



Case Report

INFLUENCE OF THE INITIAL CONDUCT IN THE PROGNOSIS OF DENTAL REIMPLANTATION

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ABSTRACT

Introduction: Despite every existing resource to improve the prognosis of dental reimplantation, the helper's chosen conduct is an essential factor to the success or failure of these cases. It is purpose of this work to discuss the influence of the helper's initial care in the prognosis of dental reimplantation, reporting two cases of dental avulsion, under a nine-year follow-up, in which milk was used as storage medium. The good conduct must be disseminated to the population substantially improving the diagnosis of the cases.

INTRODUCTION

Immediate reimplantation is recognised as the best treatment for avulsed teeth. Facing the impossibility of immediate reimplantation, the prognosis is directly connected to extra-alveolar time as well as the storage medium utilised during this period (Flores *et al.*, 2007; Patil *et al.*, 1994 and Pileggi *et al.*, 2002). The ideal storage medium is the one with competence to preserve viability and functional capacity of the traumatised ligament. That is essential for repopulating the exposed radicular surface, preventing the fixation of clastic cells (Ashkenazi *et al.*, 2011). The preservation in humid medium could provide better conditions for the survival of the periodontal ligament (PL) cells. Among the most indicated substances are: Viaspan, Hank's Balanced Salt Solution, milk, physiological solution 0.9% (Trope, 1992; Courts *et al.*, 1983; Schwartz *et al.*, 2002; Hirtz *et al.*, 1991; Sigalas *et al.*, 2004) and saliva (Blomlof *et al.*, 1981). Pasteurised milk has been reported as an excellent storage medium for its low

contamination content, similar osmolarity to extracellular fluid (Lekic *et al.*, 1996; Oikarinen *et al.*, 1987; Kenny *et al.*, 2003 and Person *et al.*, 2003), besides easy access to the population (Blomlof *et al.*, 1981 and Pettiette *et al.*, 1997). The lack of interest, by dentists, in updating theoretical and practical knowledge regarding initial care of dento-alveolar trauma, especially avulsion and intrusion, is connected to the rarity of these events in the routine of most of these professionals (Kenny *et al.*, 2003). This routine absence could be responsible for some clinical decisions capable of compromising the prognosis of these cases. Therefore, it is purpose of this work to discuss the influence of the initial conduct in the prognosis of dental reimplantation, illustrating with two clinical cases.

Case Reports

Case 1

Patient JCC, 29 years old, due to bicycle accident, was victim of a facial trauma which resulted in avulsion of the right superior central incisor (Figure 1). The tooth fell on the asphalt and thereafter it remained for approximately five minutes in the patient's hand until arriving at the hospital. The patient

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was advised by the attending doctor to place it under his tongue for 15 minutes to, thereafter, be stored in a vessel with milk for an hour and a half, until its reimplantation. The tooth was retained with a steel wire (0.6mm) and composite resin and amoxicillin 500mg was prescribed for seven days, besides anti-tetanic prophylaxis. The endodontic treatment applied was based on changes of calcium hydroxide fillings and subsequent obturation with gutta percha cones and Non-Eugenol Calcium Hydroxide Polymeric (sealapex®, Kerr, California, USA) after a year of follow-up. During a six-month period the patient disappeared and returned because of a coronary fracture in the tooth in question, caused by a second trauma. In radiographic control some spots of narrowing of the periodontal ligament space were observed, although without the presence of resorption (Figure 1). There was a compromise of the biological width and crown lengthening surgery was performed and subsequent installation of metallic nucleus and metal-ceramic crown. The left superior central incisor developed an inflammatory periapical lesion due to pulp necrosis and was endodontically treated, and it was also chosen to do whitening followed by composite resin restoration, improving its anatomy. The region was submitted as well to periodontal treatment. The patient has been under a nine-year follow-up without signs of root resorption (Figure 1).

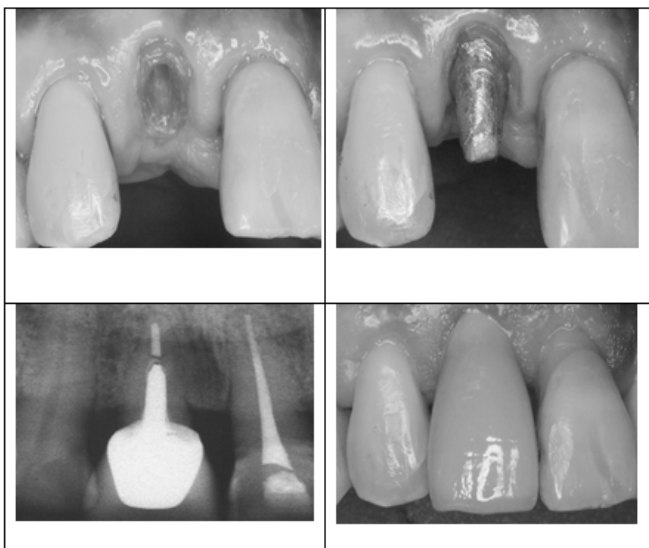


Figure 1. Case 1

Case 2

Patient RB, 17 years old, victim of physical assault (blow to the mouth) during a football match, suffered avulsion of the right superior central and lateral incisors and inferior central incisors, which were launched to dirt and grass. The teeth were washed in tap water and kept in milk. The patient was sent to the hospital for initial care. The teeth, which were already submerged in milk for three hours, had its periodontal ligament scraped off with surgical blade and then the teeth were reimplanted and retained with steel wire (0.6mm) and composite resin. Antibiotic therapy with amoxicillin 500 mg for seven days and anti-tetanic prophylaxis were performed. The endodontic treatment was applied based on changes of calcium hydroxide fillings. Within a bit more than a year of radiographic control, replacement root resorption was

observed and within almost two years of follow-up, the teeth were considered condemned (Figure 2). Since there were no clinical signs of an infectious process, the teeth were maintained in position until maximum exfoliation of the root, preserving bone height and allowing the installation of two superior dental implants of 13mm length and 3.75mm diameter and two inferior dental implants of 15mm length and 3.4mm diameter. Eleven years passed the incident, the patient is rehabilitated with prosthetics supported by osseointegrated implants (Figure 2).

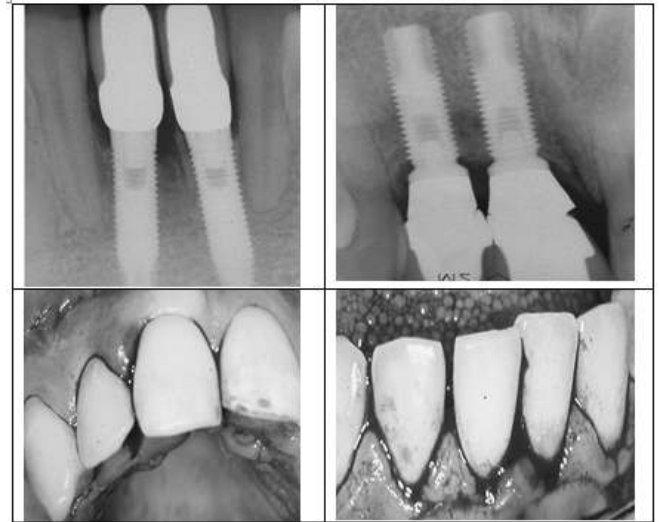


Figure 2. Case 2

DISCUSSION

The preservation of avulsed teeth in pasteurised milk has a good indication due to its favourable action to PL, as well as its facility in obtainment (Silva *et al.*, 2000; Pettiette *et al.*, 1997). In both reported cases, milk was the storage medium in which the teeth remained submerged most of the time, for a period considered not critic for the medium, as demonstrated by Hirtz and Trope (1991). They found 68.2% of viable cells when maintained in milk for six hours (Hirtz *et al.*, 1991), whereas other authors report that the first hour provides a viability of up to 90% of cells (Pileggi *et al.*, 2002; Lekic *et al.*, 1996; Kenny *et al.*, 2011). The similarity between the two cases is restrained to the storage medium utilised (Pileggi *et al.*, 2002; Lekic *et al.*, 1996; Silva *et al.*, 2000 and Kenny *et al.*, 2011) and to rapid care over the immediate necessities to the dental reimplantation (Hamilton *et al.*, 1997), nevertheless the act of scraping the periodontal ligament off was essential for the failure of the second case (Hirtz *et al.*, 1991). Another factor that influenced the final prognosis of the two cases was the type of trauma suffered, despite both being of low impact, the second case suffered a direct trauma with a higher intensity force than the first one, resulting in the avulsion of four teeth.

The trauma intensity to the PL is considered by Andreassen *et al.* (1995) as an inversely proportional factor for the good repair of this structure (Andreassen *et al.*, 1995 and Chamorro *et al.*, 2008). Most professionals who perform the care in dento-alveolar trauma have insufficient knowledge for such procedures, but the reimplantation prognosis depends widely from the ready and proper initial care (Flores *et al.*, 2007 and

Hirtz *et al.*, 1991). The time the milk provides from the moment of the trauma until reimplantation is relatively long and contraindicates periodontal ligament scraping (Hirtz *et al.*, 1991), knowledge not presented by the helper of the second case. The treatment of the radicular surface represents great importance for the success of the dental reimplantation (Patil *et al.*, 1994). The inappropriate scraping of the periodontal ligament in case 2 was probably the factor that enchained the root resorption. According to Ashkenazi *et al.* (2001) the presence of the periodontal ligament works protecting the root surface, preventing the fixation of osteoclasts on it (Ashkenazi *et al.*, 2001). The set of unfavourable factors of the second case led to its failure. In the first case, the avulsed tooth was submitted to several media (dry, saliva and milk), however this was not a factor that could lead to failure, hence the time of exposure to each one of them is not considered critical (Patil *et al.*, 1994; Hirtz *et al.*, 1991 and Pettiette *et al.*, 1997). Having known the possibility of the reimplantation success, the helper did not perform scraping of the ligament.

The negative aspect of this care was the non performance of immediate reimplantation as soon as the patient attended the emergency department, submitting the tooth to exposure of two more storage media (saliva and milk), without necessity, keeping it for another hour and 45 minutes out of the alveolus. In the nine-year follow-up it was observed an ankylosis without radicular resorption, making it possible to successfully perform oral rehabilitation on the patient using the residual root. In both cases, the teeth could have been reimplanted as soon as the patients attended the emergency department, however the first case remained almost 2 hours until reimplantation and the second case, three hours, and all teeth were maintained most of the time submerged in milk. The act of most conduct divergence was related to the scraping of the periodontal ligament, performed by the second helper, which cooperated with unsuccess. Kahabuka *et al.* (2001) asserted that dentists who perform initial care of dento-alveolar trauma need an intense training with constant motivations, in order to obtain a deeper knowledge on the matter (Kahabuka *et al.*, 2001). There is also the necessity of educational campaigns directed to family members who are usually present at the moment of the trauma, in order to increase their knowledge related to emergency procedures required in dento-alveolar traumas, especially avulsions and intrusions (Flores *et al.*, 2007 and Utomi *et al.*, 2005)

Conclusions

The knowledge of the good conduct to be taken in the initial care of dento-alveolar trauma is the threshold factor between the treatment's success or failure. This conduct must be disseminated to the population substantially improving the prognosis of the cases.

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Disclosure of Potential Conflicts of Interest

The authors declare that they have no conflicts of interests.

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