ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at:www.ijdsir.com

Volume – 4, Issue – 5, September - 2021, Page No. : 341 - 346

Hemisection: A hope for hopeless

[1]Dr. Shikha Sharma, MDS, Assistant Professor, Department of Periodontology, SGT University, Gurugram, Haryana - 122505.

[2]Dr. Amit Bhardwaj, MDS, Professor and HOD, Department of Periodontology, SGT University, Gurugram, Haryana - 122505.

Corresponding Author: Dr. Shikha Sharma, MDS, Assistant Professor, Department of Periodontology, SGT University, Gurugram, Haryana - 122505.

Citation of this Article: Dr. Shikha Sharma, Dr. Amit Bhardwaj, "Hemisection: A hope for hopeless", IJDSIR- September - 2021, Vol. – 4, Issue - 5, P. No.341 – 346.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Introduction: With the recent Advances in dentistry, as well as the increased expectation of the patients to maintain their dentition, have lead to treatment of teeth that once would have been removed in the course of the treatment. Hemisectionis one such kind of the treatment procedure which denotes removal or separation of root with its accompanying crown portion of mandibular molars.

Methods: The case report describes the hemisection procedure wrt 46 in which the distal half of the tooth was removed followed by prosthetic rehabilitation.

Results: The procedure resulted in saving the hopeless tooth meant for extraction, rehabilitating the patient functionally.

Conclusion: This procedure represents a form of conservative dentistry, aiming to retain as much of the original tooth structure as possible. The results arepredictable and success rates are high.

Key words: Hemisection, mandibular molars, conservative dentistry, hopeless tooth.

Keymessage

1. Suitable treatment for compromised teeth (endodontically or periodonticaly)
2. Preserve the bone
3. Alternative treatment option for implant
4. More economical when compared rehabilitation with implant.

Introduction

Modern advances in all phases of dentistry have provided the opportunity for patients to maintain a functional dentition for lifetime. A wide number of therapeutic measures are performed to ensure retention of teeth. Multidisciplinary approach i.e. restorative dentistry, endodontics and periodontics are undertaken to save and retain the tooth in whole or in part. Such teeth can be used as independent units of mastication or as abutments in simple fixed bridges. Progressive periodontal tissue loss

can lead to total loss of tooth unless these defects are repaired or eliminated and health of the tissues is restored. Thus tooth resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth.

The term tooth resection denotes the excision and removal of any segment of the tooth or a root with or without its accompanying crown portion. Various resection procedures described are: root amputation, hemisection, radisection and bisection. Root amputation refers to removal of one or more roots of multirooted tooth while other roots are retained.[1]

Hemisection refers to surgical separation of a multi-rooted tooth with the extraction of one root along with the overhanging crown. This usually refers to mandibular molars. Once the tooth has been selected for this treatment, it must undergo endodontic therapy first and then must be prepared for complete crown coverage. Selected removal of the root allows improved access for homecare and plaque control by the patient thus improving the periodontal health. This results in bone formation and reduced pocket depth. This treatment basically include endodontic therapy, periodontal therapy, tooth reconstruction, and prosthetic coverage so that the teeth are retained in whole or in part for longer time.[2]

In regards with the tooth resection, Weine has listed the following indications for tooth resection:

Periodontal Indications

1. Severe vertical bone loss involving only one root of multi-rooted teeth.

2. Through and through furcation destruction.

3. Unfavorable proximity of roots of adjacent teeth, preventing adequate hygiene maintenance in proximal areas.

4. Severe root exposure due to dehiscence.

Endodontic and Restorative Indications

1. Prosthetic failure of abutments within a splint: If a single or multirooted tooth is periodontally involved within a fixed bridge, instead of removing the entire bridge, if the remaining abutment support is sufficient,
the root of the involved tooth is extracted.

2. Endodontic failure: Hemisection is useful in cases in which there is perforation through the floor of the pulp chamber, or pulp canal of one of the roots of an endodontically involved tooth which cannot be instrumented.

3. Vertical fracture of one root: The prognosis of vertical fracture is hopeless. If vertical fracture traverses one root while the other roots are unaffected, the offending root may be amputed.

4. Severe destructive process: This may occur as a result of furcation or sub gingival caries, traumatic injury, and large root perforation during endodontic therapy.

Contraindications

a. Strong adjacent teeth available for bridge abutments as alternatives to hemisection.

b. Inoperable canals in root to be retained.

c. Root fusion-making separation impossible.[3]

This case report is about a patient who presented with pain and mobility in relation to 46. The initial treatment was started with endodontic therapy and further hemisection was planned due to caries in the furcation area involving the distal root. Thus distal half of the root along with the crown structure was extracted. After a month when healing was found to be satisfactory.A fixed prosthesis was given in relation to 45 46 47 which served the dual purpose of acting as a splint as well as restoring the masticatory function of tooth. Thus prognosis of tooth improved and need for extraction was eliminated.

Case report

A 40 years old man reported to the Department of Periodontics with the chief complaint of pain and mobility of right mandibular first molar. On clinical examination, the tooth was sensitive to vertical percussion and revealed grade I mobility. On probing the area, a pocket of around 5 mm and 6 mm were found on mesial and distal sides of 46(Fig 1). On radiographic examination vertical bone loss between 45 & 46 and radiolucency at the furcation area involving the distal root and apical area of the mesial root was seen (Fig 2).

It was decided that the distal root should be hemisected after completion of endodontic therapy of the tooth. The canals were obturated with lateral condensation method and the chamber was filled with composite restoration to maintain a good seal and allow the interproximal area to be properly contoured during surgical separation. Under local anesthesia, a full thickness mucoperiosteal flap was reflected after giving a crevicular incision from first premolar to second molar. Upon reflection of the flap, vertical bone loss was seen between 45 &46 (Fig 3). All granulation tissue was removed with Gracey curettes to expose the bone. The vertical cut method was used to resect the crown with distal root (Fig 4). A long shank tapered fissure carbide bur was used to make vertical cut toward the bifurcation area. A fine probe was passed through the cut to ensure separation. The distal half was extracted and the socket was irrigated adequately with sterile saline. Scaling and root planning of the root surfaces, which became accessible on removal of distal root was done. The extraction site was irrigated and debrided. The bony defect was grafted with Osseo graft along with PRF. Then the flap was repositioned and sutured. After 1 month healing of the tissues was seen and was found to be satisfactory (Fig 5). Fixed bridge involving retained mesial half and mandibular second molar with sanitary pontic was given after 4 months(Fig 6). On recall after 20 months a significant amount of bone formation was seen with a satisfactory clinical outcome. (Fig 7, Fig8)

Discussion

As practitioners of the art and science of dentistry we owe our patients to be able to provide a wide range of treatment options based on, the clinical situation, age, economical considerations of the patient and the best available clinical evidence of successful treatment modalities. The loss of posterior teeth can result in several undesirable sequelae, hence a guiding principle should be followed to try and maintain what is present. This case study presents treatment available in mandibular molars with distal root caries with a poor prognosis.

Hemisection has been used successfully to retain teeth with furcation involvement. Various resection procedures described are:

a) Root amputation

b) Hemisection

c) Radisection

d) Bisection[4]

Success of root resection procedures depend, to a large extent, on proper case selection. It is important to consider the following factors before deciding to undertake any of the resection procedures.

• Advanced bone loss around one root with acceptable level of bone around the remaining roots.

• Angulation and position of the tooth in the arch. A molar that is buccally, lingually, mesially or distally titled, cannot be respected.

• Divergence of the roots - teeth with divergent roots are easier to resect. Closely approximated or fused roots are poor candidates.

• Length and curvature of roots - long and straight roots are more favourable for resection than short, conical roots.

• Feasibility of endodontics and restorative dentistry in the root/roots to be retained.

Hemisection has been used successfully to retain teeth with furcation involvement.[1]

However, there are few disadvantages associated with it.

As with any surgical procedure, it can cause pain and anxiety. Root surfaces that are reshaped by grinding in the furcation or at the site of hemisection are more susceptible to caries. Often a favorable result may be negated by decay after treatment.

Failure of endodontic therapy due to any reason will cause failure of the procedure. In addition, when the tooth has lost part of its root support, it will require a restoration to permit it to function independently or to serve as an abutment for a splint or bridge. Unfortunately, a restoration can contribute to periodontal destruction, if the margins are defective or if non-occlusal surfaces do not have physiologic form. Also, an improperly shaped occlusal contact area may convert acceptable forces into destructive forces and predispose the tooth to trauma from occlusion and ultimate failure of hemisection.[1]

In the present study, hemisection was selected for the treatment of incomplete endodontically treated teeth with root caries wrt the distal root and a three unit fixed partial denture involving 45, 46 and 47 was given. The distal root was resected because of the location of the caries. Though Implant therapy is a predictable option with a good functionality,[5] however in this case the patient chose an alternative treatment option over the implant therapy due to financial constraints and desire to save the teeth.[4]

In a study by luxmi behl**,** hemisection was done in lower left tooth wrt 36. It was concluded that hemisection is a good alternative option for saving multirooted tooth having endodontic or periodontics problem involving one of the root. It also said that hemisection can be considered as a suitable alternative to extraction and should be discussed with the patients during consideration of the treatment options.[4]

In another study by Parmar G et al, hemisection was performed wrt 36 due to the loss of alveolar bone wrt the distal half of the tooth. They concluded their study by highlighting the importance of hemisection and root resection. They stressed upon on the advantage of preserving the natural tooth rather than removing it.[1]

In a study by Bhavesh et alhemisection was performed wrt 36 which had bone loss in the distal half of the tooth with furcation involvement .It also stated the importance of hemisection in saving the compromised tooth.[2]

In a study by Jinal desai et alhemisection was performed wrt 46 which had bone loss in the mesial half of the tooth and through and through furcation involvement, and was restored successfully with respect to function and stability.[6]

In another study by Usha Rudke et alhemisection was performed in a severely compromised 37 with subsequent prosthodontics rehabilitation.[7]

In a study by Babaji et al hemisection was performed wrt 46 which had a deep caries and periodontal pocket in the mesial half of the crown. The hemisection of the mesial half of the crown was followed by fixed restoration.[8] It also stressed on saving the tooth rather than extracting it.[2]

Conclusion

Hemisection can successfully treat a compromised tooth either periodontally or endodontically, under the roof of multi speciality approach. Even when less invasive modes of therapy have failed (scaling, root planing, occlusal adjustment, and flap surgery perhaps with osseous Recontouring and synthetic or natural bone grafting material where indicated), it is no longer necessary to lose a molar with complete furcation problems. When restorative dentistry has already been finished, and the retention of part of the tooth will extend the life of a

crown or fixed partial denture, the patient certainly deserves the option of hemi-section or root amputation rather than extraction. In this study, hemisection was performed in the lower molar which had furcation caries involving the distal root. Prosthodontics rehabilitation was done in the involved area which provided a long term survival in terms of function and stability as seen by significant change in the follow up of the patient.

References

1. Parmar G ,Vashi P. Hemisection : A case-report and review. Endotology.2003; 15:26-29.
2. Samir Shah, Bhavesh Modi, Khushboo Desai, Sarin Duseja. Hemisection – A conservative approach for a periodontally compromised tooth - A Case Report.J. Adv Oral Research.2012;3: 31-35.
3. Weine FS. Endodontic Therapy 1996, 5th Edition.
4. Ashima Bali Behl.Hemisection of a Multirooted Tooth-A Case Report. Open Access Scientific Reports.2012; 1:336.
5. Bashutski JD, Wang HL. Common implant esthetic complications.Implant Dent 2007; 16: 340-348.
6. Jinal Desai, Priyadarshini Nadig, Sarath Chandran.Hemisection: A Section for Salvation. International Journal of Periodontology and Implantology 2017;2(2):58-60
7. Usha Radke, Rajesh Kubde, and Aditi Paldiwal. Hemisection: A Window of Hopefor Freezing Tooth. Case reports in dentistry 2012; 2012:1-4.
8. Prashant Babaji, Tarun Sihag, Vishwajit Rampratap Chaurasia, and Sivaramalingam Senthilnathan. Hemisection: A conservative management of periodontally involved molar tooth in a young patient. J Nat Sci Biol Med2015, Jan-Jun; 6(1): 253–255.

Legends for illustrations

Figure 1: Pre operatively probing of the area (clinical)

Figure 2: Pre-operative radiographic image of the area

Figure 3: Full thickness mucoperiosteal flap reflection

Figure 4: Sectioning the tooth with long tapered bur

Figure 5: Post-operative (1 month)

Figure 6: Post-operative (4 months) with bridge

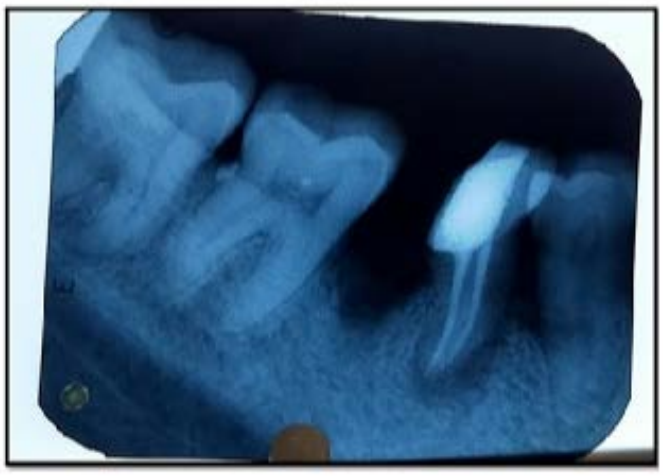

Figure 7: Post-operative Radiographic image (1 month)

Figure 8: Post-operative Radiographic image (20months)