

# Comparison of Effects of Single Visit Full Mouth Ultrasonic Debridement with Two Visits Partial Mouth Ultrasonic Debridement in the Treatment of Chronic Periodontitis

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## ABSTRACT

**Objective:** The objective of this study is to compare the clinical effects of single visit full mouth ultrasonic debridement to those of two visit partial mouth ultrasonic debridement up to one month following periodontal treatment.

**Study Design:** An Experimental & Interventional study

**Place and Duration of Study:** This study was conducted at the Out-patient Department (Periodontology) of Isra Dental College Hospital, Isra University, Hyderabad from April 2017 to September 2017.

**Materials and Methods:** Sixty patients of moderate chronic periodontitis were selected through purposive non-probability sampling. All patients were examined at baseline i.e. before treatment, followed up by 1 week, and 1 month respectively. Probing pocket depth (PPD), clinical attachment level (CAL) Index and Plaque index (PI) was measured.

**Results:** After treatment, both groups showed significant improvement in clinical parameters. Full-mouth treatments resulted in greater improvements in full-mouth mean plaque percentage, probing pocket depth and bleeding on probing as conventional therapy. When data was analyzed based on pocket depth and tooth type, there was no difference between groups in attachment gains. The full-mouth groups demonstrated greater reduction in BOP% and number of pockets and the total treatment time was significantly shorter.

**Conclusion:** This study concluded that Full mouth has more beneficial effects on reducing gingival inflammation, plaque level, probing depth, but not significant improvement in clinical attachment level as compare to partial mouth. Moreover, full-mouth ultrasonic debridement provides clinically relevant improvements in the periodontal treatment.

**Key Words:** Periodontitis, Full mouth ultrasonic debridement, Partial mouth ultrasonic debridement. PPD (Probing pocket depth), PI (Plaque index) CAL (Clinical attachment loss), BOP (Bleeding on probing), QRP (Quadrant root planning), FMRP (Full mouth root planning) Q-SRP (Quadrant scaling root planning) FMdis (Full mouth disinfection)

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## INTRODUCTION

Chronic periodontitis is the most common form of periodontitis with about 80% of prevalence<sup>1-2</sup>. The periodontal disease is an opportunistic infection

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associated with the formation of bacterial bio films on the tooth surfaces<sup>3</sup> The bio film is considered as the primary agent in the etiology of periodontitis. However, only the bio film is not enough to determine the disease, genetic and host (e.g., oral hygiene stress, diabetes, and smoking) may also be present<sup>4-5</sup>.

Adequate removal of pathogenic bacteria from the supra- and sub gingival environment, non-surgical mechanical periodontal therapy is required for optimal healing of the diseased periodontal tissues. Conventionally, non-surgical mechanical therapy is performed in a quadrant- or sextant-wise manner with a time gap of 1 or 2 weeks between appointments. Thus, it usually takes 1-2 weeks to complete mechanical treatment of the whole mouth<sup>6</sup>. Numerous clinical and microbiological studies have confirmed that non-surgical mechanical therapy performed in the conventional method is effective in reducing the

bacterial load, resulting in clinical improvement<sup>7</sup>. If the transmission of pathogens happen in earlier phase of healing, it can re-infect the site and thus delaying healing. In order to avoid this, Quirynen et al in 1995 introduced one stage full-mouth therapy which resulted in significantly greater improvements than conventional quadrant-wise therapy<sup>8</sup>.

The study demonstrated superior results with full-mouth mechanical debridement and adjunctive anti-microbial agents but raised the question regarding the currently accepted approach with spaced appointments as the initial treatment. Full-mouth treatment without the use of adjunctive anti-microbial agents was also capable of providing similar results, implying that extra-dental sites may not play a major role in the re-infection of treated pockets. Although this treatment concept appears to be rational considering the infectious nature of periodontal disease, there appear to be no studies done in our population which have actually addressed this issue. So for that reason, the purpose of the present study was to compare the clinical effects of single-visit full-mouth ultrasonic debridement to those of two visit partial mouth ultrasonic debridement.

## MATERIALS AND METHODS

An interventional study was conducted at Department of Periodontology, Isra Dental College for six months. The sample size was calculated to be 60 using RaoSoft sample size calculator with error =0.05, confidence interval =95%, population =250. The patients were selected using non-probability purposive sampling. All the patients from age 30-60 years and those with at least 20 teeth present at the time of study, moderate chronic periodontitis with up to 5mm of pocket depth and having no periodontal treatment in 6 months' time were included in the study.

All those patients with pregnancy, normal gingiva, advanced periodontitis, patients with diagnosed systemic diseases, smokers and those who have received periodontal treatment in 6 months or any antibiotic treatment in last 3 months were excluded from the study.

The study was performed after the approval of ethical review committee of Bhitai Dental and Medical College, Mirpurkhas. All patients were examined at baseline i.e. before treatment, followed up by 1 week, and 1 month respectively after patients consent. Probing pocket depth (PPD) was checked with periodontal probe, clinical attachment level (CAL) Index was measured using a CPITN probe and was calculated by subtracting the gingival margin level from the probing depth. Bleeding on probing (BOP) was recorded after probing as present or absent. And Plaque index (PI) was detected with dental explorer. These measurements was performed at four points i.e. mesial, buccal, distal and palatal/lingual areas. Measurements were recorded by a single calibrated examiner on clinical Proforma. After

recording of all measurements the patients was divided into two groups:

**a. Single visit full mouth ultrasonic debridement:** Complete ultrasonic debridement of all teeth (supra and subgingivally) was done in one visit with piezoelectric ultrasonic scaler.

**b. Two visit partial mouth ultrasonic debridement:** Complete ultrasonic debridement was done in two halves. On the first visit debridement of the entire upper quadrant was done with piezoelectric ultrasonic scaler. Patient was then recalled after one week for the debridement of the lower jaw. The first evaluation was performed after one week of treatment. CAL, BOP, PPD and PI was measured. The final evaluation was made after 30 days of treatment.

After examination the data was tabulated and analyzed statistically for mean and Standard deviation by using Statistical Package for Social Science (SPSS) software, version 21. After collecting data student t-test and chi-square was applied. P value less than or equal to 95% confident interval ( $p=0.05$ ) was considered statistically significant.

## RESULTS

Total 60 subjects were analyzed and they were equally divided ( $n = 30$ ) into two groups i.e. Group I: (Full-mouth) and Group II:(Partial mouth). In Group I: (Full-mouth), the mean age of study subjects was  $42.34 \pm 10.37$  years. In Group II:(Partial mouth), the mean age of study subjects was  $45.6 \pm 8.24$  years. There was no statistically significant difference of age between Group I: (Full-mouth) and Group II:(Partial mouth). ( $p$  value = 0.415)

Table 2 shows the difference two groups with respect to Plaque index score, probing pocket Depth, bleeding on probing and clinical Attachment level. The mean difference was significant in all the above mentioned criteria.

**Table No.1 Distribution of subjects according to age (in years) among the groups (full and partial ultrasonic debridement) n = 60**

	<b>Group I: (Full-mouth) n = 30</b>	<b>Group II: (Partial mouth) n = 30</b>	<b>t-value</b>	<b>P value</b>
Age (in years) Range	$42.34 \pm 10.37$ (32 to 53 years)	$45.6 \pm 8.24$ (37 to 54 years)	0.074	0.415

Results are presented as Mean  $\pm$  Standard Deviation

## DISCUSSION

In the present study, the Full mouth debridement group was treated by ultrasonic tooth debridement in one visit. The results of this study showed that Full mouth has more beneficial effects on reducing gingival

inflammation, plaque level, probing pocket depth, and improving clinical attachment level as compare to partial mouth.

**Table No: 2 Comparison of different variables between the two groups (N=60)**

Plaque Index Scores	Group I Full Mouth (n=30)	Group II Partial Mouth (n=30)	Difference of the means	p value
	Mean±SD	Mean±SD		
Baseline	1.84±0.11	1.83±0.21	0.01	0.001
At one week	1.32±0.12	1.06±0.20	0.26	
At 1 month	1.03±0.15	1.04±0.09	0.01	
<b>PROBING POCKET DEPTH</b>				
Baseline	4.17 ±0.59	4.18 ±0.66	0.01	0.005
At one week	2.76±0.57	3.74 ±0.63	0.98	
At 1 month	2.60±0.52	2.57 ±0.56	0.03	
<b>BLEEDING ON PROBING</b>				
Baseline	73.85±15.20	72.75 ± 25.70	1.1	0.006
At one week	15.90 ±9.32	17.70 ± 9.29	1.8	
At 1 month	12.75±13.69	6.6 ± 5.39	6.5	
<b>CLINICAL ATTACHMENT LEVEL</b>				
Baseline	4.20 ± 0.57	4.20±0.67	0.01	0.04
At one week	3.99 ± 0.59	4.10 ± 0.62	0.11	
At 1 month	3.79 ± 0.54	3.98 ± 0.56	0.19	

p value = 0.05 is significant, 0.01 is very significant and 0.001 is highly significant

This was similar to the study conducted by Shakeel M et al.<sup>9</sup> who revealed that Full mouth disinfection (FMdis) has more beneficial effects on reducing gingival inflammation, plaque level, probing depth, and improving clinical attachment level over Quadrant scaling root planning (Q-SRP). It is also an agreement with the study of Zijng V et al.<sup>10</sup> reported similar findings in his study i.e. FM-SRP and MS-SRP result in overall clinically and microbiologically comparable outcomes where recolonization of periodontal lesions may be better prevented by FM-SRP. The results of

present study are in contradiction with the studies done by Predin T et al.<sup>11</sup> who showed similar clinical outcomes following both treatment modalities. It is also in contrast with the study of Soares L.G.<sup>2</sup> which reported that at the evaluation, 90 days after treatment, no statistical difference was found between the two periodontal therapies.

The clinical findings in the present study were in agreement with Wennstrom et al. who observed improvements in the PI, PPD, BOP, and CAL. In this study the PI improved in each session which might be due to the oral hygiene re-instruction in this study for all patients especially for those in the Q-SRP group as they needed more visits to complete the Q-SRP and within these sessions oral hygiene was reinforced<sup>12</sup>.

The present study is in agreement with several studies which also found mean increase of CAL and reduction of CPD in both groups<sup>13,14</sup>. The results of Vandekerckhove et al<sup>15</sup> also agreed with the study of Quiryren et al.<sup>16</sup> but they showed treatment reduced the CPD of multi rooted teeth as well as the single rooted teeth compared to Q-SRP. The CPD reduction in both of the mentioned studies was not statistically different for less than the 6 mm pockets. In our research moderate cases of chronic periodontitis were incorporated in the study.

In the present study, both treatment strategies resulted in similar and significant (P < 0.01) improvements in PI, PPD, POB, and CAL from baseline at 1 week and 1 month following the completion of therapy. The results of this study indicate a continuous clinical improvement at 1 week and 1 month, thus confirming previous findings of Badersten et al.<sup>17</sup> Moreover, in this study, the PD in the area of an initial pocket depth of 4-5 mm decreased by 1.35 mm after QRP and 1.53 mm after FMRP. Lee et al<sup>18</sup> reported a PD in the area of an initial pocket depth of 4-5 mm, which decreased by 1.4 mm and 1.7 mm after QRP and FMRP, respectively.

However, there were no significant differences in the clinical effectiveness between QRP and FMRP. These findings are in accordance with the results reported by Apatzidou and Kinane<sup>19</sup> and Koshy et al<sup>20</sup> who also failed to find statistically significant differences between the two treatment modalities.

Several authors compared the microbiological effects of full-mouth disinfection with quadrant wise root planning, reporting differing results. For example, the studies by Quiryren et al<sup>21</sup> and De Soete et al<sup>22</sup> indicated advantages of the full-mouth approach versus quadrant wise treatment.

By contrast, Apatzidou and Kinane<sup>19</sup> and Jervøe-Storm et al<sup>23</sup> reported no significant differences between the groups for the bacterial load. Nevertheless, a comparison between studies is difficult due to their differences with respect to sampling time points, sampling methods, and microbiological techniques applied.

In this study, the probing depth in the area of the initial pocket depth of 4-5 mm decreased 1.10 mm after Q-SRP and 2.40 mm after FMdis. Knofler et al<sup>24</sup> reported a probing depth in the area of the initial pocket depth of 4-5 mm, which decreased by 1.1 and 1.0 mm after Q-SRP and FMdis, respectively. Jervoe- Storm et al<sup>25</sup> reported similar results showing decrease of 1.6 mm and 1.5 mm, respectively.

## CONCLUSION

This study concluded that Full mouth has more beneficial effects on reducing gingival inflammation, plaque level, probing depth, gingival recession and improving clinical attachment level as compare to partial mouth. Moreover, full-mouth ultrasonic debridement provides clinically relevant improvements in the periodontal treatment.

### Author's Contribution:

Concept & Design of Study: Arsalan Ahmed  
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**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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