



Clinical Trial

COMPARATIVE EVALUATION OF SCALING AND ROOT PLANING WITH AND WITHOUT MAGNIFICATION LOUPE - A RANDOMISED CONTROLLED CLINICAL TRIAL

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ABSTRACT

Aim: To compare the efficacy of scaling and root planing with or without magnification loupe by evaluating the presence of residual calculus using stereomicroscope.

Materials and Methods: A total of 10 teeth with grade II and III mobility in patients diagnosed with chronic periodontitis indicated for extraction were included in the study. The proximal surfaces of the selected teeth were randomly divided into two groups, group 1 and group 2 respectively. Scaling and root planing was done in group 1 and group 2 using gracey curettes by microsurgical (x2.5 magnification compound loupe) and conventional approach respectively. After scaling and root planing, teeth were extracted, sectioned and evaluated for the presence of any residual calculus using stereomicroscope.

Results: Group 1 teeth treated with magnification loupe showed less residual calculus compared to group 2 teeth treated without magnification.

Conclusion: From this study, it was concluded that microsurgical approach increases the efficacy of scaling and root planing compared to the conventional approach.

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INTRODUCTION

Periodontitis is an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms or a group of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with increased probing depth formation, gingival recession or both^[1]. Biofilm and calculus present on the tooth surface are considered to be the main etiologic factor for the progression of the disease. Mechanical debridement by means of scaling and root planing is the prime therapy of periodontics^[2,3]. Lindhe and coworkers (1984) suggested that the success of the periodontal therapy is based on the complete mechanical debridement of the root surface^[4,5]. Over the past few decades there has been a great evolution in the field of periodontics. Microsurgery was introduced into the field periodontics by Tibbetts and Shanelac in 1992^[6]. Microsurgery has found its way in both nonsurgical and surgical procedures as it increases the visibility of the surgical field, allow gentle handling of the tissues with reduced soft tissue trauma and increased patient compliance than the conventional procedures. Despite of its many advantages in the surgical approach, there are only few literature evidences about its role in the field of nonsurgical periodontal therapy.

Hence the aim of the present study is to compare the efficacy of scaling and root planing with and without magnification loupe by evaluating the presence of residual calculus using stereomicroscope.

MATERIALS AND METHODS

The study was carried out in a total of 10 natural single rooted teeth indicated for extraction from a six individuals (3 Males and 3 Females) in the age group of 45-70 years. The six individuals were recruited from the Department of Periodontics, K.S.R Institute of Dental Science and Research, Tiruchengode, Tamilnadu. All the individuals who were recruited in the study were explained about the procedure and written informed consent were obtained.

Inclusion criteria

- Probing depth : ≥ 5 mm.
- Mobility II, III indicated for extraction.
- Calculus (NO.17 Explorer)
- Not received any periodontal treatment for the past 6 months.

Exclusion criteria

- Carious teeth.
- Teeth with subgingival restorations.
- Root canal treated teeth.
- Fractured teeth.

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- Pregnant women
- Lactating mothers.
- Medically compromised.
- Undergone any periodontal therapy for the past 6 months.

The proximal surfaces of the single rooted teeth were randomly divided into two groups using a coin toss method. (Coin toss head - Group 1, Coin toss tail - Group 2).

Group 1(10): Scaling and root planing with magnification loupe (Fig.1)

(2.5x compound).

Gracey curettes (Hu-Friedy)

Group 2(10): Scaling and root planing without magnification loupe (Fig.2)

Gracey curettes (Hu-Friedy)

Group 1



Fig 1a Gracey curettes



Fig1b Compound magnification loupe.



Fig 2 Gracey curettes

Description of the Procedure

Following infiltration anaesthesia with 2% lignocaine and 1:80,000 adrenaline, scaling and root planing was done on the proximal surfaces of the teeth based on the above mentioned criteria in a single session with the same set of gracey curettes by the same operator in the Department of Periodontics (K.S.R Institute of Dental Science and Research).

There is no time limit for scaling and root planing. Scaling and root planing was done until a smooth hard surface was obtained which was determined clinically by visual and tactile examination using no.17 explorer. The proximal surface of teeth treated under magnification were marked with a round bur about 3mm above the CEJ in order to identify the surface of the teeth after sectioning during stereomicroscopic evaluation.

Following scaling and root planing, the teeth were extracted with the forceps without contacting the proximal surfaces of the teeth in the Department of Oral and Maxillofacial surgery, K.S.R. Institute of Dental Science and Research. After extraction, the teeth were rinsed thoroughly under running tap water for about 20 seconds to remove blood and any soft tissue tags. The extracted teeth were stored in formalin until the sectioning of teeth were done (Fig.3).



Fig 3 Samples of teeth stored in formalin

Sectioning of teeth for evaluation of residual calculus by stereomicroscope

All the ten teeth which were extracted and stored in formalin were sagittally sectioned into the mesial and distal surface using carborundum disk (Fig.4 a). The sectioned surfaces of the teeth were air dried for 24 hrs until the evaluation of any residual calculus was done using stereomicroscope (Fig.5).



Fig.4a Carborundum disk



Fig 4b Sectioned tooth



Fig 5 Stereomicroscope

Evaluation of residual calculus under stereomicroscope

The sectioned surfaces of the teeth were evaluated under 10X magnification stereomicroscope for the presence of any residual calculus using Remaining Calculus Index (RCI) (Lie and Meyer, 1977)^[7]

- 0-No calculus remaining on the root surface.
- 1-Small patches of extraneous material, probably consisting of calculus.
- 2-Definite patches of calculus confined to smaller areas.
- 3-Considerable amounts of remaining calculus appearing as one or a few voluminous patches or as several smaller patches scattered on the treated surface. The sectioned surface of the teeth under evaluation were photographed at 10x magnification (Fig.6).



Fig.6a GROUP 1(Score -0)



Fig.6b GROUP 2 (Score-3)

Statistical Analysis

Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA, Version 20.0 for Windows). The chi square test was used to analyse the

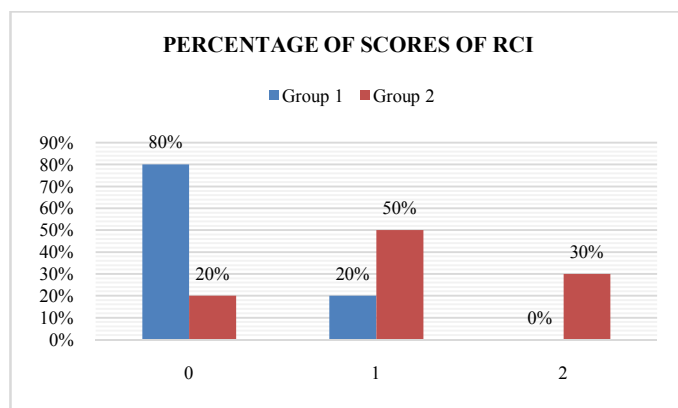
frequencies of scores of remaining calculus index and between groups.

RESULTS

Stereomicroscopic analysis of Group 1 (scaling and root planing done with magnification loupe) showed less residual calculus compared to Group 2 (scaling and root planing done without magnification loupe). Table 1 illustrates that the proximal surfaces of the teeth treated in group 1 showed less residual calculus compared to group 2.

Table 1 RCI-Remaining Calculus Index Group:1 SRP with magnification Group:2 SRP without magnification

Group	Scores of Remaining Calculus Index		
	0	1	2
Group 1 (n=10)	n=8 80%	n=2 20%	n=0 0%
Group 2 (n=10)	n=7 20%	n=5 50%	n=7 70%



Graph 1 Percentage of scores of remaining calculus index of group 1 and group 2.

Table 2 illustrates that there is a significant reduction in the mean score of the remaining calculus index in group 1 compared to group 2.

Group	N	Mean	Std. Deviation
Group 1	10	0.2	0.42164
Group 2	10	1.1	0.73786

p-value = 0.019*

Table:2 Mean, standard deviation of group 1 and 2 with significant p value* (*p value<0.05)

DISCUSSION

Periodontitis is an inflammatory disease caused by the presence of local factors like plaque and calculus containing the colonies of microorganisms with endotoxins which contributes to the progression of the disease. Hence there is an urge to eliminate the local factors responsible for the disease. Complete mechanical debridement by means of scaling and root planing is the gold standard therapy of periodontics. However the complete removal of the etiologic factors cannot be obtained through conventional scaling and root planing.

Microsurgical technique introduced by Shanelac in 1992 can be incorporated in the nonsurgical periodontal therapy which increases the visual acuity of the operator to remove the residual calculus and altered cementum to obtain a smooth, hard tooth surface.

Studies are evident regarding the comparative evaluation of scaling and root planing in patient related outcomes with and without magnification loupe. Mohammed fahad *et al* (2018) found no significant difference between the conventional and microsurgical approach regarding the intensity and duration of pain^[8].

Stefan carbello *et al* (2018) also found no significant difference in the pain perception and quality of the treatment between conventional and microsurgical approach⁶. Only few studies have been done regarding the comparative evaluation of scaling and root planing by assessing the presence of any residual calculus using stereomicroscope and scanning electron microscope^[9].

Rajiv MP *et al* (2010) assessed the percentage of residual calculus by scanning electron microscope and found less residual calculus on the surfaces of teeth treated by curettes compared to ultrasonic instruments^[10].

Hence the present study was to compare the efficacy of scaling and root planing using stereomicroscope between the conventional and microsurgical approach. Periodontally compromised teeth with probing depth > 5mm with grade II or III mobility indicated for extraction were included in the study. Scaling and root planing were done on the proximal surfaces of the teeth with and without magnification loupe. The teeth were extracted, sectioned and evaluated under stereomicroscope for the presence of any residual calculus. The proximal surfaces of the teeth treated using magnification loupe showed very minimal residual calculus compared to conventionally treated teeth.

The limitation of this study is the smaller sample size. Hence in future many randomised controlled clinical trials with maximum number of samples has to be conducted to further support the promising role of magnification loupe in nonsurgical periodontal therapy.

CONCLUSION

From this present study it is concluded that magnification increases the efficacy of operator during scaling and root planing for the successful management of periodontal disease.

Reference

1. Newman, Takei, Klokkevold, Carranza's Clinical Periodontology. Second South Asia edition
2. Lindhe J, Westfelt E, Nyman S, Socransky SS, Haffajee AD. Long term effect of surgical and nonsurgical treatment of periodontal disease. *J Clin Periodontol*. 1984; 11(7):448-458.
3. Lindhe J, Nyman S. Long term maintenance of patients treated for advanced periodontal disease. *J Clin Periodontol*. 1984; 11(8):504-514.
4. Tibetts LS, Shanelac DA. An overview of periodontal microsurgery. *Curr Opin Periodontol*. 1994;2:187-193.
5. Fleischer HC, Mellong JT, Brayer WK, Gray JL, Barnett JD. Scaling and root planing efficacy in multirrooted teeth. *J Periodontol*. 1989;60(7):402-409.
6. Buchanan SA, Robertson PB. Calculus removal by scaling and root planing with and without surgical access. *J Clin Periodontol*. 1987;58(3):159-163.
7. Lie T, Meyer K. Calculus removal and loss of tooth substance in response to different periodontal instruments. A scanning electron microscope study. *J Clin Periodontol* 1977; 4:250-62.
8. Parvez MF, Manjunath N. Comparative Evaluation of Conventional Scaling With and Without Magnification Loupes. *IOSR J Dent Med Sci*. 2018;17(5): 73-76.
9. Corbella S, Taschieri S, Cavalli N, Francetti L. Comparative evaluation of the use of magnification loupes in supragingival scaling procedures. *J Invest Clin Dent*. 2018; 9(2):e12315.
10. Dadwal A, Kaur R, Jindal V, Jain A, Mahajan A, Goel A. Comparative evaluation of manual scaling and root planing with or without magnification loupes using scanning electron microscope: A pilot study. *J Indian Soc Periodontol* 2018; 22:317-21.

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