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. Hemisection and prosthetic rehabilitation yielded a satisfactory result.

Key Words: Fixed partial denture, 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. Hemi-section of the affected tooth helps preserve the remaining tooth structure, alveolar bone and promote cost savings over other treatment options.

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.

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.
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. On clinical examination, the distal margin of the tooth 36, there was evidence of decay extending subgingivally. Radiography revealed that the decay had almost obliterated the coronal third of the distal root (Fig. 1). The extent of decay rendered the tooth nonrestorable. However, the patient was reluctant to lose the tooth, The option of hemi section was discussed with the patient. The patient agreed to this treatment option.

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. This treatment may include endodontic therapy, periodontal therapy, tooth reconstruction, and prosthetic coverage so that the teeth are retained in whole or in part for longer time.

The following appointment included endodontic access. After working length determination chemomechanical preparation and obturation was completed. (Fig.2,3)

Figure 2 Root canal treatment of mesial root

Figure 3 Post endodontic restoration of mesial half of tooth

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. 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 Amalgam and the surgical site were then allowed to heal with no occlusal stress placed on the root for four weeks. (Fig.4,5)

Figure 4 Radiograph after hemisection of distal part of tooth

Figure 5 Clinical image after hemisection of distal part of tooth

Patient was recalled after 4 weeks. Scaling and root planning of the root surfaces, which became accessible was done. A 3 unit fixed partial denture was placed including the mesial half of the tooth (Fig.6,7)

Discussion

Root-resection therapy is very technique sensitive and complex, proper case selection is essential. 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.

For this patient, hemisection was selected for treatment of root decay in the terminal abutment of a fixed prosthesis. Implant therapy was considered but not chosen; instead, a 3-unit fixed partial denture, extending from the 2nd molar to the 1st premolar, was completed. The distal root was resected because of the location of the decay.

Implant therapy is a predictable option with good functionality; however, in this case, the patient chose an alternative treatment because of financial considerations and her desire to retain the teeth.

Hemisection allows for physiologic tooth mobility of the remaining root, which is thus a more suitable abutment for fixed partial dentures than an osseointegrated
counterpart. The smaller size of the occlusal tables, under-contouring of the embrasure spaces and ensuring that the crown margin encompasses the furcation are all factors in the high success rates observed with hemisection therapy.

**Conclusion**

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 the same as for routine endodontic procedures provided that case selection has been correct, the endodontics has been performed adequately, and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient.

In conclusion, hemisection may be a suitable alternative to extraction and implant therapy and should be discussed with patients during consideration of treatment options.

**References**