DOI:10.21276/sjodr.2017.2.3.1

Saudi Journal of Oral and Dental Research
Scholars Middle East Publishers
Dubai, United Arab Emirates
Website: http://scholarsmepub.com/

ISSN 2518-1300 (Print)
ISSN 2518-1297 (Online)

Case Report

Intentional Replantation of an Endodontically Treated Tooth with Separated Instrument: A Case Report

Sonam Thaore[1], Niranjan Desai[2], Srinidhi S.R[3], Omkar Balsaraf[4]

[1]Post Graduate student, Department of Conservative Dentistry and Endodontics, Sinhgad Dental College and Hospital, Pune

[2]Reader, Department of Conservative Dentistry and Endodontics, Sinhgad Dental College and Hospital, Pune

[3]Professor and H.O.D, Department of Conservative Dentistry and Endodontics, Sinhgad Dental College and Hospital, Pune

[4]Lecturer, Department of Conservative Dentistry and Endodontics, Sinhgad Dental College and Hospital, Pune

***Corresponding Author:**
Sonam Thaore
Email: sonam.thaore7@gmail.com

Abstract: Intentional replantation is defined as extraction of the tooth followed by replacement in its socket. Intentional replantation is considered as a last resort where surgical endodontics or conventional root canal therapy cannot be performed. Factors determining success in intentional replantation are periodontal cell viability, removal of irritant, good apical seal and procedure carried out under aseptic condition with a traumatic extraction. In this article, a case of intentional reimplantation is described and discussed as a treatment approach for failed root canal treatment with separated instrument periapically beyond the apical terminus in mandibular second molar.

Keywords: Intentional replantation, MTA, Occlusal splint

INTRODUCTION

Grossman in 1982 defined Intentional Replantation as: a purposeful removal of a tooth and its reinsertion into the socket almost immediately after sealing the apical foramina [1]. 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'. In the 11th century, Abulcasis described use of ligatures to splint the replanted tooth [2]. In 1593, replantation of three avulsed teeth was done by Pare [3]. Pierre Fauchard, in 1712, recommended intentional replantation after fifteen minutes of extraction [4]. In 1768, Thomas Berdmore reported intentional replantation for mature and immature teeth [5]. The main reason for failure occurring in replanted teeth is root resorption; ankylosis or replacement resorption which are directly related to the amount of time the tooth is out of the socket while the procedure is being carried out. Messkoub reported that success rates vary between 52- 95% in retaining replanted teeth [6].

Instrument separation is the most common cause which leads to complications in endodontic treatment. Common causes which lead to file separation are fatigue failure, torsional failure and corrosive failure. Cyclic failure occurs when material is subjected to repeated stresses. Torsional failure is when an object is twisted with an applied force and a portion of it gets locked and the remaining continues to rotate till a point is reached where separation of instrument takes place. Corrosive failure occurs when combination of torsional and fatigue failure of an instrument is present with signs of corrosion [7].

This case report describes the management of separated instrument in mandibular molar by intentional replantation.

CASE REPORT

A 23 year old male reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of persistent pain in lower left back region of jaw. History of the patient revealed tooth 37 (mandibular left second molar) was endodontically treated 6 months back. A detailed history along with clinical and radio graphical evaluation of the patient was done. The radiograph revealed separated instrument in mesial canal which was extending beyond the apical terminus (Figure 1). Treatment options given to the patient were periapical surgery, extraction or intentional replantation. The advantages and disadvantages of each were explained to the patient. After knowing the risks and benefits of the explained treatment, patient

preferred to undergo intentional replantation procedure and consent was obtained.

Upper and lower impressions were recorded and an occlusal splint was fabricated in cold cure acrylic resin extending from mandibular left second premolar to mandibular left second molar. Under antibiotic coverage patient was then scheduled for an intentional replantation procedure. Local anaesthesia lignocaine and adrenaline injection (EL-LIGNO, Adrenaline 1:200000, Elder pharmaceuticals, Mumbai, India) was administered and the tooth was extracted traumatically (Figure 2a).Immediately after extraction, the tooth was held in moist saline gauze sponge followed by storage in tetracycline tab (Resteclin 500mg, Abbott Healthcare pvt ltd, Thane, India) dissolved in saline for 30 sec. Using a sterile gauze sponge, the tooth was held by the crown while root end resection was done using straight bur with diameter of 1 mm (SS White Dental Technologies, UK**)** in high speed hand piece followed by root end preparation using ultrasonic diamond coated retro tips S12 90 ND (Satelec/Acteon, Merignac, France) to a depth of 3mm. Mineral Trioxide Aggregate (Angelus Solaces Odontologicas, Londrina, Brazil)was condensed into the preparation. The alveolus was gently curetted and the broken instrument was carefully taken out (Figure 2b). The tooth was then washed with sterile saline and replanted into its socket (Figure 3a). The extra oral time of the tooth was limited to less than 10 minutes.

Following this, the pre-fabricated acrylic occlusal splint was placed for duration of three weeks (Figure 3b). A COE-PAK^{TM} (GC America Inc., Alsip, IL, USA) was given followed by an antibiotic course of Amoxicillin tab, USP 500 mg (Copal pvt Ltd. Goa, India) for three days. On 6 month recall examination, patient was completely free of symptoms. Percussion test elicited a normal response. The radiograph showed no evidence of root resorption, and the root surface and supporting structure appeared intact. At 1 year recall, tooth appeared clinically sound with no signs of resorption or ankylosis (Figure 4).

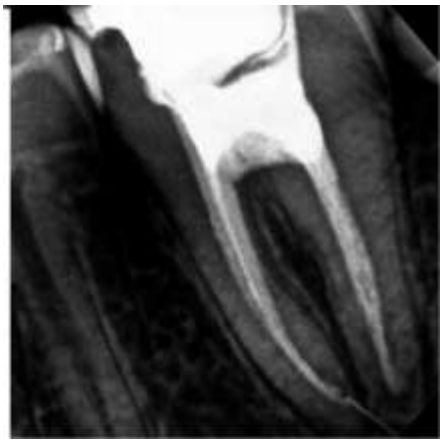

Fig-1: Preoperative Radiograph

Fig-2(a): Extraction socket

Fig-2(b): Separated file in the socket

Fig-3(a): Immediately after reimplantation

Fig-3(b): Acrylic splint in place with COE- PAK dressing

Fig-4: One year follow up Radiograph

DISCUSSION

Cleaning and shaping is one of the important steps in endodontic treatment. Procedural errors occurring during cleaning and shaping may be ledging, zipping, canal perforation, canal transportation and instrument separation [8]. The success rate of separated instrument management depends on location of the fragment and the anatomy of the root canal. The reported incidence of hand instrument separation is 0.25% and for rotary instruments, it ranges from 1.68% to 2.4% [9, 10]. The most common causes for instrument separation are improper use, limitations in physical properties, inadequate access, root canal anatomy and manufacturing defects [11].

Depending on the location of instrument separation, treatment modality varies. If the fractured instrument is located at the apical third and it can be bypassed, this method should be employed as retrieval may be associated with the risk of root damage. If it is located in the middle or coronal third and straight line access is possible, then removal should be attempted. When attempting retrieval, various factors have to be taken into consideration like root length, curvature, dentine thickness, technique of removal, length of fragment, presence or absence of periapical radiolucency and stage of preparation when instrument separation has taken place [12]. Different techniques for retrieval of instruments include ultrasonics which include use of "ProUltra endo tips Kit (Dentsply, Tulsa, Oklahoma, USA), micromechanical micro tube tap and thread techniques, PRS technique (SybronEndo; Orange, CA, USA), instrument retrieval kits like Masserann Kit (Micro Mega, France), Endo Extractor (Brasseler USA Inc., Savannah, GA), wire loop technique (the Canal Finder System, FaSociete Endo Technique, Marseille, France), Cancellier Extractor Kit (SybronEndo, Orange, CA) and Meitrac Endo safety system (Hager and Meisinenger GmbH, Neuss, Germany).

The prognosis of intentional replantation depends upon the vitality of periodontal ligament cells. The vitality of these cells can be maintained by keeping the extra oral dry time as minimal as possible and maintaining all the aseptic conditions. The recommended extra oral dry time should not exceed more than 20 min [13].

Advantages of intentional replantation over periapical surgery are lesser invasiveness and time consumption. It is indicated in cases of limited access, anatomical limitations, perforations in areas not accessible to surgery, failed apical surgery and persistent chronic pain. Contraindications include cases of moderate to severe periodontal disease, curved or flared roots, a non-restorable tooth and missing interseptal bone [14]. The most common cause which leads to failure in intentional replantation is external inflammatory resorption or replacement resorption and ankylosis. This is caused by periodontal ligament damage and further necrosis of the periodontal ligament and cementum.

In this case, root end was resected and retro filled with Mineral Trioxide Aggregate (MTA). Use of MTA as a retrograde material was due to its excellent properties like biocompatibility, minimal toxicity and pulpal irritation, mild periapical inflammation, nonmutagenicity and dentinal bridge formation [15].

The presence of healthy cementum on the root surface plays a very important role in preventing ankylosis of the tooth In order to produce a root surface that is conducive to cellular adhesion and growth, several solutions like tetracycline, citric acid and ethylenediaminetetraacetic acid (EDTA) are used. In this case, tetracycline was applied to the root surfaces to

increase periodontal ligament fiber attachment and prevent ankylosis of the tooth.

CONCLUSION

Intentional replantation is indicated in cases in which conventional endodontic re treatment or surgical endodontics cannot be performed. It can be a reliable and predictable procedure if proper case selection and protocol is followed.

REFERENCES

1. Grossman, L. I. (1982). Intentional replantation of teeth: a clinical evaluation. The Journal of the American Dental Association, *104*(5), 633-639.
2. Weinberger B (1948). Introduction to the History of Dentistry. St Louis: Mosby.
3. Kupfer J, Sidney R, Kupfer BS (1952). Tooth replantation following avulsion. NY State Dent J, 19:80.
4. Le Chirurgien dentist outrait edes dents dentist outraitedes'dents. Paris: Chez Pierre-Jean Mariette 1746.
5. Berdmore T (1768). A treatise on the disorders and deformities of the teeth and gums. London: White, Dodsley, Beckett and de Hondt.
6. Messkoub M (1991). Intentional replantation: a successful alternative for hopeless teeth. Oral Surg, 71(6), 743-7.
7. Ingle JI, Peters OA, Koka RS (2008). Preparation of coronal and radicular spaces. In Ingle JI, Barkland LK, Baumgartner JC, Ingle's Endodontics 6th edition, , BC Decker Inc, Hamilton, 943-944.
8. Carrotte P (2004). Endodontics Part 7. Preparing the root canal. Brit Dent J, 197(10), 603-613.
9. Iqbal MK, Rafailov H, Samuel BS, Kratchman I, Karabucak BA (2006). Comparison of three methods for preparing centered platforms around separated instruments in curved canals. J Endod, 32(1), 48-51.
10. Wolcott S , Wolcott J, Ishley D, Kennedy W, Johnson S, Minnich S, Meyers J(2006). Separation incidence of Protaper rotary instruments: a large cohort clinical evaluation. J Endod,32(12), 1139-41.
11. Roda RS, Gettleman BH (2006). Nonsurgical retreatment. In: Roda RS, Gettleman BH, editors. Pathways of the pulp. 9th ed. St. Louis: CV Mosby, 982–90.
12. Rambabu T (2014). Management of fractured endodontic instruments in root canal: a review. J Sci Dent, 4(2), 40.
13. Andreasen JO, Hiorting-Hansen E (1966). Replantation of teeth II .Histological study of 22 replanted anterior teeth in humans. Acta Odontol Scand, 24,287-306.
14. Kratchman S (1997). Intentional Replantation. Dent Clinics North Am, 41(3), 603-17.
15. Thomson TS, Berry JE, Somerman MJ, Kirkwood KL (2003).Cementoblasts maintain expression of osteocalcin in the presence of mineral trioxide aggregate. J Endod, 29(6), 407–412.