



Molar Hemisection in Teeth with Advanced Furcation Lesion: A Hope for the Hopeless

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Authors' contributions

This work was carried out in collaboration among all authors. Author MB designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors PVSK and SS managed the analyses of the study. Author RVSK managed the literature searches. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Aim: The preservation of a functional dentition is very important in young individuals. Mandibular molar teeth, the first to erupt in the oral cavity are highly susceptible to caries. Pulpal involvement of these teeth along with furcation defects is a challenge to the maintain them in a functional occlusion. Advances in Restorative and Periodontal dentistry have made this possible.

Presentation of Case: This is a case report of a 20 year old male patient with a chief complaint of pain and mobility in the mandibular left first molar. On examination, the tooth had a carious involvement, was sensitive to percussion and revealed grade 1 mobility with Glickman's grade III furcation defect. A provisional diagnosis of a primary endo with secondary perio with tooth number 36 was given. On radiographic examination, bone loss was evident involving the furcation area. Root canal treatment was performed along with hemisection of tooth.

Discussion: In the Past cases exhibiting Glickman's grade II or III furcation defects were considered untreatable. Root resection procedures help maintain a part or the entire tooth. These procedures are highly complex and their success depends upon a proper case selection.

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Conclusion: The conservative management of teeth in young patients showing furcal defects can not only help maintain the tooth in functional dentition but it also reduces the financial burden, psychological stress and occlusal dysfunction.

Keywords: Hemisection; mandibular molars; furcation defects; root resection surgery; root separation.

1. INTRODUCTION

The treatment, management and retention of mandibular molars having furcation defects have always been a challenge for clinicians [1]. Advances in all areas of dentistry have provided alternatives to ensure retention of teeth in order to maintain a functional dentition. Treatment may involve the combination of restorative dentistry, endodontics and periodontics to retain the tooth as a whole or in parts [2,3]. The most commonly proposed treatment for such tooth/teeth may include extraction followed by a removable partial denture, fixed partial denture, or a dental implant to replace the missing tooth. However, with appropriate case selection, hemisection can be a relatively simple, conservative, inexpensive treatment with good chances of success [4]. Surgical resective like root resection, hemisection and furcation tunneling procedures were introduced by Farrar, which have been used for the treatment of Glickman's grade II and III furcation defects [5]. Several authors have listed the following indications such as [6-11].

- i. Severe bone loss affecting one or more roots untreatable with regenerative procedures.
- ii. Root fractures or perforations.
- iii. Root caries of furcation area
- iv. Systemic factors or poor oral hygiene
- v. Retained roots endodontically untreatable
- vi. Fused roots or unfavourable tissue architecture

Bicuspidisation / Bisection is a surgical procedure carried out exclusively on the mandibular molars, where the mesial and distal roots are separated along with the crown portions and are further retained as individual teeth. These teeth when separated make it easier for the patient to maintain the furcation area with the use of interdental aids [12-14]. This article presents a case of dental caries in a mandibular molar with Glickman's grade III furcation involvement successfully treated by a Hemisection with roots maintenance procedure and its subsequent restoration.

2. CASE REPORT

A 20 year old healthy, non-smoker male patient reported to the clinic with pain in the mandibular left molar region. Pain was dull and intermittent, subsided on taking medication. On clinical examination, carious involvement was seen on the disto-occlusal aspect of mandibular left molar with a swelling on the buccal gingiva. The tooth was tender on percussion, exhibited Grade I mobility and a Pocket probing depth of 12 mm in the furcation area (Fig. 1).



Fig. 1. Shows furcation involvement assessed using a Naber's probe

Vitality testing revealed a delayed response. After obtaining the patients consent, Endodontic treatment was carried out and radiographs taken (Fig. 2).



Fig. 2. Radiograph taken after completion of root canal therapy



Fig. 3. Tooth sectioned into two cusps



Fig. 4. Radiograph taken after sectioning of the tooth



Fig. 5. Tooth restored using metal crowns

Local Anaesthesia using 2% lignocaine with 1:80000 adrenaline (Indoco remedies Ltd.,

Promoted by Warren pharmaceuticals, Goa, India) was administered and a full thickness mucoperiosteal flap was raised in relation to 36. Complete debridement of the area was carried out and bone defect visualised. The tooth was then sectioned and separated into two cusps (Figs. 3, 4).

Osseous surgery was done in order to obtain a positive architecture. The flap was then approximated and direct loop sutures placed. Occlusal reduction was done and temporary crowns placed. Patient was recalled after 3 months. No signs pain or mobility was seen and the tooth was restored using metal crowns (Fig. 5). Patient was kept on periodic follow-up and was constantly motivated to follow oral hygiene procedures.

3. DISCUSSION

In the past cases exhibiting Glickman's grade II or III furcation defects were considered difficult to treat and had a poor prognosis. Farchian and Kaiser have stated that the success of molar hemisection with roots maintenance depends upon certain factors such as [14]:

- i. Stability of the individual tooth sections and the supporting bone structure.
- ii. Absence of severe root fluting on either the mesial or distal roots.
- iii. Adequate separation of the mesial and distal roots to aid in proper oral hygiene maintenance.

In A systematic review carried out by Needleman, showed the survival rate of molars treated non-surgically was >90% (follow up 5-9 years), those treated with surgical respective procedures was 62-100% (follow-up 5-13 years), and Guided tissue regeneration 83.3-100% (follow up 5-12 years) [15]. According to Newell, the advantage of root resection procedures such as amputation, hemisection or biscuspidisation is the retention of parts of the tooth or even almost the whole tooth. However, the disadvantage being that the remaining tooth requires endodontic treatment along with prosthesis in purely periodontal (no caries involvement) cases. The case presented in this article depicted pulpal involvement resulting in bone loss in the furcal area. Hence, hemisection with roots maintenance being the treatment of choice in order to maintain a functional dentition. A Good long-term survival rate can be achieved

with resective surgery, but case selection plays an important role [16]. It is essential to take some of the following factors into consideration before any root resection procedures [1]:

- i. Bone loss around furcation area, level of bone around the remaining roots.
- ii. Angulations and position of the tooth in the arch. A tilted molar cannot be separated and resected.
- iii. Divergence of the roots - teeth with divergent roots is easier to resect.
- iv. Length and curvature of roots - long and straight roots are more favourable for root separation and resection.
- v. Feasibility of endodontics and restorative dentistry in the retained roots.

Postoperative healing response was good in the case. Conservative management of extensive carious molar in young patients can not only help to preserve the tooth but also reduces the financial burden, psychological trauma and occlusal dysfunction.

4. CONCLUSION

Root separation or resection should be considered for treatment options by clinicians, determined to retain the natural dentition. With recent advances in endodontics, periodontics and restorative dentistry, root separation and resection have received acceptance as a conservative and reliable dental treatment.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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