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CASE REPORT

SURGICAL MANAGEMENT OF ENDODONTIC FAILURE BY ROOT RESECTION- CASE SERIES

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ABSTRACT

Maintaining a natural tooth than extraction will conserve the tooth and also will be beneficial for the patient. Root resection is a technique for maintaining a portion of a diseased or injured molar by removal of one or more of its roots. A periodontally or endodontically compromised tooth can be retained. In this case series the diagnosis and management of two endodontically and periodontally compromised tooth i.e maxillary first molar is achieved by surgical resection of the root followed by regenerative procedure if required and MTA placement.

INTRODUCTION

It is a treatment which is carried out in molars with endodontic, periodontal, restorative or prosthetic problems. It can be defined as a surgical procedure in which one or more roots of multi-rooted tooth are removed at the level of furcation entrance whilst the crown and remaining roots are left in function (American Academy of Periodontology, 2001). There are mainly two reasons

1. Periodontal based, which include severe bone loss affecting one or more root(s), severe recession, Grade II or III furcation involvement or dehiscence, unfavorable root proximity between adjacent teeth.
2. Endodontic based, include root fracture, root resorption, root caries, root perforation, failed endodontic treatment or a combined endodontic-periodontal lesion (DeSanctis, 2000).

It is an alternative treatment for a combined lesion which will change the configuration of the remaining root portion (Raja et al., 2008). Nonsurgical endodontic treatment has lower percentage of success rates due to the anatomy of molars (Imura et al., 2000). There is almost 13-20% of accessory canals (Degerness, 2008) and around 42-52% of secondary canals in the mesiobuccal (MB) root of maxillary molars (Pattanshetti et al., 2008). The main goal of the treatment is to eradicate bacteria which will prevent infection. This case series include two endodontically or periodontally compromised mesiobuccal root of maxillary first molar which were respected near the furcation entrance for the better functioning of the remaining tooth portion.

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Case Report 1: A 28-year-old male reported to department of Conservative Dentistry and Endodontics, Rural Dental College, Loni with pain in the upper right back region of jaw since a week. Clinical examination revealed a mesio-occlusal restorative material with 16 tooth was tender on vertical percussion with grade I mobility. On radiographic (Fig. 1) examination 16 showed an broken instrument of about 4mm long in the mesiobuccal root along with a fracture line in the middle third with loss of lamina dura. Patient gives history of root canal treatment with the same tooth 1 months ago. Based on the clinical and radiological signs and symptoms, chronic periapical periodontitis was diagnosed. And surgical root resection of mesiobuccal root was planned. The area of interest was anesthetized with local anesthetic agent. A crevicular incision was made involving premolar and molar with a mesial and distal vertical releasing incisions at the mesial line angle of premolar and distal line angle of molar using a scalpel and a #15 blade. A full thickness flap was reflected with the help of periosteal elevator (Fig. 2). Lateral widow was made in the bone of about 9mm for accessibility with mesiobuccal root using a #6 round carbide bur with copious irrigation to facilitate horizontal sectioning of root below the furcation fornix. A long shank tapered fissure bur was used to make a horizontal cut at the most coronal level of the furcation entrance. A explorer was used intermittently to check complete sectioning of the root After complete sectioning the mesiobuccal root was extracted using a forcep (Fig. 3). Odontoplasty and alveoplasty was done. Irrigation was done. Proper isolation was maintained and MTA was used to seal the resected area of the tooth and also coronally. PRF was prepared by patients own blood and placed in the osteotomy site (Image 4).

The flap was approximated and silk sutures were given (Fig. 5). Post-operative instructions were given to the patient Analgesic and antibiotics were prescribed for 5 days and patient was recalled after 7 days for follow up (Fig. 6).

Clinical examination revealed a mesio-occlusal restorative material with 26 which tooth was non-tender on vertical percussion with grade I mobility. Sinus tract opening was seen with pus drainage.



Fig.1. Preoperative periapical radiograph: separated instrument in the mesiobuccal root canal



Fig. 4. Platelet Rich Fibrin Placed



Fig.2. Full thickness flap was reflected



Fig. 5. 3-0 silk sutures given



Fig. 3. Complete sectioning of the root and extraction



Fig. 6. POST-OP IOPA showing resected mesio-buccal root

Case Report 2: A 55 year old male reported to department of Conservative Dentistry and Endodontics, Rural Dental College, Loni with pain in the upper left back region of jaw since 1month.

On radiographic examination (Fig.7) periodontal ligament widening was seen with the mesiobuccal root and root canal filling material in all three canals till the apex was seen. Patient gave the history of root canal treatment done 10 years ago which was followed by crown prosthesis. Based on clinical and radiographic signs and symptoms abscess drainage was planned. On the same day abscess drainage was done through the sulcus. And patient was recalled after 7 days for follow-up. On follow-up examination the abscess still persisted. Detailed examination revealed vertical fracture with the mesiobuccal root. As per the diagnosis surgical root resection was planned with the mesiobuccal root. A crevicular incision was made involving premolar and molar with a mesial and distal vertical releasing

incisions at the mesial line angle of premolar and distal line angle of molar using a scalpel and a #15 blade. A full thickness flap (Fig. 8) was reflected with the help of periosteal elevator. Buccal bone loss was seen till the apical third of mesiobuccal root and middle third of distobuccal root. A long shank tapered fissure bur was



Fig. 7. Preoperative periapical IOPA, showing periodontal ligament widening, bone loss with mesio-buccal root and clinically sinus tract seen with 26



Fig. 8. Full thickness flap was reflected

used to make a horizontal cut at the most coronal level of the furcation entrance. An explorer was used intermittently to check complete sectioning of the root.

After complete sectioning the mesiobuccal root was extracted using a forceps. The root was fractured and was extracted in two parts that is one mesial and one distal portion (Fig.9). Odontoplasty and alveoplasty was done.

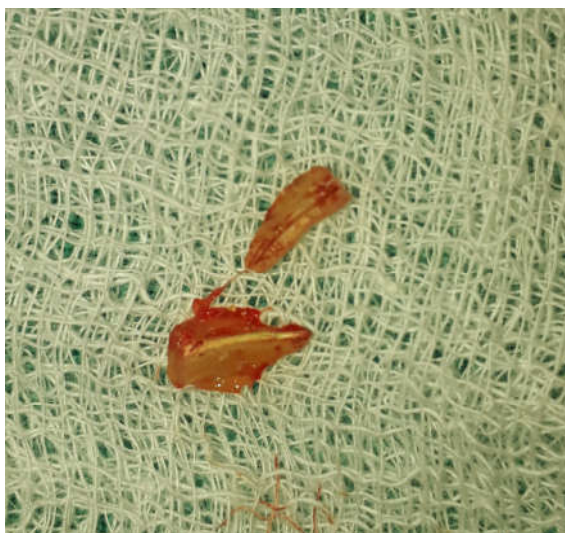


Fig. 9. Complete sectioning of the root and extraction



Fig. 10. Platelet Rich Fibrin Placed

Irrigation was done. Proper isolation was maintained and MTA was used to seal the resected area of the tooth and also coronally. PRF was prepared by patients own blood and placed in the osteotomy site (Fig. 10).

The flap was approximated and silk sutures were given. Post-operative instructions were given to the patient. Analgesic and antibiotics were prescribed for 5 days and patient was recalled after 7 days for follow-up.

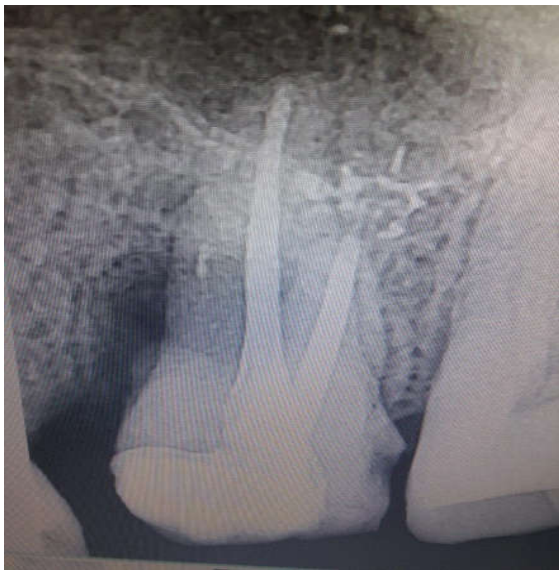


Fig. 11. POST-OP IOPA showing resected mesio-buccal root

DISCUSSION

The present case report demonstrates the management of endodontic-periodontal combined lesion with root resection, MTA and PRF placement. It is a treatment option for multi-rooted teeth with endodontic, periodontal, prosthetic or restorative problems. It is the process in which one or more roots of multi-rooted tooth are removed at the furcation level of the furcation and the remaining roots and crown are left intact (American Academy of Periodontology, 2001). In furcation involvement cases it would eliminate morphological characteristics which would aid in an area favorable for good oral hygiene (DeSanctis, 2000). Uncontrolled bacterial endodontic infection would result in loss of attachment through apical foramen. Uncontrolled endodontic infections result in the loss of attachment. Bacterial and inflammatory by-products readily pass through the apical foramen and cause the periapical pathosis. The planning for which root should be resected should depend upon;

- The root which has least amount of bone support.
- The furcation should be obliterated and eliminate the periodontal defect.
- Should facilitate plaque removal.
- The root which is most difficult to treat by endodontist.
- The ability of remaining root or roots of tooth to serve as abutment.

Root resection is a successful treatment option for tooth with furcation involvement and endodontically failed tooth. There are certain disadvantages also, with the surgical procedure there can be pain and anxiety to the patient or the root which are reshaped by grinding near the furcation area are caries susceptible. If the crown does not have proper physiologic form and if the margins are defected this may lead to periodontal destruction. Even after successful treatment a combined lesion has a poor prognosis as it requires healing of both endodontic and periodontal tissues (Oh, 2009). Histological studies conducted on extracted human molars demonstrates 76% of accessory canals in furcation region (Burch et al., 1974; Smadi et al., 2007). There is possibility of presence of more than one canal in the MB roots of maxillary molars (Testori et al., 1999).

Untreated MB root may cause recurrent infection. In such cases surgical endodontics is considered. Success rates of surgical endodontics in cases of only endodontic lesion is high (Park et al., 2009). when compared to success rate of the success rates surgical endodontics in endodontic– periodontal combined lesions are very low (Park et al., 2009). Failure rate ranges from 25% to 38%. Failure rates of root-resected molars range from 25% (Green, 1986) to 38% (Blomlof, 1997) However, use of PRF and MTA in resected area has better prognosis of the tooth.

Conclusion

It is one of the treatment available for molars with furcation involvement and endodontic failure. Placement of PRF and MTA post operatively gives a better prognosis for the affected tooth.

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