

Case Report:

Renaissance of the Doomed tooth: A case report

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Abstract

As the title suggests, this case report describes an effort undertaken to save a previously endodontically treated lower molar having poor prognosis for survival with endodontic retreatment alone. The affected mandibular molar with perforation defects and instrument fracture having poor prognosis and on the verge of extraction has been restored back to function with intentional replantation technique as a treatment approach. At 6 month follow up, no painful symptomatology was reported, probing depth was no greater than 3 mm, the peri radicular area had normal appearance and no evidence of root resorption or periapical lesion was seen.

Key words : Intentional Replantation ; perforation defects ;extraction

Introduction

The goal of an ideal endodontic treatment is to achieve a root canal system devoid of any bacterial contamination and thereby help in prevention of bacterial contamination in future. The success and failure of any endodontic treatment depends solely on the root canal configuration of teeth over and above the skill and expertise of the clinician.

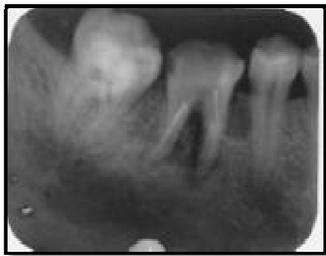
In cases such as endodontic retreatment due to catastrophic instrument fracture or irreparable perforation , where it is difficult to clean the root canal systems with nonsurgical endodontic treatment alone , it becomes imperative to explore and execute other endodontic surgical treatment modalities such as periapical surgery , intentional replantation etc.

In the following case report, intentional replantation was the chosen treatment modality over all other available options to restore the doomed tooth back to optimum form and function.

Intentional replantation may be defined as the purposeful removal of a tooth to repair a defect or cause of a treatment failure and then placing the tooth in its original socket ⁽¹⁾ .Fauchard and Woofendale in the seventeenth century were amongst the first clinicians who advocated the replantation of teeth in cases of extraction of the wrong tooth or teeth in which the nerve could not be readily destroyed ⁽²⁾ .Wiene has stated that intentional replantation is only indicated when all other endodontic nonsurgical or surgical treatments have been performed and failed or were deemed impossible to perform ⁽³⁾ .

Case report

A 26 - year old female patient reported to the Department of Conservative Dentistry and Endodontics, GDCH - Ahmedabad with the chief complaint of recurrent pain and swelling in right lower posterior teeth region since 3 months. The patient was relatively asymptomatic before a period of 3 months. Then she gradually developed a dull aching pain in the right mandibular posterior teeth region that was intermittent in nature. On eliciting history, it was discovered that she had undergone an endodontic therapy in the same region elsewhere before a period of 3 years. On clinical examination, it was found that the lower right mandibular first molar was the affected tooth that had been subjected previously to an endodontic therapy. The affected tooth was tender on percussion. Probing depths and mobility, both were within normal limits. She gave no history of any underlying systemic ailment.



Preoperative IOPA

On radiographic examination, an instrument fracture in the mesiolingual canal as well as rarefaction around the furcation and periapical regions of the lower first mandibular molar suggestive of furcal perforation were evident thus depicting the doomed status of the tooth. The patient was informed of the anticipated difficulties in retreatment of the tooth by nonsurgical means alone. In the first appointment, following the removal of the full cast crown, the existing restoration was completely removed and access opening was achieved under adequate illumination. The previous obturating GP points were carefully removed.



IOPA confirming furcal defect

On examining the pulpal floor, furcal perforation was clearly visible thus correlating with evident rarefaction in the intraoral radiograph.

The canal orifices were clearly visible, however, on trying to negotiate the canals with a 10 K- file (Dentsply Malleifer) the mesiolingual canal couldn't be negotiated, beyond the middle third of root canal due to previously lodged fragment of instrument.

Only retreatment beyond this point wouldn't have improved the prognosis of the tooth and would have turned futile and so in the next appointment, intentional replantation was scheduled after due consent from the patient.

The patient was prescribed antibiotics (amoxicillin plus clavulanic acid 1 g daily) starting the day before surgery and continuing for another 6 days and was instructed to rinse her mouth with a 0.12% solution of chlorhexidine twice daily for 1 week.

In the second appointment, after due consent, adequate anesthesia (Xylocaine) was achieved in the right mandibular posterior quadrant region. To avoid tooth fracture and minimize mechanical damage to the PDL, elevators were not used to luxate the tooth before extraction. A rubber dam was placed around the handle of the forceps to maintain constant pressure on the crown. The tooth was extracted gently with no intraoperative complications; subsequently, the patient was instructed to bite on moist gauze during the extraoral procedures.

The extraoral time was kept limited to 10 minutes. The extracted tooth was gently rinsed with physiologic saline; held in a moist gauze and inspected under adequate illumination. On inspection, a perforation which was

not discernible clinically and radiographically was discovered on the lateral aspect of the mesial root along with furcal perforation. The root end of both the distal and mesial roots was resected with a high-speed turbine using copious water and a class I cavity prepared.

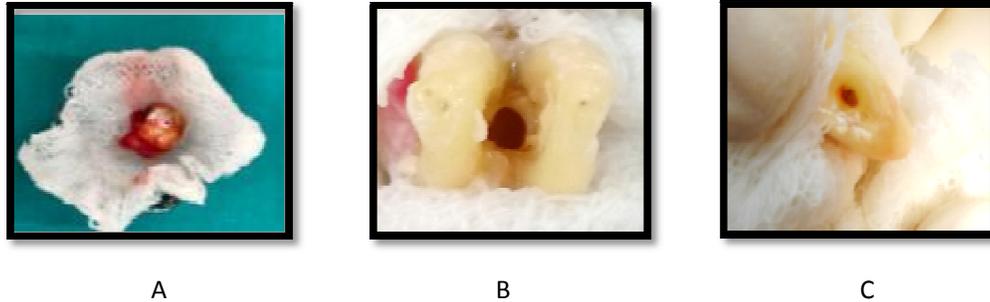


Figure 1: Extracted tooth inspected under adequate illumination to analyse the perforation defects

Following this , the furcal and mesial root perforations as well as the root ends of both the roots were sealed with a bio compatible material such as Mineral trioxide aggregate (MTA Plus ; Prevest Denpro Limited.). MTA was also placed along the pulpal floor to achieve adequate sealing of the root canal system , followed by placement of temporary restoration coronally. Before replantation of the treated tooth , the socket was gently debrided apically , & bone graft (PerioGlas) was placed.

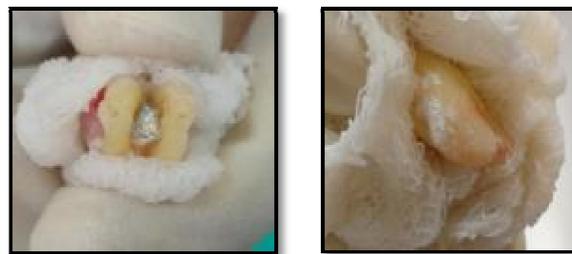


Figure 2: Sealing of defects

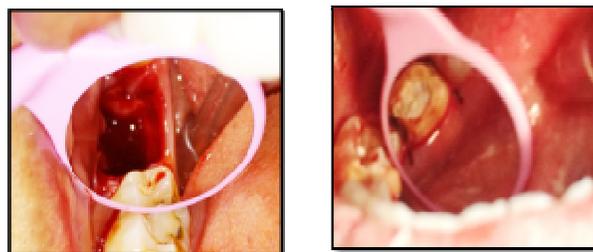


Figure 3 : Socket debridement and post replantation



Then the tooth was replanted and the patient was asked to bite firmly on a gauze piece for some time till the tooth was firmly placed back to occlusion. Post operative radiograph was taken to confirm the adequate sealing of the perforation defects and root end resections as well as placement of the extracted tooth back in the socket.

At 1 week follow up, perio pack was removed and semi rigid splint was placed for a period of 21 days.

Immediate post operative IOPA



Figure 4: Post replantation 1 week and after 21 days

After 21 days, the splint was removed and the tooth was examined. Mobility was within normal limits and healing was satisfactory. Temporary restoration was restored with a permanent restoration and occlusion was optimised to avoid excessive loading.

Post 45 days, the tooth was restored with a full cast crown.

Patient had no pain or discomfort during postoperative period.

At 6 month follow up, the patient was asymptomatic, percussion was negative and IOPA revealed healing and there were no signs of any pathological condition, good gingival health and no periodontal pocket.

Follow up radiographs were taken at 21 days, 45 days, 3 months, 6 months.



21 days



45 days



6 months



3 months

Discussion

Intentional replantation in dentistry has been performed for more than ten centuries and was used extensively to manage odontalgia. At the eleventh century AD, Abulcasis described the first account of replantation and the use of ligatures to splint the replanted tooth . In 1712, Pierre Fauchard replanted a tooth and reported it to be stable on follow-up ^(4, 2). IR is an accepted endodontic treatment procedure in which a tooth is extracted and treated outside the oral cavity and then reinserted into its socket to correct an obvious radiographic or clinical endodontic failure . In this case, intentional replantation was chosen over other endodontic surgical interventions such as apicectomy and hemisection. Hemisection was not chosen as the treatment modality due to well defined periapical radiolucency beneath both the roots as well as furcation defect ⁽⁵⁾. Apicectomy was ruled out citing difficulty in access owing to the thick mandibular cortical bone. Bender and Louis reported 31 cases of intentional replantation with an overall success rate of 80.6% and with six recorded failures ⁽⁶⁾. Survival times varied from 1 day to 22 years. Messakob have reported a successful three unit bridge on a replanted root for the first time ⁽⁷⁾. Benenati did a 15.5-year follow-up clinical examination, which revealed the patient to be asymptomatic and functional ⁽⁸⁾. A recall film showed no evidence of root resorption. The success or failure of intentional replantation of the extracted tooth depends upon the viability of PDL cells. These PDL cells can be kept vital by maintaining the extracted tooth in a moist aseptic condition for extraoral time as least as possible. In this case, the extraoral time was limited to a period of 10 minutes. It has been reported that extraoral time must be limited maximum to 20 – 30 minutes to avoid damage to the viable PDL cells. Intentional replantation per se has been considered as the last resort owing to its adverse outcomes , the reasons of which can be attributed to risk of fracture of tooth during extraction ; damage to the PDL cells ; infection ; external root resorption or ankyloses etc. To minimize the risk of adverse effects, the tooth in question was extracted as atraumatically as possible without use of elevators to luxate the tooth and a rubber dam placed around the forceps handle to maintain constant pressure on the crown. Care was also taken to not place the beak of forceps beyond the CEJ of the said tooth to avoid damage to the pericemental tissues. The perforation defects in the furcation and on the lateral aspect of the mesial root as well as the root end preparations were sealed using MTA Plus (Prevest Dentpro Ltd.). Commonly used root-end filling materials are amalgam, Intermediate Restorative Material (IRM), Super EBA, GIC, Diaket, composite and MTA. The sealing ability and marginal adaptation of MTA have been proven to be superior and not adversely affected by blood contamination. In addition, MTA promotes deposition of new cementum and stimulates osteoblastic adherence to the retro-filled surface thus qualifying as a good biocompatible material ⁽⁹⁾. Bone graft (PerioGlas) was used in this case to enhance periapical healing and achieve favourable outcome post intentional replantation. After replantation, the tooth was splinted for 21 days. The splint enabled physiological movement of the tooth to prevent ankylosis. Final restoration was completed 21 days after replantation to allow splicing of periodontal fibres, thus limiting the seepage of potentially harmful restorative materials into the traumatised periodontal ligament. Final restoration of the tooth was sub occlusal to avoid loading and to ensure that proper healing of periodontal ligament took place.

Conclusion

The treatment outcomes achieved in this case were :

- ✓ no pockets extending beyond 3 mm,
- ✓ no gingival recession,

- ✓ and significant resolution of the radiographic radiolucency at the furcation and periapical regions at a 6-month follow-up.

There is no reason to believe continued healing will not occur.

Therefore, this case shows that intentional replantation is a reliable and predictable procedure and should be considered more often as a treatment modality rather than a last resort.

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