



Hemisection : Divide and Rule – A Case Report

Dr.Priyanka Sarangi

Postgraduate Student , Department of Conservative Dentistry and Endodontics, KLE VK Institute of dental sciences , Belgaum,Karnataka.

Dr.Veerendra M Uppin

Professor , Department of Conservative Dentistry and Endodontics, KLE VK Institute of dental sciences , Belgaum,Karnataka.

Dr.Ramesh Halebathi Gowdra

Professor, Department of Conservative Dentistry and Endodontics, KLE VK Institute of dental sciences , Belgaum,Karnataka.

ABSTRACT

Advances in dentistry, as well as the increased desire of patients to maintain their dentition, have led to treatment of teeth that once would have been removed. Hemisection of a mandibular molar may be a suitable treatment option when the decay is restricted to one root and the other root is healthy. The treatment may involve combining restorative dentistry, endodontics and periodontics so that the teeth are retained in whole or in part. Such teeth can be useful as independent units of mastication or as abutments in simple fixed bridges. Thus tooth resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth. Hence, this article describes a simple procedure for hemisection in mandibular molar and its subsequent restoration.

KEYWORDS : Hemisection , Mandibular Molars.

Introduction

In every clinical situation there are a wide variety of treatment options that can be undertaken. Patients are enquiring about the latest in treatment options and materials available. Implants and veneers are examples of heavily marketed treatment modalities that patients are coming into dental offices and asking for by name. 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 modality.

The loss of posterior molar can result in several undesirable sequelae including shifting of teeth, collapse of the vertical dimension of occlusion, super eruption of opposing teeth, loss of supporting alveolar bone and a decrease in chewing ability. The treatment options to replace severely damaged and possibly unrestorable teeth include removable partial denture, fixed partial denture and dental implants. A guiding principle should be to try and maintain what is present.

This case study presents one treatment option available in cases of extensive decay in molars or molars affected by extensive periodontal lesions that threaten the loss of the tooth. Hemi-section of the effected tooth allows the preservation of tooth structure, alveolar bone and cost savings (time and money) over other treatment options.

The term hemi-section refers to the sectioning of a molar tooth with the removal of an unrestorable root which may be affected by periodontal, endodontic, structural (cracked roots), or caries. Careful case selection determines the long term success of the procedure.¹

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. Hemisection denotes removal or separation of root with its accompanying crown portion of mandibular molars. Radisection is a newer terminology for removal of roots of maxillary molars. Bisection / bicuspidization is the separation of mesial and distal roots of mandibular molars along with its crown portion, where both segments are then retained individually²

Weine² 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. Unfavourable 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 amputated.
4. Severe destructive process: This may occur as a result of furcation or subgingival caries, traumatic injury, and large root perforation during endodontic therapy.

Contra indications²

- 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.

Risks^{3,4} of this treatment modality include:

1. Increased risk of caries in the area of the resection due to increased difficulty in hygiene of the area.
2. Increased stress on abutment teeth if the span is too wide because of the loss of 50 percent of root structure resulting in mobility (periodontal) or fracture due to structure loss.

Case Report

A 28 year old lady reported to the Department of Conservative dentistry and Endodontics Patient complained of pain in the left back tooth of the lower jaw since 20 days. On clinical examination tooth was tender on percussion and there was root caries and coronal destruction of distal half of tooth structure. Radiographic findings showed -radiolucency

in the furcation and radiolucency on distal root. Hence, a diagnosis of chronic irreversible pulpitis with apical periodontitis was established.

Procedure

- ❖ Before the surgery, mesial root was endodontically treated and a GIC core build up was done
- ❖ Under local anesthesia, a crevicular incision from second premolar to second molar was given and a full thickness flap reflected
- ❖ A long shank tapered fissure carbide bur was used to place Grooves buccally and lingually
- ❖ A radiograph was taken to confirm separation. The distal root adequately elevated and extracted. The socket was irrigated with saline to remove bony chips and debris
- ❖ The furcation area was finished with a 12 fluted carbide bur to ensure that no irregularities were present to maintain periodontal health
- ❖ Flap was then repositioned and sutured with black silk sutures. Post-operative instructions were given
- ❖ After 7 days patient was recalled for suture removal
- ❖ After complete periodontal healing was obtained full coverage restoration in the form of a bridge was given in the department of prosthodontics.

DISCUSSION

Grossman⁵ referred hemisection as a dental proof of half a loaf being better than none. Weine² quoted cases where great time, effort and expense were invested but wasted because aspects of treatment were not evaluated thoroughly or carried out improperly due to insufficient expertise.

Success of root resection procedures depend, to a large extent, on proper case selection. It is important to consider the following factors⁶ before deciding to undertake any of the resection procedures.

- (FIGURE ABOUT HERE)



- 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 resected.
- 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 favorable for resection than short, conical roots.

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

Success of hemisection procedure depends, to a large extent, on proper case selection.

This case was selected for hemisection because –

- ❖ Presence of furcal caries
- ❖ coronal destruction of distal half of tooth structure

Factors favoring the procedure were adequate bone support and lack of curvature in roots.

Hemisection has been used successfully to retain teeth with furcation involvement. 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.⁶

The disciplines of endodontics and periodontics fuse when molars that have bifurcation or trifurcation involvements are treated with hemisection and root amputation. Attempts to save parts of teeth go back 100 years or more, but it is the increased predictability of success of endodontic therapy and the increased sophistication of periodontal treatment that has given us the means to save molars with furcation problems that, otherwise, would be lost. 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 hemisection or root amputation rather than extraction.⁷

Periodontal, prosthodontics, and endodontic assessment for appropriate selection of cases is important.⁸ The developments in surgery, periodontal, endodontic, and restorative dentistry provide for predictable restoratives options that can be offered to patients. Success rates in the range of 60% over a ten year period can be expected.^{1, 3} As the population ages and is more determined to keep their teeth for longer periods hemisection provides one more treatment option.

CONCLUSION

Hemisection should be considered as another weapon in the arsenal of the dental surgeon, determined to retain and not remove the natural teeth. With recent refinements in endodontics, and restorative dentistry, hemisection has received acceptance as a conservative and dependable dental treatment and teeth so treated have endured the demands of function.

REFERENCES

1. Buhler H, H. 1994, Survival Rates of Hemisected Teeth: An attempt to Compare Them With The Survival Rates of Alloplastic Implants. The International Journal of Periodontics and Restorative Dentistry, Vol: 14 no: 6 536-43. | 2. Weine FS. Endodontic Therapy, 5th Edition | 3. Caplan, CM, CM 1978, Fixed Bridge Placement Following Endodontic Therapy and Root Hemisection. Dental Survey. Vol: 54 no: 6 28-9. | 4. Burke, FJ, F J 1992, Hemisection: A Treatment Option for the Vertically Split Tooth. Dental Update. Vol: 19 no: 1 8-12. | 5. Shah N, Gupta YK 2000, Endodontic Miscellany: 1. Hemisection and Full coverage to relieve crowding and lingual displacement of pulpo-periodontally involved mandibular first molar. Endodontology. Vol : 12 no:83-85. | 6. Parmar G, Vashi P.2003, Hemisection: A case-report and review Endodontology. Vol 15. | 7. EN Green.1986, Hemisection and root amputation. The Journal of the American Dental Association April 1, vol. 112 no. 4 511-518 | 8. Usha Radke, Rajesh Kubde and Aditi Paldiwal 2012, Hemisection: A Window of Hope For Freezing Tooth Case Reports in Dentistry Volume 2012 , Article ID 390874, 4 pages