

Decision Making On The Treatment Of Endo-Perio Lesion (Resective/Regenerative): A Case Series; A Clinical And Radiographical Study

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ABSTRACT

An Endo perio lesion has been one of common clinical entity associated with the tooth. The involvement of both pulpal and periodontal diseases can complicate the entire diagnosis and treatment planning. The present case series shows the importance of periodontal therapy that includes regeneration of lost periodontium/ resection of roots to provide better prognosis for the affected tooth. The tooth was first endodontically treated and followed by periodontal treatment. Post operatively there was evident gain in clinical attachment level and evident bone fill observed in a cases were treated through regeneration. A better functional, esthetic restoration were seen after the resective treatment.

Keywords: periolesion, furcation defect, regeneration, resection.

INTRODUCTION

Pulpo-periodontal conditions are complex in nature and have different pathogenesis. The treatment planning, decision making and prognosis were depends primarily on the diagnosis of the current state of specific disease. To have the best prognosis, clinician must refer the case to various areas of specialization, to perform restorative, endodontic and periodontal therapy either singly or in combination.¹

The most commonly used classification was given by Simon, Glick and Frank in 1972, which includes : Primary endodontic lesion, Primary periodontal lesion, Primary endodontic lesion with secondary periodontal involvement, Primary periodontal lesion with secondary endodontic involvement, True combined lesion²

Healing of primary endodontic lesions usually take place after root canal therapy. Presence of microorganisms in the root canal influences the outcome of therapy with a proper focus on control of infection, a good prognosis is expected with the treatment.²

Primary periodontal lesions can solely be treated by periodontal therapy. Prognosis of primary

periodontal lesions depends on: The severity of the periodontal disease, Efficacy of periodontal therapy, Response of the patient. However, prognosis of primary periodontal lesions is not as favorable as primary endodontic lesions. Vigorous removal of cementum and exposure of dentinal tubules during periodontal surgery may deteriorate the outcome, by causing pulpal inflammation and necrosis of the dental pulp. Avoiding the use of irritating chemicals, minimizing the use of ultrasonics and rotary scaling instruments may aid in the good outcome of the disease.

The prognosis of Primary endodontic with secondary periodontal lesions depends principally on the severity of periodontal involvement. If the endodontic treatment is adequate, the prognosis depends on the severity of the marginal periodontal damage and the efficacy of periodontal treatment. The outcome of these lesions caused due to iatrogenic damages such as root perforations depends on the size, location, time of diagnosis and treatment, degree of periodontal damage as well as the sealing ability and biocompatibility of the sealer.²

Efficacy of periodontal therapy usually determines the prognosis of Primary periodontal secondary

or even hopeless prognosis is expected in such cases, especially in patients with chronic and extensive periodontal diseases. A part of the root or tooth structure can be saved through hemisection or bicuspidization, root amputation. However, various factors such as tooth anatomy, function, restorability, root filling, bone support and patient's compliance should be considered before root resection by the operator.³

An improved prognosis can also be achieved by increasing the bone support of the affected tooth by the means of bone grafting and GTR. These regenerative procedures have reported to have a success rate 77.5% in the treatment of combined lesions (Parolia et al. 2013)⁵. On the contrary, the success rate ranges from 27% to 37% without regenerative procedures. Besides, patient-specific, defect-specific, and healing factors should also be considered at each level while determining the prognosis.⁵

A CASE REPORT 1

A 45 year old male patient came to the dental clinic with chief complaint of pain and swelling in his lower right back tooth regions since 3 months. Patient was systemically healthy. He gave the history of root canal treatment 3 year back in 47.

On Intra-oral clinical examination presence of deep periodontal pocket in relation to midbuccal aspect of 47 with grade 2 furcation involvement with presence of exudate and grade 1 mobility in relation to 47. IOPA of 47 revealed radiopacity in the occlusal surface, extending into the pulp chamber of mesial and distal roots 2mm short of the apex, suggestive of incomplete endodontic treatment and hypercementosis of root ends. Radiolucency involving the apical area of the distal root along with radiolucency in furcation area was present. Primary endodontic with secondary periodontal lesion in relation to 47. (According to classification proposed by Simon et al, 1972)². Involvement should first be treated with endodontic therapy (Rotstein et al, 2002)¹, along with first phase one (hygiene phase) of endodontic lesion and true combined lesions. A poor periodontal therapy. After the evaluation of treatment results in 2-3 months, further periodontal therapy should be considered (Parolia et al, 2013).⁵

In the present case report, amalgam restoration w.r.t 47 was performed 3 year back was developed secondary caries and reaches the pulp with abscess. IOPA revealed bone loss in furcation area. So, we have started with Endodontic therapy, access

opening, Antibiotics and anti-inflammatory drugs were prescribed. Periodontal therapy was planned after a week. Phase 1 therapy was instituted. Patient was recalled after 1 week for re-evaluation and reinforcement of oral hygiene. Endodontic therapy was done for 47 and obturated. After 3 weeks, periodontal pocket was reassessed. Deep periodontal pocket of more than 7mm was present in relation to 47 on the midbuccal aspect. Periodontal flap surgery was planned in relation to 47 under local anesthesia. A full thickness mucoperiosteal flap was raised w.r.t 46, 47 and 48. The area was thoroughly debrided using hand curettes and ultrasonic scalers. A bovine derived xenograft (Bio-Oss) graft was placed in relation to 47 in furcal and distobuccal area along with amniotic membrane. Simple interrupted braided black silk sutures were placed and periodontal dressing was applied over the area. Post-operative medications and instructions were given and patient was recalled after 7 days.

The patient was recalled after one month of flap surgery for re-evaluation. A good oral hygiene of the patient was observed. There was absence of bleeding on probing w.r.t 47. Resolution of the inflammation and a reduction in probing pocket depth was observed. RVG taken at 3rd month, 6th month and 1 year postoperative showed complete bone fill in the furcation area.



Figure 1. probing depth measured after endodontic treatment



Figure 2. A full thickness flap raised for debridement.



Figure 3 & 4. Xenograft placed in bony defect with amniotic membrane.

Figure 6 & 7. Periodical radiographical assessment shows the bonefill (regeneration)



CASE REPORT 2 & 3

A 55 year old male patient came to the dental clinic with chief complain of pain in his upper and lower right back tooth region since 2 months. Patient was systemically healthy.

Intra-oral clinical examination shows gingival recession, Supragingival calculus and swelling in gingiva in relation to 46 and 16 with presence of exudate.

Periodontal findings shows presence of deep periodontal pocket in relation to distobuccal aspect of 16 with grade 3 furcation involvement. Miller's class 3 gingival recession on the buccal aspect of 16. Miller's class 3 gingival recession on the buccal aspect of 46 with grade 4 furcation involvement with grade 1 mobility present in relation to 16 and 46.

OPG of 16 revealed radiolucency involving the apical area of the distobuccal root along with radiolucency in furcation area was present and revealed furcation radiolucency in relation to 46. Primary periodontal secondary endodontic lesion and true combined lesions w.r.t. 16 and 46. al,1972)2

Involvement should first be treated with endodontic therapy (Rotstein et al, 2002)1, along with first phase one (hygiene phase) of periodontal therapy. After the evaluation of treatment results in 2-3 months, further periodontal therapy should be considered (Parolia et al, 2013)5.

In the present case report, OPG revealed bone loss in furcation area. So, we have started with Endodontic therapy, access opening, Antibiotics and anti-inflammatory drugs were prescribed. Periodontal therapy was planned after a week. Phase 1 therapy was instituted. Patient was recalled after 1 week for re-evaluation and reinforcement of oral hygiene. Endodontic therapy was done for 16 and 46 and obturated. After 3 weeks, periodontal pocket was reassessed. Periodontal resective surgery was planned in relation to 16 and 46 under local anesthesia. A full thickness mucoperiosteal flap was raised w.r.t. 45, 46 and 47. The area was thoroughly debrided using hand curettes and ultrasonic scalers. The resection of distobuccal root was done under local anesthesia in relation to 16 and bicuspidization of 46 done under local anesthesia. Simple interrupted braided black silk sutures were placed and periodontal dressing was applied over the area. Post-operative medications and instructions were given and patient was recalled after 7 days.

The patient was recalled after one month of flap surgery for re-evaluation. A good oral hygiene of the patient was observed. There was absence of bleeding on probing w.r.t. 16 and 46. Resolution of the inflammation and a reduction in probing pocket depth was observed. RVG taken at 3rd month, 6th month and 1 year postoperative showed good maintenance furcation area.

2. Case Photos:



Figure 8.OPG shows furcal bone loss in relation to 46 and radiolucency in distobuccal root apex with furcal bone loss in relation to 16 .



Figure 9.Grade 4 furcation defect in relation to 46 after phase 1 therapy.



Figure 11.bicuspidization was done in relation to 46.
 Figure 12 and 13.radiographs shows preoperative and postoperative 46 procedure (bicuspidization)
 Figure 10.Muccoperiosteal flap reflected and debridment was done in relation to 46.



Figure 11.bicuspidization was done in relation to 46.

Figure 12 and 13.radiographs shows preoperative and postoperative 46 procedure (bicuspidization)

Figure 10.Muccoperiosteal flap reflected and debridment was done in relation to 46.



CASE PHOTOS 3:

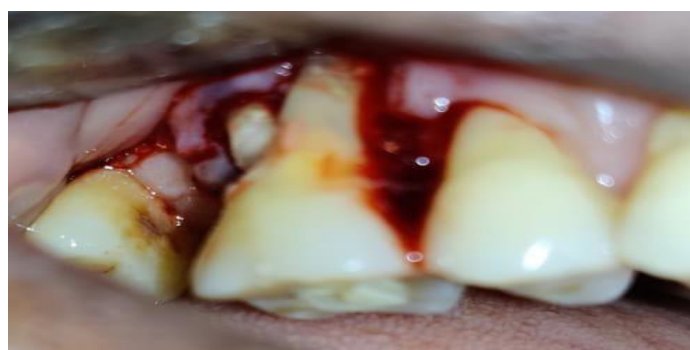


Figure 14.Muccoperiosteal flap was reflected and debrided in relation to 16.

Figure 15 and 16.Resection of distobuccal root was

done in relation to 16.

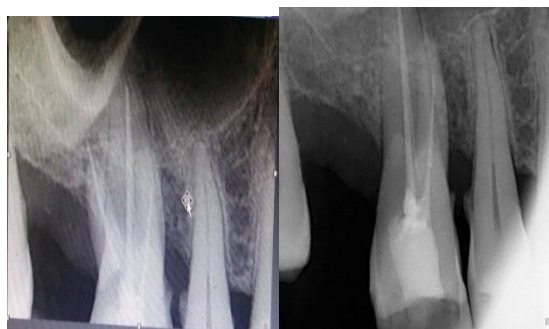


Figure 17. sutures placed in relation to 16.



DISCUSSION

The diagnosis and prognosis of the tooth having endo-perio lesions presents a challenge to the clinicians. Correct diagnosis is important to determine the treatment and long term prognosis.³ However, treating a complex endodontic periodontal lesion is still one of the most common challenges in today's clinical practice. The pulp and periodontium share common features of embryonic, anatomic, and functional characteristics.¹ The simultaneous existence of endodontium and periodontium tissue destruction can complicate the diagnosis and subsequently affect the prognosis of the involved teeth. This highlights the importance of following a critical diagnostic strategy to ensure a correct treatment plan. It also requires thorough understanding of wound healing process involving both complex tissues.²

The first step for proper diagnosis is the vitality tests. Although the vitality test cannot provide the histological status of the dental pulp, their ability to register pulp vitality is quite satisfied. The ability of vitality tests to detect non-sensitive reaction represented a necrotic pulp was reported as 89% with the cold test and 88% with the electrical test.¹²

Treatment of endo-perio lesion requires both endodontic treatment and periodontal regenerative treatment. The treatment strategy is to first focus on debridement and disinfection of the root canal system followed by an observation period.¹ The goal of

periodontal surgery is to remove all necrotic tissues from the surgical site and facilitate the regeneration of hard and soft tissue along with the formation of new attachment apparatus.⁴

The infected root canal can cause a chronic inflammatory reaction which extends the gingival sulcus and drains through the sinus tracts. If the rest of the dentition is periodontally healthy and any root cracks and fractures has been ruled out, healing of the periodontal tissues can be expected after endodontic treatment as it was to be observed.⁹ Therefore, further treatment requirements should always be considered followed by an observation period of at least 3 months.³ Conversely, there has been a debate in the literature about the impact of the endodontic treatment on the healing potential of the periodontium. Some studies have been reported that endodontic treatment may cause an inhibitory effect on periodontal wound healing while some of them have been demonstrated no significant effects.⁵

In the reported cases the established diagnosis was of primary endodontic with secondary periodontal involvement.¹⁰ Hence; endodontic therapy was done and followed by periodontal surgery. Since buccal furcation was involved, an attempted regeneration was done with the help of bone graft. Bone graft used was Bio-oss xenograft with amniotic membrane. Other cases with true combined lesions in this series are treated following the periodontal resective surgical techniques.⁶

Similarly; in a case series published by Hacer Aksel in 2014, one case with primary endodontic and secondary periodontal lesions was reported.³ Endodontic treatment was administered followed by periodontal surgery after 3 months. One year follow up of the patient revealed resolution of the symptoms and improved clinical and radiographic findings.⁷

The actual relationship between periodontal and pulpal diseases was first described by Simring and Goldberg in 1964.¹⁰ An attempt to completely debride the root canal system followed by good seal with obturating materials usually results in healing of primary endodontic lesions with the closure of the

sinus tract if there was any. This also results in normal periodontal architecture in about 4–6 months along with signs of osseous repair of even large periapical rarefactions without any surgical intervention. Hence any invasive procedure, either endodontic or periodontal, should be avoided as this may cause further injury to the attachment, possibly delaying healing.⁹

Viable options to be considered for extensively carious and periodontally weak multirouted teeth before extraction are hemisection and bicuspidization. Hemisection involves root canal treatment of the remaining roots followed by a fixed prosthesis to maintain the occlusal balance. It not only preserves the tooth but also reduces the financial burden, psychological trauma, and occlusal dysfunction. As in case 2 and 3, good prognosis was observed with proper occlusion, absence of mobility, and healthy periodontal condition up to 1 year of follow-up.⁸

Miranda et al. suggest that endodontic treatment performed 6 months before the surgical debridement of the furcation of mandibular molars did not impair the clinical parameters of periodontal healing.¹¹ Therefore, further treatment requirements should always be considered followed by an observation period of at least 3 months. Conversely, there has been a debate in the literature about the impact of the endodontic treatment on the healing potential of the periodontium. Some studies have been reported that endodontic treatment may cause an inhibitory effect on periodontal wound healing^{13,14} while some of them^{15,11} have been demonstrated no significant effects.

CONCLUSION

HPV subtypes 16, 18, 31, 33, 35, 39, 45, 51, 52 and 56 are high risk groups and are mainly associated with cervical cancer. Munoz et al in his studies has shown that HPV subtypes 16, 18, 31 and 33 are also most commonly associated with oral squamous cell carcinoma.¹¹ HPV 16 is the most potent subtype accounting for the majority of oropharyngeal tumors. It was detected in 16 % of oral squamous cell carcinomas among 70 % of HPV positive cases. HPV 18 is the next most common oncogenic HPV type detected in 8 % of oral squamous cell carcinoma.¹²

REFERENCES

1. Rotstein I, Simon JH. Diagnosis, prognosis and decisionmaking in the treatment of combined periodontal-endodontic lesions. *Periodontol.* 2000, 2004; 34:165-203.
2. Simon JH, Glick DH, Frank AL. The relationship of endodontic-periodontic lesions. *J Periodontol.* 1972; 43:202-8.
3. Aksel H, Serper A. A case series associated with different kinds of endo-perio lesions. *Journal of clinical and experimental dentistry.* 2014; 6, 1(91).
4. Harrington GW, Steiner DR, Ammons WF. The periodontal–endodontic controversy. *Periodontology.* 2000, 2002; 30(1):123-30.
5. Parolia A, Gait TC, Porto IC, Mala K. Endo-perio lesion: A dilemma from 19 th until 21 st century. *Journal of Interdisciplinary Dentistry.* 2013; 3(1)
6. Gupta, Sanjay, Vandana KL. Evaluation of Hydroxyapatite (Periobone-G) as a Bone Graft Material and Calcium Sulfate Barrier (Capset) in Treatment of Interproximal Vertical Defects: A Clinical and Radiologic Study. *Journal of Indian Society of Periodontology.* 2017; 17(1):96-103.
7. Suchetha A, Salman Khawar, Sapna N, Apoorva SM, Darshan BM and Dr. Divya Bhat. Endo-perio lesion: A case report. *International Journal of Applied Dental Sciences.* 2017; 3(3): 113-116.
8. Vijetha Vishwanath, H. Murali Rao, B. S. Keshava Prasad, K. Shashikala. Successful endodontic management of endo-perio lesions with different treatment modalities: Case series. *SRM Journal of Research in Dental Sciences.* 2019; 10(2).
9. Singh P. Endo-perio dilemma: A brief review. *Dent Res J (Isfahan)* 2011; 8:39-47.
10. Simring M, Goldberg M. The pulpal pocket approach: Retrograde periodontitis. *J Periodontol* 1964; 35:22-48.
11. de Miranda JL, Santana CM, Santana RB. Influence of endodontic treatment in the post-surgical healing of human Class II furcation defects. *J Periodontol.* 2013; 84:51-7.
12. Petersson K, Söderström C, Kiani-Anaraki M, Lévy G. Evaluation of the ability of thermal and electrical tests to register pulp vitality. *Endod Dent Traumatol.* 1999; 15:127-31.
13. Morris ML. Healing of human periodontal tissues following surgical detachment and extirpation of vital pulps. *J Periodontol.* 1960; 31:23- 6.

14. Sanders JJ, Sepe WW, Bowers GM, Koch RW, Williams JE, Lekas JS et al. Clinical evaluation of freeze-dried bone allografts in periodontal osseous defects. Part III. Composite freeze-dried bone allografts with and without autogenous bone grafts. *J Periodontol.* 1983;54:1-8
15. Perlmutter S, Tagger M, Tagger E, Abram M. Effect of the endodontic status of the tooth on experimental periodontal reattachment in baboons: a preliminary investigation. *Oral Surg Oral Med Oral Pathol.* 1987;63:232-6.