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CASE REPORT

RESECT TO RESTORE: HEMISECTION – REPORT OF TWO CASES

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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. Periodontally diseased teeth with severe bone loss may well be retained by removal of one or more of their roots. The term hemisection refers to the sectioning of a molar tooth, with the removal of an unrestorable root which may be affected by periodontal, endodontic or caries.

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Introduction:-

Root amputation procedure may be indicated when a multirooted tooth has one root that cannot be retained and the other roots have adequate periodontal support and the remaining crown structure can be restored.[1] Grossman has referred to root amputation as a dental proof of the old adage that half a loaf is better than none.[2] Thus tooth resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth[3].

Various resection procedures described are : root amputation, hemisection, radisection and bisection. Hemisection denotes removal or separation of root with its accompanying crown portion of mandibular molars[4].

As always, case selection is an important factor in success. Proper diagnosis, treatment planning, case presentation, and good restorative procedures are all critical factors equally important to the resective procedure itself. Bony support, the crown–root ratio, occlusal relations, and restorability of the remaining segment all determine the case outcome[1].

Weine[4] has briefed various tooth resection indications that includes: Severe vertical bone loss involving only one root of multi-rooted teeth, through and through furcation destruction, unfavorable proximity of roots of adjacent teeth preventing adequate hygiene maintenance in proximal areas, severe root exposure due to dehiscence, vertical

root fracture confined to a single root of a multirooted tooth or any severe destructive process that is confined to a single root, including caries, external root resorption, and trauma.

Case reports:-

Case I:-

A 45 years old man reported to the department of conservative dentistry and endodontics, with the chief complaint of pain and mobility of left mandibular first molar since 4 months. On examination, the tooth was sensitive to percussion and revealed grade 1+ mobility. On probing the area, there was a 13 mm deep periodontal pocket around the mesial root of the tooth (Fig 1). On radiographic examination, severe vertical bone loss was evident surrounding the mesial root and involving the furcation area. The bony support of distal root was completely intact (Fig. 2). It was planned that the mesial root should be hemisected after completion of endodontic therapy of the tooth[6].

The working length was determined and the canals were biomechanically prepared using stepdown technique. Obturation was done with lateral condensation method in the distal root only and the chamber was filled with composite to maintain a good seal (fig 3).

Amputation of mesial half (crown and root) was done with vertical cut method (Fig 4). The crown was cut with a long shank tapered fissure carbide bur was used to make vertical cut toward the bifurcation area. A fine probe was passed through the cut to ensure separation. The mesial root was extracted and the socket was irrigated adequately with saline to remove bony chips and composite debris (Fig 5&6). The furcation area was trimmed to ensure that no spicules were present to cause further periodontal irritation. Scaling and root planning of the root surfaces, which became accessible on removal of mesial root was done. The extraction site was irrigated, debrided and sutured with 3/0 black silk sutures.

After healing of the tissues, fixed bridge involving retained distal half and mandibular second pre molar with sanitary pontic was planned (Fig 7 a&b).

Fig 1: Preoperative

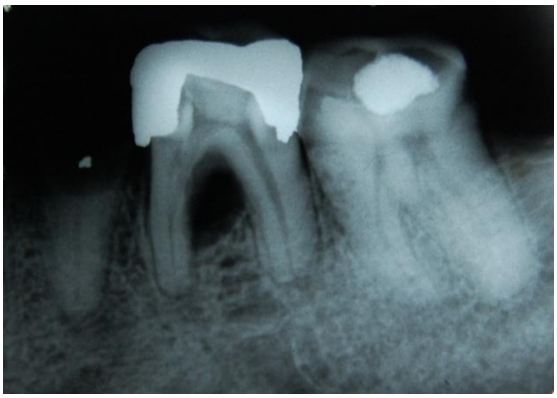

Fig 2: Preoperative radiograph showing Vertical bone loss around mesial root

Fig 3: Obturation in distal root only

Fig 4: Vertical cut toward bifurcation area

Fig 5: Retained distal root

Fig 6: Extracted mesial half

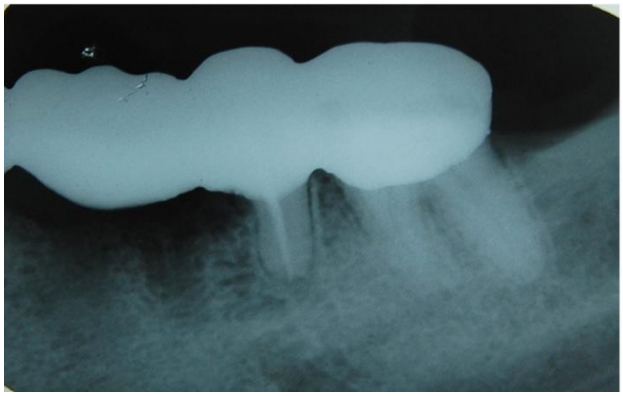

Fig 7a: Radiograph after bridge cementation

Fig 7b: After prosthetic rehabilitation

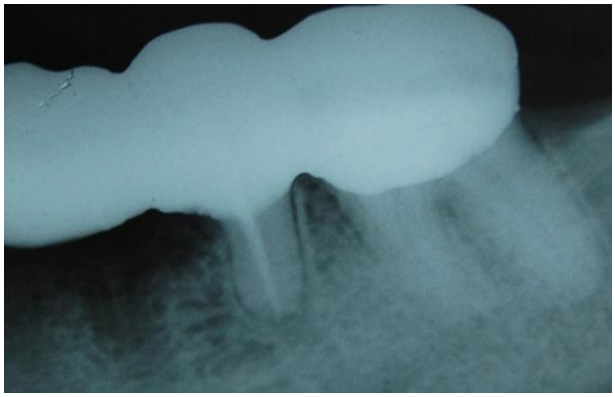

Fig 8: 9 month follow up

Case II:-

A 50 year old female patient came to Department of Conservative Dentistry and Endodontics with the chief complain of pain on chewing food and food lodgment on lower left back tooth region since 2 months. On intra oral examination, 36 was found grossly decayed with caries involving the total distal half of crown (Fig 1). On radiological examination (Fig 2) confirmed dental caries in relation to 36 with furcation invovlment. The extent of decay rendered the tooth non restorable and the patient was explained different treatment options and she opted for hemisection.

Under local anaesthesia, access preparation was done in tooth 36 and biomechanical preparation was done with protaper rotary instruments. Obturation was done by cold lateral compaction method in mesial root only. Access cavity was restored with composite restoration (Fig. 3). Vertical cut method was used for hemisection using a long shank tapered fissure diamond at the bifurcation area (Fig 4). With the help of probe the separation was ensured. The distal root was removed with forcep. (Fig 5a). The socket was irrigate with saline. The flap was repositioned and sutured. To confirm, an intraoral periaical radiograph was taken. (Fig 5b). The occlusal table was minimized to redirect the forces along the long axis of the mesial root. After the healing of tissues, fixed bridge was placed using the mesial root of tooth 46 as abutments (Fig 7&8).

Fig 1: Preoperative

Fig 2: Preoperative radiograph

Fig 3: Obturation in mesial root only

Fig 4: Vertical cut toward bifurcation area

Fig 5a: Retained mesial root

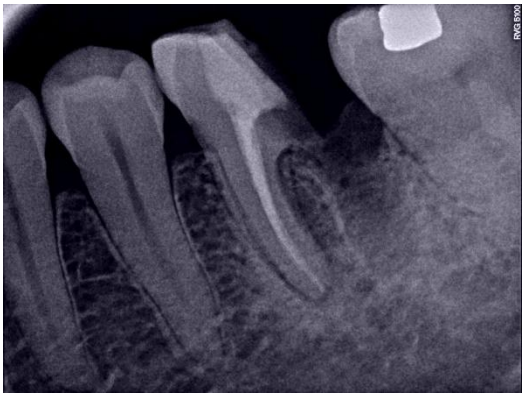

Fig 5b: Radiograph showing completely removed distal half

Fig 6: Extracted distal half

Fig 7: After Prosthetic Rehabilitation

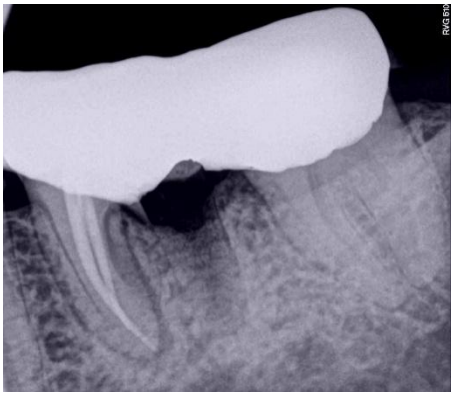

Fig 8: Radiograph after bridge cementation

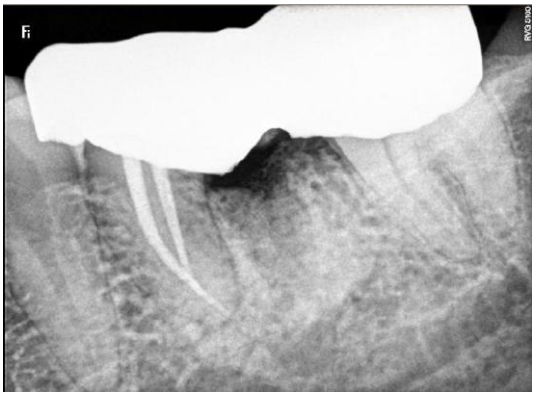

Fig 9: 9 month follwup

Discussion:-

Hemisection represents a form of conservative procedure, which aims at retaining as much of the original tooth structure as possible[5]. The results are durable, and success rates are high if certain basic considerations are taken into account.[6] Periodontal, prosthodontic, and endodontic assessment for appropriate selection of cases is important. Success of root resection procedures depends, to a large extent, on proper case selection.

Buhler stated that hemisection should be considered before every molar extraction,[7] because it provides a good, absolute, and biological cost saving alternative with good long-term success. A guiding principle should be to try and maintain what is present.[8] 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 site of hemisection are more susceptible to caries. Failure of endodontic therapy due to any reason will cause failure of the procedure. Unfortunately, a restoration can contribute to periodontal destruction, if 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. In the case reported, various aspects of occlusal function such as location and size of contacts and steepness of cuspal inclines were considered seriously before prosthetic treatment. During treatment, occlusal contacts were reduced in size and repositioned more favorably. The keys to long-term success include thorough diagnosis, selection of patients with good oral hygiene, careful surgical and restorative management.

Hemisection may be a suitable alternative to extraction and implant therapy and should be discussed with patients during consideration of treatment options.[9]The results obtained with this tooth offer possibility of a successful repair technique for this otherwise hopeless complication of endodontic therapy. To conclude, we recommend hemisection

as a treatment option to conserve tooth structure and use it as an abutment. The prognosis of root resected molars may not be as grim as previously believed; rather such teeth can function successfully for long periods. It is thus a conservative option with acceptable prognosis.

Conclusion:-

Prognosis for hemisection is the same as for routine endodontic procedures provided that case selection has been correct, the endodontic treatment has been performed adequately, and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient. It is a successful and valuable alternative treatment to extraction and implant in cases suitable for this treatment and should always be a part of the restorative and prosthetic clinical practice.

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