

Hemisection – A Boon for hopeless teeth: A Case Report

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Abstract—Abstract After several times of unprofitable characteristic periodontal treatment, an advanced endo-perio lesion on a right- mandibular first molar was successfully treated by root canal treatment and hemisection after the reevaluation of the lesion. This successful treatment appeared to have a positive effect on the case's general well- being.

IndexTerms—Hemisection, periodontally compromised teeth, endo- perio

I. INTRODUCTION (HEADING 1)

Recent advances in dentistry provide the chance for patients to take care of a functional dentition for lifetime. Hemisection refers to surgical separation of a multi-rooted tooth with the extraction of one root alongside the overhanging crown. Selected root removal allows improved access for homecare and plaque control with resultant bone formation and reduced pocket depth.¹

Bisection/ bicuspidization is the splitting of mesial and distal roots of mandibular molars along with its crown portion, where both parts are also retained individually².Radisection may be a newer terminology for removal of roots of maxillary molars. Weine² has listed the subsequent indications for tooth resection

Periodontal Indications:

1. Severe vertical bone loss involving just one root of multi-rooted teeth.
2. Complete furcation destruction.
3. Unfavorable proximity of roots of conterminous teeth, precluding acceptable hygiene conservation in proximal areas.
4. Severe root exposure due to dehiscence.

Endodontic and Restorative Indications :

1. Prosthetic failure of abutments within a splint: If one or multirooted tooth is periodontally involved within a fix bridge, rather than removing the entire bridge, if the remaining abutment support is sufficient, the involved tooth is extracted.
2. Endodontic failure: Hemisection is salutary in cases in which there`s perforation through the bottom of the pulp chamber, or pulp canals of 1 of the roots of an endodontically involved tooth which can not be instrumented.
3. Vertical fracture of 1 root: The prognosis of vertical fracture is hopeless. If vertical fracture traverses one root while the opposite roots are unaffected, the offending root could also be amputed.
4. Severe destructive process: this might occur as a result of furcation or subgingival caries, traumatic injury, and enormous root perforation during endodontic therapy.

CONTRAINDICATIONS

- a.Strong adjacent teeth available for bridge abutments as alternatives to hemisection.
- b. Incurable canals in root to be retained.
- c. Root fusion-making separation impossible.

Bühler stated that hemisection should be considered before every molar extraction, because this procedure can provide a good absolute biological cost savings with good long term success.³ This is a kind of conservative procedure which preserves tooth structure as much as possible and retains at least a part the tooth rather than extraction of the whole tooth.⁴

Thus, it is important for dentists to know the necessary suggestions, contraindications, surgical ways and prosthetic operation for successful hemisection.

This case report is about a patient who presented with pain and mobility in relation to 46.

After a month when healing was found satisfactory a fixed prosthesis was given in relation to 45 46 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 wish for extraction was eliminated

CASE REPORT

A 60 years old women reported with the complaint of pain and mobility of right mandibular first molar.

On examination, the tooth was sensitive to percussion and revealed grade 2+ mobility. On probing the area, there was a 10mm deep periodontal pocket around the mesial root of the tooth. On radiographic examination, severe Vertical bone loss was apparent girding the mesial root and involving the furcation area. The bony support of distal root was sufficient than mesial root (Fig. 1). It was decided that the mesial root should be resected after completion of endodontic remedy of the tooth.

The working length determined and therefore the distal root canals were biomechanically prepared using crown down technique. The canals were obturated with lateral condensation system and the chamber was filled with composite to maintain a good seal and allow interproximal area to be duly contoured during surgical separation.

Under local anaesthesia, full thickness flap was reflected after giving a crevicular incision from first premolar to 2nd molar. Upon reflection of the flap, the bony disfigurement along the distal root came relatively apparent. chronic inflammatory tissue was removed with curettes to expose bone. The vertical cut method was used to resects the crown. A long shank tapered fissure carbide bur was used to make vertical cut toward the bifurcation area. A fine probe was skilled the move ensure separation (Fig. 2). The mesial root was extracted and the socket was irrigated adequately with sterile saline to remove bony chips and any debris (Fig. 3). The furcation area was trimmed to make sure that no spicules were present to cause further periodontal irritation. Scaling and root planning of the basis surfaces, which became accessible on removal of mesial root was done.

The extraction site was irrigated and debrided and therefore the flap was then repositioned and sutured with 3/0 black silk sutures. The occlusal table was reduced to redirect the forces along the long axis of the distal root. After healing of the tissues, fixed bridge involving retained distal half and mandibular second Premolar with sanitary pontic was given and advised for follow up.

RADIOGRAPH

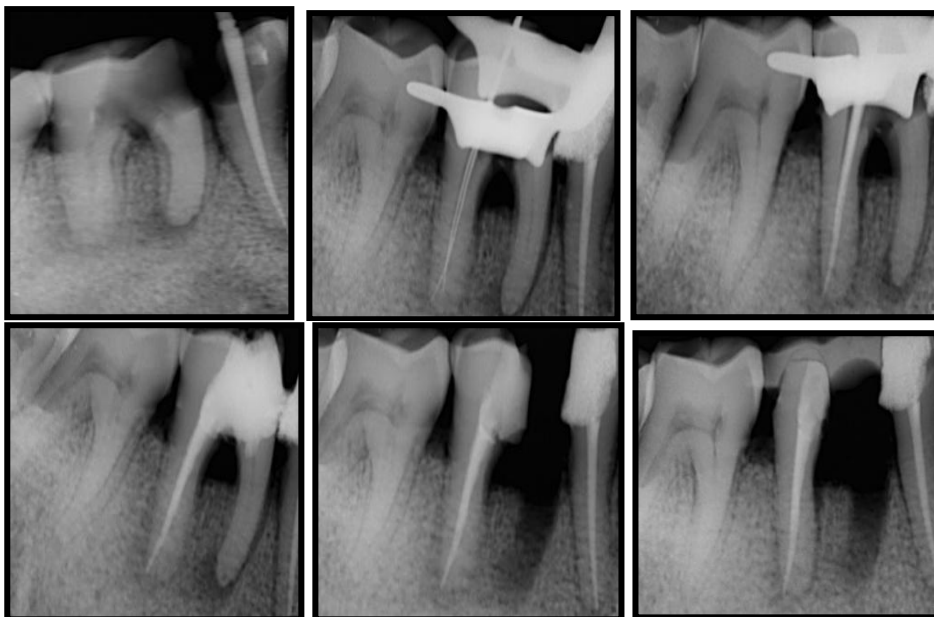


FIG.1- PREOPERATIVE RADIOGRAPH, 2 -WORKING LENGTH, 3- MASTER CONE, 4-OBTURATION WITH POR, 5-HEMISECTION, 6- PROSTHESIS

CLINICAL PICTURES



FIG.1- CLINICAL PICTURES AFTER HEMISECTION, 2- CLINICAL PICTURES AFTER SURGERY (1WEEK LATER), 3- CLINICAL PICTURES AFTER SURGERY (3 MONTHS FOLLOW UP)

DISCUSSION

It's important to consider the following factors before deciding to take over any of the resection procedures.

- Advanced bone loss around one root with respectable position of bone around the remaining roots.
- Angulation and position of the tooth in the arch. A molar that's buccally, lingually, mesially or distally tilted can't be resected.
- Divergence of the roots- teeth with divergent roots are easy to resect, nearly approached or fused roots are poor campaigners.
- Length and curve of roots- long and straight roots are more favourable for resection than short, conical roots.
- Feasibility of endodontics and restorative dentistry in the roots to be retained.

Bühler stated that hemisection should be considered before every molar extraction, because this procedure can provide a good absolute biological cost savings with good long term success.³

Carnevale reported a group of 72 cases with 175 furcated molars, treated with root resection and prosthetic restoration and followed longitudinally for 10yrs. The healing results attained after remedy were maintained with minimum variations until completion of the study. At the 10- year examination the tooth survival rate was: 93 and the prosthetic survival rate was: 96. The causes of failure were: periapical granuloma (4 teeth), secondary decay (3 teeth), recurrence of periodontitis (3 teeth) and root fracture (2 teeth).³

Carnevale⁵(1995) suggested the following sequence of therapy:

Phase 1 Endodontic treatment

Phase 2 Crown build-up

Phase 3a Root resection or root separation during preliminary prosthetic prep

Phase 3b Relining and insertion of prefabricated shell provisional restoration

Phase 3c Impression for a corroborated (metal reinforced) provisional restoration

Phase 4 Insertion of the corroborated provisional restoration

Phase 5a Periodontal surgery

Phase 5b Root resection or root separation if not previously executed

Phase 5c Tooth preparation during surgery

Phase 5d Relining of the corroborated provisional restoration

Phase 6 Clinical and radiographic re-evaluation

Phase 7 Final prosthetic tooth preparation and impressions

Phase 8 Insertion of definitive prosthetic reconstruction

" According to Newell⁶, the advantage of the amputation, hemisection is retention of some or all of the tooth. Still ,the disadvantage is that the remaining root or roots must undergo endodontic Remedy and the crown must undergo restorative procedure. Still, failure to perform endodontic care first isn't a contraindication for root resectioning, if it can be determined that a successful root canal filling is practical and possible.

It has been shown that vital root resections are possible, especially in maxilla with symptoms not being manifested until several weeks after the placement of a sedative dressing of choice. Vittles also must be made to stabilize the remaining portion of the molar, unless it formerly serves as a bridge abutment. On the other hand, if a hemisection is performed, the remaining root may be used as an abutment for a small bridge; alternately, it may remain as a single crown or be used as a telescopic crown. When a bisection is performed, each root of the molar created by the bicuspidization should stand on its own, unaided by splinting.

An inaptly shaped occlusal contact area may convert respectable forces into destructive forces and Dispose the tooth to trauma from occlusion and ultimate failure of hemisection. In the case reported, colorful aspects of occlusal function similar as position and size of connections and the steepness of cuspal inclines may have played a significant part in causing mobility before treatment. During treatment, occlusal connections were reduced in size and dislocated more positively. Lateral forces were reduced by making cuspal inclines less steep and eliminating balancing incline contacts.⁷

CONCLUSION

Hemisection is thus a good treatment option for periodontally compromised teeth, and a proper case selection is necessary for long-term success of the procedure. With recent refinements in endodontics, periodontics, and restorative dentistry, hemisection is a ray of hope for a hopeless tooth.

This case report presents a technique for the dentist to offer patients to maintain tooth structure where that structure is compromised.

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