sheet#16 periodontics

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**Non-surgical periodontal treatment**

\*You need to refer to the slides

We always start treating emergencies in our treatment plane , **Emergency phase :** uncontrolled medical problem /disease , dental emergency like abscesses

After treating emergencies we can start a “cause-related therapy/**nonsurgical phase**”; our work is mainly done within this phase (removing the causes of the periodontal diseases : plaque 1°, calculase 2°, and other local factors)

Since periodontitis generally is a chronic disease and not easily controlled ,for example if you have deep pockets 6-9 mm it’s really hard to eliminate them and there’s a risk for the disease to be reactivated even after treatment because it’s hard-for the dentist and the patient- to clean deep pockets ,so we need a **maintenance phase** to evaluate the results and to follow up the patient’s state to make sure that the disease is stable , at this stage you can decide if the patient needs further treatment moving for the **surgical phase**( surgical periodontal therapy or extraction if the tooth is not responding to treatment and replacing it by an implant) or to the **restorative phase** (Final restorations ,Fixed and removable prosthodontic appliances) and then re-evaluation –returning to the maintenance phase–

* More or less the treatment planning goes in this sequence in whole dentistry ,The Dr said that in the final exam in perio clinics there’s a question of 10 points about treatment planning for a case ,and the common mistake that many students just answer “ scaling and polishing” so they get 1 point out of 10 , the patient may have hepatitis , abscesses , caries …etc that also need to be treated so you should think comprehensively for all cases and not to miss any thing by concentrating only on the periodontal therapy.

**Non surgical therapy is also called :**

phase I therapy , initial therapy , cause-related therapy , etiotropic phase of therapy

**The rationale of the Non surgical therapy is to :**

- achieve good oral hygiene , restore the health of teeth , correct restorations, remove calculus and then to evaluate tissue response

**The goals of None surgical therapy :**

-get rid of the plaque

-gain an equilibrium between the bacterial plaque and the host response

-halt the progression of the disease

-restore health ,function and esthetics

\*The difference between rationale and goals is that goals are more general , what are the main goals of any treatment in dentistry is : to maintain/restore health , function and esthetics of teeth and surrounding tissues. Always remember to start treatment with the most important complain of your patient.

***Treatment planning for the non-surgical phase always follow this arrangment :***

**patient education and plaque control:** it’s very important especially when the treatment is taking long time and many visits , some cases of periodontitis may take the whole semester to complete it’s treatment ,so if the patient is not understanding why he’s supposed to have an appointment every two weeks for many months he won’t continue the treatment so you need to educate your patients and show them the radiographs and bone loss and the consequences if they didn’t resume the treatment, they may be not be able to put crowns for example.

**start removing the cause (plaque , calculus and other local factors):**

* + *Removal of calculus and root planing*
	+ *Correction of restorative and prosthetic irritational factors*
	+ Excavation of caries and restoration (temporary or final)
	+ *Antimicrobial therapy (local or systemic) used for aggressive periodontitis and necrotising periodontitis and usually not for chronic periodontitis*
	+ *Extraction of hopeless teeth (this may save other adjacent teeth)*
	+ *Occlusal therapy*
	+ *Minor orthodontic movement*
	+ *Provisional splinting and prosthesis (mobile teeth that patient don’t want to them to be extracted)*

It’s not necessary to include all the previous procedures for all cases of periodontal diseases , it depends on the case scenario, for example orthodontic movements is not required if it’s not written that the patient has crowding …. if there’s an aggressive periodontitis case then add antibiotic therapy and so on.

\*aggressive periodontitis : the best thing to diagnose aggressive periodontitis if the patient has a base line measures ( full documentation periodically) and if you don’t have a base line chart you use the age of the patient as indication that the loss of attachment happened in a short period. Recall : aggressive periodontitis is also caused by plaque yet there’s an exaggerated host response , disturbance in the equilibrium between bacterial plaque and host response due to genetic predisposition and the type of bacteria (aggregatibacter actinomycetemcomitans)

**Evaluation of response to nonsurgical Phase:** You need to see the difference between the diseased and the healthy tissues ,before and after your treatment

**Non-surgical treatment steps :**

1. Education & Plaque Control

2. Scaling & Root planing

3. Remove local factors

4. Treat/temporize carious lesions

5. Adjunctive aids

6. Re-evaluation

**1st step. Education & Plaque Control**

-plaque control methods : every method has it’s indications , interdental brushes are more useful than the floss between spaced teeth and when there’s a concavity in the proximal surfaces, use waxed tape floss in tight contacts…etc

**2nd step. Scaling & Root planing**

- the difference between scaling and root planning is that scaling is the removal of both sub and supra gingival calculus is the removal of calculus deposits from root suface and achieving a smooth hard root surface, **root debridement :** is a new term replacing the term “root planning” which is theremoval of plaque and/or calculus from the root surface without the intentional removal of tooth structure, because studies have shown that it’s not necessary to remove cementum to have healing.

-calculus is a secondary etiological factor for periodontal diseases, because it retains plaque ,and there’s a study demonstrated that we can gain reattachment/healing of periodontal tissues to a sterile calculus (calculus without superficial plaque)

-the difference between sub-gingival calculus (harder,darker) and supra-gingival calculus (less hardness, yellow) is due to the difference of the source of minerals , crevicular fluid supplies the sub gingival calculus, and saliva supplies the supra-gingival calculus “that’s why the most common sites of calculus accumulation is beside the opening of the salivary glands’ ducts on upper molars and lower incisors”

* Factors that may influence calculus

 removal include :

1. The extent of disease,
2. Anatomic factors
3. Skill of the operator,
4. Instruments used

**Methods used for non-surgical root surface scaling and root planing/ debridement.**

1. Manual instruments
2. Powered instruments : (their main characteristics are written in the slides and I will mention only extra information about them)

Sonic means :it’s sound is within our level of hearing so we can hear it’s sound(less frequent vibrations than the ultrasonic)

Ultrasonic means : it’s sound is above our level of hearing so we can’t hear it’s sound

-we need to know how every one rotates, this gives a hint which surfaces are the cutting/effective surfaces

-piezoelectric scalers are used in Asia and Europe and magnetostrictive scalers are used in USA.

-we use the most effective side to remove heavy calculus and the least effective sides to remove soft plaque…we use the lateral sides against the tooth because they are the least destructive, if we used the tip of the magnetostrictive scaler (the most effective part in it) on a hypomineralized surface this may damage the tooth structure or it may damage composite and GI restorations

- the effectiveness of scaling is depending on the angle which the scaler (tip) is against the calculus , when this angle is increased ( maximum is 90 degrees) , the effectiveness is increased , we chose the angle depending on the hardness of the calculus …. the least effective angle is 0 when the sides are against the tooth surface / calculus surface.

-amplitude is about how much distance the tip moves which indicates the the power of each vibration/oscillation, some powered scalers have a controllable amplitude so you can change it’s force.

-water have many advantages other than reducing heat generated by the instruments , like flushing effect ,

Also we have other theoretical effects ( not proven yet) cavitation effect (bubbles burst against the tooth surface and it helps in mechanical removal of plaque and calculus ) , acoustic streaming , acoustic turbulence , lavage

-one of the side effects of using powered instrument is the production of aerosols which transmits microorganisms and diseases , we can minimize the effect of aerosols by 1-using good suction (high and low volume) 2- wearing masks and goggles 3- give the patient a rinse/mouthwash before treatment to reduce the microbial load

-the sequence of clinical procedure is written in slide number 52 : we use hand scalers to have more tactile sensation and to get a smoother surface , also you can use a floss to check for any roughness

 **Working tips :**

 *Use probing depths and radiographs as guides for ultrasonic activation*

 *Use “Painting” strokes(light force)/Tapping Strokes for large deposits*

*(prolonged scaling with forceful strokes can harm the the surrounding tissues)*

*Keep insert moving at all times*

*( don’t spend a lot of time working on the same tooth because this causing heat generation which harms the tooth )*

 *use light lateral pressure*

*Work from coronal areas apically to root surfaces*

-there’s a special tips for furcation areas.

-the rest of the working tips you must read it by yourself from the slides

**Precautions of using powered instruments :**

**-** Pacemakers (only affected by magnetostrictive scalers), but the new types are not affected by the magnetostrictive scalers.

-communicable diseases (aerosols)

-immunosupression

-children ( sensitive to ultrasonic scalers which causes pain for them , because their teeth have a huge pulp chamber )

-demineralized tooth surface

-hypersensitive areas ( some patients need nerve blocks for all their teeth to be able to have treatment without pain)

-veneers, crowns and implants ( If you were not careful you may break them)

**Advantages of using powered instruments:**

-increased efficiency ( saves time)

-no need for sharpening

-no need for force and pressure

-less chance of repetitive strain injuries

-water lavage and irrigation

-biofilm distruption

**Disadvantages of using powered instruments:**

- Less tactile sensation ( the main disadvantage)

-more precautions and limitations

-aerosols

-less visibility

-potential occupational hazards ( noise and water)

\*we can’t tell that any type of the powered instruments is better that the others because the studies about this subject lacks enough evidence and these studies are usually funded by commercial companies that try to tout for their products.

**Limitations of scaling and root planing:**

* Meticulous and requires more experienced operator .(because you are working blindly especially subgingivally you are not sure that you’ve removed all calculus or not)
* Time consuming( compared to surgery , if you opened a flab you can remove calculus more quickly by 2 times)
* Ineffective as mono therapy in the treatment of aggressive periodontitis
* Less predictable in deep pockets ,furcations and interproximal groove.

**Post treatment complications :**

* Pain *(transient for few days ,especially with beginners because of the trauma to the soft tissues)*
* Dentine hypersensitivity  *(transient for 2-3 weeks, caused by opening of the dentinal tubules after treatment , resolved by the formation of peritubular dentine)*

-The extent of the sensitivity can be diminished through good plaque removal.

-Higher in pre-existing sensitivity, intensity decrease with time

* Gingival recession ( if the procedure was very traumatic also if the patient had a noticeable swollen and inflamed gingiva before the treatment , after the treatment the tissues will shrink and black triangles can be formed so the patient thinks that the dentist caused this recession so the dentist must inform his patient by that before starting treatment.
* Mobility ( not proven), caused by removing calculus which was splinting the teeth , like calculus in lower incisors so you must take a radiograph before and show the patient the bone loss and that just the calculus is what retaining the teeth , but this doesn’t mean we should not remove calculus because it’s only hiding the progression of the disease and after a while things will be worse and the treatment will be more difficult.

**Which is more efficient , powered or manual instruments ?**

Studies have demonstrated that all methods are effective in removing calculus generally ( no difference ) , the difference is in the time required, yet the powered instruments are more effective in removing calculus from the furcation areas.

**Why don’t we always use periodontal surgery to remove calculus since it’s more effective in removing calculus?**

Because it’s very traumatic and may lead to loss of attachment more than the probable gain of attachment after healing, so we use it when the probing depth is above the critical probing depth for periodontal surgery ( 4.2mm ± 0.2)

\* the critical depth for scaling and root planning is 2.9mm ± 0.4 and less than this depth root planning is traumatic.

**c.**laser therapy : laser used in scaling is different from that used in surgical procedures, laser works generally by drying tissues (dehydration and coagulation)

**Advantages of laser therapy:**

* It has bacteriocidal and detoxification effects.
* Can remove the epithelium lining and granulation tissue within the periodontal pocket which may potentially improve healing.
* Removing plaque and calculus with extremely low mechanical stress and no formation of a smear layer on root surfaces.
* May allow access to sites that conventional mechanical instruments cannot reach.

**Carbon dioxide lasers**: only remove soft tissues which is not enough

**Er:YAG lasers:** can remove calculus, plaque and soft tissues

-there’s no evidence that laser is better than the usual scaling , yet it has a comparable results to scaling and root planning so it’s promising but it’s very expensive **.**

**Precautions:**

-it’s not very safe since it may cause damage to other tissues if the laser beam is shifted or reflected by mistake

-can cause excessive heat generation > may lead to bone necrosis (if temp. goes above 47 degrees)

-high cost

**d.**photodynamic therapy : it’s mechanism is that they invented a photosensitive dye, that is injected in the sulcus and then this dye is activated by light and kills bacteria , it has many advantages : no trauma ,no need for anesthesia or antibiotics

-it can’t replace scaling and root planning because it can’t remove calculus or hard tissues but it can be useful as adjunctive aid after doing the usual scaling and root planning , especially in deep pockets and furcation areas.

ستكتشف بالتدريج ، أن معركتك الأهم ، هي في داخلك ، وأن انتصارك في كل معركة خارج حدود نفسك ، لن يكون له معنى مهم ، إن لم تنتصر في معركتك مع نفسك..

-احمد خيري العمري