PREMOLARIZATION TO SALVAGE HOPELESS TEETH- A TEAM APPROACH

Patni P,* Bhutada G, Deshraj Jain D,*** Goel G.******

The article describes a simple procedure for premolarisation in mandibular molar and its subsequent restoration.

INTRODUCTION

The progression of inflammatory Pulpal-periodontal disease may affect the bifurcation & trifurcation of multirooted teeth. The Furcation areas are difficult to debride by routine endodontic procedure, periodontal instrumentation & home care.[4]

Modern advances in all phases of dentistry have provided the opportunity for such patients to maintain a functional dentition for lifetime. Therapeutic measures performed to ensure retention of teeth vary in complexity. The treatment may involve combining restorative dentistry, endodontics, periodontics and prosthodontics so that the teeth are retained in whole or in part. Such teeth can be useful as independent units of mastication or as abutments in simple fixed bridges. Continued periodontal breakdown may lead to total loss of tooth unless these defects can be repaired or eliminated and health of the tissues restored.[11]

But there are few treatment modalities available for advanced cases of furcation like Resective Procedures designed to eliminate the morphological characteristic & create an area conducive for good oral hygiene. Resective procedures are root resection, hemisection[1,6], radisection and bicuspidization. Root amputation refers to removal of one or more roots of multirooted tooth while other roots are retained. Hemisection denotes removal or separation of root with its accompanying crown portion of mandibular molars. Radisection 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[2].

Carnevale in 1995 defined "Premolarization" as the sectioning of the root complex and the maintenance of all roots in the form of two premolars.[3]

INDICATIONS

1. In mandibular pulpal periodontal problems leading to Class III furcations where adequate bone support present to maintain both the roots individually[5]
2. Destruction of tooth structure in furcation area
3. Perforation of the pulpal floor during endodontic treatment[3]

CONTRA INDICATIONS

1. Bone support is inadequate to maintain the roots individually.
2. 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 amputed.
3. Strong adjacent teeth available for bridge abutments as alternatives to hemisection.
4. Inoperable canals in root to be retained
5. Root fusion-making separation impossible.
6. Severe destructive process: This may occur as a result of furcation or sub. gingival caries, traumatic injury, and large root perforation during endodontic therapy.
7. Poor oral hygiene maintenance by the patient.

**Asst. Prof., Dept. of Endodontics, SAIMS Dental College, Indore*
***Asst. Prof., Dept. of Periodontology, VSPM, Nagpur*
****Prof. & Head, Dept.*
*****PG Student, Dept. of prosthodontics, Govt. Dental College, Indore.*

CASE REPORT

A 23 years old female reported with the complaint of swelling in left mandibular first molar region. On examination, a painless, circumscribed, soft & fluctuant swelling associated with 36 was seen which was clinically diagnosed as a pulpo-periodontal lesion (fig.1). The tooth was sensitive to percussion and revealed grade 2+ mobility. On probing the area with Naber's probe, there was a through and through (9 mm) penetration in the furcation area suggesting class III furcation involvement[4] (fig.2).



Fig. 1: Preoperative.



Fig. 2: Preoperative showing Furcation involvement.

On radiographic examination, vertical bone loss was evident involving the furcation area. (fig.3)

After discussion with the specialists from different branches of dentistry i.e endodontist, periodontist and prosthodontist a treatment plan was formulated to salvage the tooth. The treatment plan

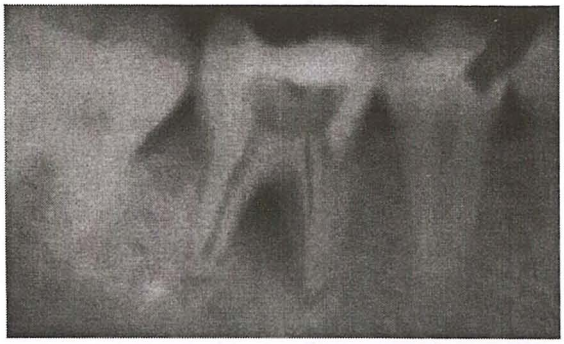


Fig. 3: Preoperative IOPA.

and the risks involved were explained to the patient and an informed consent was obtained.

As part of treatment plan Abscess drainage was first done under antibiotic cover. The working length was determined and the canals were biomechanically prepared using stepback technique. The canals were obturated with lateral condensation method and the chamber was filled with temporary cement and the tooth was kept under observation for about one month.(fig 4)

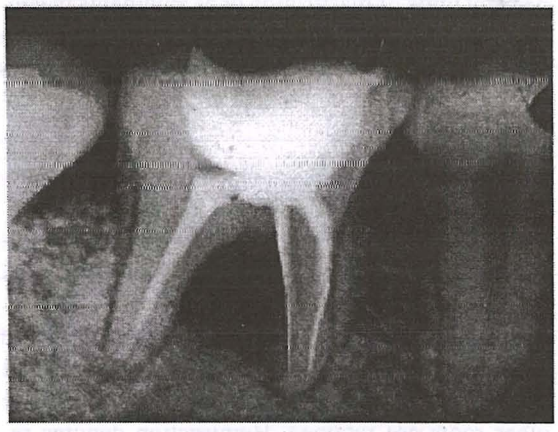


Fig. 4: After endodontic treatment

Under local anesthesia, full thickness flap was reflected by giving a crevicular incision from first premolar to second molar. Upon reflection of the flap, the bony defect in the furcation area became quite evident. All chronic inflammatory tissue was removed with curets to expose the bone. The tooth

was cut with a long, thin fissure bur from the buccal aspect towards lingual with the bur held parallel to the long axis of the tooth. A fine probe was passed through the cut to ensure separation and examined for any residual root spurs or ledges to ensure that no spicules were present to cause further periodontal irritation. Scaling and root planning of the root surfaces, which became accessible on splitting the tooth root was done. The site was irrigated and debrided and the flap was then repositioned and sutured with 3/0 black mersilk sutures. Sutures were removed after one week and the tooth kept under observation for one month.(fig.5)



Fig. 5: One month after endodontic treatment.

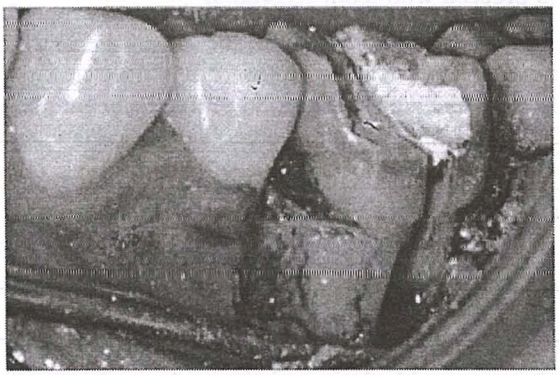


Fig. 6: Splitting of tooth.

The importance of Prosthodontic restoration of the tooth is of paramount to ensure long term success of the procedure.[13,14] The margin placement, contacts and contours which are conducive to oral hygiene maintenance by the patient and the planning of occlusal anatomy of the crowns to ensure decreased deteriorating forces.

The two sections of the tooth were individually prepared to receive metal fused to porcelain full coverage restorations.(fig.6) The restorations were fabricated with due care to the contact area and proximal contours so that gingival embrasure area was accessible to cleansing with an inter-proximal brush.(fig.7, 8)

The tooth was evaluated periodically and excellent and remarkable periodontal healing and functional condition was observed after six months (fig.10) and two years (fig.11).

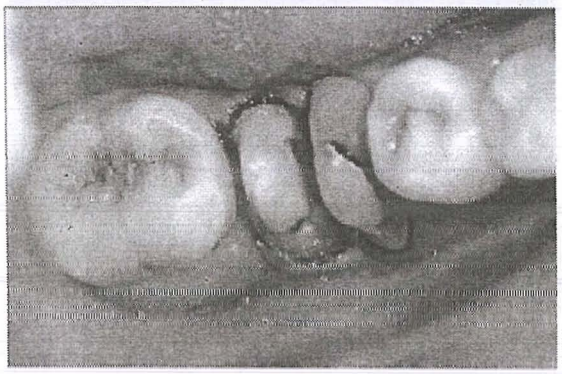


Fig. 7: Crown preparation done.

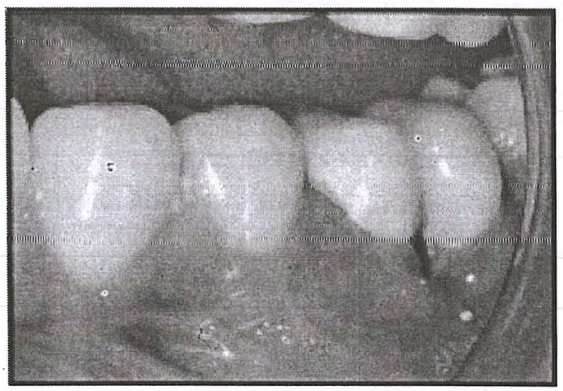


Fig.8: Postoperative view.

DISCUSSION

Success of root resection procedures depend, to a large extent, on proper case selection. It is im-

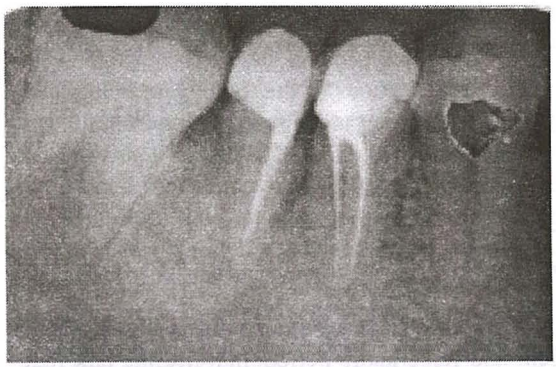


Fig. 10: Follow up after six months.

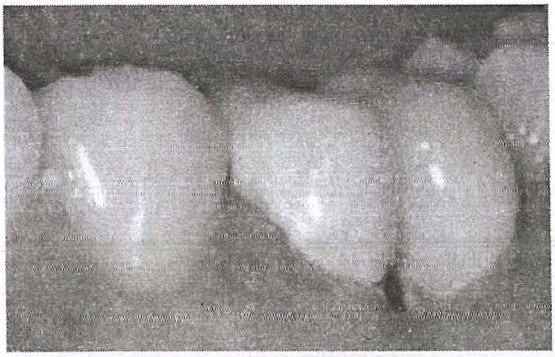


Fig. 11: Follow up after two years.

portant to consider the following factors before deciding to undertake any of the resection procedures.

- Angulations and position of the tooth in the arch. A molar that is buccally, lingually, mesially or distally tilted, cannot be resected.
- Divergence of the roots - teeth with divergent roots are easier to resect. Closely approximated or fused roots are poor candidates.
- Length and curvature of roots - long and straight roots are more favourable for resection than short, conical roots.
- Feasibility of endodontics and restorative dentistry in the crown and root/roots to be retained.[7]

Hemisection has been used successfully to retain teeth with furcation involvement[8,9]. 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 the site of hemisection are more susceptible to caries. Often a favorable result may be negated by decay after treatment. Failure of endodontic therapy due to any reason will cause failure of the procedure.

In addition, when the tooth has lost part of its root support, it will require a restoration to permit it to function independently or to serve as an abutment for a splint or bridge. Unfortunately, a restoration can contribute to periodontal destruction, if the 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 the procedure.

The possibility of successfully performing premolarization requires a comprehensive evaluation of endodontic and surgical components of treatment.

The prognosis of the endodontic treatment needs to be carefully evaluated before making a decision to proceed with tooth separation[7].

In the case reported, the success of the procedure may very well be attributed to proper case selection, meticulous execution of the treatment plan by various specialists to work as a team and maintenance of excellent oral hygiene by the patient.

CONCLUSION

The prognosis for premolarisation 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.

Premolarisation should thus be considered as another weapon in the arsenal of the dental surgeon, determined to retain and not remove the natural teeth. With recent refinements in endodontics,

Continued on Page 34

Oral Med Oral Pathol Oral Radiol Endod 1996; 82: 466-9

10. Arathi R, Ashwini R. Supernumerary teeth: A case report. Journal of Indian Society of Pedodontics and Preventive Dentistry 2005; 23: 103-105
11. Hulsmann M. Severe dens invaginatus malformation, Report of two cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1996; 82: 456-8.
12. Kirzioðlu Z, Ceyhan D. The prevalence of anterior teeth with dens invaginatus in the western mediterranean region of Turkey. Int Endod J. 2009; 42(8):727-34. Epub 2009.
13. Tiku A, Nadkarni UM, Damle SG. Management of two unusual cases of dens invaginatus and talon cusp associated with other dental anomalies. J Indian Soc Ped Prev Dent 2004; 22(3): 128-133.
14. Chen YHM, Tseng CC, Harn WM. Dens invaginatus.Review of formation and morphology with 2 case reports. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998; 86: 347-52.

Continued from Page 30

periodontics and prosthetic dentistry, premolarisation has received acceptance as a conservative and dependable dental treatment and teeth so treated have endured the demands of function.

References

1. Basaraba N. Root Amputation and tooth hemisection. DCNA 1969;13 : 121.
2. Weine FS. Endodontic Therapy, 5th Edition.
3. Ingle JI and Bakland LK. Enddodontics, 4th Edition.
4. Carranza and Newman. Clinical Periodontology, 8th edition WB. Saunders Co., Philadelphia.
5. Staffileno HJ. Surgical treatment of Furcation Invasion, DCNA 1969; 103-119.
6. Kost WJ, Stakiw JE. Root amputation and hemisection J. Canad Dent Assoc 1991; 57: 42-5.
7. Biesterfeld RC and Taintar JF : Endodontic considerations related to hemisection and root amputation. N W Dent 1978;157:142-148.
8. Ross IF and Thompson RH. : A long term study of root retention in the treatment of maxillary molars with furcation involvement. J Periodontol; 49: 238-244.
9. Basten CH, Persson R: A long term evaluation of root resected molar. Int. J Periodontics 1996;16(3):207.
10. Soft tissue management JOE 2003 vol no.4 page no 121
11. Lindhe: Textbook of Periodontology.
12. Gutman : Endodontic surgery.
13. Rosenstcil : Contemporary Fixed Prosthodontics: 4th edition.
14. Shillinburg: Fundamentals of Fixed Prosthodontics.

PROF U S KRISHNA NAYAK AWARDED



Prof. U.S. Krishna Nayak awarded has been awarded the 'Man of the Year – India 2009' award by the American Biographical Institute, Pennsylvania, USA. Nayak has been chosen for this award for his significant lifetime contributions and accomplishments.

Congratulations.