



MANAGEMENT OF ENDO-PERIO LESION WITH HEMISECTION AND BONE AUGMENTATION OF INFRABONY DEFECT WITH CALCIUM ENRICHED MIXTURE (CEM) CEMENT [ALLOPLAST] AND - PRF A CASE REPORT

Dental Science

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ABSTRACT

Endodontic periodontic lesions often creates dilemma to the clinician in making final diagnosis and treatment plan. In cases where there is severe destruction of one root of a tooth due to caries, splitting of the two roots and removal of one root along with associated crown structure is considered as a treatment modality. In cases where there is caries extending upto pulp associated with severe bone loss, bone augmentation of infrabony defect can be done ,following the initial endodontic phase of root canal treatment. In this case report root canal treatment was performed on both, endoperiodontally involved mandibular first and second molar . Hemisection of distal root of 47 was done ,following which the infrabony defect persistent in 46 was augmented using CEM (calcium enriched mixture) cement and PRF.

KEYWORDS

Calcium Enriched Mixture, Endo-periolesion, Hemisection.

INTRODUCTION

“When the total loss is inevitable wisemen sacrifice self”-Sushrutha . Endo -periodontal lesion is a pathologic communication between the pulpal and periodontal tissues at a given tooth that may occur in an acute or a chronic form. ^[1] There are various modalities for saving the teeth affected with such lesions. But preservation of such teeth becomes difficult when they there is severe loss of attachment, bone loss , and furcation involvement . In such cases hemisection of the involved tooth helps to remove the structurally compromised root structure along with the associated coronal structure through intentional excision. Presence of advanced bone loss with reduced periodontal support makes the prognosis of such teeth poor or hopeless. A Combined usage of bone grafting procedure along with incorporation of Plasma Rich Fibrin (PRF) helps to resolve this problem to a certain extent. ^[2]

Classification of endo -periodontal lesions (2017 World Workshop) ^[1]

- I. Endoperio lesion with root damage
 - Root fracture or cracking
 - Root canal or pulp chamber perforation
 - External root resorption
- II. Endoperio lesion without root damage
 - a. Endoperiodontal lesions in periodontitis patients
 - I.) Grade I - narrow deep periodontal pocket in 1 tooth surface
 - ii.) Grade II - wide deep periodontal pocket in 1 tooth surface
 - iii.) Grade III - deep periodontal pocket in >1 tooth
 - b. Endoperiodontal lesions in non-periodontitis patients
 - I.) Grade I - narrow deep periodontal pocket in 1 tooth surface
 - ii.) Grade II - wide deep periodontal pocket in 1 tooth surface
 - iii.) Grade III - deep periodontal pocket in >1 tooth.

Calcium Enriched Mixture (CEM) is a hydrophilic cement, which can be used for inducing bone and periodontal tissue formation. ^[5] Parirokh et al (2010), in his study reported the osteoinductive property of calcium enriched cement. Calcium enriched cement when comes in contact with tissue fluid releases calcium and phosphorous ions, which then forms hydroxyapatite. This property of hydroxyapatite crystal formation contributes to the osteoinductivity and conductivity of CEM. ^[6] Platelet rich fibrin [PRF] is an autogenous graft that is used in the treatment of infrabony defects to improve the prognosis. ^[7] Combination of PRF and Calcium enriched cement [CEM] decreases the volume of bone substitute and promotes revascularization.

CASE REPORT

A 57 year old male patient reported to the department of periodontology with a chief complaint of grossly decayed tooth in lower right back tooth region of mouth along with food entrapment

with respect to same area. On clinical examination, class- I silver amalgam restoration and pain on percussion was present with 46 and 47 . Pulp vitality test, electronic pulp tester showed late response suggestive of necrosed pulp. The intraoral periapical radiograph showed deep dental caries with respect to 47, involving severe destruction of distal root including enamel, dentin and pulp; along with grade I furcation involvement . Periodontal probing with distal root of 47 and mesial root of 46 revealed isolated 6 mm pocket suggestive of extensive bone loss in those area. The diagnosis was that there was a Grade III Endo-perio lesion with respect to 46 and an infrabony defect with mesial aspect of 46.

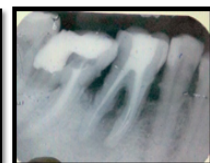
TREATMENT PLAN

Treatment plan included endodontic phase, periodontal flap surgery, hemisection and removal of distal half of 47, bone augmentation using calcium enriched mixture (CEM) cement and PRF on mesial aspect of 46; followed by prosthetically restoring 46 and 47 with fixed partial denture.

Endodontic phase comprised of Root canal treatment of 46 and mesial root of 47 alone. Following 1 week of endodontic treatment Periodontal flap surgery using combination of two flap surgery methods were performed. Under local anesthesia Kirkland flap was performed on buccal aspect of 48, 47, 46 and on lingual aspect , extending from 48 to 43 . Modified Widman Flap was performed on buccal aspect of 45, 44 and 43. Following Elevation of full thickness mucoperiosteal flaps, both buccally and lingually, proper debridement was done, therefore removing all the granulation tissues using gracey curettes (HuFriedy, USA). [figure 1]

HEMISECTION

Faciolingual cut was given with a long shank, tapered carbide bur till the furcation was reached for hemisection of the distal root [figure 2] and crown. Once the separation was completed, distal half was extracted. [figure 3] The empty socket was thoroughly debrided, irrigated along with root planing of mesial root of 47. The bone augmentation of infrabony defect between 46 and 45 was done by placement of calcium enriched mixture [CEM] cement along with PRF [figure 4, 5]. Buccal and lingual flaps were approximated and sutured back into its position.



Preoperative view

Preoperative radiograph



Figure 1: Elevation of mucoperiosteal flap

Figure 2: Hemisection done (distal root removed)

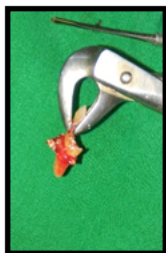


Figure 3: Distal root extracted Hemisection done (distal root removed)

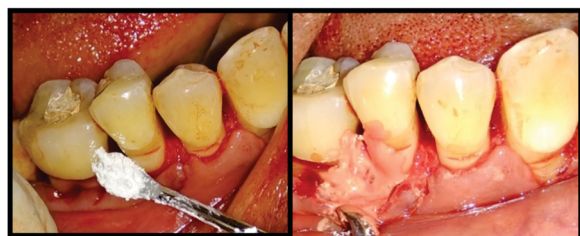


Figure 4: Bone augmentation using calcium enriched mixture [CEM]

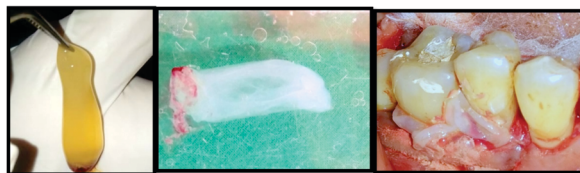


Figure 5: Placement of PRF



Post - operative Radiograph

DISCUSSION

Its always challenging to save a tooth affected with both deep periodontal pockets and severe endodontic lesion. Such teeth are usually indicated for extraction. But salvaging such tooth becomes possible through the procedure of hemisection, where one half of the grossly effected tooth is extracted and retaining the remaining part.

Various studies have showed positive long-term results following hemisection therapy. Fugazzotto^[8] reported 15-year cumulative success rates of 96.8% for root-resected molars and 97.0% for molar implants. He concluded that molar root-resection therapy and implant therapy had a high degree of functional success.

Buhler^[9] stated that hemisection should be considered before every molar extraction because it provides a good, absolute and biological cost-saving alternative with good long-term success. Success of this procedure depends on careful case selection. Clinical prediction of a long-term prognosis is crucial. This requires proper diagnosis, treatment planning and execution by all the clinicians involved in the

inter-disciplinary approach.

Saad *et al.*^[11] have also concluded that hemisection of a mandibular molar may be a suitable treatment option when the decay is restricted to one root and the other root is healthy and remaining portion of tooth can very well act as an abutment.

Akki and Mahoorkar^[12] reported a case with missing mandibular left first premolar and Grade I mobility of the mandibular left first molar with 9 mm deep periodontal pocket on the distal root. Distal root was extracted. The treated teeth were successfully used as abutments for small bridges.

Bollineni and Karunakar^[13] concluded that increasing the life of tooth by the process of hemisection has become a successful treatment option. This treatment can produce predictable results as long as proper diagnostic, endodontic, surgical and prosthetic procedures are performed. This procedure is a form of conservative approach to retain as much tooth structure as possible.

In this case report along with hemisection ,the calcium enriched cement with PRF was used for bone augmentation of infrabony defect.

CONCLUSION

This case highlights the interdisciplinary approach of molar hemisection, bone augmentation using calcium enriched mixture [CEM] and platelet rich fibrin [PRF] and prosthetic rehabilitation as an innovative procedure providing immediate results with minimal patient apprehension and long term stability.

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