



Prognostic Factors of Grade 2-3 Endo-Periodontal Lesions Treated Nonsurgically in Patients with Periodontitis

Dr Neetish Shiram Chavhan¹, Dr Jaspinder Kaur Manchanda², Rahul Kappedath Kuttikkottil³,
Ayisha Sabna Ponneth⁴, Dr.Roopan Kaur⁵, Dr. Rohit Wadhwa⁶

¹Senior lecturer MDS (Conservative Dentistry And Endodontics) Aditya Dental college, BEED.

²PG student 3rd year, Department of periodontology and oral implantology, Baba Jaswant Singh
Dental College Hospital And Research Institute Ludhiana

³Senior Lecturer, Department of Conservative Dentistry and Endodontics, Educare Institute of Dental
Sciences, Malappuram, kerala.

⁴Senior Lecturer, Department of Conservative Dentistry and Endodontics, Educare Institute of Dental
Sciences, Malappuram, kerala.

⁵BDS private practitioner India.

⁶M.D.S Reader Department of conservative dentistry and endodontics Desh bhagat Dental college &
Hospital Mandi Gobindgarh.

Corresponding author

Dr. Neetish Shiram Chavhan Senior lecturer MDS (Conservative Dentistry And Endodontics) Aditya
Dental college, BEED.

Abstract

Background: To evaluate prognosis of grade 2-3 endo- periodontal lesions treated nonsurgically in periodontitis subjects.

Materials & methods: A total of 100 teeth diagnosed with grade 2-3 endo-periodontal lesions in patients with periodontitis were enrolled. The data was collected and results were analysed using SPSS software. The p-value less than 0.05 was considered significant.

Results: No significant differences were found in age or gender between the high and low responder groups ($P < 0.05$). The significant differences in PD ($P = 0.001$), CAL ($P = 0.001$), full-mouth periodontitis severity ($P = 0.002$), between the high and low responder groups.

Conclusion: High PD and CAL, and serious full-mouth periodontitis indicated a poor prognosis for teeth with grade 2-3 endo-periodontal lesions.

Keywords: Endo- periodontal lesions, Periodontitis, Probing depth.

Introduction

Endo-periodontal lesions have been characterized as bacterial infectious diseases that lead to extensive periodontal tissue damage and pulp inflammation or necrosis. ¹ These lesions exist simultaneously in the periodontal and endodontic tissues of the same tooth. ² Once endodontic and periodontal lesions are involved, especially in patients with periodontitis, the situation becomes more complex and requires extra considerations. Managing endo-periodontal lesions remains a challenge for clinicians. Periodontal and endodontic lesions (PEL) is mostly caused by bacterial infection that leads to the destruction of periodontal tissues and pulp tissues. ^{3,4} It is not uncommon in clinical

practice. Although the etiology and pathogenesis of periodontal disease and pulpal disease are different, there are mixed infections dominated by anaerobic bacteria in deep periodontal pockets, diseased pulp tissues, and periapical inflammatory tissues.⁵ In addition, there is also a linkage reaction between autoimmunity and inflammation in the pathogenesis of PEL.⁶ The infection and lesions of the two can spread and influence each other through special anatomical structures, resulting in the occurrence of combined lesions.⁷ Because the PEL involves periodontal tissues, dental pulp, and periapical tissues, relating a variety of bacterial mixed infections, the anatomical structure of the communication between the two is special and complex, the clinical manifestations are diverse, and the treatment methods are complex.⁸ The diagnosis, treatment and prognostic evaluation of PEL are still difficult clinical problems.

The pulp-periodontal interrelationship is a unique one and can consider them as a single continuous system or as one biologic unit in which there are so many paths of communication. The interrelationship of these structures influences each other during health, function and disease. They can get affected individually or combined; when both systems are involved they are called true endo-perio lesions. Endodontic-periodontal problems are responsible for more than 50% of tooth mortality today.⁹ They present challenges to the clinician as far as diagnosis and prognosis of the involved teeth are concerned. It is very essential to make a correct diagnosis so that the appropriate treatment can be provided. The relationship between the periodontium and the pulp was first discovered by Simring and Goldberg in 1964.⁹ Since then, the term 'perio-endo lesion' has been used to describe lesions due to inflammatory products found in varying degrees in both periodontium and pulpal tissues. Hence, this study was conducted to evaluate prognosis of grade 2-3 endo- periodontal lesions treated nonsurgically in periodontitis subjects.

Materials & methods

A total of 100 teeth diagnosed with grade 2-3 endo-periodontal lesions in patients with periodontitis were enrolled. They were divided into high and low responder groups and parameters of the teeth involved after nonsurgical treatment of both the endodontic and periodontal components. Clinical parameters and symptoms were compared before and after treatment. The data was collected and results were analysed using SPSS software. The p-value less than 0.05 was considered significant.

Results

All the teeth were divided into high and low responder groups. The high responder group included 50 teeth, with an average patient age of 50.12, with 31 teeth from male patients, 19 teeth from female patients. The low responder group included 50 teeth, with an average patient age of 49.36, with 29 teeth from male patients, 21 teeth from female patients. No significant differences were found in age or gender between the high and low responder groups ($P < 0.05$). The proportion of smokers in the low responder group was significantly higher than that in the high responder group ($P < 0.05$). The clinical parameters of the high and low responder groups at baseline. The significant differences in PD ($P = 0.001$), CAL ($P = 0.001$), full-mouth periodontitis severity ($P = 0.002$), between the high and low responder groups.

Table 1: Variables

Variables	High responder (n=50)	Low responder (n= 50)	P –value
Gender			0.5
Male	31 (62%)	29 (58%)	
Female	19 (38%)	21 (42%)	
Age	50.12	49.36	0.8
Smoking			0.05*
No	36 (72%)	20 (40%)	

Yes	14 (28%)	30 (60%)	
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Table 2: Clinical parameters of the teeth

Clinical parameters	High responder	Low responder	P- value
PD (mm)	5.32	6.84	0.001*
CAL (mm)	5.10	7.74	0.001*
Severe periodontitis			0.002*
1	16 (32%)	5 (10%)	
2	25 (50%)	20 (40%)	
3	9 (18%)	25 (50%)	

periodontal probing depth (PD) \geq 5 mm, clinical attachment level (CAL) \geq 3 mm

Discussion

Primary periodontal disease with secondary endodontic involvement and true combined endodontic-periodontal diseases require both endodontic and periodontal regenerative procedures. The success rate of the endodontic-periodontal combined lesion without a concomitant regenerative procedure has been reported to a range from 27% to 37%.⁷ Combined lesions can be classified into three types, first, tooth with two separate lesions, one endodontic usually periapical and one periodontal with no communication, second, teeth with a single lesion that involves both endodontic and periodontal pathoses and third, teeth with endodontic and periodontal lesions that were once separate but now communicate. True-combined lesions should be treated initially as primary endodontic lesions with secondary periodontal involvement. Prior to surgery, palliative periodontal therapy should be completed and root canal treatment carried out. The prognosis of true combined lesion is often poor or even hopeless, especially when periodontal lesions are chronic and extensive. The prognosis of combined diseases mainly rests with the efficacy of periodontal therapy.³ Though, root amputation, hemisection or bicuspidization may allow the root configurations to be changed sufficiently for a part of the root structure to be saved, however, the operator need to consider various factors before root resection such as tooth function, root filling, anatomy, restorability, bone support around the healthy root and patient's compliance. A tooth that requires a root to be resected always needs root canal treatment; therefore, the surgery must be planned with care, particularly with respect to the timing of the root treatment. Ideally, the tooth should be root filled prior to surgery.¹⁰ Hence, this study was conducted to evaluate prognosis of grade 2-3 endo- periodontal lesions treated nonsurgically in periodontitis subjects.

In the present study, all the teeth were divided into high and low responder groups. The high responder group included 50 teeth, with an average patient age of 50.12, with 31 teeth from male patients, 19 teeth from female patients. The low responder group included 50 teeth, with an average patient age of 49.36, with 29 teeth from male patients, 21 teeth from female patients. No significant differences were found in age or gender between the high and low responder groups ($P < 0.05$). A study by Fan X et al, compared with the clinical parameters at baseline, the values of tooth mobility (TM), periapical index (PAI), and discomfort when chewing were decreased after endodontic therapy, and the values of periodontal probing depth (PD), clinical attachment level (CAL), sulcus bleeding index (SBI), TM, simplified oral hygiene index (OHI-S), full-mouth periodontitis severity, PAI, and discomfort when chewing were decreased after periodontal therapy. Univariate analysis revealed that smoking, PD, CAL, TM, PAI, clinical crown-root ratio (CR), full-mouth periodontitis severities, and the number of root canals were significantly different between the high and low responder groups ($P < 0.05$). The logistic regression analysis showed that smoking, PD, CAL, full-mouth periodontitis severities, and the number of root canals remained significantly associated with grade 2-3 endo-

periodontal lesions in patients with periodontitis ($P < 0.05$). The logistic regression analysis showed that smoking, PD, CAL, full-mouth periodontitis severities, and the number of root canals remained significantly associated with grade 2-3 endo-periodontal lesions in patients with periodontitis. High PD and CAL, multirrooted teeth, smoking, and serious full-mouth periodontitis indicated a poor prognosis for teeth with grade 2-3 endo-periodontal lesions.¹¹

In the present study, the proportion of smokers in the low responder group was significantly higher than that in the high responder group ($P < 0.05$). The clinical parameters of the high and low responder groups at baseline. The significant differences in PD ($P = 0.001$), CAL ($P = 0.001$), full-mouth periodontitis severity ($P = 0.002$), between the high and low responder groups. Another study by Guo J et al, there were 74 cases of endodontic combined treatment, with a total of 86 teeth. There was no significant difference in age and gender ratio between the effective group and the ineffective group, and the proportion of smoking patients in the ineffective group was significantly higher than that in the effective group ($P < 0.05$). At the initial diagnosis, there was no significant difference in the clinical indicators of the whole mouth between the effective group and the ineffective group. After a combined endodontic treatment, the clinical indicators of the two groups were significantly improved ($P < 0.01$). There was no significant difference in other periodontal clinical indicators between the two groups. The prognosis of nonsurgical treatment of periodontal and periodontal combined lesions is mainly correlated to the patient's oral hygiene maintenance, as well as the loss of attachment, the degree of loosening, the clinical crown-to-root ratio, the periapical index, and the number of root canals.¹² The degree of periodontal tissue destruction of the affected tooth has a significant impact on the prognosis of PEL. PEL are mostly derived from moderate to severe periodontitis.¹³ Some scholars have proposed that severe periodontitis can lead to acute or chronic pulp inflammation, pulp congestion, and pulp necrosis.¹⁴ The study found the hard tissue sections of teeth with severe periodontitis and found that bacteria were found in the dentin after root planing.¹⁵ After root planing, the cementum is lost and the dentin is exposed, so that the periodontal infection and the pulp are interconnected.¹⁶ Therefore, conservative treatment should not be taken for the teeth with severe periodontitis.¹⁷ Previous studies have shown that, for teeth with moderate-to-severe periodontitis with slow pulp vitality, the pulp of most of the teeth has undergone a certain degree of degeneration or necrosis.¹⁸ The infection in the periodontal pocket interacts with the inflammation in the root canal, which is beneficial to the control of periodontal inflammation, slowing down the development of lesions and promoting the healing of periodontal tissue, reducing the risk of periodontal surgery, thereby reducing the pain of patients.¹⁹

Conclusion

High PD and CAL, smoking, and serious full-mouth periodontitis indicated a poor prognosis for teeth with grade 2-3 endo-periodontal lesions.

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