

REVIEW

## Non Surgical Periodontal Therapy

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### Abstract:

Periodontal disease is the number one chronic infectious disease in the world. It is the leading cause of tooth loss, and begins as painless infection in the gums that is caused by buildup of bacterial plaque. The treatment modalities that exist for the treatment of gingivitis and Periodontitis depends on the extent and severity, but the primary objective is to restore the gingival health by removing the local factors viz plaque, calculus etc. that provoke inflammation. Non- surgical periodontal therapy or NSPT is one of the management of gingival infection with scaling, root planning, antibiotics and other non surgical means.

**Key words:** *Gingivitis, Periodontitis,  
Non-surgical periodontal therapy*

### INTRODUCTION

Periodontal disease is the number one chronic infectious disease in the world. It is the leading cause of tooth loss, and begins as painless infection in the gums that is caused by buildup of bacterial plaque. Loe *et al.* in their classic study in 1965 established the relationship between plaque accumulation and development of gingivitis.<sup>1</sup> If left untreated the inflammation spreads to underlying tissues leading to periodontitis.

Numerous treatment modalities exist for the treatment of gingivitis and periodontitis depending on the extent and severity, but the primary objective is to restore the gingival health by removing the elements that provoke inflammation. Non- surgical periodontal therapy (NSPT) is the management of gingival infection with scaling, root planning, antibiotics and other non surgical means. These modalities can be implemented by a general dentist or periodontist. Many studies have shown high

success rates with NSPT in successful treatment of mild to moderate periodontitis.<sup>2</sup>

Regular home care by the patient in addition to professional removal of plaque and calculus is generally very effective mode of NSPT, controlling most inflammatory periodontal diseases. When disease does recur, despite frequent recall, it can usually be attributed to lack of sufficient supragingival and subgingival plaque control or to other risk factors that influence host response, such as diabetes or smoking. Causative factors contributing to recurrent disease include deep inaccessible pockets, overhangs, poor crown margins and plaque-retentive calculus.<sup>3</sup>

### HISTORY

Analysis of Egyptian hieroglyphics and medical papyri indicate that non-surgical periodontal treatment was common 3000-4000 years ago. The presence of bacterial deposits on teeth has been

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observed since the birth of microbiology but it has taken over 300 years to understand which elements of the various hard and soft dental deposits must be removed in order to arrest the destructive processes caused by the periodontal diseases.<sup>4</sup> Albusasis of Arabia in 10<sup>th</sup> century emphasized on the etiological role of calculus and designed several sets of instruments for performing scaling.

Anton van Leeuwenhoek first published drawings of oral bacteria and performed some anti plaque experiments. The 19<sup>th</sup> and 20<sup>th</sup> centuries saw major developments in diagnosis, patho-physiology and surgical and non-surgical treatment procedures for periodontal diseases. In the early 20<sup>th</sup> century Isadore Hirschfield strongly supported non surgical treatment modalities and published many papers in support. Now the recent trends in research and treatment outcomes are re emphasizing on the importance of NSPT.

#### **DIFFERENT APPROACHES OF NSPT:**

The various treatment modalities available in NSPT are:

#### **MECHANICAL INSTRUMENTATION:**

Scaling and root planing have been shown to decrease gingival inflammation and bleeding on probing.<sup>5</sup> In areas with mild to moderate periodontitis, scaling and root planing resulted in reduced probing depth and improved clinical attachment levels when compared to supragingival plaque removal alone.<sup>6,7,8</sup>

Mechanical instrumentation has shown a shift in gingival microbial populations, with decrease in gram negative organisms and increase in gram positive rods and cocci associated with periodontal health.<sup>9</sup> But mechanical instrumentation was not effective in reducing levels of tissue penetrating bacteria, especially *Actinobacillus actinomycetem comitans*<sup>10</sup>. But mechanical debridement has shown limited ability in areas with deeper pockets, underlying bony defects and in aggressive periodontitis.

#### **ULTRASONIC INSTRUMENTATION:**

The entry of ultrasonic instrumentation in periodontics have improved the patient compliance and decreased the time taken for thorough debridement. Several studies have shown similar results with both manual and ultrasonic instrumentation in terms of plaque, calculus and endotoxin removal.<sup>7</sup> However ultrasonic instrumentation when used on medium power settings has shown comparatively lesser root surface alteration and found to be more effective in furcation areas.<sup>11</sup>

#### **SUPRA & SUB GINGIVAL IRRIGATION:**

Supra and sub gingival irrigation are more effective in flushing out the bacteria and reducing gingivitis scores when compared to mouth rinses.

Subgingival irrigation penetrates much deeper in to the pocket and significant improvements in gingival health, when compared to supra gingival irrigation.<sup>12</sup>

Several irrigant solutions are tried viz. 0. 2% chlorhexidine digluconate, 0. 5% tetracycline, 0. 5% metronidazole, 0. 02% stannous fluoride and several other agents.

Scaling followed by gingival irrigation has shown better results when compared to either of the procedure alone.

The success of the gingival irrigation depends on the patient compliance and dexterity, irrigant used, and the design of the tip.

#### **SYSTEMIC ANTIBIOTICS:**

Nonsurgical scaling and root planing may remove or decrease the bacterial loads, but is frequently ineffective against *Actinobacillus actinomycetem comitans*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Bacteroides forsythus*, staphylococci and enteric rods.<sup>13</sup>

Mechanical debridement as ineffective against tissue penetrating organisms and other those inhabiting inaccessible areas. Though systemic antibiotics are not prescribed routinely in treatment

of periodontitis, they are considered when the mechanical debridement fails to arrest the disease progression and tissue destruction, and in refractory and aggressive periodontitis cases. Commonly used antibiotics are Pencillin/amoxicillin, metronidazole, Tetracycline/doxycycline, Clindamycin, erythromycin etc.

The combination of 250 mg Amoxicillin and 200 mg metronidazole taken thrice daily for 8 days has shown to be highly effective in reducing *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivalis* counts.<sup>14</sup>

Systemic antibiotics are not substitutes for proper mechanical debridement.<sup>15</sup> Currently no ideal antibiotic for the treatment of periodontal disease exists. Therefore, if indicated, microbial specificity, spectrum of the drug, possible interactions and adverse reactions of the drug are to be considered before prescribing.

**LOCAL DRUG DELIVERY:**

Systemic antibiotics when used for treating periodontal diseases have many negative effects like failure to reach the site, development of bacterial resistance, systemic side effects etc. So local delivery of the drug directly into the diseased site might eliminate these effects and allow higher dosages of the drug to be used at the specific sites and improve patient compliance.<sup>16</sup> Several of the systems using different drugs delivered in the form of gels, intments, fibres, impregnated chips, microspheres etc.

Some of the local drug delivery systems available commercially are

Drug	Available form	Commercial Name
Tetracycline	Non resorbable fibers	Actisite®
Metronidazole	Gel	Elyzol®
Doxycycline hyclate	Gel	Atridox®
Minocycline	Microspheres	Arestin®
Minocycline	Ointment	Dentamycin®
Chlorhexidine	Resorbable Chip	PerioChip®

Use of Local drug delivery alone has shown similar results to that of mechanical debridement.

But Local drug delivery when used as an adjunct to scaling and root planing showed better clinical results in terms of probing depth reduction and clinical attachment gain especially in non-responding sites or patients with recurrent disease who need an alternate treatment approach.

Loesche *et al.* concluded that systemic and local drug delivery used in conjunction with scaling and root planing was able to reduce the need for periodontal surgery.<sup>17</sup>

**HOST MODULATION THERAPY:**

Current research and clinical data available has shown that the periodontal tissue destruction is brought about by the plaque bacteria and their toxins, and the host’s inflammation-immunity response to them. The host response which is genetically determined varies accordingly in different patients and determines the response to the periodontal infection. Susceptible patients show severe response to periodontal pathogens and deep pocketing inspite of proper plaque control. Host modulatory therapy (HMT) aims at modulation of host response to bring down the destruction levels. Various host modulatory agents which are available are subantimicrobial dose Doxycycline, Bisphosphonates, Anti-inflammatory drugs, Enamel matrix derivatives and growth factors.

**CONCLUSION:**

Non surgical periodontal therapy is as effective as the surgical therapy if correctly performed in indicated patients.<sup>18</sup> Carefully choosing the patient and employing the correct form of therapy helps in high success levels of NSPT. The importance of NSPT lies in the fact that it can be performed successfully by a regular dentist who is well educated. This helps in reducing and treating the periodontal disease in areas where a periodontist is not available.

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