J. Univ. Med. Dent. Coll., Vol.13(3), 453-455;2022
ISSN (Print) 2221-7827, ISSN (Online) 2310-5542
DOI: 10.37723/jumdc.v13i3.719
http://www.jumdc.com/

Case Report

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Hemisection as an Alternative Treatment for Mandibular Molars with Separated Instrument: A Case Report

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ABSTRACT

ABSTRACT: Hemisection is a procedure involving the removal of an untreatable root with an accompanied crown portion while saving the other healthy root with adequate bone support. This case report represents the treatment of 2nd mandibular molar with irretrievable and unable to bypass separated instruments in the mesiobuccal canal of the mesial root. After sectioning the tooth, mesial root with the crown portion was extracted, and the remaining part of the tooth was restored as a premolar. Restorative rehabilitation was done by cementing a three-unit metal ceramic bridge. The good outcomes of endodontic treatment and patient demand towards the conservation of tooth encouraged the procedure of hemisection. For the preservation of terminal mandibular molars with irretrievable and unable to bypass separated instruments, hemisection can be considered as an alternative treatment option our objective is to conserve terminal mandibular molar with adequate bone support as a replacement in this area is complex, time consuming, and costly.
KEYWORDS: Mandibular molar, Separated instrument, Hemisection.

INTRODUCTION

Hemisection as an alternative to extraction has been successfully employed as a regular treatment option in recent studies. It is the surgical separation of multi-rooted teeth through the furcation area in such a way that the root with an irreparable pathology may be surgically removed along with the associated part of crown. Hemisection permits the preservation of terminal abutments for further restorative reconstruction. Although dental implants have opened up options that were unavailable before, a healthy natural dentition is functionally and aesthetically superior to any form of prosthesis. Attempt to preserve endodontic treatment failure teeth can be a lifesaver procedure for the patients' teeth. Subsequently, maintaining the original dentition in a state of health should be the first alternative [1,2,3].

For predictable treatment of any procedure in dentistry, case selection is important. For hemisection cases to show a good prognosis, the hemisected teeth should have a high furcation level, roots should be divergent and there must be good periodontal status and more than 50% level of alveolar bone available [2, 3].

Mandibular molars are the most commonly extracted teeth due to caries and periodontal disease. Separation of an instrument within the root canal hinders root canal procedures and affects the prognosis. Cases with separated instrument show a 19% reduction in the rate of healing of apical tissue [4]. Studies done on removing mesial or distal roots in hemisection of mandibular molars showed good results in either case. These teeth are important in occlusion and have a wide pericemental area. Hemisection can provide a conservative treatment in such cases [5].

This case report describes the hemisection procedure chosen to retain the distal root of mandibular left second molar and the extraction of mesial root with a separated instrument in the mesiobuccal canal.

Rehman RU, Munir B. Hemisection as an Alternative Treatment for Mandibular Molars with Separated Instrument: A Case Report. Journal of University Medical & Dental College.2022;13(3):453-455.

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CASE REPORT

A 24-year-old female patient reported to the Outpatient Department of Operative dentistry in PMC Dental institute Allied hospital Faisalabad in September 2020. The patient presented with the chief complaint of pain in the mandibular left second molar. She gave a history of previous root canal treatment and mild to moderate pain on biting. Pain was temporarily relieved by taking analgesics. Clinical examination revealed mild pain on percussion and palpation. Radiographic examination showed a separated instrument in the mesial root of tooth mandibular left second molar with periapical radiolucency and proximal carious lesion (Figure-I, A).

Two treatment options were presented to the patient. One was to extract the tooth and restore it with an implant, the other was to save the tooth by the surgical procedure of hemisection. She chose to save her tooth by hemisection. A brief description of the procedure was given to the patient. After taking informed consent and medical history, patient was anaesthetized by giving inferior alveolar nerve block and buccal infiltration. On removing the previous filling, it was found that separated instrument was in mesiobuccal canal of the mesial root of the tooth. The separated instrument was irretrievable and unable to bypass with small files (6, 8, and 10 k-type). A sharp explorer was used to identify location of buccal and lingual furcation. Distal half of tooth was temporarily restored with glass ionomer cement (Figure-I, B). A vertical cut was placed buccolingually, keeping the buccal groove as a reference guide. Mesial root with accompanying crown portion was atraumatically extracted. (Figure-I: C,D). A periapical radiograph was taken to confirm that there were no retained root fragments or foreign bodies and that there were no spurs or ledges associated with the retained root.

After one month recall visit, soft tissue had completely healed at mesial root, and distal root had remained asymptomatic. (Figure-II, A) After removing temporary filling from the distal half, a post hole space was prepared. A screw type of metallic post was placed in the distal root. (Figure-II, B) Core was made with composite resin (VOCO Grandio). (Figure-II C) Crown preparation of distal half of mandibular left second molar and mandibular left first molar was done, and impression was taken in addition silicone (Elite HD-Zhermack). A metal ceramic bridge (Figure-II, D) was fabricated and inserted and cemented with luting type l glass ionomer cement (Shofu-dent). Occlusal interferences were checked in centric and eccentric relations (Figure-II, E).

Patient occlusion, periodontal health, and alveolar bone status was in a good condition. There was no medical problem and low caries index. The above described factors lead to good prognosis of hemisection. Proper restoration was mandatory as hemisection may allow the root configuration to be changed sufficiently for a part of the root structure to be saved [6]. In our case, a three unit bridge was placed in order to get good stress distribution. After one year of follow up, tooth was asymptomatic, and the patient was happy with his treatment.

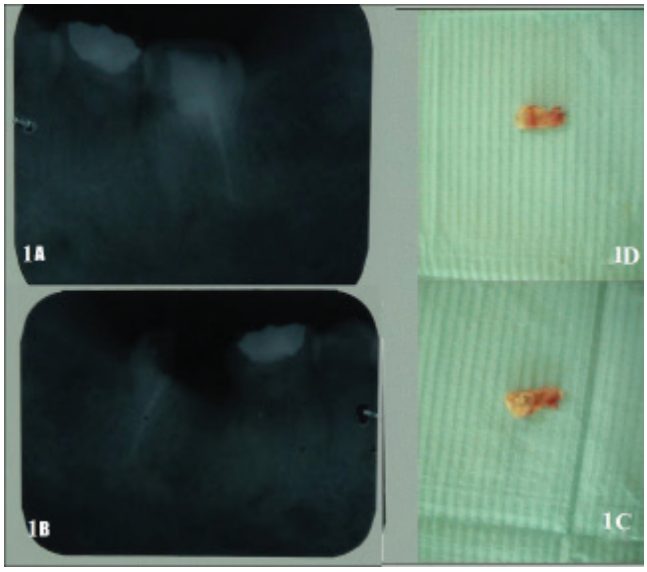

Figure-I: Pre-op radiograph (A), Retained distal root after hemisection (B), Distal view of mesial root (C), Mesial view of mesial root (D).

Figure-II: Healing after hemisection (A), Post placement (B), Post and core in distal root(C), Metal ceramic bridge (D), Centric Occlusion (E).

DISCUSSION

Modern dentistry and patient demands have led our treatment modalities towards preservation of teeth. Therapeutic measures to retain teeth follow different approaches. The complex treatment may involve combined work of operative dentistry, endodontics and periodontics [1].

The success of Hemisection procedure depends on patient's motivation and case selection. In this case, the patient was young and was motivated toward immaculate self-cleansing. There are different longitudinal studies regarding hemisection of molars teeth. Studies showed very good results for hemisected teeth with up to 88% prognosis.

Criteria for long term survival of hemisected teeth depends on the quality of corrective surgery, recontouring of

remaining part of tooth, quality of endodontic treatment in the remaining root, quality of coronal restoration, quality and quantity of remaining alveolar bone and status of patient oral hygiene. Anyone or combination of these factors can cause the failure of the hemisection. When all of these factors considered during treatment, a long-lasting result can be achieved. It is better to avoid tooth loss and prevent from more invasive and complex procedures like removable or fixed partial dentures or endosseuos implant [6,7,8]. A comparative study showed the average survival rate of implant and hemisected tooth to be six years. Another study showed the survival rate of hemisected teeth to be 5- 13 years [9,10]. In an academic setting, >50% of teeth remained functional after 9 years of root resection therapy [11] .

CONCLUSION

Unique anatomical features, such as tooth root length, curvature, shape, size, position of adjacent teeth and bone density may influence the end result. With appropriate case selection and preoperative planning fairly good prognosis of hemisected teeth can be achieved.

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Submitted for publication: 13-02-2022
Accepted after revision: 21-06-2022