MANAGEMENT OF AN UNERUPTED TOOTH AND ODONTOMA AFTER TRAUMA IN PREDECESSOR

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Palavras-chave: Odontoma. Traumatismo Dentário. Dente não erupcionado. Cirurgia. Ortodontia.

RESUMO

Objetivo: O objetivo deste relato de caso foi descrever a exposição cirúrgica e o tratamento ortodôntico de um incisivo central superior direito ectópico e não irrompido após trauma do predecessor decíduo. **Relato do caso**: Uma menina de 11 anos de idade foi encaminhada à Clínica de Odontopediatria devido ao atraso na erupção do incisivo central superior direito. As radiografias mostraram o incisivo central impactado localizado abaixo da espinha nasal anterior e seu ápice paralelo ao plano palatino e a presença de um odontoma. A cirurgia para remoção do odontoma foi realizada sob anestesia geral e duas perfurações na coroa do dente impactado foram realizadas para a tração ortodôntica. O alinhamento correto foi alcançado após 18 meses e não foram encontradas alterações clínicas ou radiográficas significativas. **Conclusão**: O manejo ortodôntico foi realizado com sucesso, e um resultado estético positivo combinado à oclusão adequada demonstrou os resultados satisfatórios deste caso.

Keywords: Odontoma. Dental Trauma. Included Tooth. Surgery. Orthodontics.

ABSTRACT

Objective: The purpose of this case report was to describe the surgical exposure and orthodontic management of an unerupted and ectopic maxillary right central incisor after trauma to the primary predecessor. **Case report**: An 11-year-old girl was referred to the Pediatric Dentistry Clinic due to eruption failure of the maxillary right central incisor. Radiographs showed the impacted central incisor located below the anterior nasal spine and its apex parallel to the palatal plane and the presence of an odontoma. General surgery was performed to remove the odontoma and two perforations in the crown of the impacted tooth were made to carry out orthodontic traction. Correct alignment was achieved after 18 months and no significant clinical or radiographic alterations were founded. **Conclusion**: The orthodontic management was performed successfully, and a positive esthetic outcome combined with adequate occlusion demonstrated the satisfactory results of this case.

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INTRODUCTION

The presence of an anterior impact tooth usually occurs in the early stage of the mixed dentition, since comparison with other children of the same age and even with the contralateral tooth generates a concern of those responsible.[1] The majority of traumatic injuries occur at the age of 2 years, during the developmental stage of the permanent crown.[2,3] Depending on the severity of the trauma and the age of child in the moment of dental trauma the chances to found alterations as enamel hypoplasia, root and crown dilacerations, dental impaction and odontomas are greater.[4,5] An unerupted tooth may be related with supernumerary teeth, odontomas, cysts, crown or root malformations, or ectopic development of tooth germs.6 Odontomas represent over 65% of all odontogenic tumors.[7] Their etiology can be associated with different factors such as trauma, local infection, genetic mutations, or even hereditary have been suggested.[8-10] Odontomas are usually found during routine radiographic examinations and appear as small, solitary or multiple radiopaque lesions.[11,12] They can cause disturbances to the eruption such as impaction, delayed eruption or retention of primary teeth.[11,13] The treatment of odontoma involves surgical management and the prognosis is favorable, with low rates of recurrence.[13,14] Surgical exposure associated with orthodontic treatment of the included tooth is considered a therapeutic approach with a high success rate. Orthodontic traction after surgical exposure is a current treatment modality, but includes possible failures due to ankylosis, external root resorption, or root exposure. Moreover, if the tooth is successfully brought into occlusion an unaesthetic gingival margin could appear.[15] The aim of this case report was to describe a successful management of an unerupted maxillary central incisor in an ectopic localization impacted by an odontoma in a pediatric patient after trauma to the primary predecessor with combined surgical and orthodontic treatment.

CASE REPORT

An 11-year-old girl was referred to the Pediatric Dentistry Clinic, Rio de Janeiro, Brazil, with esthetic complaints related to the difference in size of the teeth located in the upper anterior maxillary arch.

During anamnesis, the mother reported that the patient was generally healthy but had a traumatic injury history to the anterior region of dental arch when she was around 2 years old but no treatment was carried out at that time. The clinical examination revealed the absence of the maxillary right permanent central incisor, although there was adequate space for the incisors. In addition the presence of teeth 12, 21, 22 and 23 with complete erupted, also teeth 53, 52 and 51 with prolonged retention. However, tooth 13 was in eruption process with accentuated mobility of tooth 53 (Figure 1A). The patient was in mixed dentition and had an angle Class I molar relationship.

Although computed tomography is considered a routine exam for orthodontic traction, it was not possible to perform this exam on this patient because the treatment was performed at a public institution and the exam was not available at the time of the appointment. In addition, due to the cost, the patient cannot do in other services. However, other radiographic exams showed radiopaque mineralized masses suggestive to an odontoma-like malformation located in the vestibular position. Teeth 12, 21 and 22 present closed apex. While tooth 52 showed external resorption, however tooth 51 demonstrated any signal of resorption. (Figure 1B). The maxillary right central incisor was located parallel to the palatal plane, without dilacerations and was in intimate relation with the nasal cavity (Figure 1C, 1D).

The treatment plan consisted in a surgery, performed under general anesthesia, to remove teeth 52 and 51, the radiopaque mass and to access the impacted tooth (Figure 2A, 2B). The clinical and radiographic appearance of the radiopaque mass was characteristic to a compound odontoma, which was confirmed by histopathology (Figure 3).

Since there was inadequate access to bond a button on the crown and the field was contaminated with blood and saliva, two holes (for safety precautions) were drilled through the incisal edge of the tooth and two separated braided flexible orthodontic wires were inserted through the perforations (Figure 2C, 2D).

Two weeks before surgery an orthodontic appliance with standard edgewise brackets (Morelli, SP) for the anterior segment of the arch were bonded for alignment and leveling purposes as well as to prevent any possible space loss.

After a-one-month period for healing of the surgical area and to evaluate if there was any spontaneous movement of the impacted tooth, the closed-eruption technique for traction was started (Figure 4A, 4B). As the patient had aesthetics complaints, a resin restoration was carried out on the crown of the extracted deciduous central incisor to resemble the appearance of the permanent incisor and a bracket was bonded improving the aesthetics of the patient. Different types of orthodontic mechanisms with elastic chains (to apply traction) and NiTi wires were used. The direction of force was adjusted to guide the impacted central incisor into its correct position without disturbing the other teeth. The tooth was aligned and leveled until a stainless steel rectangular arch wire (0.019 x 0.026 inch) could be used for support for traction.

For 11 months, the tooth was under retraction but without being clinically visible. After this time it was possible to observe the tooth in the oral cavity (Figure 4C, 4D) and the holes were restored with calcium hydroxide and glass ionomer cement and a bracket was bonded to facilitate the traction. Alignment and leveling were achieved with round and rectangular wires (0.12"Niti, 0.14"Niti, 0.16"Niti, 0.18" stainless steel ligature wire, 0.20" stainless steel ligature wire, 0.18x0.24" stainless steel ligature wire, in sequence).

The orthodontic attachments were removed after 18 months when the alignment of the upper incisors was achieved and a short period of retention was observed (around 6 months). Subsequently, the restoration was substituted for a composite resin.

Although the discrepancy between the level of gingival tooth exposure and its neighboring teeth were observed, patient was satisfied with the aesthetics and in addition it was decided to avoid further manipulation of the area. Finally, at the end of the treatment the occlusion, alignment and overall aesthetics were satisfactory. Even though the patient not present any significant clinical or radiographic alterations, it's possible to observe a defect in gingival contour and a rounding of the root apex (Figure 4E, 4F). Follow-up is important to evaluate the surgical procedure and during the entire follow-up period (18 months) no signs of odontoma recurrence were observed.

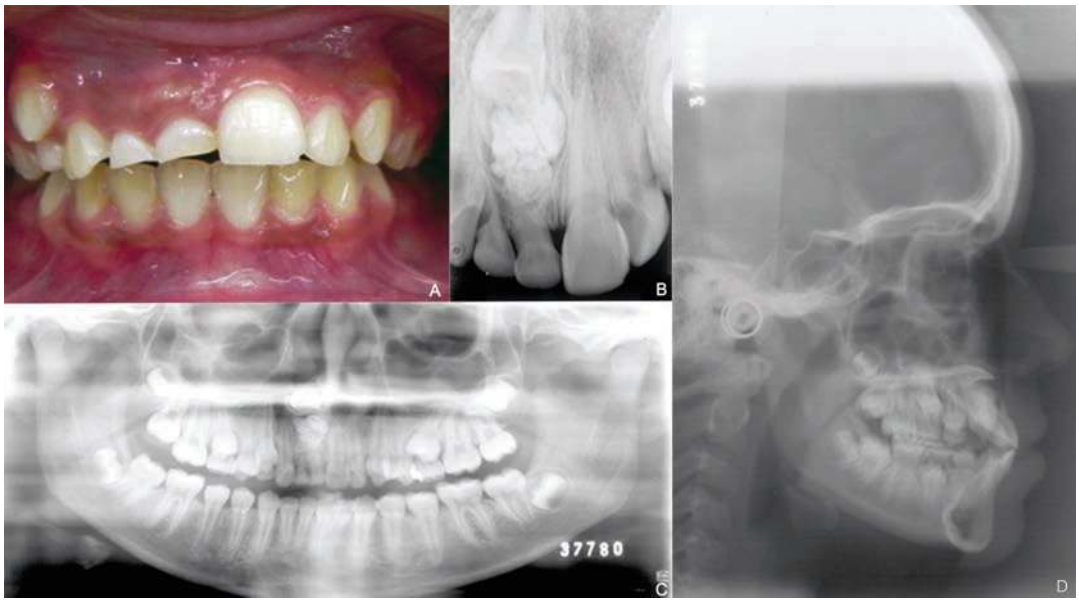


Figure 1: *(A) Patient's occlusion in front view. (B) Periapical radiography. (C) Panoramic radiography. (D) Perfil radiography.*

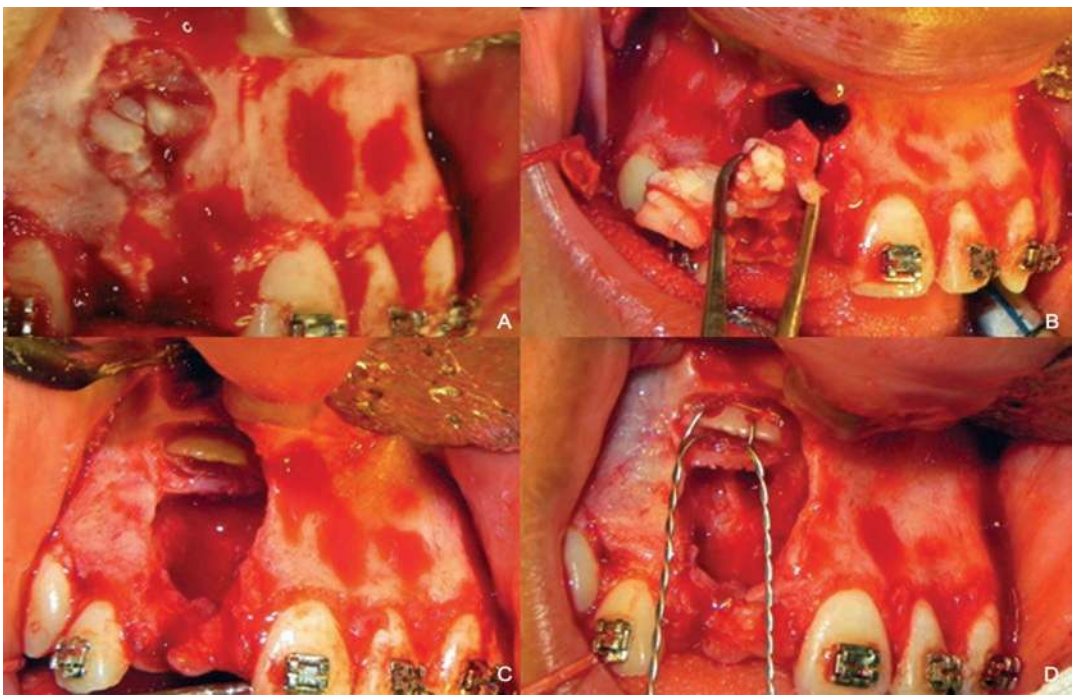


Figure 2: *(A) after extraction of deciduous teeth and showing the radiopaque mass. (B) removal of the radiopaque mass. (C) exposure of the permanent tooth. (D) braided flexible orthodontic wires inserted through the perforations.*

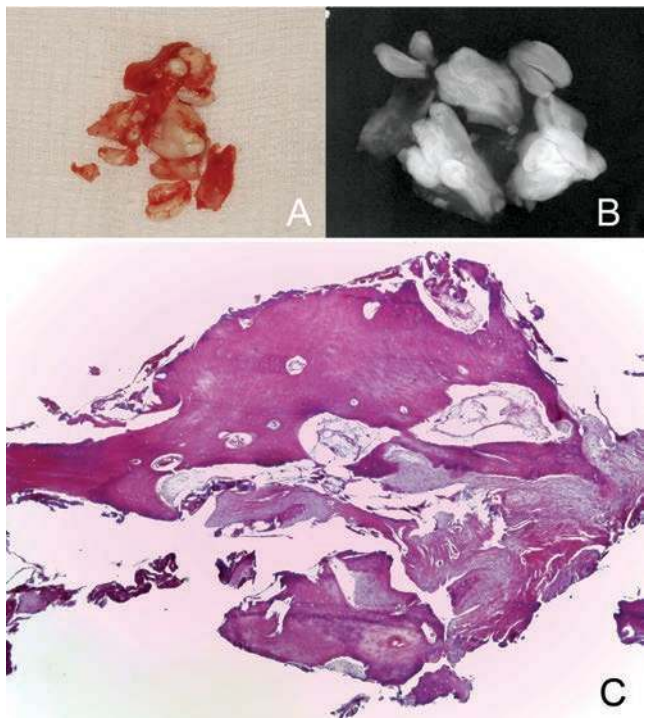


Figure 3: *(A) clinical view of odontoma. (B) radiographic view of odontoma. (C) histopathological characteristics.*

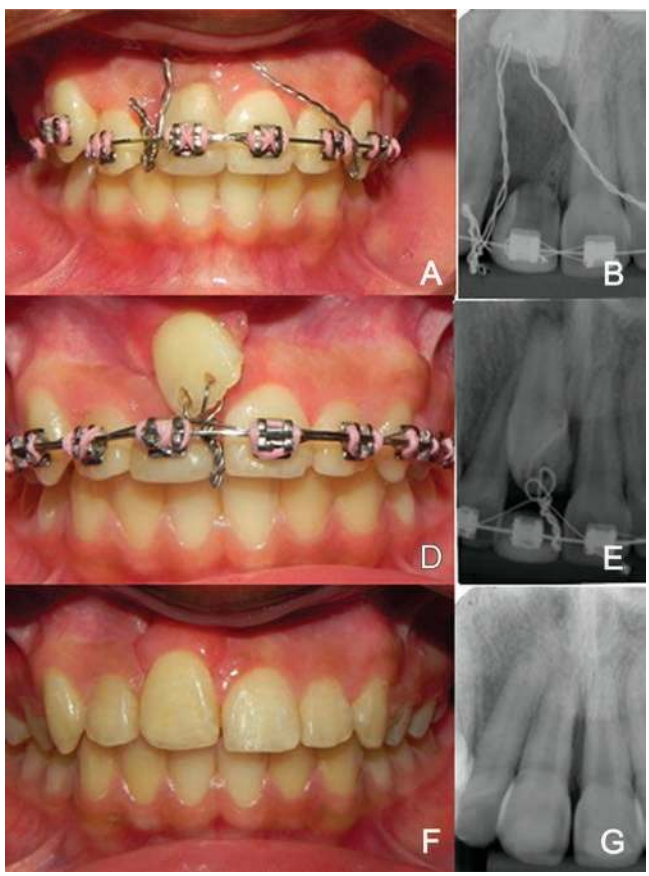


Figure 4: *(A) clinical view after 1 month, with temporary crown in place. (B) radiography after 1 month. (C) clinical view after 12 months. (D) radiography after 12 months. (E) final view of occlusion without any appliance. (F) final radiography.*

DISCUSSION

The main reason for our patient to seek treatment was the delayed eruption of the permanent maxillary central incisor. The radiographic exam detected the presence of an odontoma in the region, acting as a physical barrier and causing the ectopic position of the impacted tooth. The literature show that traumatic injuries in primary dentition can result in alterations to permanent teeth, especially if dental trauma occurs during the early developmental stages of permanent dentition.[4] During anamnesis, the mother reported a history of dental trauma in primary dentition, which could be one of the causal factors of the odontoma and ectopic location.

The treatment of choice for an odontoma is surgical excision.[16] Some authors reported the spontaneous eruption of an impacted tooth after removal of an odontoma.[13,17] A less conservative approach is exposure of the unerupted tooth at the time of surgery and begin the orthodontic traction.[18,19] The literature emphasizes the advantages and disadvantages of buccal and palatal access and also open and closed approach.[20,21]

In this case, access was performed by the vestibular due to location of the odontoma and impacted tooth. Palatal access would result in increased bone loss during surgery. Due to the location of the tooth, the difficulty of surgical access and maintenance of a dry and not contaminated surgical field, our treatment choice was to remove the odontoma and then drill two perforations in the crown of the impacted incisor where the two braided flexible orthodontic wires were tied. The most common procedure is the bonding of devices for traction of included teeth, but due to the position of the tooth in the bone it was impossible to sufficient exposure of the crown for bonding. However, despite the risk of injury to the pulp tissue during perforation of the crow, the orthodontic traction through perforations in the crown of the impacted tooth is a good option when the spontaneous eruption of the tooth does not occur and/or bonding of an orthodontic apparatus is not possible.

The maxillary central incisor is an important esthetic and functional concern for patients.[6] In this case, the recovery of the aesthetics was achieved, during traction, by fixing a temporary crown, made from the extracted primary incisor, with a bracket. The age and collaboration of the patient were both important for the success of the treatment.

The successful alignment of an impacted tooth depends on several factors, including the position and direction of the impacted tooth, the degree of root completion, the degree of dilaceration, and the availability of space for the impacted tooth.[21] In our case, the position and direction of the impacted tooth and complete root formation were some of the factors that hindered the satisfactory alignment of the tooth. Depending on the characteristics of the impacted tooth, the periodontal status of the exposed incisor after orthodontic treatment may reveal an acceptable gingival margin, eliminating the need for gingival recontouring surgery.[19,22] In our case and in other cases, the traction may result in poor gingival margin, inadequate gingival tissue attachment and a discrepancy of gingival levels between the exposed tooth and its neighboring teeth.[16,18] These fact can be explain by the traction wire rested on the mucosa during surgery due the tooth position.

Since the patient was only 12 years old and very frightened of surgical procedures, the gingival plastic reconstructive surgery was delayed for a few years, until the gingival contour returns to normal after fixed appliance removal and until bone healing at the interproximal area occurs. The authors believe that this loss is related to extensive bone loss during the time of surgery because the size of odontoma and the position of the affected tooth. McDonald and Yap,[23] found that the more bone removed initially, the greater the bone loss after orthodontic treatment. Sometimes the plastic surgery may be necessary due to poor margins, inadequate tissue attachment and discrepancy of gingival levels, as well as the type of surgery performed and the orthodontic traction. It is very important to considerate the patient expected treatment outcome and that a simple improvement in incisor aesthetic can have a positive effect on self-reported attributes such as confidence and happiness.[24]

Some limitations could be seen in this case report. The removal of an odontoma is indicated for teeth with complete root formation and an ectopic position. The surgical procedure was considered invasive due to the size of the odontoma and the necessary amount of bone removed. The child's age and the time needed for healing, traction and alignment make treatment difficult, since they need the collaboration of the child and his family. Thus, multidisciplinary approach was essential for the success of the prognosis of the case in which it was able to return aesthetics and function to the patient.

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