

Dental trauma with intrusive luxation and six-year monitoring: clinical case report

Traumatismo dentário com luxação intrusiva com acompanhamento de seis anos: relato de caso clínico

Amanda de Albuquerque Vasconcelos*

Yohana de Oliveira Ponte**

Daniela Cavalcante Girão*

Juliana Tiethbol de Almeida Reis**

Sofia Vasconcelos Carneiro*

Italo Sarto Carvalho Rodrigues***

Abstract

Objective: this study is designed to report a clinical intrusion case, which exhibited enamel hypoplasia on the crown of tooth 11 and which underwent clinical and X-ray monitoring for six years. Case report: A three-year-old female patient exhibited intrusion of deciduous teeth 51, 52, 61, and 62. After X-ray, it was detected that teeth 51 and 61 had perforated the nasal cavity floor, but all four teeth had re-erupted and began to be monitored. After six months, teeth 51 and 61 exhibited bone loss in the interproximal area, as well as mobility, which led to tooth extraction. Teeth 52 and 62 re-erupted in a satisfactory position, and exhibited no signs and symptoms of infection, periapical alteration, or mobility. These teeth were therefore maintained in the arch. After six years, it was detected that tooth 11 had erupted with enamel hypoplasia. Final considerations: Long-term clinical and X-ray control proved essential, as it allowed for the early diagnosis of potential alterations, and minimized potential sequelae to the permanent teeth.

Keywords: Dental trauma. Deciduous tooth. Pediatric dentistry.

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* Doutoranda em Clínicas Odontológicas com ênfase em Odontopediatria na Faculdade São Leopoldo Mandic, Campinas, São Paulo, Brasil.

** Mestranda em Odontopediatria na Faculdade São Leopoldo Mandic, Campinas, São Paulo, Brasil.

*** Doutor e Mestre em Microbiologia e Imunologia Oral (FOP/Unicamp).

Introduction

The World Health Organization (WHO) considers dental trauma to be a public health problem with high prevalence rates and negative impact on quality of life¹. The highest incidence in deciduous teeth occurs between 2 and 3 years of age, when motor coordination is under development².

Luxations occur more often in deciduous teeth due to greater porosity and resilience of alveolar bone and of the support structures in younger children³.

Handling trauma in deciduous teeth is different from handling trauma in permanent teeth, as there is a close relation between the deciduous tooth affected by trauma and the permanent successor tooth germ⁴.

Immediate treatment after dental trauma requires, initially, calming down parents and the patient so as to obtain the information needed during anamnesis, to establish a precise and reliable diagnosis, by asking where, how, and when the trauma occurred⁵. In addition, the parents must be informed about possible pulpal complications, parulis formation resulting from fistula, and any crown color change². Parents must also be advised that displacement of deciduous teeth may result in several complications to permanent teeth. These include enamel hypoplasia, hypocalcification, and eruption disorders, among others².

In intrusive luxation, teeth are displaced axially towards the alveolar bone⁶. Among luxations, intrusion has the most uncertain prognosis, considering its immediate sequelae are periodontal ligament rupture and neurovascular pulp suppression due to crushing⁷.

However, intruded deciduous teeth are highly capable of re-erupting, as long as the trauma has not affected the area's integrity⁸. When permanent tooth germ follicle invasion and alveolar wall fracture are detected, deciduous tooth extraction is adopted⁹.

In this sense, this study is designed to report a clinical case of intruded tooth displacement that was monitored for six years, which resulted in hypoplasia of tooth 11's crown.

Case report

A three-year-old female patient had suffered a fall and went to the dentist's office exhibiting intrusion in teeth 52, 51, 61, and 62. The mother reported that the child was healthy, her immunization chart was updated, and she had no history of thumb sucking. The trauma occurred at home, the child fell from a hammock in an area with a cement floor.

Afterwards, the clinical examination was performed, and it was detected that tooth 52 suffered a slight intrusion, while teeth 51, 61 and 62 suffered full intrusion.

An extraoral X-ray was performed on the patient's profile (Fazzi's technique) in order to view the intruded teeth. Teeth 51 and 61 were in the nasal cavity floor region, which led to choosing their extraction in a hospital environment.

The child was asked to return nine days after the dental trauma, when new clinical and X-ray tests were conducted (Figure 1).

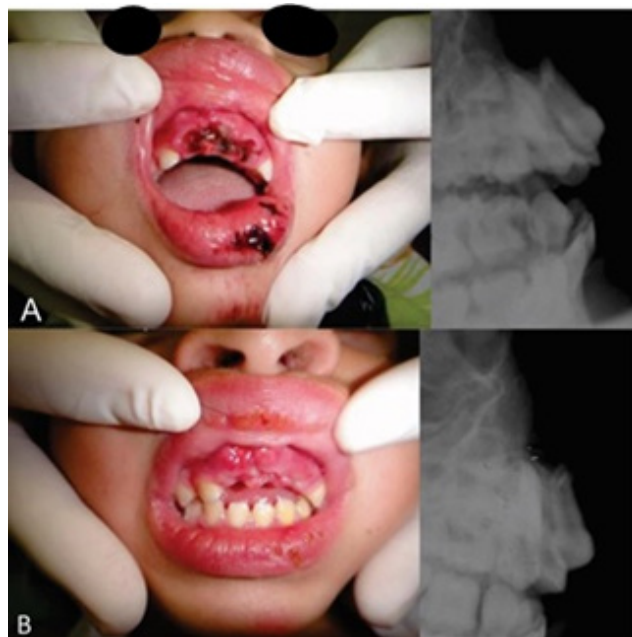


Figure 1 – A: Two days after the trauma (1st appointment) – B: Nine days after the trauma

Source: authors.

After three weeks, the four teeth re-erupted, and the monitoring patterns were adopted.

Four months after the trauma, new clinical and X-ray tests were performed. It was detected that teeth 51 and 61 had re-erupted in an

unfavorable position, and the patient was asked to return after two months, to evaluate the treatment options for these teeth (Figure 2).



Figure 2 – C: Three weeks after the trauma – D: Periapical X-ray four months after the trauma

Source: authors.

The six-month monitoring X-ray revealed that teeth 51 and 61 remained in an unfavorable position, and that there was bone loss in their interproximal area, as well as tooth mobility, which led to choosing their extraction.

Teeth 52 and 62 re-erupted in a satisfactory position with absence of clinical signs and symptoms of infection, mobility, and color alteration, and these teeth were maintained in the arch. X-rays detected the absence of radicular resorption and pulp obliteration. Two years after the trauma, new clinical and X-ray tests were conducted (Figure 3).



Figure 3 – E: Six months after the trauma – F: Fourteen months after the trauma

Source: authors.

After six years, the child, now nine years of age, had a routine appointment at the dentist's office, when it was detected that the deciduous teeth involved in the trauma had been replaced with

permanent teeth, with no significant alterations in the dental eruption sequence. However, it was detected that tooth 11 erupted with enamel hypoplasia on the vestibular side. The other teeth

involved in the trauma were replaced by normal exfoliation, by the corresponding permanent teeth, with normal characteristics (Figure 4).



Figure 4 – G: Patient, six years after the trauma – H: Tooth 11 with enamel hypoplasia on the vestibular side – I: Occlusal X-ray with normal characteristics

Source: authors.

The child's guardian authorized the publication of this work by signing a free and informed consent term, and the child is still undergoing clinical and X-ray monitoring at the Dentistry Specialties Center in the city of Aracati, Ceará, Brazil.

Discussion

The clinical case addresses an intrusive luxation in four deciduous teeth. Intrusive luxations are trauma lesions caused by the tooth's partial or total displacement towards the alveolus core¹⁰. Clinical examinations revealed that tooth 52 suffered partial intrusion, while teeth 51, 61 and 62 suffered full intrusion.

The most common etiological factors for dental traumas are falls, and the most frequently affected teeth are upper incisors¹¹, as seen in this clinical case.

Although the patient in question is a female, according to Rodrigues *et al.*¹, male patients are predominant. However, these authors emphasize that these results are not representative of the

Brazilian population, and the data compiled must be compared carefully, due to great methodological differences among the studies¹.

Fazzi's X-ray technique was selected, which consists of an extraoral X-ray, at a 90° horizontal angle with incidence on the involved teeth (size 2 film, horizontal view), allowing for the side view of these teeth¹². This X-ray allowed one to view the close contact between the intruded teeth and the permanent teeth, showing the clinical applicability of such a technique.

Wanderley *et al.*¹¹ pointed out that, in 95% of the cases, the teeth re-erupt within 6 months. After this waiting period, if the tooth is not in the correct position, extraction is recommended. In the present clinical case, re-eruption occurred after 3 weeks, despite the total intrusion. However, two teeth re-erupted in unsatisfactory clinical conditions.

Teeth 51 and 61 were monitored for 6 months, and remained in an unfavorable position. Extraction was adopted due to bone rarefaction in the interproximal area, detected during the X-ray monitoring, in addition to the presence of tooth mobility.

Teeth 52 and 62 re-erupted spontaneously, as expected, considering that tooth 52 suffered a slight displacement and tooth 62, despite being fully intruded, suffered a smaller displacement than that of the central incisors, teeth 51 and 51.

Costa *et al.*¹³ emphasize the importance of regular monitoring for complications, including possible late sequela. In their study, it was detected that the clinical conditions and the X-ray characteristics influenced the executed treatment.

In addition, Andrade *et al.*¹⁴ concluded that enamel defects had a negative impact on the quality of life related to oral health, according to the reports of children involved in the study. The patient in the present report is still undergoing clinical and X-ray monitoring, even after the intruded had been teeth replaced by permanent teeth.

Wanderley *et al.*¹¹ pointed out that the prognosis is related to the severity, to the dental development stage at the time of the trauma, and to the permanent successor being compromised.

In addition, Losso *et al.*⁴ stated that the deciduous tooth becomes favorable when the displacement direction is vestibular and re-eruption begins within two months. Prognosis may be bleak when the displacement direction is palatal, or when the re-eruption process does not start within two months. This type of trauma is the most harmful to permanent successor teeth. The lower the permanent tooth's Nolla stage, the higher the probability of sequelae⁴.

However, Wanderley *et al.*¹⁵ emphasized that it is not possible to assure the permanent tooth will be altered, and its formation must be monitored by X-rays. In addition, some sequelae will only be observed clinically, after the tooth's eruption. Therefore, it is important to monitor the permanent tooth germ's development to minimize its sequelae and to prepare the patient's mouth for the required treatment.

Fracasso *et al.*¹⁶ reported the prevalence of sequelae diagnosed during monitoring, demonstrating the importance of preservation. Therefore, six years after the trauma had occurred, eruption of tooth 11 was detected, exhibiting enamel hypoplasia on the vestibular side. Such alterations may be related to the occurrence of dental trauma when the child was three years of age.

Dental enamel hypoplasia is a significant quantitative failure of the enamel, resulting from insufficient deposition of organic matrix during the dental enamel formation¹⁷. Clinically, hypoplasia may be observed as discoloration and/or enamel defect. It frequently affects the vestibular side, involving areas of different magnitudes¹¹. In the alteration observed in the present report, it is an enamel discoloration in white, on the vestibular side of the patient's tooth 11.

The other successor teeth corresponding to those involved in the trauma exhibited normal characteristics, with no signs or symptoms of any structural alteration and/or endodontic impairment. Nevertheless, Skaare *et al.*¹⁸ propose that permanent teeth associated with the corresponding deciduous teeth exhibit 42% of the enamel defects.

Gondim *et al.*¹⁹ concluded that, considering the diagnosis after a deciduous tooth trauma is

not immediate, it is important to maintain the patient under observation and periodical and long-term control in order to allow for the early diagnosis of alterations and to minimize, as much as possible, the damages caused to the permanent dentition.

To preserve intrusion cases, Wanderley *et al.*¹¹ recommended that, in addition to the initial X-ray, subsequent ones should be taken at 1, 2, 3, 6, and 12 months after the accident, and, subsequently, X-rays must be done annually, until the permanent tooth erupts and its rhizogenesis has been completed. For the case reported herein, professional supervision was provided at 2 days, 9 days, 3 weeks, 4 months, 6 months, 14 months, 2 years, and 6 years, and the patient is still undergoing periodic clinical and X-ray monitoring.

Final considerations

The importance of a conscientious and safe professional approach to solving dental trauma in a children's dentistry clinic, as well as the importance of long-term clinical and X-ray control, for the early diagnosis of possible alterations and to minimize possible sequelae that may affect permanent teeth after trauma to deciduous teeth, must be highlighted.

Resumo

Objetivo: relatar um caso clínico de intrusão com acompanhamento clínico e radiográfico de 6 anos, que apresentou hipoplasia de esmalte na coroa do dente 11. Relato de caso: paciente de 3 anos, sexo feminino, apresentou intrusão dos dentes decíduos 51, 52, 61 e 62. Após radiografia, foi detectado que os dentes 51 e 61 tinham perfurado o soalho da fossa nasal, porém, ocorreu re-erupção dos 4 dentes e foi realizado acompanhamento. Após 6 meses, nos dentes 51 e 61, foram observadas perda óssea na região interproximal e mobilidade, optando-se pelas exodontias. Os dentes 52 e 62 re-erupcionaram em posição satisfatória e com ausência de sinais e sintomas de infecções, alterações periapicais e mobilidade, sendo mantidos no arco. Após 6 anos, foi observado que o dente 11 erupcionou apresentando hipoplasia de esmalte. Considerações finais: mostrou-se essencial o controle, clínico e radiográfico, em longo prazo, diag-

notificando precocemente possíveis alterações e minimizando sequelas que podem acometer os dentes permanentes.

Palavras-chave: Traumatismos dentários. Dente decíduo. Odontopediatria.

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Endereço para correspondência:

Amanda de Albuquerque Vasconcelos
Av. Engenheiro Santana Junior, 2937, apto 2001
CEP 60.192-205 – Fortaleza, Ceará, Brasil
E-mail: amanda_vasconcelos@hotmail.com

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