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CASE REPORT/CASO CLINICO

Home management of crown fractures of two central incisors complicated by exposure of the pulp

Gestione domiciliare delle fratture della corona di due incisivi centrali complicata dall'esposizione della polpa

Luca Boschini

Private Clinic, Viale Enrico Panzacchi 21, 47922 Rimini, RN, Italy

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KEYWORDS
Capping materials;
Complicated crown fracture;
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Pulp capping;
Pulp exposure;
Pulp vitality.

Abstract
Aim: As dental trauma is an unpredictable event, the patient is sometimes unable to receive dental care immediately in case of tooth fracture complicated by exposure to the pulp. It is conceivable that a long wait may favor bacterial contamination that can lead to necrosis of the pulp. The aim of this paper is to present a clinical case in which the pulp has been protected domiciliary to reduce post-traumatic hypersensitivity and the risk of pulpal necrosis.
Materials and methods: In the presented clinical case, the nail polish was used as an emergency material for the direct capping of the pulp of two fractured incisors. In this way it was possible to protect the pulp and seal the dentinal tubules for 5 days, such it is the time between trauma and therapy.
Results: The application of the nail polish led to a reduction in hypersensitivity; at 2-year follow-up both teeth were still vital.
Conclusions: Based on this experience, it is suggested the possibility to recommend the use of nail polish as a protective material for the pulp and for reducing symptoms in case of complicated and uncomplicated fractures, if the dentist is consulted by telephone and the patient is not in condition to reach it quickly.

E-mail: luca.boschini76@gmail.com.

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PAROLE CHIAVE
Materiale per incappucciamento;
Frattura complicata della corona;
Trauma dentale;
Incappucciamento pulpare;
Esposizione pulpare;
Vitalità pulpare.

Riassunto
Scopo: Poiché il trauma dentale è un evento imprevedibile, a volte il paziente non è in grado di ricevere immediatamente una cura odontoiatrica in caso di frattura del dente complicata dall'esposizione della polpa. È immaginabile che una lunga attesa possa favorire la contaminazione batterica che può portare alla necrosi della polpa. Lo scopo del presente articolo è quello di presentare un caso clinico nel quale la polpa è stata protetta domiciliarmente per ridurre la ipersensibilità post-traumatica e allontanare il rischio della necrosi pulpare.
Materiali e metodi: Nel caso clinico presentato, lo smalto per unghie è stato usato come materiale di emergenza per l'incappucciamento diretto della polpa di due incisivi fratturati. In questo modo è stato possibile proteggere la polpa e sigillare i tubuli dentinali per 5 giorni, tale è il tempo trascorso tra il trauma e la terapia.
Risultati: L'applicazione dello smalto ha determinato una riduzione della ipersensibilità; a 2 anni di follow-up entrambi i denti erano ancora vitali.
Conclusioni: Sulla base di questa esperienza viene suggerita la possibilità di consigliare l'uso dello smalto per unghie come materiale protettivo per la polpa e per ridurre i sintomi in caso di fratture complicate e non complicate, qualora il dentista sia consultato telefonicamente e il paziente non sia nella condizione di poterlo raggiungere rapidamente.

Introduction

Traumatology is an important branch of pediatric dentistry and often involves tooth pulp. The peculiarity of a trauma is that it may happen in any circumstance, even in a moment in which it is not possible to immediately reach the care of a doctor. The early management of the dental emergency is able to improve the prognosis, so generally it is essential to manage the patient as soon as possible. This is particularly true in the case of avulsive traumas, but this can also be extended to those traumas involving the pulp, in order to maintain its vitality and to reduce the high sensitivity following the trauma. Some studies about the factors influencing the maintenance of pulpal vitality observed that the subluxation associated with complicated or uncomplicated coronal fractures influences pulp vitality resulting in an increased risk of pulp necrosis, because vital pulp with a regular and functional blood circulation would appear to be more resistant to invasion of bacteria.[1,2] Also the root formation stage and the depth of the fracture significantly influence the pulp vitality; the immature elements show less probability of developing pulpal necrosis than the elements with fully formed roots and deep fractures evolve more easily towards necrosis. In the teeth with complicated fracture the time interval between the trauma and the therapy seems also to influence the maintenance of pulpal vitality,[1,3,4] but some author found no significant differences between the time elapsed before treatment and the appearance of pulpal necrosis.[5,6] The quality of the marginal seal is also important[7] and it underlines the importance of protecting the pulp from bacterial contamination. All these factors suggest the need for a rapid emergency treatment.

Report

This case report describes the personal experience of the 9 years old son of the author.

The child slipped on the edge of a water slide, bumping into the upper central incisors and fracturing them. The teeth fractures were both complicated by pulp exposure. The fragments have been recovered. The child has experienced a high dentinal sensitivity after the trauma.

The trauma occurred during the Easter holidays and all dentists were unavailable.

It was impossible to provide a professional treatment before 5 days, thus it was mandatory to find a material to perform an emergency pulp capping and a nail polish was used for this purpose.

Nail polish was carefully applied after drying the tooth with a paper towel; there was a micro-bleeding of the pulp immediately after applying the first coat of nail polish on one of the two teeth. After waiting a minute a second layer of nail polish was applied. Following application, all the pulp and dentin were protected up to the cavity edge in enamel. Sensitivity was immediately diminished after applying nail polish. The pulp has always remained protected and no longer exposed until the therapeutic session was performed (Fig. 1). The fractured fragments were stored in saliva, changed daily after rinsing the fragments under running water.

After 5 days from the trauma, the therapeutic treatment was performed. The vitality was tested before anesthesia and was positive. Nail polish was removed from the teeth with an excavator. Immediately after the removal of the nail polish

Figure 1 Teeth after application of the nail polish over the fractured surfaces.

Figure 2 Teeth after fragments reattachment.

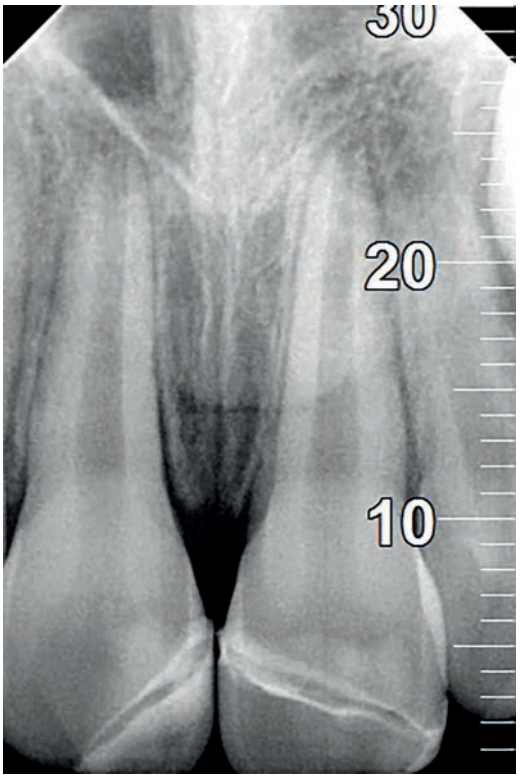

Figure 3 Radiographic follow up of the fractured.

there was a slight bleeding of the pulp that stopped spontaneously in a few seconds. With a margin trimmer the enamel prisms not supported by dentin were removed, both on the cavity edge and on the fractured fragment. Then, in accordance with the guidelines of the IADT (International Association for Dental Traumatology),[8] a direct pulp capping was performed using calcium hydroxide and protected with a very thin layer of glass-ionomer cement. On the side of the fragments a small removal of dentinal tissue was performed in order to compensate for the increase in volume due to the capping. The reattachment of the fragments was carried out with the common methods of adhesion (Fig. 2): etching of the cavities and fragments, application of a layer of bonding agent and application of flowable composite on the fragments, which, once repositioned, squeezed out the excess of composite material. This excess of composite was removed with a micro-brush before curing. After the polymerization, a polishing with a silicone rubber was performed.

The vitality test was repeated quarterly for up to two year and was always positive. The radiograph done two years after the trauma showed the reattached fragments in position and no periapical lesion accordingly to the positive vitality test (Fig. 3). The root apexes are still open accordingly to the age of the child.

Discussion

The unpredictability of a trauma can cause delay in the appropriate therapy even when it would be important to intervene in a short time. The motivation is that the more rapid the intervention, the lower the bacterial invasion; also the improvement of the symptoms and the patient's comfort is greater if the time interval between trauma and treatment is smaller.

Some interventions should be managed at the site of the trauma even by rescuers who are not operators in the dental sector, perhaps under the directives of their dentist. This is especially true in the case of traumas such as dental avulsions,[9] but also the early protection of an exposed pulp can help to maintain the vitality of the tooth and reduce the high sensitivity following the trauma. Traumatology is usually considered a dental emergency, therefore it is desirable that the therapy could be performed within a few hours from the trauma (cut off point 3 h) in the acute phase compared to intervention in the subacute phase (within 24 h) or delayed (over 24 h).[10]

In the case described in the present report, the vitality was still present at a distance of two years from the trauma, even though 5 days passed before performing the therapy. Most of the factors were favorable because the teeth had not undergone a subluxation and because the apexes were still open; also the area of exposure of the pulp was not particularly extensive. Without the emergency protection of the pulp, the risk of necrosis would have increased and the patient's discomfort would have been greater.

In an emergency situation, a nail polish could be easily found and may provide an early pulp protection and a temporary seal for the dentinal tubules, while waiting for the patient to go to the dentist for the appropriate treatment.

Conclusion

It is reasonable to provide protection to the pulp exposed by a trauma in the shortest possible time in order to maintain the vitality and reduce the sensitivity. In an emergency condition, it is possible that the pulp capping and the restoration performed by the dentist should be post-poned and alternative materials available at home or on holiday may represent a resource for protecting the pulp. In this case report, nail polish was used as emergency material and it allowed to maintain the vitality of the tooth and reduce symptoms even if 5 days passed after the trauma to perform the appropriate dental intervention. Therefore, even considering the limitations of a case report, the nail polish can be recommended as a material to perform an emergency home pulp capping when the patient is not able to reach the dentist quickly.

Clinical relevance

An emergency material for home capping is useful for protecting the pulp and reducing the symptoms. Nail polish can be suggested to this purpose.

Conflict of interest

The author declare that he has no conflict of interest.

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