Re-implantation of hopeless tooth due to periodontal disease by using implant surgical drilling: Case report study

E.A. Elgendya a,*, M.Y. Shoukhebab b, T. Abo-Shady b, B.N. El Fahl b

a Oral Medicine, Periodontology, Oral Diagnosis and Radiology Dep., Faculty of Dentistry, October 6 University, Egypt
b Oral Medicine, Periodontology, Oral Diagnosis and Radiology Dep., Faculty of Dentistry, Tanta University, Egypt

Abstract

Aim and methodology: This article presents an intentional replantation of a periodontally involved hopeless incisor tooth with one year of results. This involves the purposeful removal of the tooth and its reinsertion into the socket after proper endodontic manipulation and repair.

Results: A hopeless periodontally involved central incisor was replanted after root canal treatment and tetracycline-HCl conditioning using implant surgical drilling technique and supplemented with bone graft material and kept under observation for one year. It was seen that the tooth was asymptomatic and still in function with no radiographic signs of pathosis. Periodontal health was in normal limits with no bleeding on probing and no pathological pocket formation. Reasonable amount of alveolar bone support was observed. The results obtained may indicate that intentional replantation is a viable mode of treatment in certain situations to preserve the natural dentition.

Conclusion: Intentional tooth reimplantation can be an alternative treatment option for periodontally involved teeth with poor or hopeless prognosis.

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Keywords: Replantation; Periodontal diseases/treatment; Treatment outcome

1. Introduction

Treatment of a single hopeless tooth is a routine challenge in dentistry [1]. Intentional replantation is an accepted procedure in which a tooth is extracted and treated outside the oral cavity, then reinserted into its socket [2,3]. It is a treatment option when more conventional forms of treatment either fail or are impossible [4]. It has been used in the treatment of vertical fractures [5], endodontic—periodontic lesions [6], periodontally involved teeth with a hopeless prognosis and certain anatomical malformations, such as radicular groove [1,7].

Although intentional replantation is contraindicated in the presence of periodontal disease in which there is marked tooth mobility, furcation involvement or gingival inflammation [8], there are some studies with successful results with periodontally involved teeth [9,1].
2. Case report

Systemically healthy 25-year old female patient who was referred to Periodontal department, Faculty of Dentistry, Tanta University for treatment with aesthetical and functional complaints, was diagnosed as localized aggressive periodontitis based on clinical and radiological examinations. Periodontal bone loss reaching to the apex of the root, deep periodontal pockets, class III mobility, over-extrusion, pathological migration, suppurative, bleeding on probing and discomfort on the previously root canal treated left mandibular central incisor and over all, gum bleeding and recession (Fig. 1). Intraoral examination revealed mild to moderate oral hygiene, few cavities and generalized moderate to severe attachment loss.

Radiographic examination revealed severe alveolar bone resorption reaching to the apex of the teeth especially around the mandibular left central incisor area widening in periodontal ligament space, and root canal treatment failure as indicated by short gutta percha (Fig. 1). The medical history was satisfactory with systemic diseases interfering with the intended treatment plan. The intentional replantation was described to the patient and she was willing to try the treatment even though the tooth still might not survive, a written consent was then signed by the patient.

2.1. Reimplantation procedure

The patient was scheduled to advanced periodontal treatments for the whole set of teeth. Oral hygiene motivation, scaling and root planning were applied as an initial periodontal therapy. At the 4th week after the initial therapy, a considerable improvement in oral hygiene and gingival health and reduction in periodontal pocket depths were observed the clinically. One visit endodontic treatment was applied to the central incisors before proceeding to the replantation. During the intentional replantation procedures, the tooth was gently extracted asatraumatically as possible, and placed on a sterilized moistured sponge. The apex was gently dried and a small amount of zinc-free amalgam used to seal the apical foramen. All granulation tissues, calculus, necrotic cementum and affected periodontal ligament were removed using sharp new hand instruments (Gracey, Hu-Friedy, Chicago, IL, USA.). The granulation tissue at the bottom of socket was curetted and rinsed gently with sterile saline solution. The socket walls were prepared using a low traumatic drilling speed and cooling with cooled sterile saline (Fig. 2). The root surfaces were scaled and planned. Fresh tetracycline-HCl (100 mg/ml) was applied for 5 min to the root surfaces with sterile cotton pellets.

Following tetracycline- HCl conditioning, root surfaces were rinsed with sterile distilled water for 1 min. The socket was treated by gentamycine then the tooth was replaced into the socket and xenogenic cancellous large granules (1.0—2.0 mm) bone graft was condensed to fill the cavity around the tooth. Tooth stability was reinforced with 0/3 black silk suture (Ethicon, Johnson and Johnson Ltd., Somerville, NJ, USA.) using an interrupted suture technique and the tooth was splinted with composite filling material (Fig. 2). The treatment procedure took 30 min. Post-operative the patient was advised to cold fomentation in the first day and not to eat stiff foods using anterior teeth at least for 3 months. Patient was prescribed Augmentin 1000 mg two times a day for 5 days; Cataflam 50 mg three times a day for 5 days and 0.12% Chlorhexidine rinses three times for seven days. The sutures were removed 2 weeks after surgery and the patient was placed in a maintenance recall program every 3 months. After 6 months, the composite used to splint the tooth was removed.

The tooth was relatively firm and asymptomatic in the first 6 months. There was no bleeding on probing. The patient was able to use the tooth normally although he paid a special attention not use it in cutting hard food. Clinical and radiographic follow up for 12 months demonstrated new bone formation around the root, the radiolucency had diminished almost totally and all clinical parameters indicated a trend of healing. The mobility of this previously grade III mobile incisor returned to normal limits (Fig. 3).

3. Discussion

Recent interest has focused on intentional replantation as an alternative for restoring an original tooth instead of replacing it with a prosthesis or implant. Some studies dealing with immediate replantation have
shown successful results even for periodontally involved teeth [10].

Lu et al. [9], replanted a periodontally involved and endodontically mistreated mandibular first premolar and reported that the replanted tooth remained functional and asymptomatic for 32 months. Additionally, Demiralp et al. [1], suggested that intentional replantation can be an alternative approach to extraction in cases where advanced periodontal destruction is present and no other treatments could be considered. Moreover, Yaprak et al. [11], after 4 years follow up concluded that intentional replantation can be considered as an alternative treatment of extraction, and can provide some aesthetical benefits in combination with restorative approaches for periodontally hopeless teeth.

The success of intentional replantation is likely dependent upon a minimally traumatic extraction, short extra-oral time with copious irrigation and meticulous instrumentation as well as carefully controlled postoperative patient compliance [12]: Messkoub [4], reported success rate in retaining replanted teeth up to 52–95%.

On the other hand, some complications should be considered, such as root resorption and ankylosis that leads to failure of the treatment [13,14]. Our concern was to replant a periodontally involved teeth with deep periodontal pockets, advanced bone loss, and a diseased periodontal ligament with necrotic cementum which might lead to the above-mentioned complications. Hence, two aspects were considered to avoid complications, one is the extracted root surface and the other is the periodontium of the extraction socket.

Concerning the extracted root surface, most studies suggested not touching the root surfaces of the tooth to be replanted if its periodontal ligament attachment is intact and sound [4,15,8]. Mahajan & Sidhu [16], reported that the removal of the periodontal ligament raised the success rate of tooth replantation. This is thought to be due to either the effective elimination of a necrotic periodontal ligament and/or microorganisms prior to replantation.

Teeth with a necrotic periodontal ligament showed a high incidence of resorption and ankylosis. Denuding the root surface chemically prior to replantation of the teeth without vital periodontal membrane was suggested in order to prevent resorption [17]. Thus,
diseased periodontal ligament was removed prior to replantation in this case.

Demiralp et al. [18], reported that, at the end of 36 months, radiographically no resorption or ankylosis was seen in their case. They explained that to be due to effective elimination of necrotic periodontal membrane and the associated microorganisms.

Regarding the second aspect to avoid complication Kratchman [8], reported that, touching the walls of the socket might increase the risk of ankylosis. Furthermore, many studies have shown that granulation tissues containing mesenchymal stem cells help to heal the socket [19,20].

However, the granulation tissue was removed from the bottom of the socket in the current case also the socket was prepared used an implant drill, then it was treated with xenogenic cancellous bone graft. Clinical and radiographic follow-up for 12 months demonstrated new bone formation around the root and all clinical parameters indicated a trend of healing. The mobility of this previously grade III mobile incisor returned to normal limits. We speculate that intentional replantation with xenogenic cancellous bone graft (or other regenerative procedures) application using implant technique may induce wound healing and may induce bone formation, this might be a successful alternative to tooth extraction.

4. Conclusions

Within the limitation of this case report, these results suggest that intentional replantation may be an alternative to prosthetic or implant dentistry. It is a promising technique to maintain the dentition and to preserve the periodontally hopeless teeth.

However, further human research is recommended in this area with long standing follow up periods and comparative studies between dental implant replacement and intentional replantation as a cost-effective treatment for periodontally affected teeth.

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