

Hemi section Saving the Hopeless Teeth: A Case Report

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Abstract

Hemi section refers to the sectioning of a molar tooth with the removal of unrestorable root (along with the crown part) which may be affected by periodontal, endodontic, structural (cracked roots), or caries. It is one of the treatment options for preserving remaining part of molar having sound periodontium.

Method: A patient reported with pain and pus discharge. After clinical and radiographic assessment a diagnosis of chronic apical periodontitis with fraction involvement was given. Patient was explained the pros and cons of treatment plan which included extraction of the diseased root segment, root canal of the remaining root segment followed by fixed prosthesis.

Keywords: Root resection, hemi section,

Introduction

Modern advances in all phases of dentistry have provided the opportunity for patients to maintain a functional dentition for lifetime. [1] Today's dentistry is based on conservation. Retaining molars with extensive decay and compromised periodontal status has always been challenging and the treatment options, in the past, were limited to dental extraction and replacement.[2] The aim of any treatment modality is to preserve the natural, but proper periodontal, prosthetic, and endodontic assessment for appropriate selection of cases is important.[3]

Various resection procedures described are:

- a) Root amputation
- b) Hemi section
- c) Redirection
- d) Bisection

Root amputation refers to removal of one or more roots of multicoated tooth while other roots are retained.

Hemi section denotes removal or separation of root with its accompanying crown portion of mandibular molars.

Redirection 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 individually [4]. Appropriate endodontic therapy must be performed before these tooth modifications to avoid intrapulpal dystrophic calcification and postoperative tooth sensitivity. The fraction region is

carefully smoothed, to allow proper cleansing and thus to prevent accumulation of plaque.[5]

Weiner F [4] 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 fraction 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 multi-rooted tooth is periodontal 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: Hemi section 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 endodontic ally 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 amputee.
4. Severe destructive process: This may occur as a result of fraction or sub gingival caries, traumatic

injury, and large root perforation during endodontic therapy.

Contraindications

1. Strong adjacent teeth available for bridge abutments as alternatives to hemi section.
2. Inoperable canals in root to be retained.
3. Root fusion-making separation impossible.

Hemi section (removal of one root) involves removing significantly compromised root structure and the associated coronal structure through deliberate excision.[6] This procedure represents a form of conservative dentistry, aiming to retain as much of the original tooth structure as possible. The results are predictable, and success rates are high if certain basic considerations are taken into account [7].

Case Report

An 18-year-old girl reported to the department of Conservative Dentistry and Endodontic with the chief complaint of intermittent pain and pus discharge in the lower right region of jaw since 3 months. Pain was not associated with any fever. On clinical examination, the right mandibular first molar was sensitive to percussion. On probing the tooth, there was a deep periodontal pocket in relation to the distal root of the tooth with a Class II fraction involvement. On radiographic examination; periapical pathology was evident around the distal root. The bony support of mesial root was intact.



Figure 1

Treatment: For long term survival of the tooth, it was planned to preserve the mesial root after endodontic therapy, respecting the distal part of crown with corresponding root portion. This would also aid in maintenance of good hygiene and plaque control. The option of hemi section was discussed with all the risks explained. The patient agreed to this treatment option. The following appointment included endodontic access. After working length

determination chemo mechanical preparation and obscuration was completed. The coronal seal was made with the help of glass ionomer cement (GC Fuji 2 universal glass ionomer cement). A surgical approach to gain access for adequate vision of the furcating in order to section the root is the most predictable technique. Flap was raised and tooth was respected involving root as well as crown portion. Vertical cut method was used to separate the crown under local anesthesia. A long shank tapered fissure carbide bur was used to make vertical cut towards the bifurcation area. The distal root was removed. Scaling and root planning of the root surfaces, which became accessible was done. The occlusal table was minimized to redirect the forces along the long axis of tooth. The patient is recalled after 4 weeks.



Figure 2 (Post Hemi section)



Figure 3 (clinical image)



Figure 4



Figure 5

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.

It is important to consider the following factors before deciding to undertake any of the resection procedures. [8]

1. Advanced bone loss around one root with acceptable level of bone around the remaining roots.
2. Angulations and position of the tooth in the arch. A molar that is basically, lingually, mesially or distally tilted, cannot be respected.
3. Divergence of the roots - teeth with divergent roots is easier to resect. Closely approximated or fused roots are poor candidates.
4. Length and curvature of roots - long and straight roots are more favorable for resection than short, conical roots.
5. Feasibility of endodontic and restorative dentistry in the root/ roots to be retained.

Conclusion

The prognosis for hemi section is the same as for routine endodontic procedures provided. [9] That case selection has been correct. The endodontic has been performed adequately, and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient. Root amputation and hemi section should be considered as another weapon in the arsenal of the dental surgeon, determined to retain and not remove the natural teeth. [10] With recent refinements in endodontic, periodontics, and restorative dentistry. Hemi section has received acceptance as a conservative and dependable dental treatment and teeth so treated have endured the demands of function

In conclusion, hemi section may be a suitable alternative to extraction and implant therapy and

should be discussed with patients during consideration of treatment options.

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