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Reabilitação cirúrgico-restauradora de dente anterior com fratura coronorradicular: relato de caso

Surgical restorative rehabilitation of an anterior tooth with coronoradicular fracture: case report

Rehabilitación quirúrgica restauradora del diente anterior com fractura de raíz coronaria: reporte de caso

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Resumo

Introdução: Fraturas em dentes anteriores podem ocasionar danos estéticos e funcionais. O tipo, disposição e extensão da fratura são determinantes para o prognóstico e tratamento. **Objetivo:** Relatar o manejo odontológico em paciente diagnosticado com fratura coronorradicular. **Relato de caso:** Paciente do sexo masculino, 13 anos de idade, compareceu ao Departamento de Odontopediatria e Ortodontia da FO-UFRJ com relato de trauma no dente 21 por queda da própria altura na escola há cerca de 3 meses. Clinicamente, observou-se uma linha de fratura na mesial e, através do exame radiográfico, observou-se a fratura no terço cervical da raiz, adjacente à parede pulpar. O dente afetado apresentou resposta positiva ao teste de vitalidade, negativa a dor por palpação/percussão e sem alteração periodontal. O plano de tratamento consistiu na cirurgia periodontal a retalho sem alívio e posterior colagem do fragmento. **Conclusão:** O atendimento pós-trauma deve ser imediato com o objetivo de possibilitar um tratamento eficaz sem sequelas. Neste relato de caso, o acompanhamento clínico realizado por uma equipe interdisciplinar proporcionou uma decisão terapêutica conservadora e estética através da técnica de colagem de fragmento.

Palavras-chave: Traumatismos dentários; Colagem dentária; Condutas terapêuticas.

Abstract

Introduction: Anterior teeth fractures can cause aesthetic and functional damage. The type, provision and extension of the fracture are determining for prognosis and treatment. **Objective:** Report the dental management in a patient diagnosed with coronoradicular fracture. **Case report:** Male patient, 13 years, attended to the Department of Pediatric Dentistry and Orthodontics of FO-UFRJ with trauma report on tooth 21 by falling from his

own height at school about 3 months ago. Clinically, it was noted a mesial fracture line and, through radiographic examination, it was noted the fracture in the cervical third of the root, adjacent to the pulp wall. The affected tooth showed a positive response to the vitality test, negative on palpation/percussion pain and no periodontal alteration. The treatment plan consisted in the periodontal flap surgery without relief and subsequent fragment bonding. **Conclusion:** The post-trauma care should be immediate to enable effective treatment without sequel. In this report case, the clinical follow-up by an interdisciplinary team provided a conservative and aesthetic therapeutic decision through the fragment bonding technique.

Keywords: Tooth injuries; Dental bonding; Therapeutic approaches.

Resúmen

Introducción: Las fracturas em los dientes anteriores pueden causar daños estéticos y funcionales. El tipo, la disposición y la extensión de la fractura son decisivos para el pronóstico y el tratamiento. **Objetivo:** Informar sobre el tratamiento dental em un paciente diagnosticado con fractura de raíz coronaria. **Informe del caso:** Un paciente masculino de 13 años asistió al Departamento de Odontología y Ortodoncia Pediátrica del FO-UFRJ con un informe de trauma em el diente 21 por caerse de su propia altura em la escuela hace aproximadamente 3 meses. Clínicamente, se observó una línea de fractura en el mesial y, mediante examen radiográfico, se observó una fractura en el tercio cervical de la raíz, adyacente a la pared pulpar. El diente afectado mostró una respuesta positiva a la prueba de vitalidad, negativo al dolor de palpación/percusión y sin cambios periodontales. El plan de tratamento consistió em cirugía de colgajo periodontal sin alivio y posterior adherencia de fragmentos. **Conclusión:** La Atención pos traumática debe ser imediata con el objetivo de permitir un tratamento efectivo sin secuelas. En este informe de caso, el seguimiento clínico realizado por un equipo interdisciplinario proporcionó una decisión terapéutica conservadora y estética a través de la técnica de unión de fragmentos.

Palabras clave: Traumatismos de los dientes; Recubrimiento dental Adhesivo; Conductas terapéuticas.

1. Introduction

Dental trauma is considered a public health problem since, the fracture of a tooth, generates negative psychological and social impacts due to aesthetic damage, especially when

considering school-aged patients (Ninawe, Doifode, Khandelwal & Nayak, 2013). Fractures of anterior teeth are common in pediatric patients, especially children and adolescents undergoing bone growth. Thus, coronary fracture is the most prevalent type of traumatic injury in permanent dentition, with the teeth most affected being the upper central incisors due to their position in the dental arch (Jagannath-Torvi & Kala, 2014).

The most common causes of fractures are: sports activities; falls; automobile accidents; violence, in addition to predictive factors such as: malocclusions, excessive overjet, short lip coverage and the mouth breather syndrome (Choudhary, Garg, Bhalla & Khatri, 2015). Thus, the role of the dentist to intervene in cases of dental injury, as well as to establish the correct treatment, is extremely important for a favorable prognosis.

The intervention for this type of situation, usually, is the restoration of the fractured tooth with composite resin. Despite being a minimally invasive method, it has disadvantages such as the difference in color with the dental structure (Choudhary et al., 2015). Therefore, the dental fragment bonding represents a conservative restorative option when compared to the conventional method. The benefits are: aesthetics through the return of the shape, surface texture, position and color of the tooth itself; maintenance of the function; simple, safe and low cost technique (Kumari, Sujana, Sunil & Reddy, 2012).

Thus, the objective was to report the dental management in a patient diagnosed with coronoradicular fracture through the fragment bonding technique.

2. Methodology

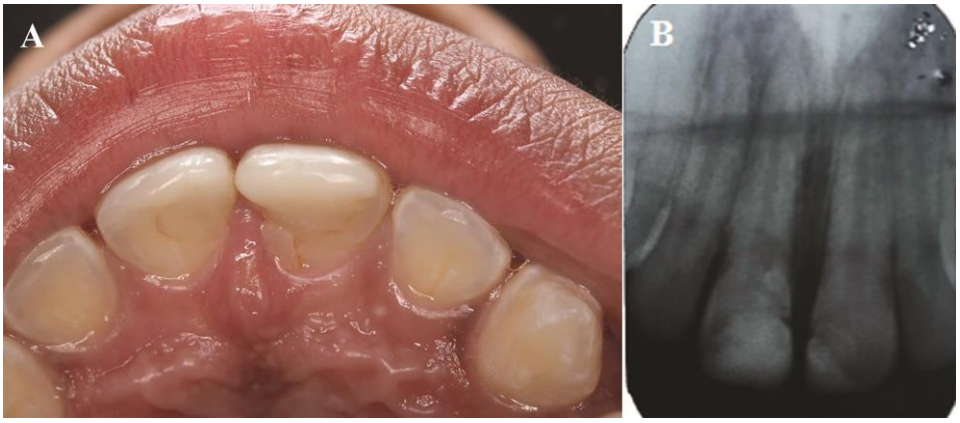
The present work is a case report of dental trauma in a pediatric patient. After carrying out the treatment plan, the patient's guardian signed the Free and Informed Consent Form.

3. Case Report

Patient, male, 13 years, attended to the Department of Pediatric Dentistry and Orthodontics of FO-UFRJ with trauma report in the element 21 by falling from his own height at school about 3 months ago. The mother reported that parts of the dental fragment that were on the floor, the teacher kept and handed it on a napkin. The next day, they went to the Dentistry service at the health center, however, as the fragments were dehydrated, it was not possible to use them. As an emergency, the dentist performed an increase with composite resin in the space referring to the lack of dental structure.

Clinically, a mesial fracture line with partial detachment of the fragment was noted (Figure 1A). After the analysis of the radiographic examination, it was observed that the fracture was directed to the cervical third of the root adjacent to the pulp wall (Figure 1B). The affected tooth presented a positive response to the vitality test, negative to palpation/percussion pain and no periodontal alteration.

Figure 1 - A) Initial image of the fracture of the element 21. Fracture at cervical height and B) Periapical radiography



. Source: Authors.

After the necessary examinations, it was established the diagnosis of coronoradicular fracture covering enamel, dentin and cementum, classified as uncomplicated because it has no pulp involvement and extends below the gingival margin.

Firstly, prophylaxis with Robinson brush (Microdont Micro Usinagem de Precisão Ltda, SP, Brazil) and prophylactic paste (Herjos 90G TuttiFrutti – RJ- Brazil) were realized.

It was made the cleaning of the surgical area with Riohex- chlorhexidine digluconate 2% (Rioquímica– SP - Brazil). Topical anesthetic Benzotop (Nova DFL, Rio de Janeiro, Brazil) was used followed by infiltration anesthesia (Figure 3C) with a 2% Lidocaine anesthetic cartridge with Adrenaline 1: 100,000 (Alphacaine, Nova DFL, Rio de Janeiro, Brazil) with complementation in the papilla and in the palate region. The surgery consisted of gingivectomy and gingivoplasty on the palatal and mesial surfaces of tooth 21. The objective was to facilitate the removal of the fractured fragment and provide access to clinical procedures for tooth restoration (Figure 2A).

The surgical procedure was performed with a 15C scalpel blade (Maxicor - Paraná-Brazil) that allowed an intra-sulcular incision with an internal bevel. The small shape of this blade provided the incision inside the narrow interdental region that included the gingival

tissue and a small part of the alveolar mucosa, an incision that extended along the entire fractured area. There was no damage to the alveolar bone and its adjacent tissues.

The incised tissue was removed using a Gracey 3/4 type periodontal curette (Golgran 2013 Desenvolvimento N2 Mídia-SP, Brazil) and the exposed dental surface was subjected to scaling and root planning with the same curette (Figure 2B). Curved Goldman-Fox scissors (Golgran - São Caetano do Sul - SP) were also utilized to remove small insertions of the gingival tissue and refine the parabolic gingival contour.

The area was abundantly irrigated with saline. Control of intraoperative bleeding was achieved by aspiration and supplemented with the pressure of sterile gauze (Ultracotton – MG - Brazil) in the surgical area. There was no suture or placement of surgical cement, therefore, healing by secondary intention was achieved.

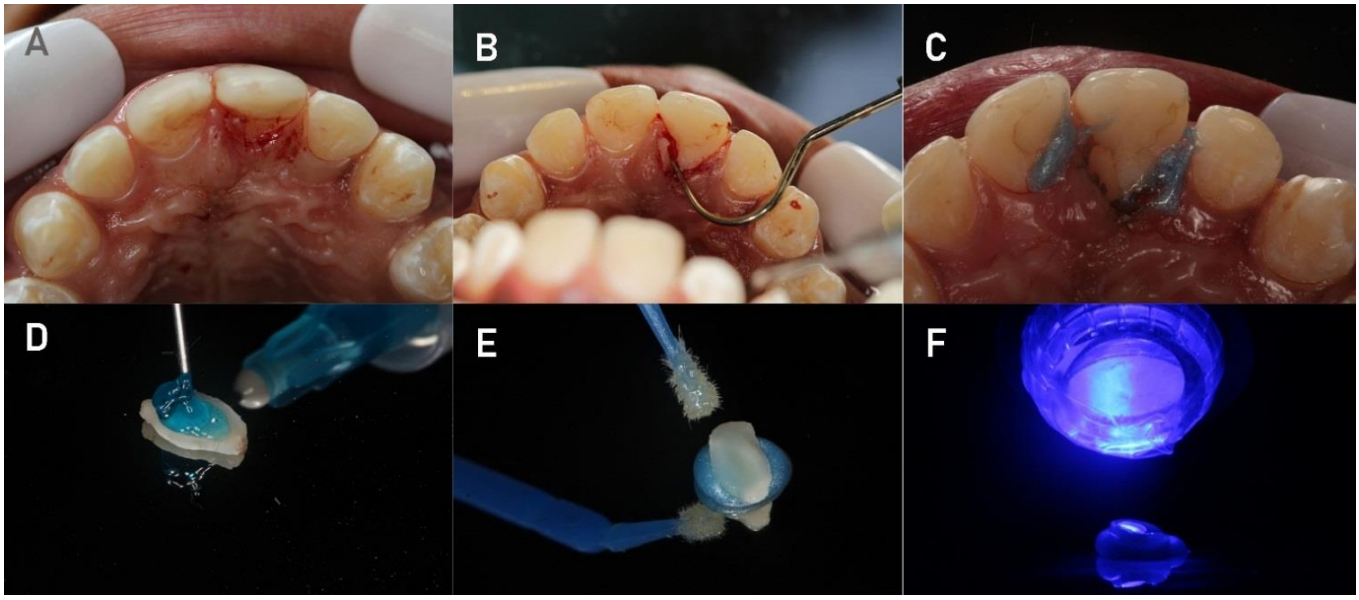
After this stage, the dental fragment was washed with saline solution and for the relative isolation of the operative field and the bleeding control, it was used a light cured resin as gingival barrier (Top dam FGM Produtos Odontológicos - SC - Brazil) (Figure 2C). The fragment and the tooth were conditioned with phosphoric acid at 37% (Figura 2D) (Condac FGM Produtos Odontológicos- SC – Brazil), during 30 seconds in enamel and 15 seconds in dentin, followed by abundant washing with water.

Later, it was made the air drying and was applied the adhesive system Ambar APS (FGM Produtos Odontológicos - SC - Brazil) with help of microbrush (Figure 2E), according to the rules of the manufacturer and, then, light cured Valo Cordless, Ultradent- Salt Lake City, Utah, USA) (Figure 2F) (Mader, 1971).

For adhesion of the interface fragment/tooth, it was used the resin Vittra APS (FGM Produtos Odontológicos - SC – Brazil) in the color A2-dentinand light cured for 60 seconds (Sargod & Bhat, 2010), later use of sanding discs for finishing and polishing (Figure 3A).

As post-operative guidelines, it was recommended the pasty diet, use of 0.12% chlorhexidine gluconate (Periogard®) for mouthwash until tooth brushing can be established in the area of the surgical procedure.

Figure 2 - A) Periodontal surgery for fracture site exposure; B) Removal of dental fragment; C) Relative isolation for fragment adhesion and bonding; D) Acid conditioning; E) Adhesive system application and F) Light curing.



Source: Authors.

One week after the procedure, the patient returned and only polishing was carried out in order to maintain the smoothness of the surface and the aesthetic-functional aspects. The patient returned 2 years later for follow-up consultation and still presented the restoration in satisfactory clinical conditions with periodontium in normal conditions (Figure 3B and 3C).

Figure 3 - A) Final aspect after bonding of the dental fragment. B) and C) Follow-up after 2 years.

Source: Authors.

4. Discussion

The prevalence of traumatic injuries in the permanent dentition is high and is considered a public health problem. Anterior teeth fractures can cause aesthetic and functional damage. The type, provision and extension of the fracture are crucial for prognosis and treatment. The elaborated anamnesis and the clinical and radiographic examination allow an accurate diagnosis of the dental trauma (Humberto & Hayden, 2014).

Chosak and Eidelman (1964) presented the first publication involving the bonding of dental fragments and since then the technique has been increasingly used in cases of dental injury, where it is possible to use the same dental remnant for patient rehabilitation.

When there is an invasion of the biological space and in an attempt to allow the fragment bonding to become more effective, it is essential to perform periodontal surgery in order to restore biological distances and obtain access to all margins of the dental remnant, as described in this case report.

The dental management should respect the appropriate parameters regarding dental trauma, as well as the criteria in choosing the technique to avoid the occurrence of periodontal injury or biological invasion (Glendor, 2009). Several case reports and studies have proven that the fragment bonding of a fractured tooth is a viable treatment when indicated and long-term success can be achieved (VamsiKrishna et al., 2015).

The way the fragment was packaged allows to define a treatment prognosis when using the fragment bonding technique. When dehydrated, the susceptibility to new fractures will be greater and the adhesion between the fragment and the remaining tooth is not compatible, corroborating the findings of this case report in which there was no success in the technique when seeking the health service the next day (Andreasen, Lauridsen, Gerds & Ahrensburg, 2012).

In this sense, the scientific literature reports that the forms of packaging in situations of dental trauma are saline, saliva or milk therefore, when seen at the Pediatric Dentistry Clinic and observed that part of the dental fragment was still present due to adhesion on the palatal mucosa, that is, being constantly hydrated, the indication of the technique was made possible (Silva et al, 2012). Besides that, no difference in color or lack of adaptation to the dental remnant was noted.

Due to be a pediatric patient, there was a positive response from the patient responsible for using the fractured tooth fragment itself. This technique is characterized as conservative treatment, allowing aesthetics, low cost and agility in care. In addition, as the

tooth is restored with its original contours and margins, gingival problems tend to occur less frequently than occur around restoration margins in composite resin (Arora, Shivakumar, Rao & Vijay, 2013).

According to Wiegand, Rodig and Attin (2005), the quality of the material used for the fragment bonding has an influence on the treatment, however the mastery of the dentist's knowledge and the technique guarantee the clinical success of the procedure. These authors reported that the use of the conventional system with acid conditioning provides less susceptibility to dental fracture after fragment bonding. Therefore, it was decided to use the conventional system with acid conditioning in this case report.

The photopolymerizable resin becomes a viable option of dental material to aid the bonding of dental fragments, as it presents several advantages, such as easy access and manipulation, choice of color and aesthetics. Thus, hybrid resins have a good recommendation, as they are characterized by wear resistance, favorable adaptation of the fragment to the dental remnant, satisfactory polishing and finishing (Robertson, Andreasen, Bergenholtz, Andreasen & Munksgaard, 1998). In this case report, the dental fragment was adhered to the remaining tooth using the micro-hybrid resin Vittra APS that presents excellent consistency, low polymerization shrinkage, lower incidence of postoperative sensitivity, high aesthetics, durability, APS technology and spheroidal zirconia silicate filler.

Regarding the limitation of fragment sticking, it was observed in the follow-up follow-up that the fragment did not acquire the original color of the remainder. However, on clinical examination, no marginal infiltration, gap or loss of tooth structure was detected, being considered a successful case.

According to the Guidelines of the International Association of Dental Traumatology (DiAngelis et al., 2012) to the approach of traumatic dental injuries, the patient adherence to follow-up and preservation visits provides a favorable prognosis. The patient and caregiver guidance is extremely important to prevent future dental trauma, even as to keep the oral hygiene to prevent tooth decay or other clinical changes.

5. Final Considerations

This case report was considered a successful treatment because it restored aesthetics and function to the patient in a minimally invasive way, showing that the integrated multidisciplinary rehabilitative treatment provides a conservative therapeutic decision in cases of complicated coronary fractures.

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