

# Full Mouth Disinfection: A Novel Clinical Method

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### Abstract

#### AIM:

To discuss the effectiveness, drawbacks and the future perspective of Full mouth Disinfection technique

**Background:** Periodontal destruction occurs when the microbial load within the periodontal pocket surpasses the local and systemic host defence mechanisms. Reduction of this load by prevention of recolonization is achieved by disinfection of the intraoral sites. Hence full mouth disinfection

**Technique:** Scaling and root planing of all teeth within 24 hours was carried out in order to reduce the number of remaining bacteria in the pockets, they are irrigated three times within 10 min with a 1% chlorhexidine gel and also chlorhexidine spray was used for disinfection.

**Clinical Significance:** Antimicrobial effect of the irrigation and rinsing product i.e. chlorhexidine provides disinfection for the sites of the oral niches which is the basis of the reduction of the micro flora.

**Conclusion:** Full-mouth disinfection might suppress the risk of cross-contamination between treated and untreated sites as well as other ecologic habitats. A full-mouth approach to treatment might prove more beneficial than conventional nonsurgical treatment, which is performed in a quadrant-wise or sextant-wise manner.

**Keywords:** Full mouth disinfection, Chlorhexidine, Periodontitis.

### Introduction

Periodontitis is a multifactorial inflammatory disease process, which leads to the destruction of the supporting structures of the teeth in a susceptible host. Periodontal destruction occurs when the microbial load within the periodontal pocket surpasses the local and systemic host defence mechanisms. Such an imbalance can result either from specific increase in the total amount of bacteria or increase in the pathogenic species above a certain threshold level. Several studies have shown that pathogenic bacterial species such as *Porphyromonas gingivalis*, *Actinobacillus actinomycetemcomitans*, *Prevotella intermedia* and *Treponema denticola* are increased in periodontitis. Presence of these species is not confined to the sub gingival flora but they are also found to colonize the oral mucosa, the tongue and the tonsils.

The main goal of treatment in patients with periodontitis is to establish infection control that is to reduce the bacterial load. Nonsurgical therapy which includes oral hygiene instructions, scaling and root planing constitutes the initial step in the management of periodontal disease. It is conventionally performed in a quadrant or sextant wise manner consisting of multiple appointments. Even though the quadrant wise therapy is beneficial in treating most of the periodontitis patients, threat for recolonisation of the treated sites from untreated periodontal pockets and intra oral niches and patient's reluctance for multiple visits are the main drawbacks. To overcome it alternative treatment protocol i.e. full mouth disinfection was described by Quirynen et al where full mouth is disinfected with chlorhexidine within a time period of 24 hours. It helps in prevention of

recolonization of treated sites and better patient compliance as the entire treatment is completed in two sessions within 24 hours

#### Technique

The concept of full mouth disinfection is a modification of the non-surgical treatment of periodontitis by scaling and root planing. Full mouth disinfection comprises

- Scaling and root planing all teeth within 24 hours, in order to reduce the number of subgingival pathogenic bacteria, thereby reducing the bacterial load in the other niches<sup>1</sup>.
- In order to reduce the number of remaining bacteria in the pockets, they are irrigated three times within 10 min with a 1% chlorhexidine gel so as to reduce the subgingival flora up to 99%.<sup>2</sup>
- The tongue of the patients is brushed with chlorhexidine 1% gel to reduce the number of bacteria on this surface as it is an important reservoir of black-pigmented bacteria.<sup>3</sup>
- The number of bacteria in the saliva is reduced by rinsing two times in one min with a 0.2% chlorhexidine solution.<sup>4</sup>
- Finally, the tonsils are disinfected by means of a topically applied 0.2%, spray of chlorhexidine a mode of application with nearly the same antimicrobial effect as a 0.2% chlorhexidine rinse.<sup>5</sup>
- In order to delay the subgingival recolonisation, the patients are asked to rinse 2 times daily with chlorhexidine for 2 months.<sup>6</sup>

#### Discussion

Full mouth disinfection can be carried out for the patients with;

- Aggressive periodontitis
- Chronic periodontitis, especially when generalized
- Refractory cases (i.e. poor response after previous treatment)
- Medically compromised patients
- When speed is important (e.g. before radiotherapy or cardiac surgery)

The additional effects of full mouth Disinfection over conventional treatment are due to reduced risk of cross-contamination of an already treated pocket from infected untreated pockets. In addition, the antimicrobial effect of the irrigation and rinsing product i.e. chlorhexidine provides further disinfection. An interesting phenomenon is the rise in temperature observed only in the full-mouth-treated patients, which is associated to a Schwartzman-like reaction, rise in temperature might be detrimental to subgingival flora. Also antibody production, in reaction to the large antigen release in the circulation after the single episode of instrumentation, might be a possible explanation, too.

Some studies have attributed the success of full-mouth treatment protocol to an acute immunologic reaction due to introduction of lipopolysaccharides from the subgingival area into the underlying tissues during scaling of the remaining quadrants.<sup>7</sup>

The concept of full-mouth disinfection is based on a sound rationale that takes into consideration the infectious nature of periodontal disease.

While conventional treatment consisting of quadrant-wise instrumentation takes four to six visits to complete the entire treatment, the full-mouth approach considerably reduces the number of visits for patients and costly treatment

time. Full-mouth disinfection provides improved clinical and microbiological results, with minimal side-effects. It might even eliminate the need for surgical treatment of pockets. Quirynen and coworkers<sup>7</sup> suggested that full-mouth disinfection might be advisable in patients with a low compliance. In addition, this approach might be useful when applied in combination with systemic antibiotics for treatment of various forms of periodontal disease. It might be possible to increase the time period between maintenance visits if the results can be maintained longer than 3 months. Supra- and subgingival instrumentation are provided in one stage and this requires adequate removal of the deposits for proper healing of the tissues. Thus, results largely depend on the expertise of the operator who performs instrumentation. As, the most important factors underlying improved scaling efficacy appear to be operator experience, skill, and training. For these reasons, Badersten et al. have questioned the feasibility of a single instrumentation in general clinical use.<sup>8</sup> Duration of treatment may also be a problem, as scaling and root planing are performed in 24 h, each appointment being long. While administering full-mouth therapy, transmission of pathogens from other intraoral niches and subgingival sites may be largely prevented. However, there is no way to rule out reinfection by transmission from an extraoral source or person. Transmission may occur between intraoral sites or individuals, but bacterial transfer may not always lead to colonization or infection. To initiate or cause disease progression at a specific site at a particular time, the host must be susceptible, the local environment must be favorable for expression of virulence factors of the pathogens, and coexisting bacterial species must be unable to inhibit pathogen activity.

**Clinical Significance**

Numerous investigations demonstrated that

periodontitis could be regarded as a specific infection which is associated with specific key pathogens.<sup>9</sup> The origin of these pathogenic bacteria is from endogenous or exogenous sources. If their origin is exogenous, the goal of periodontal treatment must be the elimination of all bacteria located in the oral cavity. To achieve this goal, mechanical treatment of inflamed periodontal pockets is not sufficient to eliminate all pathogenic bacteria from the oral cavity because most periodontal pathogens colonize additional oral niches such as the oral mucosa, tongue, all oral hard surfaces and the tonsils.<sup>10</sup> Bacteria in these oral niches that are not eliminated by conventional periodontal treatment may be able to re-colonize treated periodontal pockets and contribute to a re-infection, which may jeopardize the success. Due to these considerations, the complete and simultaneous elimination of all exogenous pathogens from periodontal pockets and all oral niches is the therapeutic goal of full-mouth disinfection.

**Conclusion**

Research conducted so far indicates that full-mouth disinfection may be effective in treating periodontitis patients. Full-mouth disinfection might suppress the risk of cross-contamination between treated and untreated sites as well as other ecologic habitats. A full-mouth approach to treatment might prove more beneficial than conventional nonsurgical treatment, which is performed in a quadrant-wise or sextant-wise manner. However, this approach needs to be studied in more detail to confirm its effectiveness. In addition, the effects of each component of full-mouth disinfection need to be examined. A proper explanation for its added benefits is lacking, too. Although application of antiseptics, the immune response, and full-mouth scaling have been suggested to be responsible for the improved results the role of each needs to be clarified. Chlorhexidine may

be substituted with other antiseptics and the original protocol could be modified in ways to improve the outcome. In conclusion, the new full-mouth approach shows promising results, but needs further investigation.

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