

HEMISECTION- A CASE REPORT

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Abstract

Hemisection is a removal of compromised root and the associated crown portion. It is one of the treatment options for preserving remaining part of molar having sound periodontium. Present case report demonstrates the successful management of hemisection of 46 with occlusal rehabilitation with fixed partial denture.

Key Words: Fixed partial denture, Furcation involvement, Hemisection, Root resection.

Introduction

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.¹ Hemisection denotes removal or separation of root with its accompanying crown portion of mandibular molars. Weine F¹ 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 multi-rooted 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 sub gingival caries, traumatic injury, and large root perforation during endodontic therapy.

Hemisection represents a form of conservative dentistry, aiming to retain as much of the original tooth structure as possible.² Hemisection (removal of one root) involves removing significantly compromised root structure and the associated coronal structure through deliberate excision³

Indications for Hemisection include

1. The tooth is affected by caries, vertical root fracture, periodontal disease or iatrogenic root perforation

where only one root of a multirooted tooth is affected.

2. The surviving root is accessible and treatable endodontically.
3. The surviving root is structurally capable of supporting a dowel and core restoration.
4. The surviving root is aligned so as to provide proper draw for the resulting fixed prosthetic restoration.

The root morphology allows for surgical access and proper periodontal maintenance of the final restoration.⁴⁻⁹

Contra indications of using a tooth root as an abutment can include

1. Poorly shaped roots or fused roots.
2. Poor endodontic candidates or inoperable endodontic roots.
3. Patient unwilling to undergo surgical and endodontic treatments and undertake the care or the resulting restoration.⁶⁻⁸

Case Report

A 50-year-old woman reported to the department of Conservative Dentistry and Endodontics with the chief complaint of intermittent pain 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 and revealed Grade II mobility. On probing the tooth, there was a deep periodontal pocket in relation to the distal root of the tooth with a Class II furcation involvement. On radiographic examination; severe vertical bone loss was evident at the furcation area with 46 surrounding the distal root. The bony support of mesial root was intact. (Figure1).



Figure 1: Intraoral periapical radiograph of 36

Treatment

For long term survival of the tooth, it was planned to preserve the mesial root after endodontic therapy, resecting the distal part of crown with corresponding root portion. This would also aid in maintenance of good hygiene and plaque control. The opposing arch had no opposing molar occlusion. 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 chemomechanical preparation and obturation was completed. (Figure 2)



Figure 2: Post Obturation IOPA Radiograph

A surgical approach to gain access for adequate vision of the furcation in order to section the root is the most predictable technique. The tooth was carefully sectioned and the damaged distal root was removed. Any defect on the sound mesial root was made smooth. The mesial root was temporized with IRM (Dentsply International Inc. Milford De. USA) and the surgical site were then allowed to heal with no occlusal stress placed on the root for four weeks. Patient was recalled for surgical intervention. Flap was raised and Tooth was marked with a dye. (Figure 3)



Figure 3: Flap reflection and marking with a dye on 46

Tooth was resected involving root as well as crown portion. Vertical cut method was used to separate the crown under local anaesthesia. A long shank tapered fissure carbide bur was used to make vertical cut towards the bifurcation area. The distal root was removed (Figure 4).



Figure 4: Suturing of flap after removal of resected piece of 46.

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 each root and a 3 unit fixed partial denture was placed including the mesial half of the tooth (Figure 5, Figure 6 and Figure 7).

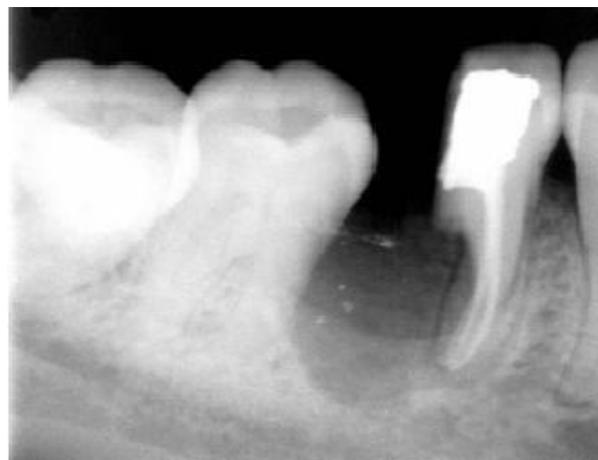


Figure 5: IOPA immediately after performing Hemisection



Figure 6: IOPA of six months follow up



Figure 7: Fixed Partial Denture

Root-resection therapy is very technique sensitive and complex, proper case selection is essential.^{3,4} Root resection is a treatment option for molars with periodontal, endodontic, restorative, or prosthetic problems. Therapeutic measures performed to ensure retention of teeth vary in complexity. The predictable management of a mandibular molar that has lost all bone support of a root in other words, that has experienced a Class II furcation invasion, or furcation involvement often is a disappointing process for both clinician as well as patient. The treatment, management and long-term retention of mandibular molar teeth exhibiting such invasions have always been a challenge to the discerning general dentist or dental specialist. One of the approaches to treat such cases is Hemisection. The clinician splits the mandibular molar vertically through the furcation, removing that half of the root where vertical bone loss is present.

A 3-unit fixed partial denture, extending from the hemisected molar to the premolar, was completed. The distal root was resected because of the location of the decay. Hemisection allows for physiologic tooth mobility of the remaining root, which is thus a more suitable abutment for fixed partial dentures. In conclusion, Hemisection may be a suitable alternative to extraction and it should be discussed with patients during consideration of treatment options.

Hemisection is thus removal of one root that involves removing significantly compromised root structure and the associated coronal structure. Hemisection is one of the treatment options for preserving remaining part of molar having sound periodontium. The prognosis for hemisection is similar to routine endodontic procedures provided that case selection has been performed correctly and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient as it was in this case. Thus, present case report demonstrates the successful management of hemisection of 46 with occlusal rehabilitation with fixed partial denture.

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