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The diagnosis and management of a severe case of dilaceration: adhering to basic principles (clinical case)

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Диагностика и лечение тяжелой дилацерации: соблюдение основных принципов (клинический случай)

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严重畸形情况的诊断和管理：遵循基本原则（临床案例）

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When primary teeth are injured, it is possible for their permanent successors to be dilacerated. The majority of dilacerations go undetected until the patient visits a dental clinic for a checkup or treatment. The present case report describes an unerupted maxillary central incisor, which was incidentally detected on a Orthopantomogram during orthodontic assessment.

Keywords: Dilaceration, Diagnosis, Injury, Tooth impaction

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При травме молочных зубов возможно развитие дилацерации сменяющих их коренных зубов. Большинство случаев дилацерации остаются незамеченными до тех пор, пока пациент не обращается в стоматологическую клинику для профилактического осмотра или лечения других состояний. В данной статье представлен случай ретенированного центрального резца верхней челюсти, который был обнаружен случайно по данным ортопантограммы во время ортодонтического обследования.

Ключевые слова: Дилацерация, диагностика, травма, ретенированный зуб

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当乳牙受伤时，它们的永久继承者可能会发生牙根弯曲。多数牙根弯曲的情况直到患者去牙科诊所做检查或接受治疗时才被发现。本病例报告描述了一个未萌出的上颌中切牙，在进行正畸评估时，偶然在全景牙片上被发现。

关键词: 畸形断裂，诊断，损伤，牙齿嵌塞

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Introduction

A distortion of a tooth causing the normal axial relationship between the crown and root to be disrupted during development is termed dilaceration. The condition most commonly arises in permanent incisors as a consequence of trauma to an apex of the primary predecessor, which lies close to the permanent tooth germ, but may also occur as a result of unidentified developmental factors [1, 2]. The slightest displacement of a primary incisor may disrupt the follicles of new permanent teeth, but the incidence of dilacerations affecting the permanent dentition following trauma to the primary dentition is relatively low [3]. The prevalence rate of dilaceration for maxillary central incisors was reported to be within the range of 0.4% to 1.2% [4, 5].

Case Report

A 27-year old Caucasian female reported to the Department of Orthodontics and was concerned about her malaligned maxillary anterior teeth and the absence of her maxillary left permanent central incisor. Interestingly, the patient had attended a different dental office 24 years earlier with an intruded maxillary left primary central incisor due to trauma. Her dental records indicated that when she presented back then, she was symptomless and the intruded tooth was extracted by the attending dentist.

Clinically, the patient had a removable partial denture replacing the missing maxillary left permanent central incisor. She had a class I canine relationship with normal overjet and moderate anterior spacing. Four molars were missing, the right maxillary and mandibular first molars, and the left mandibular first and third molars which may have been removed due to dental pathological conditions.

There was a hard palpable bulge in the maxillary vestibular area (Figure 1). Upon radiographical examination, a “bull’s eye” image was observed on both the Orthopantomogram (OPG) and periapical radiographs. This peculiar image is generated by a radiopaque mass with a central radiolucent area formed by the pulp chamber and the root canal and was described previously in the literature [6] (Figure 2).

Analysis of radiographs revealed that there was an impacted maxillary left central incisor. Given the characteristic feature of the radiopaque mass with a bull’s eye that was shown in both radiographic images, and the fact that such peculiar appearance is associated with a dilaceration angle of 90 degrees or more, it was determined that the tooth is dilacerated. Consequently, surgical extraction of the impacted tooth was planned as orthodontic extrusion is not a viable option in such cases.

Thereafter, presurgical assessment was carried out, including detailed clinical and medical history and the surgery was undertaken shortly after under local anesthesia (2% lidocaine with epinephrine (1: 100,000)). An incision was made and

a buccal flap was elevated exposing the alveolar bone and the unerupted dilacerated tooth. The labial surface of the cervical third of the root was immediately visible as the patient had a dehiscence defect of 8.0 mm x 6.0 mm at the that site (Figure 3).

The tooth was luxated and removed in one piece with a straight elevator (Figure 4). Finally, the surgical site was sutured with (#3/0) silk thread. The extracted tooth was examined and photographed. The crown was sound and the root showed no sign of resorption. The cervical third of the root was at an angle to the rest of the tooth, and a diagnosis of a dilacerated tooth was confirmed. Interestingly, the dilacerated tooth was found to have a 120° dilaceration angle (Figure 5).

The patient was recalled after one week for a review and the removal of sutures. Healing was progressing satisfactorily and orthodontic treatment was planned (Figure 6).



Figure 1. Pre-operative image of the area of concern showing a hard palpable labial bulge

Рис. 1. Предоперационный снимок проблемной области, отображающий твердое пальпируемое лабиальное выпячивание

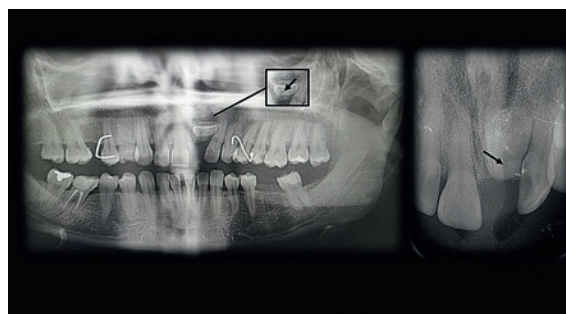


Figure 2. Radiographic examination. The characteristic bull’s eye image is observed on the OPG radiograph (Left) and the periapical radiograph (right)

Рис. 2. Рентгенографическое исследование. Характерный вид “бычьего глаза” на рентгенограмме ОПГ (слева) и периапикальной рентгенограмме (справа)

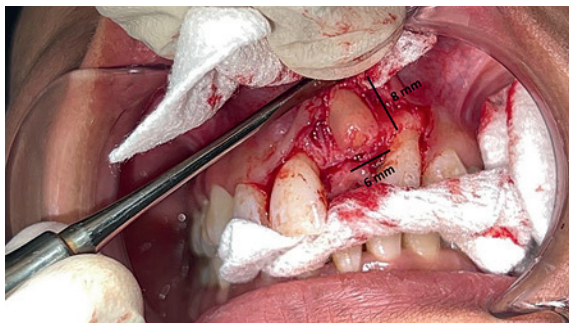


Figure 3. Elevated buccal flap showing a dehiscence defect of the maxillary left central incisor root

Рис. 3. Приподнятый щечный лоскут, демонстрирующий дефект дегисценции корня левого центрального резца верхней челюсти

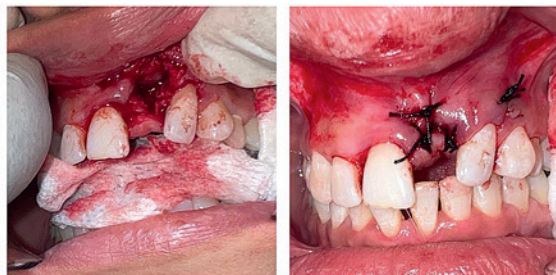


Figure 4. Postoperative images

Рис. 4. Вид после операции

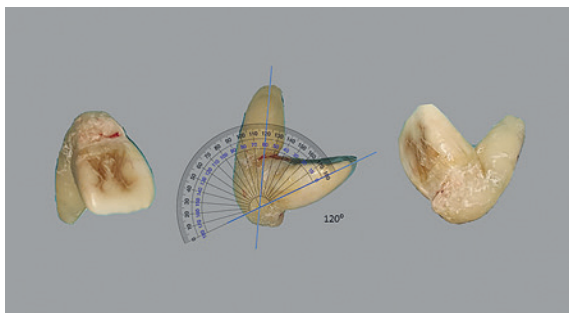


Figure 5. Dilacerated tooth images. The dilaceration angle was measured using a transparent protractor PNG image superimposed on the dilaceration angle

Рис. 5. Вид дилацерированного зуба. Угол дилацерации измеряли с помощью прозрачного PNG-изображения транспортира, наложенного на угол дилацерации



Figure 6. One week after surgery

Рис. 6. Через неделю после операции

Discussion

The most common cause of tooth dilaceration is trauma [7]. Generally, primary teeth injuries occur between the ages of 2-4 years, at which point the primary incisors are fully developed and their root apices are very close to their permanent successors tooth germs. If the root touches the tooth germ, this can cause significant harm. The root of the primary tooth may cause significant damage if it comes into contact with the tooth germ [8, 9].

The majority of dilaceration cases go unnoticed clinically. If the defect is so severe that the tooth is not capable of erupting, the only clinical indication will be a missing tooth [10]. Radiography is the most reliable method of detecting the condition. The condition would be easily spotted on a periapical radiograph if the root bends mesially or distally. This is clearly not the case if the root is bent labially or lingually where it gives the relatively difficult to diagnose “bull’s eye” appearance which is usually seen as radiopaque area with a dark shadow or a radiolucent center cast by the root canal space. This phenomenon is attributed to the fact that the X-ray beam central ray passes almost parallel with the deflected portion of the root [5].

In the present reported case of dilaceration, it was postulated that the traumatic incident identified by the patient’s past dental records may have caused the dilaceration just before the maxillary left central incisor was due to erupt. The shape of the dilacerated root may have facilitated the dehiscence defect described above as the deflected root appears to have penetrated the thin labial bone at some point during the root maturation process. The odds of developing fenestration or dehiscence defects in the labial cortical plate increases the longer the primary predecessor tooth is retained [1].

A severely dilacerated tooth poses a significant surgical challenge for dentists because root fractures are likely to occur as a result. Typically, the preferred treatment option is to expose the tooth surgically followed by orthodontic treatment [11]. Nevertheless, an unerupted severely dilacerated tooth makes this treatment modality less favorable [12, 13].

Conclusions

For an unerupted tooth with a severe dilaceration defect with an angle of more than 90, surgical extraction remains to be the first line of treatment and a minimally invasive approach would not be advisable. By establishing a correct diagnosis with adequate knowledge of the characteristic radiographical features of rare dental anomalies, and adhering to the basic principles of diagnosis and management, a complex case can be successfully managed.

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