INTENTIONAL REPLANTATION – A CASE REPORT

Saleem Azhar,[1] Mohan Gundappa, [2] Rashmi Bansal, [3] Abhinay Agarwal [4]
Post Graduate Student,[1] Principal, Professor & Head,[2] Professor,[3] Reader [4]
1-4 Department of Conservative Dentistry and Endodontics, Teerthanker Mahaveer Dental College & Research Centre, Moradabad.

Abstract

Intentional replantation is a procedure in which an intentional tooth extraction is performed followed by reinsertion of the extracted tooth into its own alveolus after doing needful treatment. This case report describes intentional replantation in mandibular right first molar as a treatment approach for failed root canal treatment with separated instrument in the mesio-lingual root canal. At 3 month follow up the patient remained asymptomatic, radiograph showed healing and no evidence of root resorption.

Key Words: Extraction, Intentional Replantation, Periodontal Ligament.

Introduction

Root canal treatment is considered a successful therapy that helps to retain tooth in form and function asymptomatically in the oral cavity. Still there are failures involved with this treatment modality as for any surgical treatment of the body. The primary reason for a negative outcome with endodontic treatment is the persistence of bacteria within the intricacies of the root canal system. Failure may also be attributed to the persistence of bacteria in the periapical tissues, foreign body reactions to overfilled root canals, and the presence of cysts.[1]

Every tooth cannot be treated with conventional root canal therapy. Cases with ledge formation, instrument seperation, calcifications, limited access, anatomical limitations, and perforations in areas not accessible to surgery, failed apical surgery and persistent chronic pain where non-surgical or surgical root canal therapy (RCT) is not possible or impractical. In these situations, intentional replantation may be considered as a treatment option for preserving the tooth. Messkoub[2] reported success rate in retaining replanted teeth between 52- 95%.

Glossary of Endodontic terms defines intentional replantation as "insertion of a tooth into its alveolus after the tooth has been extracted for the purpose of performing treatment, such as root end fillings or perforation repair". Grossman[3] in 1982 defined it as: 'a purposeful removal of a tooth and its reinsertion into the socket almost immediately after sealing the apical foramina.'

Replantation was first reported in 1593, when Pare replanted three avulsed teeth.[4] In 11th A.D, Abulcasis described replantation and use of ligatures to splint the replanted tooth.[5] Pierre Fauchard[6], in 1712, reported an intentional replantation, fifteen minutes after extraction. In 1768, Thomas Berdmore[7] reported intentional replantation for mature and immature teeth. In 1890, Scheff[9] addressed the periodontal ligament role in prognosis of replanted teeth. In 1955, Hammer[10] described the importance of leaving an intact periodontal ligament on intentionally replanted teeth. In 1961, Loe and Waerhaug[11] tried to replant teeth immediately after extraction successfully. This case report describes a case of intentional replantation of a symptomatic mandibular molar with non-retrievable separated instrument in mesiolingual canal.

Case Report

A 21-year-old male patient presented a root canal treated 46 with a separated instrument in mesio-lingual canal. (Figure 1)

Figure 1: Pre-Operative Radiograph with separated instrument

The tooth was symptomatic and efforts to remove the instrument were fruitless. Apical surgery was ruled out as accessibility was limited due to shallow vestibule. It was decided to replant the tooth intentionally. The treatment option was explained to the patient, and a written consent was obtained for the same.

After obtaining adequate anaesthesia, the tooth was extracted atraumatically (Figure 2) with an extraction forceps. Surgical elevators were not used and care was taken such that the beaks of the forceps did not go beyond the Cemento-Enamel Junction (CEJ), as this could damage the cementum and the periodontal ligaments.

Figure 2: Post Extraction socket

Unfortunately mesial root with separated instrument got fractured during the extraction which was then removed with the help of H-file (Figure 3).

Figure 3: Fractured Mesial Root with separated instrument

Following extraction, the tooth was kept moist by immersing it in normal saline. Root canal treatment was performed extra orally and obturation was done with lateral condensation.

Thereafter, cavity was prepared in mesio-lingual, mesiobuccal and distal canals with inverted cone bur and retrograde filling was done with dental amalgam. (Figure 4)

Figure 4: Retrograde amalgam filling

The extraction socket was irrigated with normal saline and gently suctioned to remove blood clots. The tooth was carefully reinserted into its socket and brought into occlusion with digital manipulation and patient bite force (Figure 5). The entire procedure was completed in 20minutes. The tooth was stabilized with ligature wire.

Figure 5: Tooth replantated in its socket and splinted with ligature wire

The patient was re-evaluated after seven days.

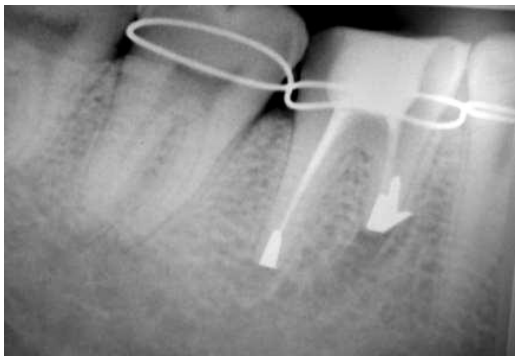

Figure 6: Post Replantation radiograph

Clinical evaluation revealed that the patient was asymptomatic and there were no sign of vestibular tenderness or percussion and the tooth was non mobile. Post Replantation radiograph was taken with ligature splint in place. (Figure 6)

Patient was recalled after 3 months for follow up and the tooth was asymptomatic and in function. The radiograph showed signs of healing. (Figure 7)

Figure 7: 3 Months follow up

Discussion

The most common causes of failure are external inflammatory resorption or replacement resorption and ankylosis caused by PDL damage and further necrosis of the PDL and cementum. These complications are related to the degree of PDL damage.

The success or failure of the intentional replantation depends on vitality of PDL cells.[12, 13] These cells can be kept vital while the tooth is out of the socket by keeping the tooth moist and in aseptic codition. The extraoral time is crucial which should be limited to 20 - 30 minutes. Proper planning and team work is the key.

Some factors influencing the periodontal healing includes:

1. *The extra-alveolar time:* This is probably the most important factor that should be considered. Thirty minutes appears to be the maximum time limit. More

extraoral time can increase the possibility of root resorption.[14]

2. *Presence of preoperative radiolucency:* Teeth with radiolucency are more inclined to healing without root resorption, which may be due to the facility of the extraction of teeth with apical radiolucency which results in less damage of the root.[15]
3. *Patient's age*: Inflammatory resorption is more frequent in the age group of 10 to 30 years than in older age patients, which may be due to the wider dentinal tubules in younger patients.[15]
4. *Root end filling:* Replantation of teeth sealed by a filling material seems to be more successful than replantation without root canal filling.
5. *Care should be taken to minimally manipulate the root surfaces:* Replanting teeth with the intact PDL attached encourages periodontal remodelling and inhibits ankylosis and root resorption. After two weeks, the PDL has two-thirds of its original adhesion.[11-14]

Conclusion

Although the success rate of intentional replantation is below that of routine RCT or apical surgery and the most common cause of failure with this procedure are external inflammatory resorption or replacement resorption and ankylosis caused by periodontal ligament damage; still they can be considered as a treatment alternative when other options are not feasible.

References

1. Cohen S. Treatment choices for negative outcomes with non-surgical root canal treatment: non-surgical retreatment vs. surgical retreatment vs. implants; endodontic topics 2005.
2. Messkoub M. Intentional replantation: a successful alternative for hopeless teeth. Oral Surg Oral Med Oral Pathol 1991;71(6):743-7.
3. Grossman L. Intentional reimplantation of teeth. J Am Dent Assoc 1966;72:1111.
4. Kupfer 1J, Sidney R, Kupfer BS. Tooth replantation following avulsion. NY State Dent 1952;19:80.
5. Weinberger B. Introduction to the History of Dentistry. St Louis: Mosby, 1948.
6. Fauchard P. Le Chirurgien dentist outrait edes'dents. Paris: Chez Pierre-Jean Mariette 1746.
7. Berdmore T. A treatise on the disorders and deformities of the teeth and gums. London: White, Dodsley, Beckett and deHondt 1768.
8. Hunter H. A practical treatise on the diseases of the teeth. London. J Johnson 1778.
9. Scheff J. Die replantation der zahne. Ost Vjschr Zahnheilkd 1890; 2:181-278.
10. Hammer H. Replantation and implantation of teeth. Int Dent J 1955; 5:439-57.
11. Loe H, Waerhaug J. Experimental replantation of teeth in dogs and monkeys. Arch Oral Biol 1961; 3:176-84.
12. Sherman P Jr. Intentional replantation of teeth in dogs and monkeys. J Dent Res 1968;47(6):1066-71.
13. Deeb E, Prietto PP, Mckenna RC. Reimplantation of luxated teeth in humans. J South Calif Dent Assoc 1965;33(4):194-206
14. Edwards TS. Treatment of pulpal and periapical disease by replantation. Br Dent J 1966;121(4):159-66.
15. Emmertsen E, Andreasen JO. Replantation of extracted molars. A radiographic and histological study. Acta Odontol Scand 1966;24(3):327-46.

Correspondence Address

Dr.Mohan Gundappa
Principal, Professor & Head
Department of Conservative Dentistry & Endodontics
Teerthanker Mahaveer Dental College & Research Centre, Moradabad
Email Id: - drmohangundappa@gmail.com