

Intentional Replantation of Teeth: A Report of Two Cases

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Abstract: Intentional replantation which is considered as “treatment of last resort” has become more widely accepted procedure now. Although this technique has variable success rates, evolution in techniques and armamentarium have helped in increasing its success rates. It may be opted as alternative of extraction when tooth is not treatable by surgical or nonsurgical approaches.

In this case series, 2 cases with different clinical conditions have been presented which were successfully treated by intentional replantation technique.

Keywords: Intentional, replantation, techniques, replant, reimplant.

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I. Introduction

Teeth in which nonsurgical endodontic treatment has been performed, may sometimes develop inflammation in periradicular areas suggesting failure of the treatment. This may be due to persistence of microorganisms in root canal system or in periradicular area which may lead to development of new lesion.¹ Most common cause for this is found to be the ineffective removal of microbes from root canal system during the treatment.

These cases of nonsurgical endodontic treatment failure may be treated again non surgically or surgically.² Non surgical management of such teeth may be complicated by separated instruments in the canal, presence of post in the canal or inaccessibility in root perforations.³ Surgical management in some cases is limited by anatomical factors such as: nerve proximity, maxillary sinus proximity, poor accessibility and buccal plate thickness.^{3,4}

When surgical and non surgical both treatment modalities can not be applied for management of failed endodontic treatment; extraction remains the last option. Intentional replantation is the procedure which may be used to avoid extraction.

Grossman has defined intentional replantation as: “intentional removal of a tooth and its reinsertion into the socket after endodontic manipulation or obturation of the canals or both.”

Intentional replantation should not be performed in cases which need periodontal therapy such as: tooth with deep pockets, furcation involvement and gingival inflammation. This procedure should also not be performed when tooth roots are long and curved; attempt to remove such tooth from its socket may cause root fracture.

Advantages of this procedure over other surgical and non surgical procedures are: It is cost effective and less time consuming. However, there is always the risk of root fracture and root resorption may occur over a period of time.

There are wide variations in the success rates of intentional replantation; multiple studies have reported its success rates between 81-95%.

Case:1

An 18 year old female patient presented to the department of conservative dentistry and endodontics with the chief complaint of pain in upper front tooth region. There was no significant medical history. Dental history revealed root canal treatment done in tooth #21 which was asymptomatic. Patient also underwent initiation of RCT in tooth #11 by some other practitioner but treatment was not completed (fig.1). Clinical examination revealed access opening done in tooth #11 and tooth was tender on percussion. It was not associated with any sinus or abscess formation. On periodontal examination, tooth #11 was not associated with any pocket and probing depths were in their normal limits.

On radiographic examination, tooth #11 was buccally perforated at approximately mid root level and rest of the canal was calcified (fig.2). All attempts were done to establish patency of the canal but patency could

not be established. It was decided to repair the perforation as well as to seal the root apex by using intentional replantation approach.



fig.1: Preoperative photograph fig.



2: preoperative radiograph showing buccal perforation

After profound anaesthesia and proper disinfection, tooth #11 was extracted out of the socket in least traumatic manner. Tooth was kept on a moist gauze piece with normal saline and continuous irrigation was done with normal saline (fig.3). Buccal perforation was evident on approximately mid root level (fig.4). Patency of the canal was established in retrograde manner and canal was prepared up to 30# K file (fig.5). 3 mm of the root apex was resected and root end cavity was prepared. Root apex and perforation site were sealed with MTA (fig.6 & 7). Continuous irrigation was done throughout the procedure and tooth was placed back into its socket within 10 minutes. Tooth was stabilized with Interlig® fibre splint [Angelus Industria de Produtos Odontologicos S/A Londrina-PR, Brazil] (fig.8). Rest of the canal was filled with MTA on the next appointment (fig. 9). Splint was removed after 10 days. Tooth became completely asymptomatic after one month and at that time temporary restoration was replaced with composite restoration. Regular follow up was done upto a year and patient was completely asymptomatic (fig. 10).



Fig. 3: extracted tooth



fig. 4: buccal perforation at mid root level



Fig. 5: patency established



fig. 6: root apex resected and sealed with MTA

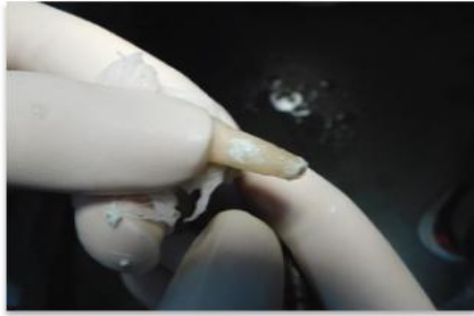


Fig. 7: perforation sealed with MTA



Fig. 8: tooth placed back into the socket and splinted



Fig. 9: root canal filled with MTA



Fig. 10: radiograph after 6 months

Case:2

A 30 years old female patient presented to the department of conservative dentistry and endodontics(Dr. Z.A.D.C., AMU, Aligarh) with the chief complaint of pain and difficulty in chewing in lower left back tooth region. Patient also complained of on& off discharge from the gingiva around tooth #36. There was no significant medical history. Patient was not allergic to any medication. There was no significant dental history also. On clinical examination, teeth #35 & 36 were carious. Tooth # 36 was tender on percussion and grade 1 mobility was there. On radiographic examination, tooth #36 was giving appearance of radix paramolaris,there was large periapical pathology associated with tooth #36 and roots were resorbed (fig.11).



Fig. 11: preoperative radiograph

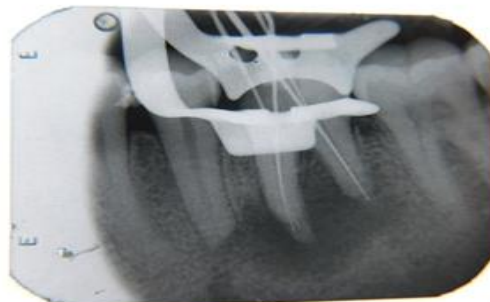


Fig. 12: working length determination

In the management of tooth #36 periapical surgery was not planned as the periapical pathology was large in size and it was in proximity to mandibular nerve. Hence it was decided to manage by intentional replantation approach. Access opening was done in tooth #36 and working length was established (fig.12). BMP was completed and Ca(OH)_2 dressing was given for a week. After a week obturation was completed (fig.13& 14).

On the next appointment, after proper disinfection local anaesthesia was given. Tooth #36 was extracted out of the socket and it was placed at moist gauze piece with normal saline (fig.15). 3 mm of root

apices were resected and retro filled with MTA (fig.16). Socket was gently curetted and tooth was placed back into the socket within 5-7 minutes (fig.17). Wire and resin splint was given for a duration of 2 weeks. After approximately 4 weeks, tooth became completely asymptomatic without any discharge, mobility and tenderness. At 2 months follow up size of periapical pathology was significantly reduced (fig.18) and at 1 year follow up lesion was completely healed (fig.19).



Fig. 13: master cone radiograph



Fig. 14: obturation done



Fig. 15: tooth extracted out of the socket

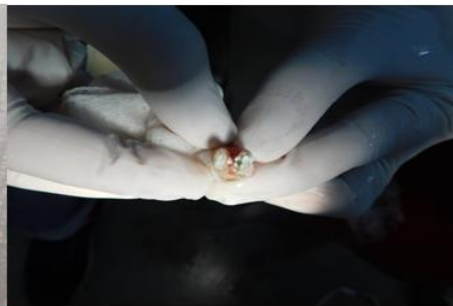


Fig. 16: root apices resected and sealed with MTA



Fig. 17: postoperative radiograph



Fig. 18: 2 months follow up



Fig. 19: 1 year follow up

II. Discussion

Although no universally accepted protocol has been given for intentional replantation, various techniques and methods have been suggested by different authors. Intentional replantation procedure should ideally be performed in presence of two operators.^{7,8} One for extraction of tooth and other one for endodontic manipulation of the tooth. Presence of two operators not only increases the efficiency but it also helps in reducing the extraoral time of the tooth.

Disinfection of the oral cavity before the procedure is universally accepted . It includes oral prophylaxis and rinse with chlorhexidine (0.12% or 0.2%).

Tooth should be extracted out of the socket in a very gentle manner with least damage to PDL. Extraction forcep should be used to extract the tooth out of the socket and it should contact the tooth only on crown portion not on the root as contact of forcep to the tooth root may damage PDL.⁹ After extraction, tooth should either be hold with saline soaked gauge or with the help of forcep; in both these techniques contact should be limited to enamel only.^{10,11} During the procedure Hank's balanced salt solution is considered the best root hydrating medium, however; universally accepted hydration medium is normal saline.⁹Most of the authors have recommended that root ends should be prepared before placing the root end filling material. Studies suggest that length of the root to be resected should be approximately 2-4 mm at 0° bevel angle. Depth of class I cavity prepared at root apex should be approximately 3 mm.¹² Newly introduced calcium silicate based cements such as MTA, biodentine, super EBA etc. are now the best root end filling materials.^{13,14}

Dryden and arens have suggested that splinting should be done in every case of intentional replantation.¹⁵ However, many studies suggest that splinting should be done only in the cases where tooth is grossly mobile. Duration of splinting may vary from 1-10 days or 3-4 weeks. Different methods of splinting have been tried in the past such as wire splinting, wire and resin, fiber splinting, acrylic splint and suturing around the tooth.

Extra oral time of the tooth is the most critical factor in the success of intentional replantation. According to Kratchman, extraoral time for endodontic manipulation should be as minimum as possible and it should not be more than 10 minutes.¹¹ Jang et al reported that there was high success rate in the teeth having extra oral time less than 15 minutes in comparison to the teeth where tooth was kept outside for more than 15 minutes.¹⁴

III. Conclusion

There are a lot of variations in the techniques and methods used for intentional replantation. However, incorporation of newer technologies, materials and armamentarium has improved the success and survival rate of teeth using intentional replantation approach and this procedure should be considered over extraction.

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