Original Research Paper

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Dentistry

HEMISECTION : RAY OF HOPE FOR THE HOPELESS

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ABSTRACT Hemisection is the surgical removal of the root and the associated portion of the crown of a multi-rooted tooth especially a mandibular molar through the furcation. The treatment goal is preservation of the remaining tooth structure and restoration of function. Advanced dental therapeutic measures have provided opportunity to retain teeth that were once considered non restorable. Such therapeutic measures involve multidisciplinary approach.

KEYWORDS : Hemisection, Root resection, multidisciplinary approach.

INTRODUCTION

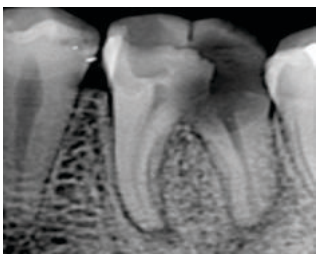
Hemisection is sectioning of multi-rooted teeth followed by removal of compromised root along with its associated crown portion and leaving the healthy root (with crown) intact. This treatment option can be considered when caries, resorption, perforation, or periodontal damage is restricted. Advanced dental therapeutic measures have provided opportunity to retain teeth that were once considered non restorable. Such therapeutic measures involve multidisciplinary approach. Hemisection is one such treatment modality involving principles of restorative dentistry, endodontics, periodontics, oral surgery and prosthodontics.[1] Modern advances in all phases of dentistry have provided the opportunity for patients to maintain a functional dentition for lifetime. The overall survival rate for root-resected molars was found to be **60-91.1%.** Carnevale et al. reported a survival rate of about **93%** over a **10-year follow-up** [6] among patients who received hemisection as the management. This case report describes a case in which hemisection was chosen as a treatment plan to retain the mesial root of mandibular left first molar and extraction of untreatable distal half of the tooth.

Case Report

A 26-year-old male reported to v.y.w.s dental college Amravati to the department of conservative dentistry and endodontics with a chief complaint of decayed tooth and discomfort while mastication in the lower left back region of jaw. On intraoral examination, tooth #36 was found to have a deep carious lesion involving distal and occlusal surfaces. There was tenderness on percussion present.

Radiographic examination

Radiographical examination revealed carious lesion extending to the furcation area.



(Fig.1: preoperative radiograph)

Diagnosis

It was diagnosed as pulp necrosis with symptomatic apical periodontitis

Treatment

Since the extent of decay rendered the tooth non restorable, the patient was explained about the condition and prognosis of tooth with feasible treatment options. After explaining the patient about prognosis and treatment options Root canal of the mesial root followed by Hemisection was finalized as the treatment of choice. Local anaesthesia was administered, inferior alveolar nerve block using 2% solution of lignocaine hydrochloride with 1:80000 adrenaline was given. After achieving anaesthesia root canal treatment was performed of the mesial root. Endodontic access was prepared using round bur of the mesial root mesiobuccal and mesiolingual canals were located, working length was determined using apex locator and biomechanical preparation was done till 25.04% (micromega hero shaper gold) The canals were obturated and post endodontic restoration was done. Followed by distal root resection. Furcation area was separated using straight hand piece using long straight bur and distal root was removed using anterior forcep.

Root canal treatment of the mesial root

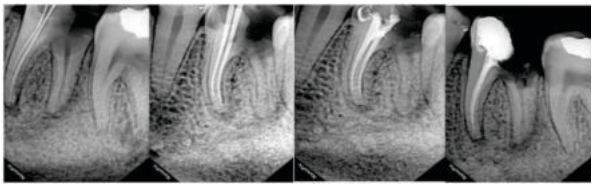


Fig.2A: working length, fig. 2B: Master cone, Fig.2C Obturation Fig.2D: Post endodontic restoration

Root resection of the distal root

Fig.3: distal root removal

Patient was recalled after a month for follow-up. The tissue healing was found to be satisfactory Tooth preparation of the mesial portion of the 1rst permanent molar and second molar was performed. Followed by two unit all metal prosthesis

Fig.4A: tooth preparation, Fig.4B Two-unit metal prosthesis involving permanent first and second molar. Fig.4C: Buccal view

Patient was recalled for followups after 6 months and 1 year

Fig5A: 6-month follow-up fig5B: 1 year follow-up

DISCUSSION

Loss of posterior teeth may result in several undesirable sequelae such as mesial drifting, loss of masticatory function.[4] As previously discussed, treatment options for an extensively decayed and non-restorable molar are limited. A clinician must decide a treatment option based on the patient's age, medical history, and the ability to maintain oral hygiene. Consideration of the cost of treatment and available clinical evidence of success of different modalities is indispensable. In the present case, all possible treatment options were explained to the patient, including hemisection, as the decay was limited to distal root. Since the patient was young, he was reluctant to lose his tooth. In addition, his financial conditions made him to reject other options. The long-term success of hemisected molar depends on a number of interrelated factors: periodontal condition of tooth, maintenance, endodontic and restorative therapy, and the surgical procedure itself. From periodontal aspect, the amount of bone support and degree of furcation involvement are major determinants for case selection and prognosis.[3] Root resection or hemisection performed at the incipient stage of furcation invasion is more likely to result in successful outcome. A Systematic review and meta-analysis was conducted by frank et al. He concluded that there was overall cumulative survival rate of 85.6% for Crown resection and Root resection identified in this study which was comparable with those identified for primary endodontic treatment (87%–97%) nonsurgical retreatment (89%)[8]. Thus, this data may encourage clinicians to use these procedures to prolong the life of a tooth instead of earlier replacement.[5]

CONCLUSION

Conservative management of grossly carious multirooted teeth in young patients not only preserves the dentition but also reduces the financial burden, psychological fear of losing the teeth, and occlusal dysfunction associated with tooth loss. Hemisection seems to be a reliable treatment option for saving a non-restorable molar which otherwise needs to be extracted[7]. The prognosis for hemisection is the same as for routine endodontic procedures provided that case selection has been correct, and the treatment performed is adequate.

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