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Comparative Evaluation of Conventional Scaling With and Without Magnification Loupes

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Abstract: ***Background:*** *The mechanical removal of plaque and calculus has to be considered, together with oral hygiene instructions and motivation reinforcements, as A fundamental part of periodontal Supportive Treatment.*
Aim:*To document the intensity And duration of pain immediately after conventional procedure (Scaling And Curettage) followed by the same using Magnification Loupes.*
Methodology:*A comparative descriptive study was undertaken among 10 subjects who were chosen conveniently and were divided into 2 groups. First group received the conventional therapy (Scaling And Curettage) followed by the second group which received the Same (Scaling And Curettage)with magnification loupes. Visual Analogue Scale (Heft-Parker Scale) was used to assess pain before scaling and curettage after undergoing the procedure*
Results: *The mean gingival Index value at baseline was higher in microsurgical group (2.37 ± 0.52) as compared to conventional (2.13 ± 0.33) group and it was not statistically significant. plaque Index at baseline Showed Higher Mean Values For Conventional Group (2.28 ± 0.27) as compared to microsurgical Group(2.15 ± 0.15) which was not statistically significant.*
Conclusion: *no difference could be found among the groups in terms of objective outcomes. More randomised controlled trials are better to understand the usefulness of magnification loupes for supragingival scaling. In particular exploring the effect of pain perception on wider samples.*

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I. Introduction

Gingival and periodontal diseases, in their various forms have afflicted humans since the dawn of the history.[1]During the initial treatment of periodontitis, most time is spent for mechanical debridement. Firmly adhering subgingival calculus has to be removed, containing a variety of micro-organisms and endotoxins capable of producing periodontal disease.[2]

Numerous studies have shown that plaque removal leads to the resolution of inflammation and can prevent further disease progression. Scaling and root planing with hand curettes is the most commonly used procedure for root surface debridement. However, even skilled operators cannot always achieve the desired biologically compatible clean root surface by non-surgical scaling and root planing due to difficult root anatomy. Moreover, the instrumentation of root surfaces with hand curettes is exhausting for the operator and consequently often induces postoperative root hypersensitivity.[3]

Magnification devices were used in dental clinical practice to increase treatment precision, the accuracy of the performed treatments, and diagnostic procedure improvement and decrease the impact of the interventions to patients quality of life and pain perception. Surgical microscope, endoscope and magnification loupes are the most frequently used devices in dentistry.[4]Because the use of microscopes was mainly described in surgical interventions and in endodontics, magnification loupes have larger indications that depend also on the magnification power and technical characteristics.[5]

Most practitioners have heard anecdotal reports of pain and discomfort from their patients undergoing periodontal therapy, but there are relatively few data available concerning the specific magnitude or duration of discomfort after these procedures. A very few studies have used visual analogue scale to compare the perceptions of pain that patients recalled having experienced during previous surgical and nonsurgical periodontal treatments. Results have shown that surgical procedures have resulted in significantly more discomfort than non-surgical treatment for several outcome measures.[6]

However, the specific magnitude, duration and variability of post procedural pain perceived by patients in the immediate hours after undergoing periodontal therapy have not been reported. Hence the study was done

with an aim to document the intensity and duration of pain immediately after using conventional treatment procedures and magnification loupes.

II. Materials And Methods

A comparative descriptive study was undertaken among 10 subjects who were chosen conveniently. The target population included the patients attending department of periodontics at A.J institute of dental science, Mangalore.

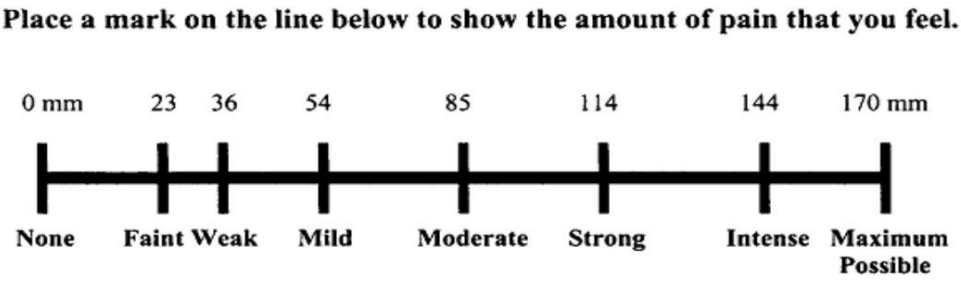
Systemically healthy patients with the pocket depth of less than 5 mm were included in the study and patients having pocket depth more than 5 mm and with chronic periodontitis were excluded.

A questionnaire was prepared and was interviewed to the patients which included demographic details, and clinical examination was done at baseline for gingival index, plaque index and Visual analogue scale (Heft-Parker scale). To find out the pain perception after the periodontal therapy with conventional technique and using of magnification loupes.

The subjects were divided into 2 groups. First group received the conventional therapy (scaling and curettage) followed by the second group which received the conventional therapy (scaling and curettage) with magnification loupes (2.5x). The patients were interviewed about their demographic details and the clinical parameters (plaque index, gingival index) were assessed.

Before the treatment, each subject completed a dental and medical history and underwent an oral soft-tissue and periodontal examination. Each subject was individually instructed by a single trained research assistant in the use of visual analogue scale (Heft-Parker scale). Using this scale, each subject was allowed to assess his or her pain before scaling and curettage after undergoing the procedure.

The treatment protocol consisted of full mouth supra-gingival scaling with ultrasonic devices and curettes. Oral hygiene instructions were provided to all patients who were instructed to use a manual tooth brush and adequate inter dental devices.



Visual analogue scale (Heft-Parker scale)[6]

Statistical analysis:

Descriptive and inferential statistics were done with the SPSS package version 22 (IBM, Chicago). A p value of 0.05 was considered statistically significant (95% Confidence interval). Independent sample t test was used to compare the clinical parameters between the groups.

III. Results

Table 1: Comparison of the groups based on gingival index, plaque index at baseline using independent sample t test

		Minimum	Maximum	Mean S.D	t value	p value
Gingival Index at baseline	Conventional	1.80	2.60	2.13 ± 0.33	-0.88	0.4
	Microsurgical	1.83	2.83	2.37 ± 0.5		
Plaque Index at baseline	Conventional	2.00	2.60	2.28 ± 0.27	0.90	0.39
	Microsurgical	2.00	2.30	2.15 ± 0.15		

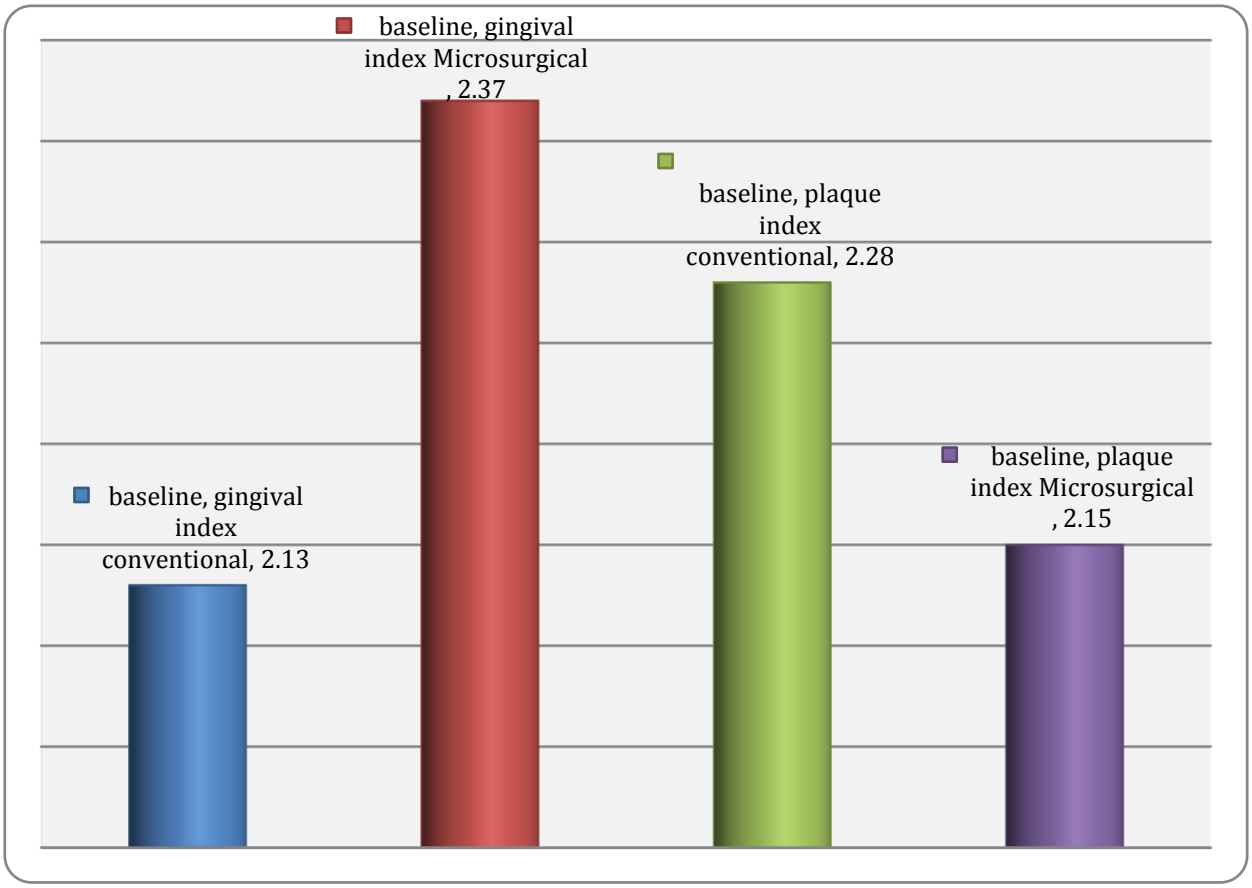
The mean gingival index value at baseline was higher in microsurgical group (2.37 ± 0.52) as compared to conventional (2.13 ± 0.33) group and it was not statistically significant (t=-0.88; p=0.4) whereas plaque index at baseline showed higher mean values for conventional group(2.28 ± 0.27) as compared to microsurgical group(2.15 ± 0.15) and it was not statistically significant (t=0.9;p=0.39).

Table 2: Distribution of the groups based on visual analogue scale

	Mild- N (%)	Moderate- N (%)
Conventional	5(100%)	0
Microsurgical	0	5(100%)
Total	5(100%)	5(100%)

Out of 5(100%) patients in each group(conventional and microsurgical), mild pain was seen in microsurgical group for all subjects -5(100%) and moderate pain was seen for all subjects in conventional group -5(100%)

Comparison of the groups based on gingival index, plaque index at baseline



IV. Discussion

Periodontitis is a destructive inflammatory disease of the tooth supporting tissues caused by gram negative bacterial infection. Subgingival bacteria, bacterial endotoxins and other antigenic components often induce an inflammatory host response causing loss of periodontal tissues. Scaling and root planing is the most commonly used procedure for root surface debridement. Many studies have reported beneficial results on both clinical and microbiological healing parameters after scaling and root planing.[7] The primary objective of cause-related periodontal therapy is the effective reduction of subgingival plaque and calculus and prevention of a re-colonisation of the pockets by periodontal pathogens.[8]

Success of periodontal therapy depends on visual access to the root surface for removing the residual calculus, treating the pathologically altered root surface, and achieving a clean and smooth root surface. Clinical and research studies with stereomicroscopy have demonstrated that the root planing is more effective when done under greater magnification and enhances periodontal regeneration.[9] A magnified view of the interproximal area between two teeth allows a dentist to better determine the location of the interfaces between tooth structure, gingival and alveolar bone, and the location of the contact areas. The dentist can better estimate the dimension of the contact area in three dimensional space from the Buccal to the lingual direction, and the dimensions of the empty embrasure space between the teeth. When the dentist feels a hard structure inter-proximally and subgingivally, a magnified view of the interproximal allows a dentist to intelligently presume if this hard structure is calculus, tooth structure or alveolar bone.[10]

Although periodontal scaling and root planing is one of the most common procedures used in dental practice, there is little information available about the degree of post procedural pain associated with it. Hence the study was conducted with an aim to document the intensity and duration of pain immediately using conventional treatment procedures and magnification loupes.

The present study showed mean gingival index value at baseline was higher in microsurgical group as compared to conventional group and it was not statistically significant whereas plaque index at baseline showed higher mean values for conventional group as compared to microsurgical group and it was not statistically significant. Similar results were seen in the study by corbella S[11] where no differences among groups with regard to the primary outcomes related to the clinical results measured through Full-mouth Plaque score and Full- mouth bleeding score. Moreover, no differences could be found for patient-centered outcomes. The duration of the treatment was significantly higher in the group in which loupes and illumination was used than in the control group.

Sample size was limited and it could be considered as a limitation for the validation of the study results, not many studies have been published comparing the use of magnification devices. However, some papers have investigated the use of minimally invasive non-surgical treatment of periodontitis. The need to report patient centred outcome (in the form of pain) in addition to clinical ones, in periodontology was highlighted as a requirement for research in this field. In the present study, perceived pain was significantly different among groups with mild pain seen in microsurgical group for all subjects-5(100%) and moderate pain seen for all subjects in conventional group-5(100%).

Considering the limitations of the study, it can be concluded that no difference could be found among the groups. More randomised controlled trials are needed to understand the usefulness of magnification loupes for supra-gingival scaling, in particular exploring the effect of pain perception on wider samples.

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