

Treatment of a Crown Malformation in a Lower Left Permanent Central Incisor Tooth Derived from Earlier Traumatic Injuries to a Primary Tooth Based on Diagnosis using 3DX™

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Abstract: We treated a crown malformation of the lower left permanent central incisor teeth in a girl aged 10 years 8 months. The malformation derived from traumatic injuries to a primary tooth at 2 years old. We determined the treatment plan using 3DX™. The crown of the lower left permanent central incisor tooth had bent at 90 degrees against the root. The labial enamel entered to the dentin of the crown, and part of the enamel reached to near the pulp. We treated the tooth using indirect capping with calcium hydroxide paste for four times at intervals of two months to induce reparative dentin formation. The occlusion and esthetic appearance were adjusted by composite resin restoration. 3DX™ was useful for diagnosis and treatment of a tooth with crown malformation derived from traumatic injuries.

Key Words: traumatic injuries, crown malformation, 3DX™

Introduction

There are many reports presenting the effects of traumatic injuries to primary teeth on their permanent successors^{1,2}. Teeth growth patterns deviate from normal ones when problems occur during the growth stages of teeth^{3,4}. We describe a case involving treatment of a crown form using 3DX multi image micro CT (3DX™, Morita Co) of the lower left permanent central incisor teeth having a crown malformation derived from traumatic injuries to a primary tooth.

Case report

1. Patient: Girl aged 10 years and 8 months at the time of writing
2. First examination: April 5, 2003 (at the age of 8 years 5 months)
3. Chief complaints at first examination: Treatment of the lower left permanent central incisor teeth with crown malformation
4. Family history: No siblings showed similar symptoms
5. Medical history: Suffered pneumonia at six years old.
6. Present case history: The lower left primary central incisor of this patient was extracted after traumatic injuries resulting from a fall at 2 years 7 months. Observation was carried out for a period of time. Then, when the lower left permanent central incisor erupted at 7 years, it had an abnormal form of lingual tubercle. At age 8 years 5 months, the patient was referred to the pediatric dental clinic unit at the Nihon University School of Dentistry at Matsudo.



Fig.1 Study model at initial presentation



7. Oral findings at first examination: The crown of the lower left permanent central incisor tooth was bent 90 degrees against the root (Fig 1). The lower left permanent lateral incisor tooth with a crown had enamel hypoplasia (Fig 2).
8. Radiographic findings at first examination: Panoramic and dental radiographs showed the lower left permanent central incisor tooth with crown malformation (Fig 3).
9. 3DX™ findings at first examination: The crown of the lower left permanent central incisor tooth was bent 90 degrees against the root. The thickness of the enamel of the lower left permanent central incisor teeth crown was normal; however, the labial enamel entered the dentin of the crown, and part of the enamel reached to near the pulp. (Fig 4).
10. Treatment: A treatment plan for the careful restoration of the occlusion and for protection of the dental pulp was made. We treated the tooth using indirect capping with calcium hydroxide paste for four times at intervals of two months to induce reparative dentin formation. The occlusion and esthetic appearance were adjusted by composite resin restoration. There are now no abnormal feelings such as the pain caused by cold water (Fig 5).

Discussion

We experienced a tooth with crown malformation derived from traumatic injuries to a primary tooth at 2 years old. We determined the treatment plan using 3DX™. The advantages of this system are its very low dose, small size, and distinct tomographic images.



Fig.2 Intraoral view at initial presentation

The 3D sectional images produced by this system are very useful, especially in dental treatment. There are many reports of 3DX™ being useful for diagnosis and treatment of implants, apical lesions, impacted teeth and dens invaginatus⁵⁾. Our patient was able to be treated to protect the pulp from an accurate understanding of the morphology of an inner tooth with crown malformation. The 3DX™ images are useful for both diagnosis and treatment of teeth with crown malformations derived from traumatic injuries that result in a complicated morphology.

Reference

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Fig.3 Panoramic and dental radiograph at initial presentation

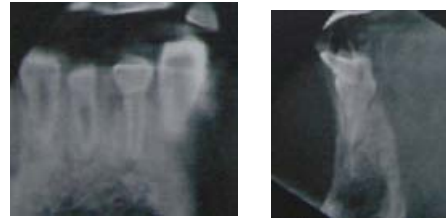
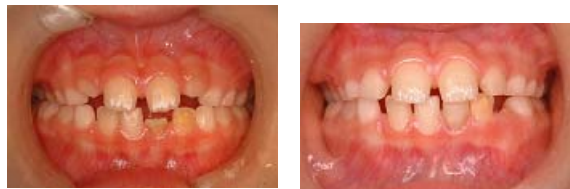


Fig.4 3DX at initial presentation



Before

After

Fig.5 Intraoral view at initial and after the treatment presentation