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COMPARATIVE EVALUATION OF PERIODONTAL STATUS BETWEEN ENDODONTICALLY INFECTED AND NON INFECTED MOLARS: A CLINICO-RADIOGRAPHIC STUDY

Dentistry

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ABSTRACT

Background: The endodontic tissues and periodontal tissues are interrelated and can cause the disease of one tissue by involvement of the other. So, thorough examination and treatment plan is required for better prognosis of the tooth. It is also very important to know the effect of endodontic infection on periodontium and vice versa. **Aim:** To compare the effect of endodontic infection on periodontal parameters. **Materials And Method:** A total of 60 teeth were assigned into 2 group; Group 1: Endodontically infected molars, Group 2: Endodontically non infected molars. Following clinical and radiographic parameters were measured: Gingival bleeding index, Probing depth, Plaque index, Clinical attachment level, Marginal bone level, Furcation involvement, Radiographic attachment loss. **Results:** The result showed statistically significant difference in clinical and radiographic parameters in group 1 compared to group 2. Conclusion: Endodontic infection has the positive influence on periodontal status; there is more distruction of periodontium in the presence of endodontic infection.

KEYWORDS

Probing depth, Radiographic attachment loss, furcation involvement, Endodontically infected molars, periodontium

INTRODUCTION

Simring and Goldberg in 1964 first described the relationship between periodontal and endodontic disease.[1] Infection of the pulp evokes an inflammatory reaction in the periodontal ligament fibers at the apical region of the tooth. Pulpal-derived inflammatory byproducts enter the periodontium and cause an inflammatory vascular response. Pulpal illness may occasionally promote epithelial development, which compromises the integrity of the periradicular tissues.[2]

It is accepted that periodontal disease has negligible effect on pulp, until it involves the apical region of the tooth. Additionally, if apical foramen maintains its vascularity, the pulp will remain vital.[3]

For a periodontal-endodontic lesion to heal successfully, combined periodontal and endodontic therapy is required. It has been stated that if both disease entities are present, neither endodontic therapy nor periodontic therapy by itself will produce a good prognosis, and that both must be taken into account simultaneously.[4]

Evidences suggest that teeth treated with root canal and teeth showing periapical infection, showed significantly higher probing depth, bone loss, and impaired periodontal healing after nonsurgical periodontal therapy, and increased progression of periodontal disease than teeth without any pulpal infection.[5]

The effect of endodontic involvement on periodontal tissue and its healing has been fully examined in single-rooted teeth with periodontal infection but is not well examined in multi-rooted teeth. Thus there is a need to evaluate influence of an endodontic infection on periodontal status in multi-rooted teeth.

AIM AND OBJECTIVES:

1) Compare clinical probing depth and clinical attachment level between 2 groups.
2) Evaluate marginal bone loss and furcation involvement between 2 groups.
3) Compare radiographic attachment loss between 2 groups.

MATERIALS AND METHODS

A cross sectional study design was carried out. The patients for this study were selected from the Outpatient Department of Periodontics & Implantology in Manubhai Patel Dental College, Vadodara according to inclusion & exclusion criteria. Written informed consent was obtained from patients.

INCLUSION CRITERIA:

1. Patients with ≥ 18 years age
2. Presence of periapical rediolucency in molar
3. Generalized chronic periodontitis
4. Teeth with positive vitality test, non-carious or restoration, and if a tooth with caries or restoration present that is not approaching the pulp will be considered as endodontically non infected molars.

EXCLUSION CRITERIA:

1. Teeth with established endo-perio lesion showing <2mm radiopaque bone between periapical lesion and periodontal destruction
2. Contralateral missing or endodontically involved tooth, 3rd molar, premolars and incisors and Endodontically treated molars.

METHOD

A total of 60 teeth were assigned into 2 group.
Group 1 endodontically infected molars (n=30): Teeth with periapical radiolucency in molars.

Group 2 endodontically non infected molars (n=30): Teeth without periapical radiolucency in molars.
Following clinical and radiographic parameters are performed for all the patients.

CLINICAL PARAMETER:

Plaque index(PI)[6], Gingival bleeding index(GBI)[7], Probing depth(PD). Clinical attachment level(CAL).[8] Marginal bone level(MBL) was accessed using transgingival probing under local anesthesia.[9] 6 sites (Mesio-Buccal, Mid-Buccal, Desto-Buccal, Mesio-Palatal/Lingual, Mid-Palatal/Lingual, Desto- Palatal/Lingual) of tooth were assessed using UNC 15 probe. Assessment of Furcation involvement was done according to Hamp's classification.[10]

RADIOGRAPHIC PARAMETERS:

A standardized IOPA was taken using X-ray grid.

Radiographic attachment level (RAL) was measured between crest of the alveolar bone and the apex at the mesial and distal sides of the tooth root. The **root** length (RL) was measured from the CEJ to the apex of the root. Radiographic attachment loss was measured as RAL-RL.[11]

STATISTICAL METHOD

Mean, standard deviation and percentage distribution of data was evaluated using descriptive statistics. Paired T test was used to compare probing depth, clinical attachment level, transgingival probing, root length, radiographic attachment level and radiographic attachment loss between the groups. By using McNemar-Bowker test comparison of furcation involvement between the groups was carried out. Statistical tests were done using SPSS 20 (Statistical Package for Social Science).

RESULTS

Study shows highest distribution of maxillary right first molar and lowest distribution of mandibular right second molar compared to other tooth in Group 1 and highest distribution of maxillary left first molar and lowest distribution of maxillary right second molar compared to other tooth in Group 2.

Mean plaque score was 1.72. Bleeding on probing was present in all patients (100%). Mean probing depth was higher in Group 1 compared to Group 2 with a t value of 2.798 and is statistically significant with a p value of 0.007 (Table: 1) Mean probing depth at mesio-buccal, buccal, lingual/palatal, disto-lingual/palatal site of endodontically infected teeth is higher with statistically significant difference (P 0.002, 0.002, 0.004, 0.002). Mean probing depth of endodontically infected teeth at disto-buccal, mesio-lingual/palatal site is higher compared to teeth without endodontic infection but, statistically not significant (P 0.119, 0.202).

On comparison of the mean clinical attachment level between the two groups showed that mean clinical attachment level is statistically significantly higher in Group 1 with a t value of 2.802 and p value of 0.007 (Table: 1)

On comparison of the mean transgingival probing between the two groups showed that mean transgingival probing is statistically significantly higher in Group 2 with a t value of 2.655 and p value of 0.01 (Table: 1).

TABLE: 1 Mean value of clinical and radiographic parameters

Clinical and radiographic parameters included	groups	Mean Value	Standard Deviation	P value
probing depth	Group 1(30)	4.68133	0.760076	0.007
	Group 2(30)	4.074	0.914118	
clinical attachment level	Group 1(30)	5.669	0.81995	0.007
	Group 2(30)	4.9813	1.06546	
transgingival probing	Group 1(30)	6.753	1.02912	0.01
	Group 2(30)	6.0527	1.01409	
radiographic attachment loss	Group 1(30)	3.5	1.42635	0.011
	Group 2(30)	2.55	1.36046	

Table: 2 shows higher prevalence of Degree 1 furcation involvement in Group 2 and Degree 2, Degree 3 in Group 1.

Table: 2 Distribution of furcation involvement Degree in group 1 and group 2 within study population

Degree of furcation involvement (Hamp'sclassification)	Group 1 N(%)	Group 2 N(%)
Degree 1	13(43.3%)	28(93.3%)
Degree 2	15(50.0%)	1(3.3%)
Degree 3	2(6.7%)	1(3.3%)
Total	30(100%)	30(100%)

Comparison of the mean radiographic attachment loss between the two groups showed that mean radiographic attachment loss is statistically significantly higher in Group 1 with a t value of 2.64 and p value of 0.011 (Table: 1).

Comparison of the mean values of radiographic attachment loss at mesial and distal site between Group 1 and Group 2, the mean values of Group 1 radiographic attachment loss at mesial and distal site is statistically significantly higher with a difference of 0.9 and 1 is with a p value of 0.003 and <0.001 (Table: 3).

Table:3 Mean radiographic attachment loss of teeth at individual sites in group 1 and group 2

Radiographic attachment loss	N	Mean Value	Standard Deviation	Paired Differences		P value
				Mean Difference	Std. Deviation	
Group 1 mesial	30	3.47	1.687	0.9	1.494	0.003
Group 2 mesial	30	2.57	1.406			
Group 1 distal	30	3.53	1.456	1	1.313	<0.001
Group 2 distal	30	2.53	1.456			

DISCUSSION

Periodontally involved teeth with presence of endodontic infection were found to exhibit significantly deeper periodontal pockets, a more advanced radiographic attachment loss and a higher frequency of angular defects compared to their periapically intact counterparts (Jansson et al. 1993).[11,12] Furthermore, periapical pathology was significantly correlated to an impaired marginal healing following periodontal treatment (Ehnevid et al. 1993).[13,14]

Periodontal lesions affecting furcations are usually seen in the 1st maxillary and mandibular molars. Maxillary molars are more frequently affected than mandibular molars.[15] Our study also shows higher involvement of 1st maxillary and mandibular molars.

Result of our study is in accordance with the study conducted by jansson et al. (1993)[11,12], who recorded mean difference in probing depth between teeth with and without periapical pathology was 0.5-1 mm.

Miyashita et al. (1998) in his study found 0.1 mm higher clinical attachment level in teeth with periapical rediolucancy than teeth without periapical rediolucancy[5]. In present study mean clinical attachment level was 5.669 mm for endodontically involved teeth and 4.9813 mm for teeth without endodontic infection with significant difference of o.6 mm (P 0.007).

Jansson at al. (1998)[16] found that mandibular molars with periapical bone loss showed frequent furcation involvement with furcation depth of >3mm and this difference was statistically significant. We have also found higher Degree of furcation involvement was seen in teeth with endodontic infection with statistically significant difference with p value of <0.001.

Timmerman (2006)[17] found that endodontic treated teeth had more bone loss compared to untreated teeth. Present study also shows significant more bone loss in teeth with endodontic infection (0.95 mm) compared to contralateral.

Jansson et al. (1993)[11] found that, mean radiographic attachment loss was 2 mm more on mesial and distal sites for teeth with periapical pathology in comparison to teeth without periapical pathology. In the present study, mean radiographic attachment loss is 3.47 mm at mesial site in group 1 compared to 2.57 mm in group II, 3.53 mm at distal site in group I compared to 2.53 mm in group 2 with a significant difference (P 0.03, <0.001) respectively.

CONCLUSION

Presence of endodontic infection has shown more clinical and radiographic attachment loos. There is also higher degree of furcation involvement in presence of periapical rediolucancy. So whenever there is periodontal and endodontic involvement present, treatment for both the problems should be considered for better treatment outcome.

REFERENCES

1. . Endo-perio dilemma: a brief review. Dent Res J 2011; 8:39-47.
2. Rotstein I. Interaction between endodontics and periodontics. Periodontol 2000 2017; 74:11–39.
3. Langeland K, Rodrigues H, Dowden W. Periodontal disease, bacteria, and pulpal histopathology. Oral Surg Oral Med Oral Pathol 1974; 37:257–270.
4. Grossman L, Oliet S and Del Rio C. (1965) Endodontic practice. Endodontic-periodontal therapy. Philadelphia. 6th edn; pp: 477.
5. Miyashita H, Bergenholtz G, Grondoni K, Wennström L J. Impact of endodontic Conditions on Marginal Bone Loss. J Periodontol 1998; 69:158-164.
6. Löe H. The Gingival Index, the Plaque Index and the Retention Index Systems. J Periodontol 1967; 38:610-6.
7. Ainamo J, Bay I. Problems and proposals for recording gingivitis and plaque. Int Dent J 1975; 25:229-35.
8. Pihlstrom B L. Measurement of attachment level in clinical trials: Probing methods. J Periodontol 1992; 63:1072-1077.
9. Greenberg J, Laster L, Listgarten M A. Transgingival Probing as a Potential Estimator of Alveolar Bone Level. J Periodontol 1976; 47:514-517. Hamp
10. S E, Nyman S, Lindhe J. Periodontal treatment of multi rooted teeth. Results after 5 years. J Clin Periodontol 1975; 2:126-135.
11. Jansson L, Ehnevid H, Lindskog S, Blomlöf L B. Radiographic attachment in periodontitis-prone teeth with endodontic infection. J Periodontol 1993; 64:947–953.
12. Jansson L, Ehnevid H, Lindskog S, Blomlöf L. Relationship between periapical and periodontal status. A clinical retrospective study. J Clin Periodontol 1993; 20:117–123.
13. Ehnevid H, Jansson L, Lindskog S, Blomlöf L. Periodontal healing in teeth with periapical lesions. A clinical retrospective study. J Clin Periodontol 1993; 20:254–258.
14. Ehnevid H, Jansson L, Lindskog S, Blomlof L. Periodontal healing in relation to radiographic attachment and endodontic infection. J Periodontol 1993; 64:1199-1204.
15. Cattabriga M, Pedrazzoli V, Wilson T G. The conservative approach in the treatment of furcation lesions. Periodontol 2000 2000; 22:133-53.
16. Jansson L E, Ehnevid H. The influence of endodontic infection on periodontal status in mandibular molars. J Periodontol 1998; 69:1392–1396.
17. Timmerman M F, Vander Weijden G A. Bone level around endodontically treated teeth in periodontitis patients. J Clin Periodontol 2006; 33:620–625.