

Management of Luxation Injury and Associated Impacted Mesiodens- Case Report with 3 Years Follow Up

Lüksasyon Yaralanması ile İlişkili Gömülü Meziyodense Tedavi Yaklaşımı: 3 Yıllık Takipli Olgu Sunumu

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Geliş Tarihi/Received: 25.06.2016
Kabul Tarihi/Accepted: 21.11.2016

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ABSTRACT Lateral luxation injuries are characterized by partial or total separation of the periodontal ligament. In immature teeth, revascularization can be occurred after the trauma. Mesiodens is the most prevalent type of supernumerary tooth. However, as regards surgical removal of mesiodens, ideal timing of intervention remains to be a controversial issue. This report describes a case of a 8-year-old female who had traumatic injuries at her permanent maxillary incisors. Intraoral examination showed lateral luxation of tooth 21. In addition to the traumatic injury, an impacted conical shaped mesiodens was observed. The tooth 21 was gently pushed back into its original position and a semi-rigid-splint was applied. The patient was monitored about devitalization symptoms. At first year follow-up, surgical procedure was performed for extraction of the mesiodens. At 3th year, the tooth was clinically and radiographically asymptomatic. In case of lateral luxation associated with mesiodens surgical intervention was delayed until the root formation was completed.

Keywords: Tooth injuries; pediatric dentistry; tooth, supernumerary

ÖZET Lateral lüksasyon tipindeki yaralanmalar periodontal ligamentin kısmi veya tam olan kopmasıyla karakterizedir. İmmatür dişlerde, travma sonrası revaskülarizasyon kendiliğinden gerçekleşebilmektedir. Meziyodens ise supernumere dişlerin en sık görülen formu olup optimal müdahale zamanı tartışmalı bir konudur. Bu olgu bildiriminde 8 yaşında kız hastanın daimi maksiller kesici dişlerinde oluşan travmatik yaralanmadan bahsedilmektedir. Yapılan intraoral muayenede 21 numaralı dişte lateral lüksasyon yaralanması meydana geldiği ve bu duruma ek olarak yaralanma bölgesinde konik şekilli, gömülü bir meziyodens varlığı saptandı. Hastanın 21 numaralı dişi orijinal konumuna yerleştirilip yarı esnek splint yapılarak dişlerin stabilizasyonu sağlandı. Hasta, gelişebilecek devitalizasyon semptomları açısından takibe alındı. Meziyodensin cerrahi olarak alınması ise kök oluşumu tamamlanana dek ertelendi ve 1 yılın sonunda opere edildi. Yapılan 3 yıllık takibin sonucunda 21 numaralı dişin klinik ve radyografik olarak asemptomatik olduğu görüldü. Meziyodens varlığı ile birlikte görülen lateral lüksasyon olgularında, komşu dişe gelebilecek potansiyel zararları önlemek için cerrahi operasyonun kök oluşumu tamamlanana kadar ertelenmesi uygulanabilecek bir tedavi seçeneğidir.

Anahtar Kelimeler: Diş yaralanmaları; çocuk diş hekimliği; diş, süpernumere

Lateral luxation injuries are characterized by partial or total separation of the periodontal ligament. Following the pulpal condition is essential to diagnose the root resorption. If the pulp becomes necrotic, root canal treatment is necessary to prevent infection related root resorption.^{1,2} In immature developing teeth, revascularization may be confirmed radiographically by evidence of continued root formation, initiation of pulp

canal obliteration and usually a return to a positive response to sensibility testing.³

The most common type of supernumerary is mesiodens which used to refer to a supernumerary tooth in the central region of the premaxilla between the two central incisors.⁴ The prevalence of mesiodens in Turkish population was estimated to range from 0.3% to 8.3%.^{5,6} Mesiodens occurs more frequently in boys than in girls, with the ratio being approximately 2:1.⁵

Mesiodens can be diagnosed with clinical and radiographic examinations. Mesiodens can occur individually or as multiples, may appear unilaterally or bilaterally. The most common position of mesiodens found is vertical. The majority of mesio-

dens do not erupt spontaneously and remain impacted.⁷ Mesiodens usually results retention of primary teeth and delayed eruption of permanent teeth. In addition to rotation, root resorption and pulp necrosis of permanent teeth, also obturation of eruption path, diastema, nasal eruption and formation of dentigerous cysts could be observed.⁸⁻¹⁰

However, as regards surgical removal of mesiodens, ideal timing of intervention (immediate or delayed intervention) remains to be a highly controversial issue. Among the disadvantages and risks of immediate intervention are potential damage to adjacent teeth resulting in devitalization and/or root malformation, and the inability of a young child to tolerate the surgical procedure psy-

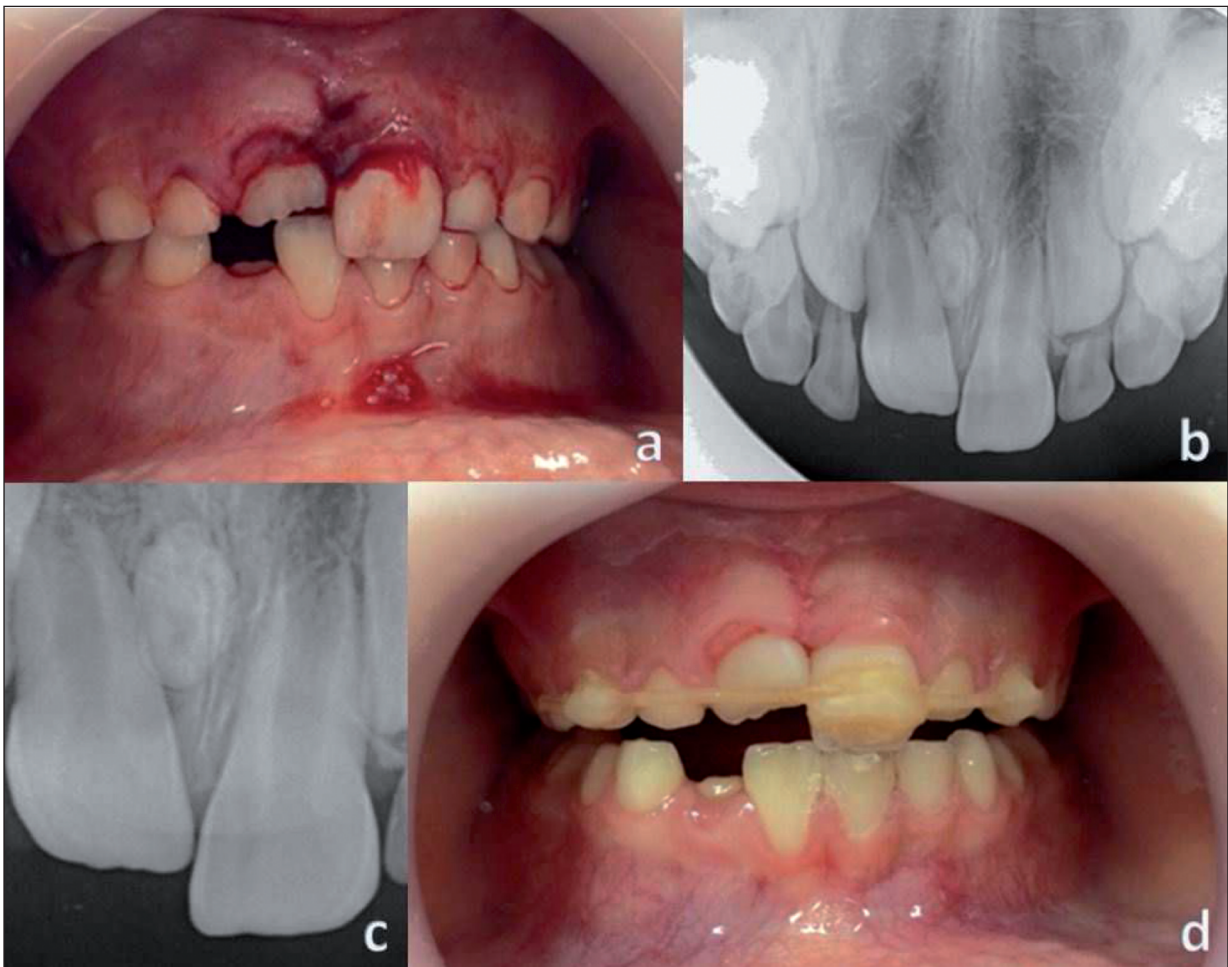


FIGURE 1: Clinical and radiographic examination of the patient. **a:** Intraoral examination after the trauma; **b:** Occlusal radiography shows the presence of mesiodens; **c:** Periapical radiography shows the affected teeth and localisation of the mesiodens; **d:** Application of a semi-rigid splint during the initial examination.



FIGURE 2: Extraction of the mesiodens during the surgical operation.

chologically.⁷ Yet, delayed intervention in mesiodens cases may have an important influence on prognosis because of the type of trauma and the location of mesiodens.¹¹

This article reports a case of impacted mesiodens which was diagnosed during the management of lateral luxation injury with 3 years follow up.

CASE REPORT

A healthy 8 year-old female was referred to the Department of Paediatric Dentistry after suffering trauma to her maxillary incisors, following an accident occurred an hour before. Examination of facial bone and temporomandibular joint revealed no pathological signs and symptoms, while intraoral examination showed lateral luxation of tooth 21. The tooth 11 was seen like intruded but it was independent of the trauma, normal eruption status was corrected by her parents (Figure 1a).

Occlusal and periapical radiographs excluded bone and root fractures. Because of the patient's age, apex of the tooth 21 was opened. The root development of the tooth 21 was stage 9 (root almost completed) for Nolla's classification¹² In addition to that presence of an impacted conical shaped mesio-

dens was observed (Figure 1b, 1c). With the parents' informed consent, a local anesthetic (Maxicaine; İdol İlaç, Turkey) was administered. The tooth 21 was gently pushed back into its original location with manual repositioning. A flexible splinting with a 16 pound fishing line and composite resin (Tetric N-Ceram, Ivoclar Vivadent, Liechtenstein) was positioned from tooth 53 to tooth 63 (tooth 52 and tooth 62 couldn't be used for splinting because of their exfoliation period) for a period up to 4 weeks, as suggested by the guidelines of the International Association of Dental Traumatology (IADT) (Figure 1d).¹³ Systemic antibiotic (amoxicillin 25-50 mg/kg/day for 7 days) and analgesic medicament on demand were prescribed. The patient received instructions about an appropriate soft diet and about an adequate oral personal hygiene (chlorhexidine 0.12% mouth rinse twice a day for 1 week and a soft toothbrush to brush her teeth after each meal).

The patient was scheduled for follow-up and was monitored periodically. Because of the open apices, root canal treatment wasn't planned immediately. The patient was monitored about symptoms of the tooth for devitalization. In addition, to eliminate the risk of devitalization and/or root mal-

formation of adjacent tooth and to prevent affecting the young child psychology with surgical procedure, mesiodens was left without extraction until the root development was completed.

At the one year follow up, the tooth was clinically and radiographically asymptomatic. There was no evidence about pulp devitalization and root development was completed. Surgical procedure was performed by oral surgeons for extraction of the mesiodens. Cone beam computed tomography (CBCT) couldn't taken because of the patient's age and her active behaviours, so radiographic evaluation was made with periapical and panoramic radiographs. The mesiodens shape was conical, located on palatal region and its length was approximately 15 millimeters (Figure 2 a-c). After the surgical operation, the tooth was clinically and radiographically asymptomatic at 2 year-follow-up (Figure 3 a-b).

Patient was reviewed regularly according to the protocol. Three years clinical and radiographic follow-up show good prognosis (Figure 4 a-b).

DISCUSSION

A lateral luxation injury produces a displacement of the tooth in a direction other than an axial direction. It occurs in conjunction with comminution or fracture of the alveolar socket, and renders the tooth immobile.¹⁴ Luxation injuries are frequently seen among young population. The frequency of luxation injury in permanent dentition is 15 to 40% of all dental injuries whereas lateral luxation rates were 7 to 11%.¹⁵

Monitoring is required to control pulpal healing at least 12 months. The evaluation of pulpal health requires: vitality testing (cold, electric pulp test, pulse oximeter, etc.), radiographs (periapical, panoramic, CBCT, etc.), evaluation of any symptoms (pain, swelling, etc.) and clinical monitoring for changes in colour and the development of a sinus or swelling or tenderness to pressure.¹⁴⁻¹⁶ In this case, periapical and panoramic radiographs and electric pulp testing showed tooth 21 was vital and root development was completed on the end of 24 months follow up period.

Ramesh et al. reported that mesiodens were frequently seen in males and conical shaped mesiodens was the most common type.¹⁷ Additionally, most of the patients required orthodontic treatment following the surgical operation in their study.

Mesiodens can cause various clinical complications such as displacement of adjacent permanent maxillary central incisors and delayed eruption which are the most common ones. Despite of the several researches in which tuberculate-type mesiodens commonly results complications, Nam et al. reported that conical type mesiodens is associated with complications more frequently.¹⁸⁻²⁰ Mesiodens are generally located in the palatal side of adjacent permanent maxillary central incisors. In this case, conical type mesiodens was located palatally.

Mesiodens could be a risk factor in both the occurrence and the treatment of dental trauma. There can be confusion about whether and when



FIGURE 3: Clinical and radiographic follow-up examinations. a: Intraoral examination at 2 year-follow-up; b: Radiographic examination at 2 year-follow-up.

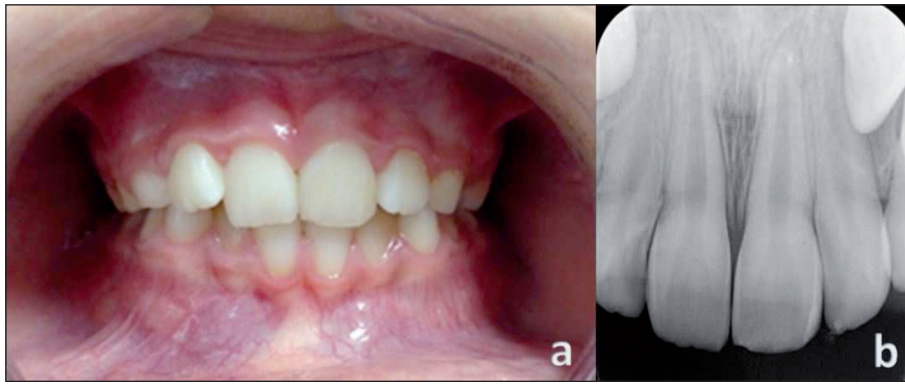


FIGURE 4: Clinical and radiographic follow-up examinations. **a:** Intraoral examination at 3 year-follow-up; **b:** Radiographic examination at 3 year-follow-up.

mesiodens should be surgically removed. Russell and Folwarczna and Mason et al. have defended the interceptive treatment.^{8,21} The clinicians believe that early removal before root formation of the permanent central incisor increases the chance of spontaneous eruption.

Alacam and Bani have defended delayed treatment, to lower the risk of iatrogenic surgical damage to the permanent central's apical development. In very young children, the surgical removal needs more attention because of the close proximity of the developing permanent tooth.¹¹ Any trauma to the developing young permanent tooth will lead to arrest in root development. Hence, there is a need for regular follow-up of any surgically removed mesiodens to see the development of adjacent permanent tooth.

Omer et al. reported that when the supernumerary tooth was removed after complete closure of the central incisor's apex, root resorption occurred more commonly.²² In their study, 170 permanent central incisors associated with impacted supernumerary teeth were investigated. They recommended early removal of the supernumerary tooth to reduce complications of adjacent permanent incisors.

In this case, the surgical operation needs more attention to avoid damaging the developing of permanent tooth. Any trauma to developing young permanent tooth lead to arrest the root develop-

ment. When the root development of permanent tooth completed, the surgical operation could perform reliably. Because of this condition and the patient's young age, the surgery was delayed after the completion of development of the permanent tooth root. At the end of three year follow up, permanent maxillary central incisor teeth were clinically and radiographically asymptomatic.

Clinicians should evaluate mesiodens cases according to the fact that patient's age and eruption status of adjacent teeth. Complications associated with immediate surgical intervention include potential damage to adjacent teeth. Also, devitalization and/or root malformation could be occurred. Besides, the inability of psychological toleration of the surgical procedure for a young child should not be overlooked. On the other hand, delayed intervention may cause over retention of primary teeth, delayed eruption of permanent incisors, impaction and diastema between central incisors. The achievement of therapy depends accurate diagnosis and treatment planning as well as regular follow up and multidisciplinary approach.

Conflict of Interest

Authors declared no conflict of interest or financial support.

Authorship Contributions

Writing the manuscript: Pınar Kinay Taran; **Data collection and processing:** Pınar Kinay Taran; **Critical review and supervision:** Ayşegül Ölmez.

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