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CASE REPORT

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Extrusive luxation. Therapeutic procedure

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Key Clinical Message

Repositioning a traumatized tooth involves replacing and stabilizing it. When it is not possible, a method has been developed by an acetate splint. After few weeks, the tooth was aligned and correctly positioned.

Abstract: Repositioning a traumatized tooth involves, first, replacing and second stabilizing it. Stabilization, on the other hand, usually requires flexible splints. Occasionally the immediate replacement may be impossible being necessary to use other procedure. When complete replacement is not possible.

KEYWORDS

dental trauma, repositioning, splint, tooth luxation

1 | INTRODUCTION

Diagnosis and treatment of dental trauma have been well established, and the protocols of the International Association of Dental Traumatology allow the clinician to make correct decisions when dealing with a particular case.[1] Among the different types of dental trauma, dental dislocation comprises 15%–61% of cases of the permanent teeth, with a peak at 8–12 years.[2] The dislocation usually causes a displacement of one or more teeth lingually and, less frequently, buccally or laterally.[3] Because these events are usually accompanied by fractures of the crown and/or root, they are considered emergency situations requiring immediate treatment. The dislocated tooth is a category within dental traumatisms, under which loosening (subluxation), extrusion, lateral dislocation, and intrusion are subcategories in order of severity. The extrusive lesion represents only 2.6% of the dental traumas; however, it has a high incidence of pulpal necrosis.[4] Regardless of the direction of the dislocation, the traumatically displaced permanent tooth requires a splint for its stabilization once it has been correctly replaced.[4,5] Current protocol dictates that once repositioned in its original location, it must be stabilized with a flexible splint for 4 weeks.[6]

Sometimes, correct replacement is hindered by various factors such as delayed treatment (causing stabilization of the hematoma), bony locking mechanism,[7] or the inability to achieve proper anesthesia to manipulate the tooth due to edema or soft tissue hemorrhage. In such situations, it is possible that the tooth would remain in an elongated position.

The extrusive dislocation of a permanent central incisor in an adult is described in the following case. Treatment after incompletely replacing it in its original position includes the use of a removable splint that aims to stabilize the tooth and correct the elongation.

2 | CASE PRESENTATION

A 12-year-old woman came to the clinic with severe facial trauma due to a fall. On examination, there was significant soft tissue edema, with a bite wound on the lower lip. Intraorally, tooth mobility of the upper right central

incisor (No. 11) was observed, with sensitivity to percussion and a 1.5-mm displacement in the apico-coronal direction. Radiographically, there was no bone or tooth fracture. As a result of the important inflammatory component, it was not possible to obtain sufficient anesthesia, making it impossible to manipulate the tooth (Figure 1). Anti-inflammatory treatment was prescribed, and the patient was rescheduled for 48 h (Figure 2A). Then, under local anesthesia, the tooth was repositioned by digital pressure. However, that did not prove satisfactory (Figure 2B), so a conventional alginate impression was taken. Once empty, the model cuts the incisal edge of No. 11 to its ideal position (Figure 3). On the model, a splint with an average thickness of 120 mm was made with the thermoformable, biocompatible material PETG (polyethylene terephthalate modified with glycol) (Figure 4). The patient was re-examined at 1 week (Figure 2C), 2 weeks (Figure 2D), and 12 weeks (Figure 2E), noting that the tooth was well aligned and correctly positioned. The vitality tests were positive, that is, there was no pulpar necrosis. After 4 weeks, the splint was discontinued, and the patient was instructed to return for weekly checkups.

3 | DISCUSSION

Dental luxation requires the immediate replacement of the tooth to achieve its correct position and avoid as much as possible loss of pulp vitality. Usually, replacement is done manually or by means of forceps. It may be necessary to extrude the tooth from its alveolus and reinsert it with compression of the palatal and buccal bone to facilitate healing of the periodontal ligament;[8] not so often, replacement can be done by means of a tongue depressor.[2,9,10] There is not enough information about the time limit for the successful replacement of a dislocated tooth; apparently a delay of 24[11] or even 48 hours not relevant.[7] However, delay can prevent correct replacement because of the organization of the clot. Stabilization is the second factor to be considered in treating the dislocated tooth. Before the "adhesive era," most dental traumas were stabilized by means of gold or acrylic cap splints or arch bars. The use of these types of splints tends to increase the frequency of pulp necrosis; besides, their rigidity can have a detrimental effect on the healing process and hinder oral hygiene. Currently, flexible splints are used, although different types have been described: acid-etch-and-composite splint, bonded-wire splint, splinting with fiberglass, and titanium trauma splint.[5,12] All have in common allowance for physiological movements of the teeth.

4 | CONCLUSION

The stabilization method described herein using a removable splint combined two important advantages: It stabilized the traumatized tooth and allowed the physiological movements of the teeth. In addition, it (1) guided the replaced, elongated tooth into its correct position, (2) permitted study of the pulp vitality, (3) did not hinder oral hygiene, (4) did not damage enamel or soft tissues, (5) was easy to make, and (6) was economical. It can be useful in intruding dislocated teeth, and it can be used after

FIGURE 1 Trauma day.

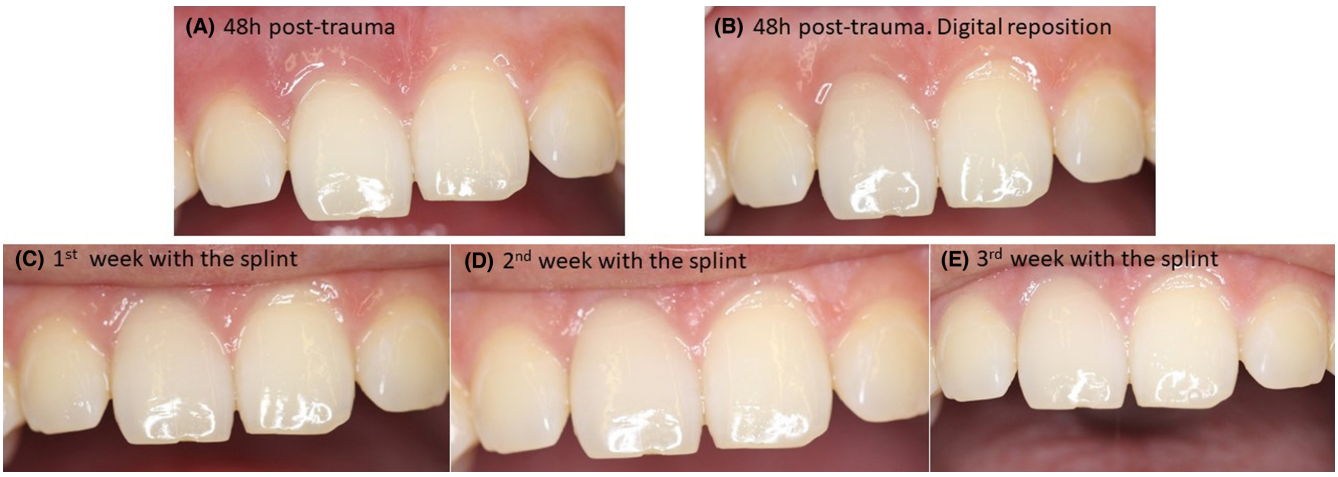

FIGURE 2 Case evolution. (A) 48-h post-trauma. (B) Tooth repositioned. (C) First week with splint. (D) Second week with splint. (E) 12 weeks after treatment.

FIGURE 3 Design for splint fabrication.

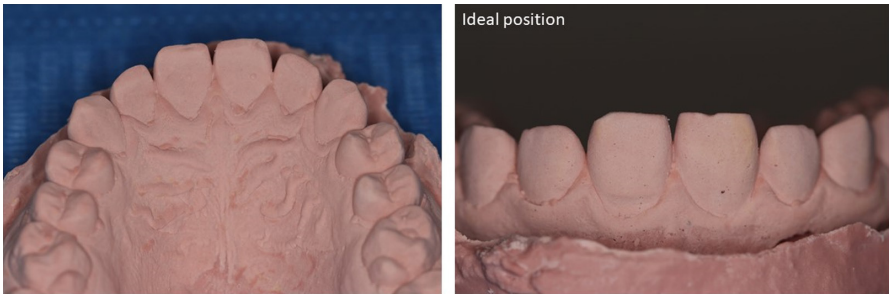

FIGURE 4 Mouth splint placement.

correcting dental replacement, for which only dental stabilization is desired.

5 | RECOMMENDATIONS

The protocol established for the treatment of dental dislocations is the immediate repositioning and maintenance with a flexible splint. The most important limitation of this method is that it requires an impression. Sometimes, due to the severity of the trauma, it is not possible due to bleeding or the poor condition of the tissues.

In some situations, correct repositioning is not possible, usually due to delay in treatment.

The favorable result of the presented case suggests that the splint described allows the tooth to be repositioned and, at the same time, it is useful as a stabilization splint.

Likewise, it allows to study pulp vitality and is easy to carry out and not expensive. Future treatment prospects are directed towards the use of flexible splints, either as described or of other types.

AUTHOR CONTRIBUTIONS

Laura Lago: Conceptualization; formal analysis; supervision; visualization; writing – review and editing. **Luis da Silva:** Visualization; writing – original draft. **Noelia Fernandez-Formoso:** Supervision; writing – original draft. **Benito Rilo:** Conceptualization; methodology; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

No conflict of interest is declared by the authors.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article.

ETHICS STATEMENT

The authors all declare that this manuscript is not published or is under consideration in other journals.

CONSENT

Written informed consent has been obtained from the patient parents to publish this report in accordance with the journal's patient consent policy.

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