

Original Research Article

# Comparing the efficacy of scaling with root planing and modified widman flap in patients with chronic periodontitis

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## Abstract

The present study was aimed to compare non-surgical treatment (scaling and root planing) with surgical (Modified Widman Flap procedure) treatment for chronic periodontitis. Modified Widman Flap procedure was chosen in our study because it results in removal of pocket epithelium to allow direct approximation of connective tissue with the tooth surface, less mechanical trauma than closed curettage, minimal bone removal, maximal conservation of periodontal tissue, facilitation of oral hygiene, and less root exposure with less sensitivity. The study was performed for a six month period. At initial examination, oral prophylaxis was performed and meticulous oral hygiene instructions were given. The patients were recalled after 21 days. At baseline, 15 subjects were selected with 5-7 mm periodontal pocket in at least 2 quadrants of the mouth. It was a split mouth design, with one quadrant of mouth as Control Group and another quadrant as Test Group. In the Control group, Scaling and

root planing was carried out and in test group modified widman flap procedure was carried out. Sutures were removed after 1 week. Oral hygiene instructions and professional tooth cleaning were repeated once every 2 weeks during study period for both selected quadrants. The clinical assessment was carried out from baseline to 3 months and 6 months to evaluate the respective treatments and to compare between Non surgical mechanical treatment (control group) and surgical treatment (test group). This study demonstrated that both surgical and nonsurgical methods of treatment are effective in eliminating gingivitis and reducing probing depths provided the subgingival plaque is eliminated and reinfection prevented following active therapy. The investigation demonstrated that active therapy including meticulous subgingival debridement resulted in low frequency of gingival sites which showed bleeding on probing, a high frequency of sites with shallow pockets 4 mm and disappearance of pockets with probing depth of > 6 mm.

## Key words

Chronic periodontitis, Modified widman flap, Root planing, Efficacy of scaling.

## Introduction

Chronic periodontitis is defined as an inflammatory disease of supporting tissues of teeth caused by group of specific microorganism, resulting in progressive destruction of periodontal ligament and alveolar bone with either pocket formation, recession or both [1]. Primary goal of periodontal therapy is to arrest inflammatory disease and to restore health and function of periodontium and maintain natural dentition for life time. This goal is achieved by removal of subgingival biofilm and establishment of a local environment and microflora compatible with periodontal health [2]. Chronic periodontitis can be treated by non-surgical or surgical therapy, provided adequate plaque control is maintained during supportive phase of treatment [3]. Non-surgical therapy consisting of oral hygiene instructions and scaling and root planing, has consistently been shown to be one of the most effective means of treating periodontal disease [4-7]. Decreased probing pocket depth, gain in probing attachment levels and modest albeit transient shift in the composition of microbial flora with decrease in population of gram negative microbes associated with disease and concomitant increase in population of gram positive rods and cocci usually associated with health have been found to occur [8-10], although a large number of investigators have reported the difficulty in

achieving complete removal of subgingival calculus, especially in deep pocket areas [11, 12].

In order to overcome the limitations of scaling and root planing in deep periodontal pockets, various surgical procedures have been used in periodontal therapy to attain access for instrumentation of diseased root surfaces and to reduce the depth of deepened periodontal pockets. Some of these procedures are designed to produce a reduced pocket depth through an apical displacement of gingival margin. This implies that the coronal portion of the root surface facing the periodontal pocket becomes exposed to the oral cavity as a result of the surgery. Gingivectomy [13] and apically displaced flap are examples of such procedures [14]. To minimize the post treatment exposure of the root surface, other surgical techniques have been developed with the aim of achieving a reduced pocket depth through regeneration of a connective tissue attachment to the diseased root surfaces. With these techniques, repair is supposed to occur from the "bottom" of the pocket in coronal direction resulting in a reduced pocket depth with minimal recession of gingival margin. The Modified Widman Flap surgery [15] and subgingival curettage [16] are procedures which are based on this principle [17]. The "unrepositioned mucoperiosteal flap" or open curettage was described by Moris in 1965 [18] and later Modified Widman Flap by Ramfjord

and Nissle in 1974 [15]. This procedure is more commonly used when the target of the surgery is to reduce the pocket depth through re-adaptation of periodontal tissues. The advantages [19, 20] of Modified Widman Flap are minimal bone removal, immediate close post surgical contact of healthy collagenous tissue with the tooth surfaces, esthetic desirability, facilitation of oral hygiene, less mechanical trauma than closed curettage.

Hence, the aim of this study was to evaluate the effect of non surgical treatment (Scaling and Root planing) versus surgical treatment (Modified Widman Flap) in terms of probing pocket depth relative attachment level and bleeding on probing for patients with chronic periodontitis.

## **Material and methods**

Sufficient number of subjects comprising of both the sexes and diagnosed with chronic generalized periodontitis with deep periodontal pockets between the age group of 25-50 years, were considered for the present study from the Outpatient Department of Periodontics, Government Dental College and Hospital Srinagar. The inclusion criteria included that, subjects who were diagnosed as suffering from generalized chronic periodontitis on clinical and radiological examination with deep periodontal pockets and Periodontal destruction was nearly similar in selected contralateral quadrants.

Subjects who were willing to appear after every two weeks for maintenance during study period were included in the study. The subjects who had history of oral prophylaxis, 6 months previous to the study or history of any antibiotics therapy or antibacterial mouth wash in past three months or systemic disease i.e. diabetes, cardiovascular disease, females who were pregnant and nursing mothers and the subjects who presented mobility of teeth in selected quadrants were not included in the study. The study was performed for a six months. At initial examination, oral prophylaxis was performed and meticulous oral hygiene

instructions were given. The patients were recalled after 21 days. At baseline, 15 subjects were selected with 5-7 mm periodontal pocket in at least 2 quadrants of the mouth. Split mouth design, with one quadrant of mouth as Control Group and another quadrant as Test Group was adapted. In the Control group, Scaling and root planing was carried out and in test group modified widman flap procedure was carried out. Sutures were removed after 1 week. Oral hygiene instructions and professional tooth cleaning were repeated once every 2 weeks during study period for both selected quadrants. The clinical assessment was carried out from baseline to 3 months and 6 months to evaluate the respective treatments in both the groups. The indices used for clinical assessment were Plaque index (Silness and Loe, 1964) [21], Sulcus bleeding index (Muhleman and Son 1971) [21], Probing pocket depth (UNC-15) [22], Relative attachment level (Acrylic occlusal stents) [22], The last three parameters were assessed using UNC-15 (University of Carolina) probe and a customized acrylic stent which served as a fixed reference point.

Data were entered into an Excel Sheet database (MS Office Excel 2000; Microsoft Corporation, Redmond, WA, USA). The Data was analyzed using SPSS Statistics 19.0 and Z test was used.

## **Results**

Percentage change in plaque index score at baseline to 3 months and baseline to 6 months in both experimental and control group was as per **Table - 1**. There was no statistically significant difference ( $p > 0.005$ ) between two groups.

**Table - 2** showed that bleeding on probing was present in around 80% of gingival units at baseline in the Control group. The percentage increase of gingival units with score 0 from baseline to 6 months was 71.43%, which was not statistically significant ( $p = 0.7792$ ). In test group, from baseline to 6 months the percentage increase of gingival units with score 0 was 74.28% at 6 months. There was statistical

significant ( $p=0.8363$ ) reduction in bleeding on probing in test group. **Table - 3** showed that from baseline to 6 months there was greater pocket depth reduction of 5-6 mm pockets to 3-4 mm in test group compared to control group which was 4-5 mm. The reduction was statistically significant ( $p<0.05$ ). Pockets of 7 mm in the test group were reduced to 3-4 mm compared to control group which was 4-5 mm

( $p<0.05$ ). The reduction was statistically significant. **Table - 4** showed that in control group from baseline to 6 months, there was a gain of 1mm in clinical relative attachment level in 10-11 mm sites which was statistically significant ( $p<0.05$ ). In test group there was a gain of 1 mm from baseline to 6 months which was statistically significant ( $p<0.05$ ).

**Table - 1:** Percentage change in plaque index score.

		Baseline-3 months	Baseline-6 months
		Percentage change in score 0	Percentage change in score 0
<b>Control Group</b>		79%	71%
<b>Experimental Group</b>		71.4%	70.23%
<b>Difference between groups</b>	<b>Z</b>	0.8475	0.1009
	<b>p value</b>	0.3967	0.9196

**Table – 2:** Percentage change in sulcus bleeding index score.

		Baseline-3 months	Baseline-6 months
		Percentage change in score 0	Percentage change in score 0
<b>Control Group</b>		72.38%	71.43%
<b>Experimental Group</b>		76.19%	74.28%
<b>Difference between groups</b>	<b>Z</b>	0.2803	0.2066
	<b>p value</b>	0.7792	0.8363

**Table – 3:** Percentage reduction in pocket depth.

		Baseline-3 months	Baseline-6 months
		Percentage change in pocket depth	Percentage change in pocket depth
<b>Control group (7 mm to 4-5 mm) mean ( 4.8 mm)</b>		83.1%	80.2%
<b>Experimental Group (7 mm to 3-4 mm) mean ( 3.5 mm)</b>		91.3%	83.5%
<b>Difference between groups</b>	<b>Z</b>	2.50	2.75
	<b>p value</b>	0.003	0.003

**Table – 4:** Percentage change in relative attachment levels (10-11 mm).

		Baseline-3 months	Baseline-6 months
		Percentage change in RAL of 10-11 mm to 10 mm	Percentage change in RAL of 10-11 mm to 10 mm
<b>Control group</b>		80%	77.9%
<b>Test group</b>		76.4%	73.7%
<b>Difference between groups</b>	<b>Z</b>	1.28	1.22
	<b>p value</b>	0.02	0.022

In summation the results demonstrate that from baseline to 6 months there was significant increase of tooth surfaces with plaque index score of 0, in both test group and control group ( $p>0.05$ ). While from baseline to 6 months, there was a significant increase in gingival units with sulcus bleeding score of 0, in both control and test group, but the difference between control group and test group was not significant. Furthermore, from baseline to 6 months, there was a significant reduction in periodontal probing depth in both control and test group, but in test group there was more reduction in probing pocket depth in deep pockets. It was also recorded that from baseline to 6, months, treatment in deep pockets resulted in gain in clinical relative attachment level with both non surgical treatment and surgical treatment.

## Discussion

Chronic periodontitis is an inflammatory disease characterized by periodontal tissue destruction. The disease initiates as gingivitis caused by plaque accumulation and is followed by complex interaction between periodontopathic bacteria and various environmental and host resistance factors, which leads to extension of the inflammation to involve the periodontal attachment tissue [23]. It is generally accepted that mechanical debridement is at the core of any periodontal therapy [24], and can be achieved by non-surgical and/or by surgical therapy with instructions in self-administered oral health care measures. These measures are directed towards reducing bacterial load and altering the microbial composition towards flora associated with health. In turn, these microbiologic changes result in lower levels of inflammation and relative stability in periodontal attachment levels [25]. The term “non surgical mechanical therapy” refers to both supra gingival and sub gingival scaling as well as root planning [26]. Non surgical mechanical therapy is usually the first mode of treatment recommended for most periodontal infections [27]. Non surgical therapy aims to control the bacterial challenge characteristic of gingivitis and periodontitis

while addressing local risk factors and minimizing the potential impact of systemic factors. Alteration or elimination of putative periodontal pathogens and resolution of inflammation are paramount objectives of non surgical therapy, creating an environment conducive to periodontal health and decreasing the likelihood of disease progression [28] while non surgical therapy is usually effective in controlling early to moderate periodontal lesion, it is not always sufficient to contain the disease in patients diagnosed with severe form of periodontitis [29]. Plaque and calculus in deep pockets cannot be completely removed by non-surgical root instrumentation [30]. In such cases, gaining surgical access to the various components of the periodontium allows an opportunity for more thorough root debridement and maintenance of periodontal health [31].

Thus the present study was aimed to compare non surgical treatment (scaling and root planing) with surgical (Modified Widman Flap procedure) treatment for chronic periodontitis. Modified Widman Flap procedure was chosen in our study because it results in removal of pocket epithelium to allow direct approximation of connective tissue with the tooth surface, less mechanical trauma than closed curettage, minimal bone removal, maximal conservation of periodontal tissue, facilitation of oral hygiene, less root exposure with less sensitivity [32].

Hence, from the present study, it can be concluded that there was significant reduction in the percentage of bleeding on probing sites and significant increase in plaque free surfaces following non surgical and surgical treatment. Furthermore, surgical therapy resulted in favorable findings in deep periodontal pockets, due to open access to root deposits than non surgical treatment. In clinical relative attachment levels, both non surgical and surgical treatment resulted in gain in clinical relative attachment level.

Our study further endorsed the importance of good oral hygiene and professionally delivered



supra gingival tooth cleaning in combination with self performed plaque control in reducing the signs and symptoms of chronic periodontitis.

The scope of present study includes, evaluating other surgical procedures and comparison of the same with non surgical procedures.

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