



EXTREME REHABILITATION OF A DENTAL ROOT EEFC TECHNIQUE

***Dr. Jesús M. González-González**

Doctor in Medicine and Surgery, University of Alicante, Specialist in stomatology, University of Murcia,
Private practice in Salamanca, Spain

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*Corresponding author

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ABSTRACT

Introduction: when there is a fracture of a tooth, the root is usually difficult to reconstruct. The objective is to describe an EEFC technique of endodontic-extrusion-fixation-crown, for restoration of that root.

Material and methods: a literature review limited to endodontic, extrusion, fixation and crown restoration techniques on roots of fractured teeth has been made, to describe a technique that can be used in general.

Results: The description of the EEFC technique is in figures 1-6.

Conclusion: the technique EEFC for the restoration of a root is described in four steps: 1.- endodontic, 2.- immediate extrusion with forceps, 3.- fixing with dental floss and composite for 3 months, and 4.- placement of a crown.

INTRODUCTION

When there is a fracture of a tooth, the root is usually difficult to reconstruct. A subgingival fracture has a poor prognosis and usually the root is extracted (Goenka *et al.*, 2011). To keep the root, in many cases orthodontic extrusion is performed (Goenka *et al.*, 2011; Fidel *et al.*, 2011; Lan *et al.*, 2011; Derton *et al.*, 2011; Türker and Köse, 2008; Suprabha *et al.*, 2006; Kim *et al.*, 2011; Saito *et al.*, 2009; Kocadereli *et al.*, 1998; Heda *et al.*, 2006; Koyuturk and Malkoc, 2005; Zyskind *et al.*, 1992; Villat *et al.*, 2004; Bate and Lerda, 2010; Delivanis *et al.*, 1978; Serrano Madrigal *et al.*, 2011), generally with endodontic (Fidel *et al.*, 2011; Türker and Köse, 2008; Kocadereli *et al.*, 1998; Heda *et al.*, 2006; Delivanis *et al.*, 1978; Bindo *et al.*, 2010; Demiralp *et al.*, 2007; Kitagawa *et al.*, 2003), which can be prior to or after extrusion. The orthodontic extrusion in some cases has been done for 2 months (Serrano Madrigal *et al.*, 2011) and in others for 3 months (Bate and Lerda, 2010). In other techniques, surgical exposure and traction have been made (Goenka *et al.*, 2011; Pinho *et al.*, 2011; Pavlidis *et al.*, 2011).

It has also been done: a partial thickness flap apically positioned (Pinho *et al.*, 2011), crown lengthening (Goenka *et al.*, 2011; Demiralp *et al.*, 2007) or contouring the gums (Kim *et al.*, 2011). Other authors have described the surgical dislocation of the tooth and its repositioning (Maestre Rodriguez *et al.*, 2010; Terry and Hegtvedt, 1993) and then fixation for 6 months without endodontic (Maestre Rodriguez *et al.*, 2010). It is also possible to use micro-screws to force the eruption through orthodontic extrusion (Derton *et al.*, 2011; Heravi *et al.*, 2011) and in other cases a post has been placed after having done endodontic (Kocadereli *et al.*, 1998). Then it is advisable to make a fixation (Lan *et al.*, 2011; Derton *et al.*, 2011; Villat *et al.*, 2004; Pinho *et al.*, 2011; Heravi *et al.*, 2011), for 2 months (Bate and Lerda, 2010), or 6 months (Villat *et al.*, 2004), which can be done with wire and composite (Jimenez Burkhardt *et al.*, 1994). Finally, this root is rehabilitated with a crown (Fidel *et al.*, 2011; Türker and Köse, 2008; Kocadereli *et al.*, 1998; Heda *et al.*, 2006) and on other occasions with composite (Kim *et al.*, 2011; Saito *et al.*, 2009; Koyuturk and Malkoc, 2005; Bindo *et al.*, 2010). According to the above, the techniques to restore a root are multiple. Taking all of them into account, the objective of this

paper is to show the EEFC technique of endodontic-extrusion-fixation-crown, as a summary of all the previous ones.

MATERIALS AND METHODS

A literature review limited to endodontic, extrusion, fixation and crown restoration techniques on roots of fractured teeth has been made to describe a technique that can be used in general. To determine how much time that root must be fixation has been reviewed previous work about teeth transplanted and by comparison we used that time in this technique.

RESULTS

The description of the EEFC technique is in Figures 1-6.

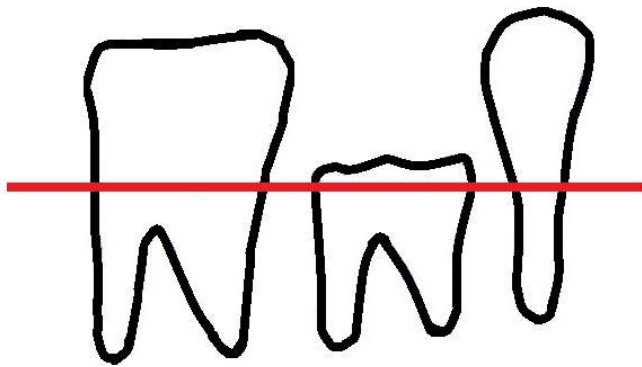


Figure 1. Initial situation. Tooth root

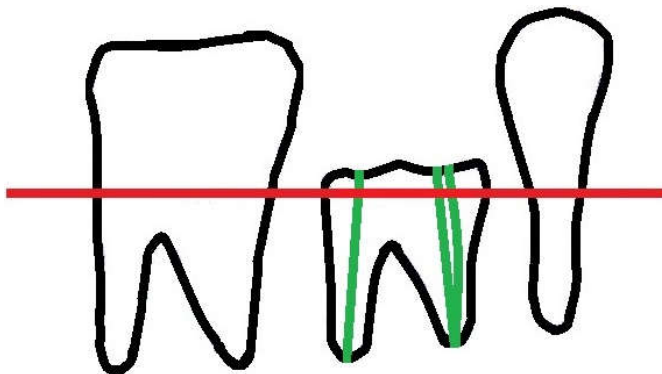


Figure 2. Endodontic of the root

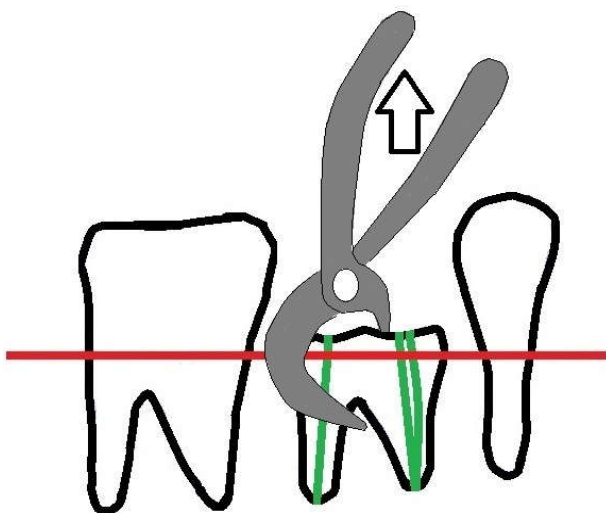


Figure 3. Immediate extrusion of the root

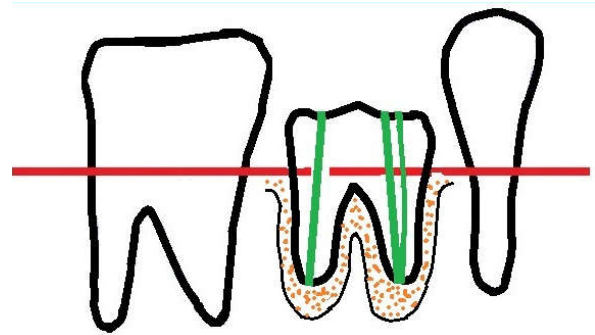


Figure 4. Root extruded but not extracted. Exposure of part of the root

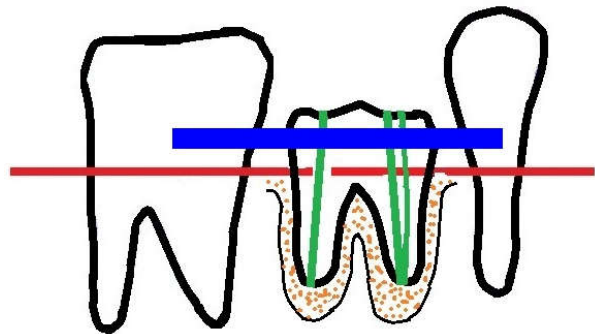


Figure 5. The root is fixed to teeth nearby for 3 months

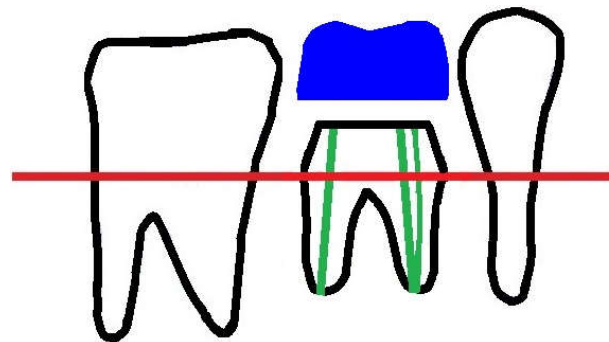


Figure 6. Restoring the root with a crown

DISCUSSION

Orthodontic extrusion has been widely used for the correction of isolated bone defects, for repositioning of the gingival margin or lengthening of crowns. With light orthodontic forces, bone and gingiva migrate coronally (Brown and Welbury, 2000). The orthodontic extrusion during 2 months (Serrano Madrigal *et al.*, 2011) or 3 months (Bate and Lerda, 2010) seems to us a long time, for which we prefer the immediate extrusion with forceps. There are cases of dental agenesis that have been treated with autotransplant without any fixation (Emerich-Poplatek *et al.*, 2005), but in other is done fixation with orthodontic (Rodríguez Prego *et al.*, 1998). In these cases, it is recommended that the transplanted tooth have immature roots with open apices to increase the probability of revascularization (Kitagawa *et al.*, 2003; Emerich-Poplatek *et al.*, 2005; Rodríguez Prego *et al.*, 1998; Zaragoza Fernández *et al.*, 1999; Andreasen *et al.*, 1990; Risueño Penderia and Marín García, 1996). If it also is done endodontics (Kitagawa *et al.*, 2003) the success rate can reach 80% (Bender and Rossman, 1993). A root is a contaminated structure that requires endodontic. Pulling it is injured the vasculonervioso package that enters through the apex. For this

reason, we recommend endodontic in this technique. Sometimes a resorbable membrane can be used to stabilize the root as has already been done with a transplanted tooth germ (Gerard *et al.*, 2002). Wire and composite can also be used as previous authors have done (Jimenez Burkhardt *et al.*, 1994), but we find it easier to fix with dental floss and composite. The period of stabilization in transplanted teeth is considered to be 3 months because there is bone formation, with a bone healing at 6 months (Waikakul *et al.*, 2002). However, in a previous bibliographic study (Quiñones *et al.*, 1995) the fixation of a transplanted tooth was done during 1-6 weeks, depending on the author applying it.

Conclusion

Taking into account the above, we think that the technique EEFC for the restoration of a root could be described in four steps: 1.- endodontic, 2.- immediate extrusion with forceps, 3.- fixation with dental floss and composite for 3 months, and 4.- finally, restoration with a crown.

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