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; Dental injuries; 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.

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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 pulp 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 dentin 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.
there was a slight bleeding of the pulp that stopped sponta-
neously 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 accor-
dance with the guidelines of the IADT (International Associa-
tion 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 frag-
ments, 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 avul-
sions,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 parti-
cularly 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 treat-
ment.

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 condi-
tion, it is possible that the pulp capping and the restoration
performed by the dentist should be post-poned and alter-
native materials available at home or on holiday may repres-
ent 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 limita-
tions 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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References