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RESTORATION OF GROSSLY MUTILATED TEETH WITH FURCATION INVOLVEMENT RESTORED WITH CAST POST - A CASE REPORT

Dental Science

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ABSTRACT

AIM: - This case report describes successful management of a grossly mutilated mandibular molar tooth.

SUMMARY:- A 25 year old male patient came to our college in the department of conservative dentistry and endodontics .

Patient complains of continuous pain with sensitivity to hot and cold stuffs and food impaction in relation to mandibular right molar region since 1 year. The IOPA reveals a grossly mutilated mandibular right second molar with furcation involvement.

The root portion of the tooth seems to be healthy with no signs of resorption. Endodontic treatment was performed with proper isolation with rubber dam. After complete removal of carious lesion and biomechanical preparation and obturation the core build up was done using coremax as core building material.

Thereafter hemisection was done and the mesial and the distal roots were separated leaving the furcation area open as it is not possible to seal the furcation area and keep it self cleansing with out separating the two roots. A cast post (custom made post) was planned and placed over the distal root and the crown preparation was done on both the mesial and the distal roots and a prosthesis in the shape of a premolar was given separately on the both the roots.

Thereafter proper oral hygiene maintenance instructions were explained to the patient. The patient was observed at 3 months and 6 months intervals. Radiographically there was no pathology and signs of resorption was observed and clinically the gingival tissues were healthy and the tooth was working perfectly fine

Key learning points:-

Ø Grossly mutilated molar tooth

Ø Restoration with post endodontic restoration

KEYWORDS

Grossly mutilated mandibular molar tooth, Post endodontic restoration, Cast post, Core max

INTRODUCTION:-

All the teeth that have undergone root canal therapy will require some form of restoration to enable them to function again. Because endodontic treatment removes the vital contents of the canal, which subsequently leads to reduction in elasticity, dessication and increases brittleness of remaining tooth structure. The objective is to return them to full occlusal and cosmetic function.[24,25,26]

It is the manipulation of the pulp chamber that leads to the greatest weakness of a treated tooth. The roof of the pulp chamber has the configuration of an arch, which extremely resist to pressure and stress. When the roof of the pulp chamber is removed for endodontic access, the inherent resistance of the treated tooth is greatly reduced. This weakening leads to the need for strong interior as well as exterior support that is achieved by post core system. Often due to mechanical reasons, the prepared tooth is reinforced by post core systems. [19,36]

When restoring an endodontically treated tooth the dentist must ask two questions:

1) is a post required and
2) what type of restoration is indicated?

The former concern is where our central issue lies. A post is a dental material placed in the root of a structurally insufficient tooth when additional retention is needed to retain the core and coronal restoration.[17]

The post should provide this support without increasing the risk of root fracture. The core itself is a dental restoration commonly made of composite resin used to build up missing tooth structure, usually for future restoration with a crown. It is worth noting that the *post itself does not strengthen or reinforce the tooth*; the inherent strength of the tooth and its resistance to fracture comes from the remaining tooth structure and the surrounding alveolar bone.[3]

Custom cast tapered post and core procedure have been the traditional way to restore endodontically treated teeth, however the use of prefabricated post has become increasingly popular and easy to manipulate.[14,16]

Current researchers recommend consideration of necessity of post placement before reconstruction of an endodontically treated teeth. Several in vitro studies support the opinion that preservation of tooth structure is one of the most important variables in successful restoration of endodontically treated teeth.[1]

Previously a preferable treatment for the badly broken down endodontically treated teeth were the removal of the offending tooth but now with recent advance and improved techniques it has become very much possible to preserve a tooth which is structurally compromised .

The predominant opinion today is that a post & core should be used to increase the retention for the fixed prosthetic reconstruction and not for reinforcement[12]

This article presents a case report on the treatment outcome of prosthetic treatment of structurally compromised dentitions, with the main emphasis on often-compromised endodontically treated teeth.

CASE REPORT:-

Mr. Abhimanau Singh age 25 year male came to our clinic complains of continuous pain with sensitivity to hot and cold stuffs and food impaction in relation to mandibular right molar region since 1 year. The IOPA reveals a grossly mutilated mandibular right second molar with furcation involvement.



PREOPERATIVE RADIOGRAPH



PREOPERATIVE PHOTOGRAPH

Clinically the crown was grossly decayed. Radiographically the root portion of the tooth seems to be healthy with no signs of resorption except for the soft caries that can be excavated easily.

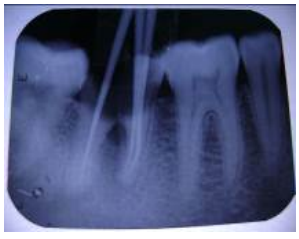
Treatment:-

After complete examination we planned to save the tooth whole procedure was thoroughly explained to the patient and with patient consent we procceded for the restorative treatment.

After Proper scaling the carious lesion was removed and with proper isolation with the rubber dam complete biomechanical preparation and obturation was done and the core build up was done using core max as a core-building material.



INSTRUMENT X-RAY



MASTER CONE X-RAY

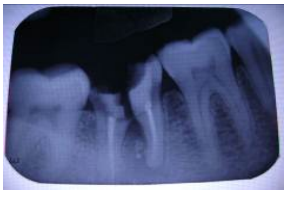


CORE BUILD UP DONE

Following the root canal treatment teeth was sectioned in two halves through the furcation area splitting the mesial and the distal roots. The furcation area was thoroughly cleaned and subgingival curettage was performed and a periodontal dressing was placed and the patient was recalled after one week.



SUBGINGIVAL CURETTAGE



SPLITTING OF ROOTS

The gingival tissues were healthy and we now proceed for the restorative treatment. The mesial root had sufficient tooth structure for the placement of the crown but the distal root did not have sufficient tooth structure to retain the cast crown.

Thereafter we planned for a cast post in the distal root so that it holds the crown. The cast post was seated into the distal canal , the crown preparation was performed on both the roots and two separate porcelain fused to metal premolar crowns were fabricated for the prosthodontic restoration and to bring the tooth in centric occlusion to get proper form and function



CAST POST CEMENTED



CROWNS CEMENTED

The patient were completely educated of the oral hygiene measures like the use of interdental tooth brushes and a dental floss to keep the area clean

The patient was observed after 1 month for follow up , no signs of inflammation or any periapical changes was observed and the tooth was working perfectly fine. The patient was later observed at 3 months and 6 months interval. Radiographically there was no signs of periapical changes and the tooth was working fine as a normal tooth.



Preoperative radiograph



postoperative photograph

DISCUSSION:-

Several clinical reports have demonstrated successful treatment of badly broken down endodontically treated teeth. Previously a preferable treatment for the badly broken down endodontically treated teeth were the removal of the offending tooth but now with recent advance and improved techniques it has become very much possible to preserve a tooth which is structurally compromised .

Dental casting alloys, amalgam, resin composites, and ceramic materials may be used as core materials.

Glass-ionomer materials, with or without silver alloy, should be avoided as core materials because of their weak tensile strength and lower resistance to fracture. In vitro studies report a higher frequency of core failures for composite cores than for metal cores. However, the force distribution is altered once a crown embracing the root is placed; the more remaining dentin, the less significant are the mechanical properties of the core materials. One proposed guideline is that a direct technique with a composite buildup may be an alternative when more than one third of the coronal dentin remains.

Success of root resection procedures depend, to a large extent, on proper case selection. It is important to consider the following factors before deciding to undertake any of the resection procedures. Advanced bone loss around one root with acceptable level of bone around the remaining roots.

Angulation and position of the tooth in the arch. A molar that is buccally, lingually, mesially or distally titled, can not be resected.

Divergence of the roots - teeth with divergent roots are easier to resect. Closely approximated or fused roots are poor candidates.

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 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 hemisection. Post-treated teeth show periapical infections more frequently than do other endodontically treated teeth; care to avoid microleakage during post canal preparation, provisional restoration, and post cementation has a positive effect on the life of both the post-treated tooth and prosthetic reconstruction.

Bacteria and endotoxins from the saliva can penetrate unsealed full-sized root canal fillings. The longer the exposure time to saliva, the greater is the risk of microleakage. The shorter the root filling, the greater also is the risk of microleakage. The seal is thus markedly compromised by a post preparation, after which only a small volume of obturating material remains as a barrier against penetration of microorganisms and toxins. This causes a dilemma for the operator, who often needs a long retentive post. An absolute minimum of 3 mm remaining gutta percha has been suggested, but the less remaining obliterating material, the more the post space should be regarded as an unsealed root canal.

Technical failures on fixed prosthodontics are often caused by fatigue fractures. The abutments, cement, and reconstruction are all subject to fluctuating stress/strain caused by occlusal loads. Cyclic deformation during function may cause formation and propagation of a crack at the weakest point or where the maximum stress occurs. Horizontal occlusal forces accelerate the process, and occlusal design of the prosthesis is a decisive factor in avoiding technical failures on abutments and reconstructions. Favorable occlusal prosthesis design is probably far more important for survival of structurally compromised endodontically treated teeth than is the type of post used.

With recent refinements in endodontics, periodontics and restorative dentistry, hemisection has received acceptance as a conservative and dependable dental treatment and teeth so treated have endured the demands of function.

The literature points to nonaxial forces as a risk for fatigue fracture of teeth, cement, and restorative material. Favorable occlusal prosthesis design is probably more important for survival of structurally compromised endodontically treated teeth than is the type of post used.

CONCLUSION:-

With several studies in account it can be stated that though the prognosis of restoration of badly broken down endodontically treated teeth is not so good and a lot depends initially on the amount of tooth structure available and the extent of the lesion but with recent advances in techniques and material it is very much possible to bring a tooth in a normal working condition thus preventing unwanted loss of the dentition.

REFERENCES :-

1. Assif D, Gorfil C. Biomechanical considerations in restoring endodontically treated teeth. J Prosthet Dent 1994;71:565–567.
2. Barkhordar RA, Radke R, Abbasi J. Effect of metal collars on resistance of endodontically treated teeth to root fracture. J Prosthet Dent 1989;61:676–678.
3. Mentink AGB, Creugers NHJ, Meeuwissen R, Leempoel PJB, Käyser AF. Clinical performance of different post and core systems—Results from a pilot study. J Oral Rehabil 1993;20:577–584
4. Basaraba N. Root Amputation and tooth hemisection. Dent Clin of N Amer 1969;13 : 121
5. Weine FS. Endodontic Therapy, 5th Edition.
6. Ingle JI and Bakland LK. Enddodontics, 4th Edition.
7. Carranza and Newman. Clinical Periodontology, 8th edition WB. Saunders Co., Philadelphia.
8. Staffileno HJ. Surgical treatment of Furca Invasion, Dent Clin of N Amer 1969; 103-119.
9. Kost WJ, Stakiw JE. Root amputation and hemisection J. Canad Dent Assoc1991; 57: 42-5.
10. Biesterfeld RC and Taintar JF : Endodontic considerations related to hemisection and root amputation. N W Dent 1978;157:142-148.
11. 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
12. Goodacre CJ, Spolnik KJ. The prosthodontic management of endodontically treated teeth: a literature review. Part III. Tooth preparation considerations. J Prosthodont 1995;4:122–8.
13. Goodacre CJ, Spolnik KJ. The prosthodontic management of endodontically treated teeth: a literature review. Part II. Maintaining the apical seal. J Prosthodont 1995;4:51–3.
14. Heydecke G, Peters MC. The restoration of endodontically treated, single-rooted teeth with cast or direct posts and cores: a systematic review. J Prosthet Dent 2002;87:380–6.
15. Glickman GN, Pettiette MT (2006) Preparation for treatment. In: Cohen S, Hargreaves K, eds. Pathways of the Pulp, 9th edn. St Louis, MO, USA: Mosby, pp. 97–135.
16. Akkayan B, Gulmez T (2002) Resistance to fracture of endodontically treated teeth restored with different post systems. Journal of Prosthetic Dentistry 87, 431–7.
17. Soares CJ, Pizi EC, Fonseca RB, Martins LR (2005) Influence of root embedment material and periodontal ligament simulation on fracture resistance tests. Brazilian Oral Research 19, 11–6.
18. Sorensen JA, Engelman MJ (1990) Effect of post adaptation on fracture resistance of endodontically treated teeth. Journal of Prosthetic Dentistry 64, 419–24.
19. Sornkul E, Stannard JG (1992) Strength of roots before and after endodontic treatment and restoration. Journal of Endodontics 18, 440–3.
20. Stankiewicz NR, Wilson PR (2002) The ferrule effect: a literature review. International Endodontic Journal 35, 575– 81.
21. Chan RW, Bryant RW: Post-core foundations for endodontically treated posterior teeth. J Prosthet Dent 1982;48:401-406
22. E. Nicholis, "Endodontics", 3rd Edn, 1984,353-76.
23. Pitt Ford, "Harty's Endodontics in Clinical Practice", 4th Edn, 251-281.
24. Grossman, "Endodontic Practice" 316-317.
25. Ingle, Chap-19, "Restoration of Endodontically Treated Teeth", 2002 Edn., 913-950.
26. Mumford & Jedvnakiewicz, "Principles of Endodontics", 1988, 163-83.
27. Walton Torabinejad, "Principles and Practice of Endodontics", 3rd Edn, 268-81.
28. Harold Gerstein, "Technique In Clinical Endodontics" 347-87.
29. Pitt Ford, "Problem-solving in Clinical Practice" 149-164.
30. Gutmann, "Problem-solving in Endodontics" 3rd Edn, 325-46.
31. Hedlund SO, Johansson NG, Sjögren G. Retention of prefabricated and individually cast root canal posts in vitro. Br Dent J 2003;195:155-8.
32. Craig RG, Ward ML, eds. Restorative dental materials. 10th ed. St Louis: Mosby, 1997:137.
33. Eissmann HF, Radke RA Jr. Postendodontic restoration. In: Cohen S, Burns RC, eds. Pathways of the pulp. 4th ed. St Louis: Mosby; 1987:640-3.
34. Aquilino SA, Caplan DJ. Relationship between crown placement and the survival of endodontically treated teeth. J Prosthet Dent 2002;87:256-63.
35. Chan FW, Harcourt JK, Brockhurst PJ. The effect of post adaptation in the root canal on retention of posts cemented with various cements. Aust Dent J 1993;38:39-45.
36. Sedgley CM, Messer HH. Are endodontically treated teeth more brittle? J Endodon 1992;18:332–5.
37. Goodacre CJ, Spolnik KJ. The prosthodontic management of endodontically treated teeth: a literature review. Part I. Success and failure data, treatment concepts. J Prosthodont 1994;3:243–50.
38. Rosenstiel SF, Land MF, Fujimoto J: Restoration of the endodontically treated teeth. InRosenstiel SF, Land MF, Fujimoto J (eds): Contemporary Fixed Prosthodontics (ed 2). St Louis, MO, Mosby, 1994, pp. 238-267
39. Balkenhol M, Wostmann B, Rein C, Ferger P. Survival time of cast post and cores: a 10-year retrospective study. J Dent 2007;35:50-58.