures (Figures 4, 5). Systemic antibiotic coverage was done with oral cephalosporin over five days and local disinfection during the first two weeks. The patient was motivated to maintain good oral hygiene.

The sutures were removed after one week (Figure 6). No postoperative infection had developed. After 10 days, the mobility of the tooth had decreased significantly. The teeth were diagnosed as having vital pulps. A wire composite splint was kept in place for an average duration of three weeks.

Follow up treatment was done at the Department of Pediatric Dentistry and Orthodontics after an additional six weeks and six months. Clinical examination included assesment of mobility, the gingival pocket depth, periapical tenderness and and vitality tests.

At the six month examination, the intraoral and radiographic examination showed the normal periodontal contour of the roots and vitality tests of the teeth were positive (Figures 7-9).

DISCUSSION

Both permanent incisors of this patient were completely intruded into the alveolar bone. Several modes of treatment for intruded teeth have been suggested. Clinical studies have shown that orthodontic treatment may be used to treat the occlusion.[5]

Orthodontic extrusion can be time consuming and has a long retention period, making cooperation a critical factor. On the other hand, it has also been shown that surgical techniques may be useful to extrude and save the root. Surgical methods need at least three weeks for root stabilization in new position. Dehydration of the root surface cells can lead to ankylosis and root resorption.[6-8]

Figure 7. Both maxillary central incisors tested positively to pulp vitality tests after 6 months.

Pulpal necrosis, periapical inflamation, external root resorption, ankylosis, pulp canal obliteration (PCO) were all mentioned as sequelae following intrusion.[1]

With increased stages of root development (closing apices), pulpal necrosis is especially frequent. The most significant prognostic factor appears to be the stage of root development at the time of injury.[4]

Finally, the team approach involving the pediatric dentist, endodontist, and oral surgeon also contributed to the successful outcome of the case described above.

Intrusive injuries of incisors are fairly common yet have a very unpredictable prognosis. [4]

In this case, many odds were against success including: the nature of the injury, patient management and excellent patient care.

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Figure 8. Facial appearance of the patient after 6 months.

Figure 9. Six-month panoramic radiograph after treatment. Note no signs of root resorption and no periapical radiolucency.