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Treatment planning for patients With Periodontal Diseases

A treatment plan is a therapy plan formulated only after a thorough examination has been completed, diagnosis and prognosis have been determined and the needs and desires of the patient have been taken into consideration. It must be recognized that as diagnosis and prognosis will change with treatment, therapeutic needs may also change. As such, the treatment plan must be changed accordingly.

The treatment plan for patients with periodontal disease includes the following phases:

1. Phase I therapy (initial, cause-related therapy, non-surgical therapy)

2. Phase II therapy (surgical therapy)

3. Phase III therapy (restorative therapy)

4. Phase IV therapy (maintenance therapy)

The aim of the treatment plan is total treatment that is, coordination of all the immediate, intermediate, and long-term goals to create a well-functioning dentition in a healthy periodontal environment.

The Immediate goals are the elimination of all infections and inflammatory processes that cause periodontal and other oral problems that may hinder the patient's general health.

The intermediate goals are the reconstruction of a healthy dentition that not only fulfils all functional and aesthetic requirements but lasts many years.

The long-term goal is the maintenance of health through prevention and professional supportive therapy. The long-term goal is set, and both the patient and the clinician work toward it from the very first visit.

Maintenance of health requires

1. patient education on disease prevention

2. oral hygiene at the onset of treatment and meticulous daily home care by the patient

3. patient adherence to professional recall maintenance at a regular interval.

The treatment plan involves decisions regarding the following:

• Emergency treatment (pain, acute infections)

• Removal of nonfunctional and diseased teeth, and possibly strategic extraction of healthy teeth to facilitate the prosthetic reconstruction of the patient

• Treatment of periodontal diseases (surgical or nonsurgical, regenerative or resective)

• Endodontic therapy (necessary and intentional)

• Caries removal and placement of temporary and final restorations

• Occlusal adjustment and orthodontic therapy

• Replacement of missing teeth with removable or fixed dental prostheses or dental implants

• Aesthetic demands

• Sequence of therapy

Extracting or Preserving a Tooth

Removal, retention, or temporary(interim)retention of one or more teeth is an important part of the overall treatment plan.

A tooth should be extracted under the following conditions:

• It is so mobile that function becomes painful.

• It can cause acute abscesses during therapy.

• There is no use for it in the overall treatment plan.

In some cases, a tooth can be retained temporarily, postponing the decision to extract

until after treatment is completed. A tooth in this category can be retained under the

following conditions:

• It maintains posterior stops; the tooth can be removed after treatment when it

can be replaced by an implant or another type of prosthesis.

• It maintains posterior stops and may be functional after implant placement in

adjacent areas. When the implant is restored, these teeth can be extracted.

• In the anterior aesthetic zone, a tooth can be retained during periodontal therapy

and removed when treatment is completed and a permanent restorative

procedure can be performed. The retention of this tooth should not jeopardizethe adjacent teeth. This approach avoids the need for temporary appliances

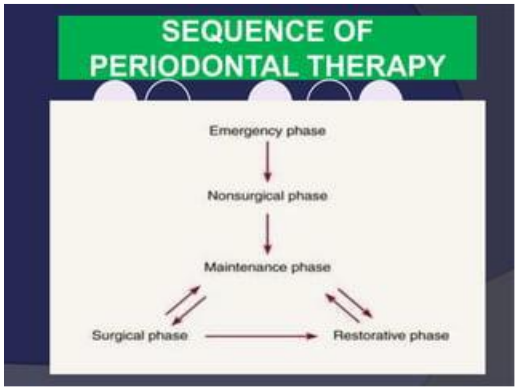
during therapy.

• Extraction of hopeless teeth can also be performed during periodontal surgery of

the adjacent teeth. This approach reduces the number of appointments needed for surgery in the same area.

Sequence of Therapy

The periodontal treatment sequence is presented in the following figures. Immediately after completion of phase I therapy, the patient should be placed on the maintenance phase IV to preserve the results obtained and prevent any further deterioration and recurrence of the disease. While in the maintenance phase, with its periodic evaluation, the patient enters into the surgical phase II and the restorative phase III of treatment.



Sequence for the treatment of periodontitis stages I, II and III

1. The first step in therapy (behavioral and risk factor modification) is aimed at guiding behavior change by motivating the patient to undertake successful removal of supragingival dental biofilm and risk factor control and may include the following interventions:

• Supragingival dental biofilm control

• Interventions to improve the effectiveness of oral hygiene [motivation, instructions

(oral hygiene instructions).

• Professional mechanical plaque removal, which includes professional interventions aimed at removing supragingival plaque and calculus, as well as possible plaqueretentive factors that impair oral hygiene practices.

• Risk factor control, which includes all the health behavioral change interventions eliminating/mitigating the recognized risk factors for periodontitis onset and progression (smoking cessation, improved metabolic control of diabetes).

This first step of therapy should be implemented in all periodontitis patients, irrespective of the stage of their disease, and should be re-evaluated frequently to:

• Continue to build motivation and adherence, or explore other alternatives to overcome the barriers

• Develop skills in dental biofilm removal and modify as required

• Allow for the appropriate response to the subsequent steps of therapy

2. The second step of therapy (cause-related therapy) is aimed at controlling (reducing/eliminating) the subgingival biofilm and calculus by

• performing subgingival instrumentation. In addition to this, the following interventions may be included:

• Use of adjunctive antiseptic agents

• Use of adjunctive host-modulating agents (local or systemic)

• Use of adjunctive locally or systemic delivered antimicrobials

• Periodontal re-evaluation.

This second step of therapy should be used for all periodontitis patients, irrespective of their disease stage, and for teeth with loss of periodontal support and/or

periodontal pocket formation. such as for preventing periodontal abscess development.

The individual response to the second step of therapy should be assessed once the periodontal tissues have healed (periodontal re-evaluation). ***If the endpoints of therapy (no periodontal pockets >4 mm with bleeding on probing or no deep periodontal pockets [≥6 mm]) have not been achieved***, the third step of therapy should be considered after 3 month. If the treatment has been successful in achievingthe endpoints of therapy, patients should be placed in a supportive periodontal care (4th step) program.

3. The third step of therapy (surgical phase) is aimed at treating those areas of the dentition non-responding adequately to the second step of therapy (presence of pockets ≥4 mm with bleeding on probing or presence of deep periodontal pockets [≥6 mm]), to gain further access to subgingival instrumentation, or aim at

regenerating or resecting those lesions that add complexity in the management of periodontitis (intrabony and furcation lesions).it may include the following interventions:

• Repeated subgingival instrumentation with or without adjunctive therapies

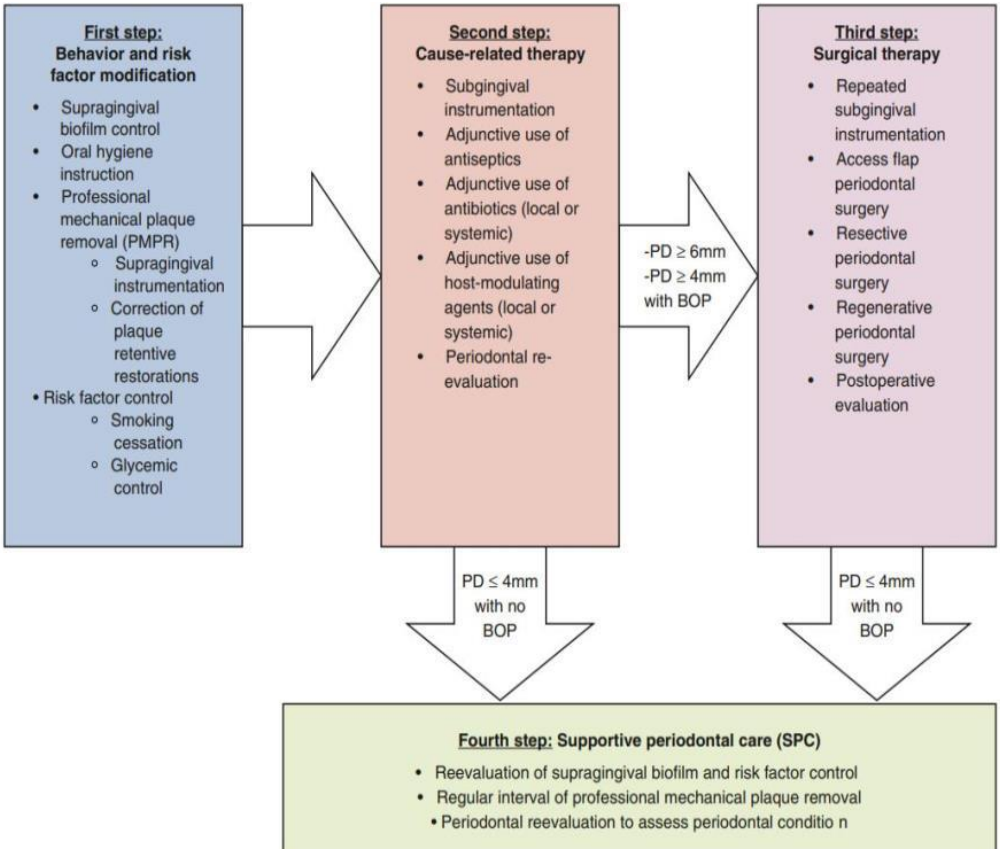
• Access flap periodontal surgery

• Resective periodontal surgery

• Regenerative periodontal surgery

4.Supportive periodontal care (maintenance phase) is aimed at maintaining periodontal stability in all treated periodontitis patients combining preventive and therapeutic interventions defined in the first and second steps of therapy, depending on the gingival and periodontal status of the patient's dentition. This step should

include Reinforcement of proper biofilm control through oral hygiene and modification if necessary • Assessment and modification of risk factors for periodontitis (smoking cessation, evaluation of glycemic control for diabetes) • Professional supragingival and subgingival biofilm and calculus control.



Objectives of initial phase I (cause–related therapy) :

The objective is to alter or eliminate the microbial etiology and factors that contribute to gingival and periodontal diseases to the greatest extent possible, thereby halting the progression of disease and returning the dentition to a state of health and comfort. The phase I therapy aimed at removal of pathogenic biofilms, toxins and calculus and the reestablishment of a biologically acceptable root surface. This is accomplished by:

1) patient education and oral hygiene instruction for plaque or biofilm control.

2) Complete removal of supragingival and subgingival plaque or biofilm and calculus (scaling & root planing).

3) Possible use of antimicrobial agents (local or systemic).

4) Correction or replacement of poorly fitting restorations and other prosthetic Devices

5) Restoration or temporization of carious lesions.

6) Treatment of Occlusal trauma.

7) Treatment of food-impaction areas

8) Orthodontic tooth movement treatment.

9) Extraction of hopeless teeth

Motivation

Steps of Motivation:

1-The patients must understand that they have a problem.

2-The problem has serious effect for the patient.

3-There is a solution to the problem.

4-The patient must participate in the solution.

5-Treatment will bring benefits for the patient.

The problem and solution should be explained to the patient in simple language, avoiding technical terms, so detailed information must be given to the patient

regarding his/her periodontal disease, its etiological factors, symptoms, consequences, prognosis and the relationship between the presence of dental biofilm and calculus in the mouth and the location of sites showing dental disease by using plaque disclosing agents.

Mechanical plaque control demands the active participation of the individual subject and the establishment of proper oral homecare habits is a process that depends on the behavioral changes, thus the patient's positive attitude to treatment may have a positive long-term effect on his/her tooth-cleaning efforts. In addition, dental professionals should try to emphasize the role of the patient personal oral hygiene procedures in the prevention of dental diseases & they should encourage the patient to take responsibility for his/her own oral health. Finally, if the clinician can establish the link between oral health & general health for the patient, this individual may be more willing to establish proper hygiene measures as part of his/her lifestyle.

Disclosing agent:

Since dental plaque is white, sometimes it cannot easily be identified, particularly if it is not thick enough and/or the observer is not well trained.

A disclosing agent is a chemical compound (tablets or solution) that stains dental biofilm such as erythrosine, fuschsine or a fluorescein. These agents should be used to demonstrate the presence and location of plaque in addition to the evaluation of theefficacy of the patient's homecare technique thus they should be applied after tooth brushing and interdental cleaning.

Self-Performed Plaque Control:

The regular use of personal oral hygiene measures (refer to the efforts of the patient to remove supragingival plaque) is essential to dental and periodontal health because plaque is the major etiological factor in periodontal disease thus plaque removal reduces symptoms of inflammation (bleeding, redness, swelling), inhibits the progression of the disease & inhibits the formation of supra & subgingival calculus which is a plaque retentive factor. Furthermore, meticulous, long-term self performed plaque removal measures can modify both the quantity & composition of subgingival plaque therefore, prevention of gingivitis, periodontitis and loss of attachment are based on the achievement of sufficient plaque removal.

These practices require not only the appropriate motivation and instruction of the patient but also adequate tools.

Brushing: The efficacy of brushing concerning plaque removal is dependent on:

a) The design of the brush.

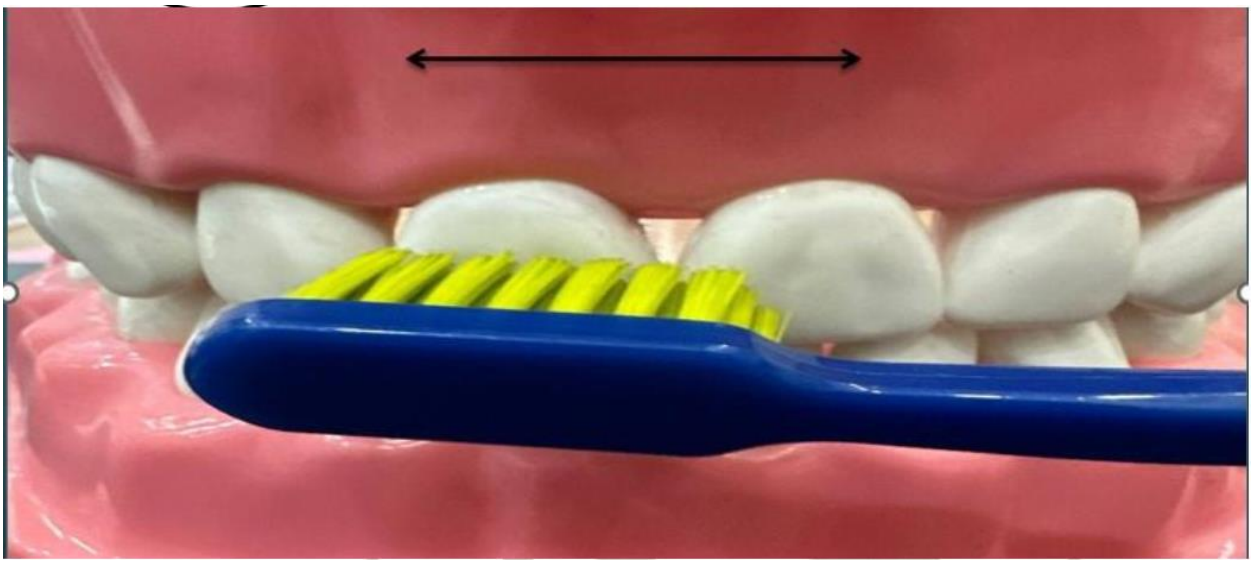
b) The skill of the individual using the brush.

c) Frequency & duration of brushing.

Methods of tooth brushing:

The design of brushes or a specific brushing method is of secondary importance to the skills of the individual in using the brush. Thus the simplest, least time-consuming procedures that will effectively remove plaque without causing any damage to the tissues and the use of the technique regularly should be recommended. If a patient prefers a specific method the clinician can evaluate & modify the technique to maximize the effectiveness rather than changing it. However, there is no single method that is correct for all patients.

Horizontal brushing (scrub): Most individuals use such a method since it is simple. The head of the brush is positioned at a 90° angle to the tooth surface and then a horizontal movement is applied. The occlusal, lingual & palatal surfaces of the teeth are brushed with an open mouth and the vestibular surfaces are cleaned with the mouth closed.



Vertical brushing (Leonard technique): lt is similar to the horizontal brushing technique, but the movement is applied in a vertical direction using up & down motion.



Circular brushing (Fones Technique): with the teeth closed, a circular motion is applied that extends from the maxillary gingiva to the mandibular gingiva. Horizontal movements are used on the lingual and palatal tooth surfaces.



Vibratory technique (Stillman technique): The head of the brush is positioned in an oblique direction toward the apex, with the bristles placed partly on the gingival margin and partly on the tooth surface. Light pressure with a vibratory movement is then applied to the handle without moving the brush from its original position.



Roll technique (Modified Stillman technique): The brush is positioned similarly to the vibratory technique, but after applying a small vibratory pressure, the head of the brush is rolled in an occlusal direction.

Charters Technique: The head of the brush is positioned in an oblique direction with the bristles directed towards the occlusal surface. A vibratory (rotary) movement is then applied without moving the brush from its position. This method is effective in cases with receded interdental papilla because the bristles can penetrate the interdental space.



Sulcular technique (Bass technique) The head of the brush is positioned in an oblique direction towards the apex and bristles are directed into the sulcus at 45° to the long axis of the tooth. The brush is moved in a back-and-forth direction using short strokes. On the lingual surfaces in the anterior regions, the brush head is kept in the vertical direction. This method is effective in removing plaque not only at the gingival margin but also could reach a depth of about 1mm subgingivally. Bass

technique is the most preferable one because of its effectiveness in breaking up the plaque biofilm adjacent to & within the gingival sulcus.

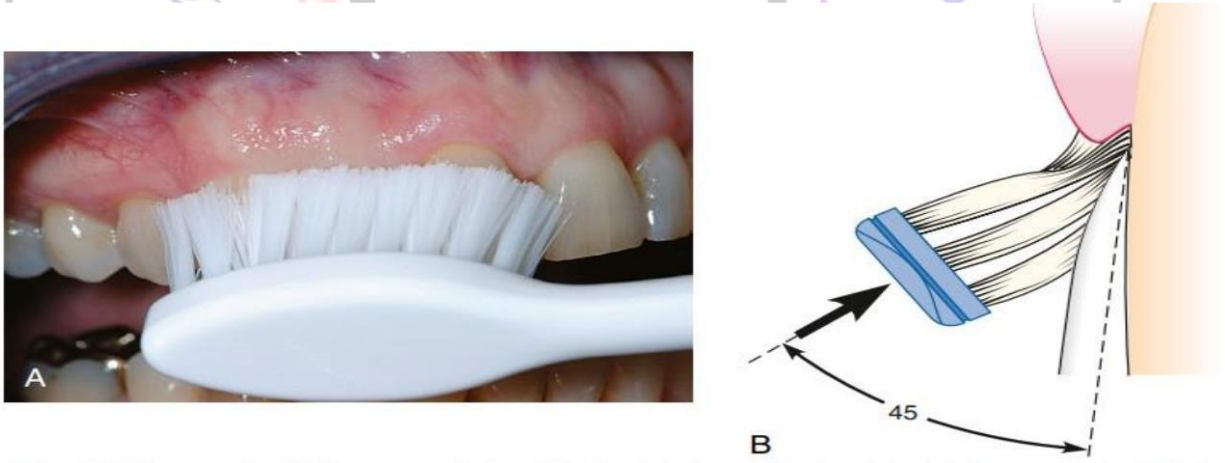
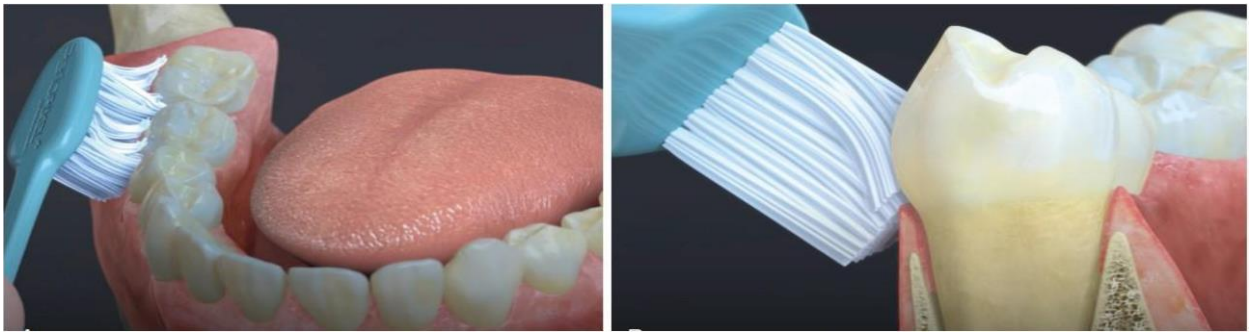


Fig. 50.6 Bass method. (A) Proper positioning of the brush in the mouth aims the bristle tips toward the gingival margin. (B) Diagram shows the ideal placement, which permits slight subgingival penetration of the bristle tips.



Modified Bass technique: The brush is positioned similarly to the Bass/Stillman technique, but after applying a back-and-forth movement, the head of the brush is rolled in an occlusal direction. It is a combination of the Bass & the modified Stillman techniques.

Toothbrushes requirements:

The shape and texture of the brush should be chosen for the individual patient, taking

into consideration:

-The size of teeth and oral cavity.

-The ease of accessibility.

-The quality and anatomy of the gingivae.

-Any sensitive places.

The features of a manual toothbrush in periodontics must be Nylon, Soft-medium strength (sensitive areas or where surgery has just been completed may need a very soft brush), rounded ends filaments to cleanwithout damaging gingiva. A smaller head is easier to reach all areas of the oral cavity so, moves freely & smoothly inside the mouth and should be trimmed flat and multi-tufted with all tufts being of the same length. The 3 brush heads clean the vestibular, occlusal & oral tooth surfaces thus this design was superior to other brushes.

Frequency and duration: Brushing twice a day is recommended, especially at night. for a minimum of 2 minutes, covering all areas of the oral cavity. lt is recommended that the toothbrush is to be replaced every 2-3 months because a worn toothbrush with frayed filaments is less effective in removing plaque than a new brush.

Electric toothbrushes: Studies have shown that efficiency in plaque removal with electric toothbrushes is at least as good as correctly used manual toothbrushes, but indicated for those with: 1. limited manual dexterity, including the elderly 2. Those with arthritis in their hands and wrists 3. Children 4. hospitalized individuals 5.physically or mentally handicapped 6. patients with neurological disorders.

7. Electric brushes have also been recommended to non-compliant patients as they are easier and faster than manual.

Dentifrices: A dentifrice is usually used in combination with tooth-brushing to facilitate plaque removal and apply agents to the tooth surfaces for therapeutic or preventive reasons. The most important active ingredient in toothpaste:

❖ Fluoride: prevent caries

❖ **Desensitizing agent:** alleviate sensitivity of exposed dentin.

❖ **Anti-plaque agents:**

a**. Triclosan**: antibacterial agent.

b. **Stannous fluoride.**

c. **Chlorhexidine:** plaque inhibiting agent.

❖ **Anti- Calculus agent:** reduces the formation of supragingival calculus.

❖ **Bicarbonate**: reduces the acidity of dental plaque.

❖ **Cleaning + Polishing agents:** these abrasive agents should have particle size and shape which facilitate plaque & stain removal without producing hard & soft tissue damage

❖ **Whitening agents**: whiten stained teeth.

❖**Detergents:** sodium lauryl sulfate has antimicrobial & plaque-inhibitory properties

Interdental Cleaning

Since interproximal areas are 1) The worst for food & plaque stagnation 2) the Earliest areas to be affected. 3) The toothbrush does not reach the interproximal spaces efficiently as they are difficult to access. An efficient tooth-brushing technique only cleans about 65% of the tooth surface, leaving the interdental areas

untouched, Factors we need to consider when selecting the appropriate interdental cleaning method are:

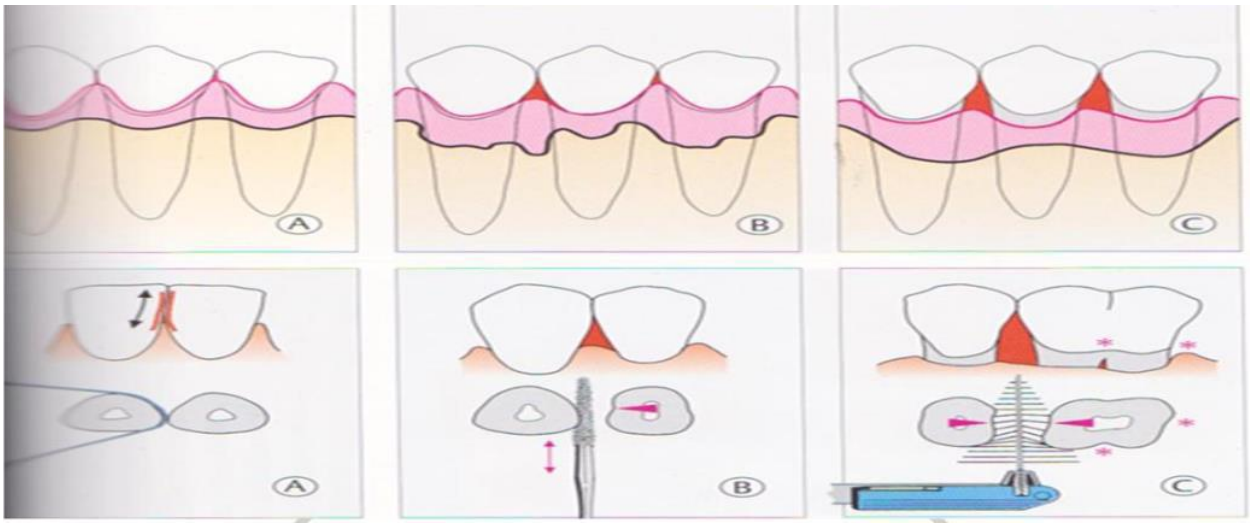
• The contour & consistency of the gingival tissues.

• The size, morphology & shape of the interproximal space.

• Tooth position & alignment.

• The manual dexterity & motivation of the patient.

• Fixed dentures, orthodontic appliances and Restorations.



Dental floss & tape:

Flossing is the most universally applicable method, removes up to 80% of proximal plaque. Even subgingival plaque can be removed since dental floss can be introduced 2-3.5 mm below the tip of the papilla. Dental floss is most useful where the interdental papilla completely fills the embrasure space in healthy patients. However flossing is difficult for most people to learn, the patient should understand that floss is positioned gently in the gingival crevice and takes up a C-shape around the mesial and distal surfaces of the teeth and then withdrawn in a coronal direction. Several types of floss are available:

1) ***Unwaxed*** is used in normal tooth contacts because it slides easily.

2) ***Waxed*** is used in tight proximal tooth contacts & after brushing because the wax deposits prevent fluoride from the toothpaste from precipitating on teeth.

3) ***A floss holder*** to facilitate flossing might be used.

4) ***Tape***: a type of broaded dental floss used for cleaning bridge pontics.

5) ***Super floss*** used for patients with crowns, bridges & orthodontic appliances.

Floss is used in a vertical direction. If it is used in a horizontal motion, the teeth can develop a grooved surface. Finally, flossing is a difficult & time consuming method.




Wood sticks:

They are indicated for plaque removal if the interdental spaces are slightly open (recession) and even in cases of poor manual dexterity since they are easy to use. Do not remove plaques as effectively as dental floss or interdental brush. They are made

from wood and have a triangular cross-section, mimicking the shape of the space between the teeth. Base toward the gingiva and apex toward the occlusal surface.



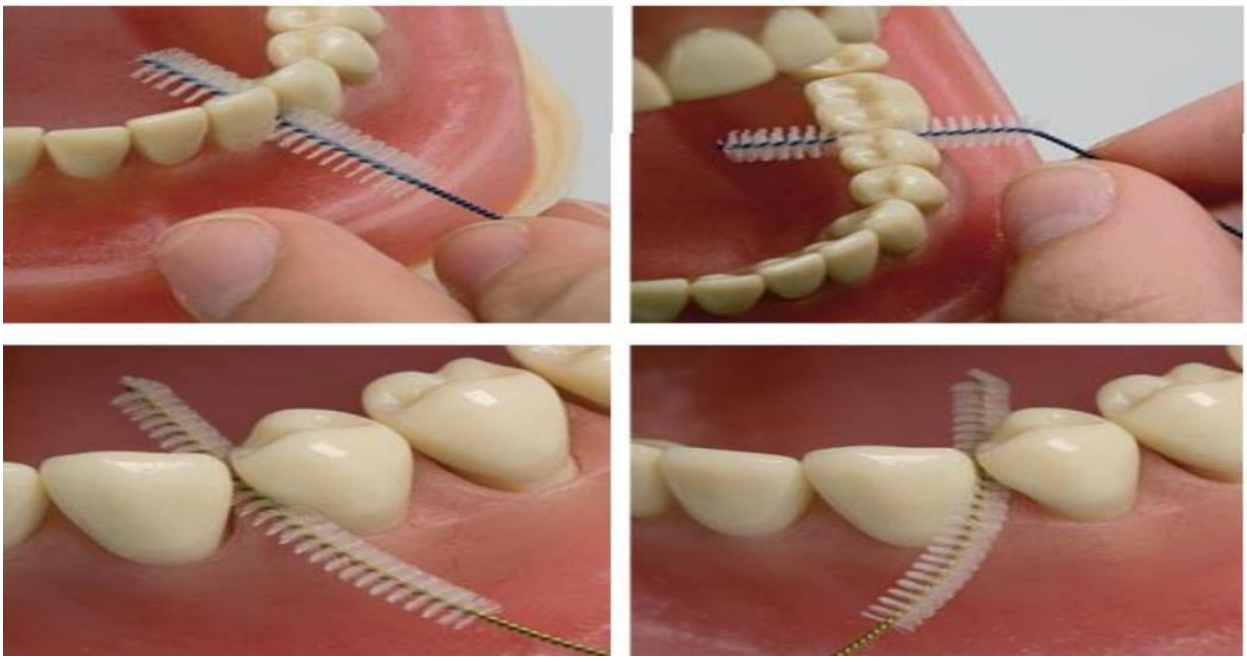

Interdental brushes:

These are the aids of choice for:

1. Widely open interdental spaces.

2. When root surfaces with concavities or grooves have been exposed.

3. In through-and-through furcation defects in periodontitis patients.It is believed that the most efficient cleaning results are achieved if the brush selected is slightly larger than the interdental space. They are easy to use & can also be used as a carrier to apply fluoride or chlorhexidine gel into the interdental space. When brushes are not properly used, they may cause dentin hypersensitivity, should be used without dentifrices because most paste is abrasive except for therapeutic purposes.



Single tufted brushes:

They are designed to improve access to distal surfaces of posterior molars, tipped & rotated teeth, to clean around & under fixed appliances, pontic, orthodontic appliances and teeth affected by gingival recession & furcation involvement.



Tongue cleaner

Tongue bacteria can serve as a source of bacterial dissemination to other parts of the oral cavity, and can contribute to dental plaque formation and halitosis. Patients should be informed that it is most important to clean the posterior portion of the tongue dorsum, but, likely, many patients do not reach far enough to contact the posterior dorsum during tongue cleaning because extended reaching causes the gag reflex. Tongue cleaning is a simple and fast procedure. Some studies have shown that tongue brushing, in combination with other methods of oral hygiene, is an effective method for reducing the formation of dental plaque. Regular mechanical tongue cleaning can play a role in controlling bacterial numbers and removing tongue coating. Individuals with coated tongues showed significantly higher malodor scores than individuals with non-coated tongues so, mechanical approaches, such as tongue brushing or tongue scraping to clean the dorsum of the tongue, have the potential to reduce tongue coating and oral malodor.

Dental water jet (oral irrigators): The daily home use of oral irrigation has been shown to reduce gingivitis & bleeding. They may be used with water or with chlorhexidine which lead to improved plaque inhibition and had an anti inflammatory effect.

Effects of the incorrect use of mechanical plaque removal devices:

Tooth brushing can cause damage both to soft & hard tissues. Trauma to the soft tissues results in gingival erosion & gingival recession. Trauma to hard tissues leads to cervical abrasion of the tooth surface which is mainly caused by the abrasives in the dentifrice. These lesions have been associated with toothbrush stiffness, the method of brushing, brushing frequency/time, excessive brushing

force, and improper use of both manual and powered tooth brushing. The use of dental floss,

interproximal brushes & wood sticks may also induce soft tissue damage; however, in most cases this damage is limited to acute lesions, such as lacerations and gingival erosions.



References

Lang, N.P., Berglundh, T., Giannobile, W.V. and Sanz, M. eds., (2021). *Lindhe's clinical periodontology and implant dentistry*. John Wiley & Sons.

Newman, M.G. *et al.* (2011). *Carranza's clinical periodontology*. Elsevier health sciences.