

Modern and perspective concepts in preventive care of periodontal disease

Horia Traian Dumitriu, Anca Murea
Bucharest, Romania

Modern dental care cannot be considered just a sum of therapeutically active attitudes; it also means survey, local and general stimulation of health status.

Although healing and functional therapeutic measures are necessary in an overt periodontal disease, closer examination of apparent healthy dento-periodontal structures and planning preventive care measures according to the risk factors has a similar importance.

To examine the periodontal apparent state of health is an additional effort because of the difficulty of noticing nonsymptomatic illness of gingiva and profound periodontium that requires high level of professionalism.

It is common knowledge: the more carefully an apparent healthy individual is investigated (dento-periodontal structures, T.M.J., muscles, occlusal relations) through clinical and paraclinical tests, the farther is he/she from the ideal state of health.

High differentiation of dento-maxillary apparatus structures, the plasticity of its tissues, the outstanding adaptability to different tasks, all these are responsible for transient hidden cellular, metabolic, vasculo-nervous disturbances and for a false state of health and functional - structural harmony.

A careful and highly competent detailed investigation, and with a certain curiosity about reality beyond the visible balance will lead to major findings; the more conceived is the present lesional status, the more important is their future significance.

That is why we have to take into consideration, even in subjects with apparent health periodontium certain risk factors such as: incorrect/absent oral hygiene, smoking, incorrect prosthetic and orthodontic appliances, calculus, decays, dento-maxillary anomalies, occlusal trauma, iatrogenic factors, stress, high dose of corticosteroids, immune system deficiency, genetical factors, systemic disease, all these associated or not to other risk indices like: age, gender, social status.

Periodontal disease has insidious onset, slow progression, mainly with decreased clinical symptoms or signs, with alleviated suffering because of

the so called adaptation to disease; the case is well known of some patients with advanced forms of disease who demand an efficient therapy with allegedly miraculous properties, products or vaccines.

To avoid such advanced forms we have to carefully take knowledge of certain aspects which represent the "prepathogenic mark" and there is summation of key circumstances for a potential periodontal illness, aspects such as discrete alterations of gingival anatomy, transient localized inflammation of the free gingival margin and papillae, reduced gingival recessions, pointing out to occlusal traumatism, horizontal atrophy-a truly favorable ground for dystrophic periodontitis onset.

The periodontal disease, in all its aspects, can be prevented and controlled, especially nowadays when its bacterial etiology and direct mechanisms of specific periodontal pathogens are unanimously recognized.

The occlusal traumatism is considered responsible for periodontal suffering but in a binomial complex: inflammation-risk factors; but the essential role in producing progressive and destructive periodontal disease is played by microbial infections.

The American Academy of Periodontology definition of preventive care is "ensemble of measures which prevents the onset and progression of gingival and periodontal disease".

Primary prophylaxis

WHO prophylaxis program in gingivitis and periodontitis encompasses primary preventive measures, which stop the onset of gingivitis and chronic periodontitis.

It is the most efficient method that puts off active treatment procedures and future sufferings.

The major primary prophylactic measure is oral hygiene.

Secondary prophylaxis: Characteristics

Its goal is to stop the evolution of early clinically evident periodontal disease towards more advanced forms of illness.

Early recognition of disease and active treatment in a timely manner.

It is put into practice through oral hygiene, professional cleaning, active treatment of gingivitis and superficial periodontitis.

Biostimulation procedures.

Tertiary prophylaxis: Goals

Prevention of recurrence after therapy of active periodontal disease.

Limitation of sequellae.

Morpho-functional rehabilitation.

Biostimulation therapy after recovering post treatment in superficial periodontitis.

Maintenance care.

Prophylactic attitudes and Healing Oriented Therapy

Primary prophylactic attitudes do not exclude healing oriented actions. E.g.: chemoprophylaxis of dental plaque (within primary prophylaxis) has antibacterial effects on early gingival lesions (within secondary prophylaxis).

Dental plaque disclosure through various means helps to calculate some indices:

1. Indices of oral hygiene evaluation

OHI - oral hygiene index composed from:

plaque index;

calculus index.

0 = no plaque/calculus;

1 = plaque/calculus in the gingival third of the tooth;

2 = plaque/calculus in the middle third of the tooth;

3 = plaque/calculus in the coronal third of the tooth.

This index can be calculated as percentage and it represents an important marker of oral hygiene status.

Sillness and Loe plaque index

0 = no plaque;

1 = surface looks clear but debris can be removed with the point of a sharp probe;

2 = visible plaque deposits, such as thin pellicular debris;

3 = abundant plaque deposits, covering gingival crevice, free marginal gingiva and dental surfaces.

Sillness and Loe index is easy to be recorded without disclosing agents and it shows plaque distribution; can be used in epidemiological studies on large people communities.

Loe plaque retention index

0 = no retentive factors;

1 = supragingival calculus, open caries, defective margins of fillings;

3 = abundant supra- and subgingival calculus, open, extensive and deep caries, overhanging fillings with defective and retentive margins.

This index gives significant data on the presence of plaque according to the surfaces that sustains plaque best; i.e.: supra- and subgingival calculus.

2. Inflamed Gingival Indices are early indicators of gingival inflammation, recording levels of gingival bleeding.

Gingival index

It is an indicator of gingival inflammation by the bleeding degree.

0 = healthy gingiva (normal looking gingiva);

1 = light inflammation of gingiva, discrete color changes, discreet edema, absence of bleeding on probing;

2 = mild inflammation, congestion, edema, bleeding on probing;

3 = severe inflammation, congestion, vascular stasis, ulceration, spontaneous bleeding.

Papillary Bleeding Index

0 = no bleeding;

1 = isolated, unique, pointed bleeding;

2 = multiple point-like bleeding, sometimes linear or on a small area;

3 = bleeding in the interdental space which is filled with blood;

4 = bleeding beyond free gingival margin.

Gingival Bleeding Index is calculated as percentage:

$$\frac{\text{Number of bleeding surfaces} \times 100}{\text{Total number of dental surfaces}}$$

Prophylactic procedures and healing oriented measures

Personal hygiene program:

- tooth brushing;

- secondary means of oral hygiene.

Professional cleaning:

- professional scaling;

- root planning of accessible root surfaces;

- debriment (removal of gingival crevice and false pockets contents).

Brushing methods:

Bass Method

Indications:

- healthy periodontium;
- periodontal disease.

Advantages:

- easy to learn;
- removes plaque from gingival crevice and interdental spaces (*Figure 1*).

Modified Stillman Method

Indications:

- gingival progressive recession due to early onset involution;

- cleaning of exposed root surfaces after gingivectomy (*Figure 2*).

Charters Method (Interdental brushing)

Indications:

- gingival massage;
- cleaning of under healing gingival areas after periodontal surgery (gingivectomy or flap surgery) (*Figure 3*).

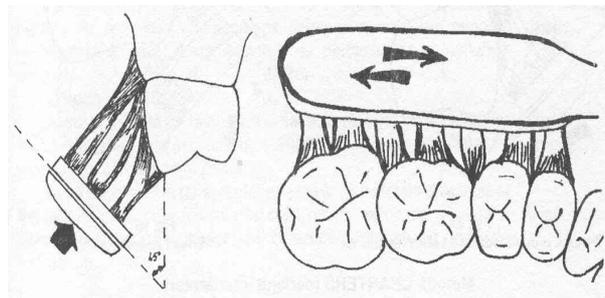


Figure 1. Bass Method

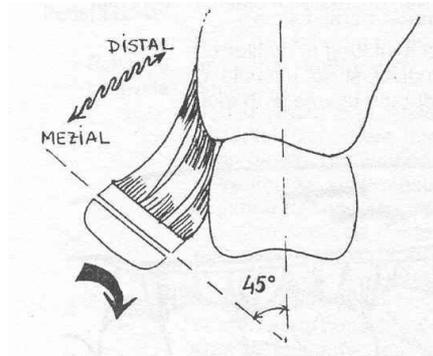


Figure 2. Modified Stillman Method

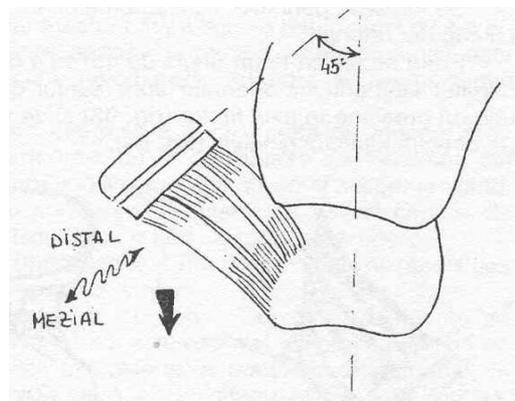


Figure 3. Charters Method

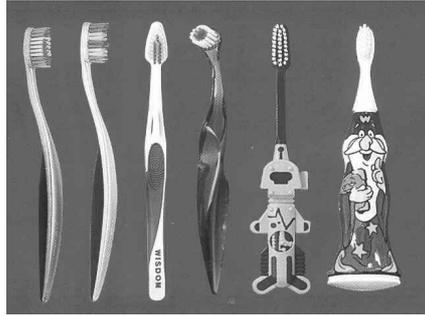


Figure 4. Images of various toothbrushes



Figure 5. Images of various electrical toothbrushes

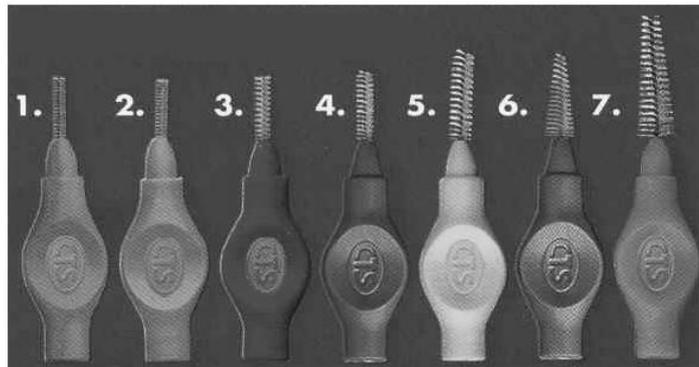


Figure 6. Interdental brushes

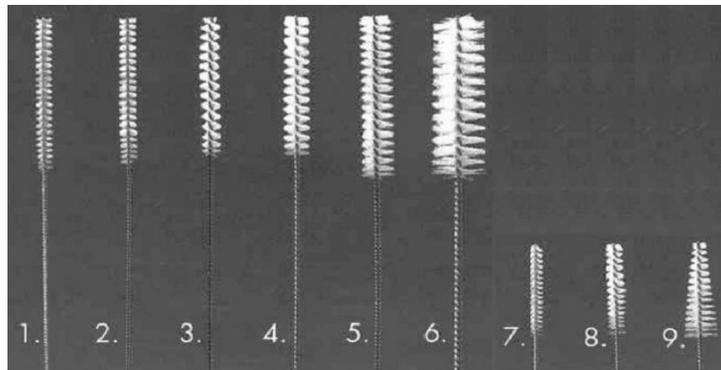


Figure 7. Interdental brushes

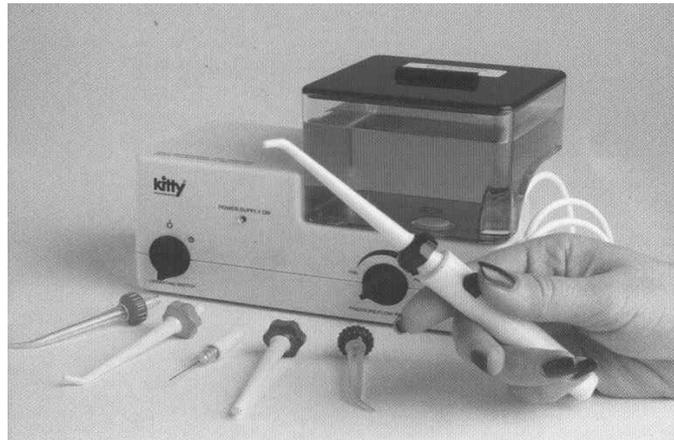


Figure 8. A system of buccal rinsing

Natural fibers toothbrushes

Advantages:

- no risk of gingival injuries;
- suppleness, intimate adaptation to dental surfaces;
- good retention of toothpaste;

Disadvantages:

- short lifetime because of retention of water and mechanical debris;
- minor range of consistency and flexibility.

Images of various toothbrushes (*Figure 4*).

Electrical tooth brushing (Figure 5)

Indications:

- small children;
- patients with orthodontic appliances;
- people with disabilities;
- impaired manual ability;
- lazy persons;
- uncooperative, sick persons.

Features - movements of the head (active piece)

- 60 degrees arch oscillatory movements from the fixed (attached) gingival towards coronal part of the tooth and back;
- horizontal movements in an alternative linear way;
- combined oscillatory and linear movements;
- complete rotational movement of the head (active piece).

Secondary means of preventive care

- dental floss;
- wooden toothpicks;
- interdental brushes (*Figure 6, 7*);
- gingival stimulator;
- oral showers and irrigators (*Figure 8*);
- mouth rinsing;
- dentifrices;
- mouthwashes.

Efficiency of antiplaque antiseptic solutions

Chlorhexidine and Triclosan from the second generation have the highest efficiency, cetylpyridinium chloride, benzalkonium chloride, phenolic compounds have the lowest efficiency; DELMOPINOL (from the third generation) has high substantivity (HANCOCK E.B., NEWELL D.H., 2000, 2001).

Anti-plaque antiseptics

Clorhexidine - action mechanism:

- ability to bind with anionic groups of bacterial and dental surface due to its strong charge;
- alters cellular wall permeability;
- modifies bacterial cell surface receptors and alters nutrients transition at this level.

Side effects of long-term use of clorhexidine:

- increased supragingival calculus deposits;
- yellow-brownish staining;
- taste alterations;
- irritation and superficial desquamation of oral mucosa;
- allergic reactions;

- digestive disturbances.

Other anti-plaque antiseptics

- Listerine: mouthrinse which contains blend of phenolic compound and methylsalicylicum; anti-plaque efficiency is visible only after long-term use (of months). It also has anti-Candida activity.

- Fluorides;

- Octenidine - similar in action to chlorhexidine;

- Alexidine;

- Benzalkonium chloride;

- T chloramine;

- Natrium ricinoleatum;

- Natrium para-hydroxi-hydrargirum benzoatum

For an authentically prophylaxis there are necessary a lot of instruments such as: Sickle Scaler, Hoe, Chisel, File, Periodontal Curettes: Universal and Area Specific Curettes (Gracey).

In our opinion "root planning" is a robust operation of removal bacterial cementum, not only root surface polishing.

Fine Cleaning and Polishing of Dental Surfaces after Calculus Removal are using:

- rubber cups;

- professional brushes;

- fine disks;

- Balsa wood interdental wedges;

- wide waxed silk strips;

- Eva System prophylactic instrument.

References

1. Dumitriu H.T. Parodontologie. Ed. a III-a. Ed. Viata Medicala Romaneasca, Bucuresti, 1999.

2. Dumitriu S., Dumitriu H. Etiologia microbiana in parodontitele marginale cronice. Profilaxie si tratament antimicrobian. Ed. Cerma, Bucuresti, 1996.

3. Dumitriu H. Bioterapia de reactivare in parodontopatiile marginale cronice. *Magazin stomatologic*, 1991; **2** (1).

4. Murea A., Dumitriu H.T., Malita C. Monitorizarea prin indici clinici a tratamentului complex in parodontitele marginale cronice. *Congres UNAS*, oct 2001.

5. Dumitriu H.T., Malita C., Jivanescu M., Murea A. Sisteme moderne de stadializare si cuan-

Ultrasonic instrumentation (Calculus removal)

Indications:

- supragingival calculus;

- tooth staining;

- subgingival calculus (3-4 mm deep);

- acute ulcerative necrotizing gingivitis;

- haemophylic patients;

- early phases of periodontal disease (gingivitis and superficial periodontitis);

- during surgery for adherent subgingival calculus removal.

Counter indications for use:

- contagious disease;

- prone to gagging patients;

- dentinal hypersensitivity;

- small children;

- unshielded pacemaker for magnetostrictive instruments.

Conclusions

Preventive care is more efficient and beneficial for periodontal health status than treatment of active disease.

Today's prophylactic measures consist of an anti-plaque specific agent and act selectively on circumstantial factors.

Periodontal maintenance procedures consist of an attentive, sustained and regular follow-up of periodontal patients.

tificare a statusului parodontal. Seminarul International de Stomatologie - Iasi, 18-20 mai 1998.

6. Dumitriu H., Dumitriu S., Murea A., Malita C. Consideratii teoretice si practice pentru o atitudine terapeutica realista din perspectiva etiopatogeniei microbiene a bolii parodontale. *Zilele Medicale Banatene*, Mai, 1999

7. Carranza F. A. jr. *Clinical Periodontology*. W.B. Saunders Co., Philadelphia, 1996.

8. Boyd R. Longitudinal evaluation of a system for self-monitoring plaque control effectiveness in orthodontic patients. *Clin Periodontol*, 1983; **10**: 380-388.

9. Poison A.M., Reed B.E. Long-term periodontal status after orthodontic treatment. *Am J Orthod Dentofacial Orthop*, 1988; **93**: 51-58.

10. Trosello V., Gianelly A. Orthodontic treatment and periodontal status. *Periodontol*, 1979; **50**: 665-671.

11. Paster B.J., Boches S.K., Galvin J.L. Bacterial Diversity in Human Subgingival Plaque. *J. of Bacteriology*, 2001; **12**: 3770-3783.

12. Rudney J.D. Saliva and Dental Plaque. *Adv Dent Res*, 2000; **14**: 29-39.

13. Schluger S., Youdelis R., Page R.C., Jhonson R.H. Periodontal Diseases. Lea & Febiger, Philadelphia, London, 1990: 47-56.

14. Schenkein H., Cochran D.L., Van Dyke T.E. The pathogenesis of periodontal disease. *J Periodontol*, 1999; **70**: 457-470

15. Wilson T.G., Kornman K.S. Fundamentals of Periodontics. Quintesence Publishing Co., 1990: 47-58.

Correspondence to: Prof. Dr. Horia Traian Dumitriu, University of Medicine and Pharmacy "Carol Davila", Faculty of Dentistry, Department of Periodontology, Dionisie Lupu Str., no. 37, sector 1, Bucharest, Romania.