

Resective Procedure in the Management of Maxillary Molar with Horizontal/Oblique Root Fractures: A Case Report

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Abstract: Root resection is one creative treatment approach for preserving compromised molars. Root resection is highly predictable procedure with a success rate similar to that of implant. This study presents the case of a patient with pain in the upper right first molar with history of root canal treatment. Clinical examination revealed an oblique root fracture of mesiobuccal root of 16 tooth for which resection was planned. Healing of the case was uneventful.

Keywords: Endodontic therapy, Maxillary molar, Root fracture, Root resection, Root separation.

I. Introduction

Root resection is the surgical procedure by which one or more of the roots of a multirouted tooth are removed at the level of the furcation whilst the crown and remaining roots are left in function [1]. The procedure of root resection was first introduced by Farrar in 1884[2].

The indications for tooth resection are -

1. Advanced periodontitis affecting only one root of a multirouted tooth
2. Cervical enamel projections
3. Inoperable root canals of endodontically treated teeth
4. Unfavourable root proximities
5. Subalveolar root fractures
6. Advanced caries extending to or beyond the alveolar crest
7. Developmental grooves
8. Iatrogenic damage

Contraindication include-

1. Poor oral hygiene
2. Fused roots
3. Unfavourable tissue architecture
4. Retained roots endodontically untreatable

Treatment planning for resection encompasses a multidisciplinary approach that includes periodontic, endodontic, and restorative considerations to the tooth being treated [3]. Failure to manage adequately any of these areas may lead to tooth loss.

This case report describes treatment procedure for maxillary molar with root fracture of mesiobuccal root that includes root resection and prosthetic rehabilitation.

II. Case Report

A 24 year old male reported in department of conservative and endodontics, Sharda University, Greater Noida, U.P., India with the complaint of pain associated with right maxillary first molar with history of root canal treatment with the same tooth. On intraoral examination, the tooth was tender to percussion along with pain on biting. Periodontal probing revealed a deep periodontal pocket associated with the buccal aspect of the mesiobuccal root. A periapical radiographic view revealed periapical radiolucency around the MB root apex along with radiolucent oblique fracture line. Considering the clinical and radiographic findings, a horizontal fracture of the mesiobuccal root was suspected (Fig. 1,2). Patient's medical history was non-contributory. After taking patient's blood test, it was decided to proceed with root resection of the affected mesiobuccal root of 16. Under local anaesthesia, full thickness flap was reflected after giving a crevicular incision (Fig.3). A high-speed, surgical length fissure carbide bur was used to make a cut from just coronal to fracture line (Fig.4). After completion of the sectioning, the root was elevated from its socket with a periosteal elevator and removed (Fig.5,6). An odontoplasty was then performed to remove the overhanging edges of tooth structure. Flaps were then approximated and sutured back to their original position (Fig.7,8).

- After surgery, 7-day course of amoxicillin (500 mg, 3 times a day) was prescribed . Patient was recalled after one week for review. Patient was asymptomatic during recall during which suture were removed. Patient was evaluated for three month after surgery and it showed uneventful healing of the respected area after which prosthesis in form of bridge was given(Fig.9).

III. FIGURES



Fig.1



Fig.2



Fig.3



Fig.4



Fig.5



Fig.6



Fig.7



Fig.8



Fig.9

Fig 1: IOPAR demonstrated a horizontal radiolucent line on mesiobuccal roots

Fig 2: Pre operative Clinical photograph

Fig 3: After reflection of a full-thickness flap

Fig 4: Sectioning the tooth

Fig 5: Elevating resected root

Fig 6: The extracted MB root fragment

Fig 7: Suture

Fig 8: Post operative radiograph

Fig 9: Radiograph taken 3 months showing healing of the bony lesion alongwith final prosthesis

IV. DISCUSSION

Root-resection therapy is treatment option for molars with endodontic, periodontal, or prosthetic problem. Before selecting a tooth for resection, patient's oral hygiene status, caries index and medical status should be considered. It is important to consider the following factors before deciding to undertake any of the resection procedures[4]: [A]Advanced bone loss around one root with acceptable level of bone around the remaining roots.[B] Angulation and position of the tooth in the arch. A molar that is buccally, lingually, mesially or distally tilted, cannot be resected. [C]Divergence of the roots - teeth with divergent roots are easier to resect. Closely approximated or fused roots are poor candidates.[D]Length and curvature of roots - long and straight roots are easier to resect.

The 4-year survival rate of maxillary molars after root amputation is reported to be 93% [5]and long-term survival of teeth after root amputation ranges from 87% to 95% [6]. In the current case, maxillary molars with mesiobuccal root fractures was preserved in the short term by surgical removal of the fractured roots. The case under discussion revealed almost all the typical features of root fracture, which have previously been described by Moule and Kahler[7]. The cause of fracture in this case may be attributable to either overzealous endodontic cavity preparation, excessive lateral and vertical forces of root canal obturation using gutta percha, inadequate post endodontic restoration or excessive occlusal trauma.

In many cases tissue reflection during the resection procedure may be necessary to provide better visualization to assess the need for osseous and tooth recontouring. To accomplish this a thorough understanding of root morphology is mandatory for proper execution of the resection procedure (Lost 1985).

Careful clinical examination and postoperative radiographs are also necessary to confirm complete removal of the extracted root segment [8].

- Following tooth resection, functional goals of the final restoration should facilitate oral hygiene, preserve the coronal restorative seal, and provide occlusal harmony to decrease the probability of root fracture. Well-contoured cast full coverage restorations that cover all the exposed tooth structure resected are indicated. Some authors advocate, however, a 3-6 month waiting period between surgery and final restoration to assess hard and soft tissue healing (Fastman & Backmejer 1986). In the present case porcelain fused to metal prosthesis was given involving 15 and 16 tooth.

V. CONCLUSION

Procedures like root resection and hemisection can save compromised teeth for longer periods and are comparatively less expensive to the patient. The prognosis for root resection is the same as for routine endodontic procedures provided that case selection has been correct, the endodontic treatment has been performed adequately, and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient.

References

- [1]. American Academy of Periodontology. Glossary of Periodontal Terms. Chicago: American Academy of Periodontology ; 2001:45.
- [2]. Farrar JM. Radical and heroic treatment of alveolar abscess by amputation of roots of teeth. *Dental Cosmos* 1884;26:7912.
- [3]. Kryshalskyi e. Root amputation and hemisection. Indications, technique and restoration, *Journal Canadian Dental Association* 1986;52, 307-S.
- [4]. Parmar G, Vashi P. Hemisection : A Case Report and Review. *Endodontology* 2003;Vol. 15.; 26-29.
- [5]. Babay NA, Almas K . A four-year clinical follow-up of nonvital root resection in maxillary molar teeth.
- [6]. *Indian Journal of Dental Research* 1996 ;7, 29–32..
- [7]. Buhler H. Survival rates of hemisected teeth: an attempt to compare them with survival rates of alloplastic Implants. *International Journal of Periodontal and Restorative Dentistry* 1994;14, 536–43.
- [8]. Moule AJ, Kahle B. Diagnosis and management of teeth with vertical root fractures. *Australian Dental Journal* 1999 Jun;44(2):75-87.
- [9]. Schmitt SM Brown FH. Management of root amputated maxillary molar teeth; periodontal and prosthetic Considerations. *Journal of Prosthetic Dentistry* 1989;61. 648-52