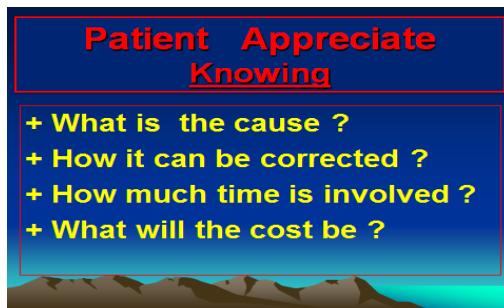


Dental Discoloration

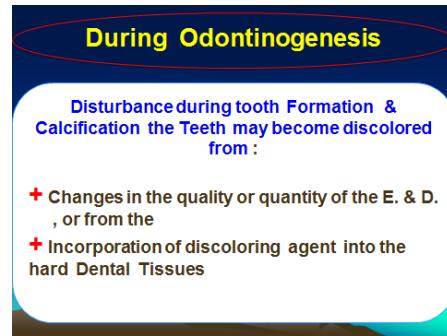
And Bleaching



Treatment of Discoloration: = Discoloration its one of the most common reasons for patient to seek Dental treatment. Before Discussing the Bleaching we have to review the etiology of Dental Discoloration



- = Discoloration of teeth are one of the most common reasons for the patient to seek dental treatment particularly if the discolorations in the upper anterior teeth
- = There are several causes of intrinsic tooth Discolorations which have either an endogenous or exogenous origin.
- = These changes or causes may occur during or after odontinogenesis

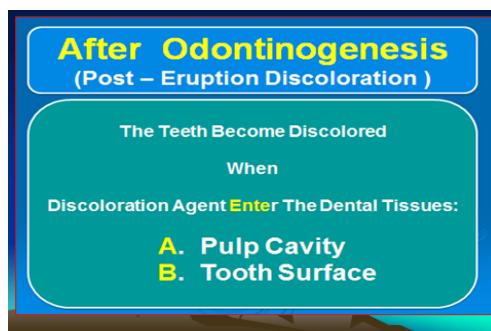


= DURING ODONTINOGENESIS :

Disturbance during tooth formation and calcification the Teeth may become discolored from

- A. changes in the quality or quantity of the E. and D. ,(amelogenesis, Dentinogenesis, Non –Fluoride Enamel Opacities)**
- B . or from the Incorporation of discoloring agent into the hard tissues (Tetracycline, Fluorosis)**

Clinically will appear



= Post – Eruption Discoloration the teeth become discolored when

The Discoloration Agent Enter The hard Dental Tissues either from:

- A. Pulp Cavity**
- B. Tooth Surface**

DISCOLORATION

- A . Extrinsic Discoloration**
- B . Intrinsic Discoloration**

= Discoloration of the dentition are classified into two main categories

+ **Extrinsic stain** result from the deposition of a film, pigment or calculus on the teeth (after odontinogenesis) . IT occurs in enamel defects and in the porous surface of exposed dentine

+ while **the intrinsic staining** refer to color change of the internal tissues of the teeth, which may be of local or systemic origin (During Odontinogenesis).

- The common causes of intrinsic staining are Tetracycline, Fluorosis, Trauma and Pulp necrosis ,Amelogenesis Imperfecta, Dentinogenesis

Extrinsic Discoloration

Local factors play important role in the prevalence of dental discoloration :

1. Rough E. surface
2. Irregular tooth location
3. Poor Oral Hygiene
 - Bleeding gums
 - Plaque accumulation
4. Composition of saliva (flow and viscous)
5. Existing restoration

= local factors play important role in the prevalence of dental discoloration

saliva flow, viscous saliva difficult to clean teeth = These Stains may related to poor oral Hygiene, Existing restorations(defective restoration increase the retention food an dental plaque) , Bleeding gums, plaque

accumulation , irregular eating habits or the presence of chromogenic bacteria or Fungi

= These superficial changes are usually caused by habitual use of highly colored foods or beverages such as Tea, Coffee , and Cola , all of which cause tenacious Brown or Black Discoloration

= Poor Oral Hygiene is a contributing factor, But Coffee, Tea, and certain types of food or medications can produce stains on plaque free surfaces.



The meager extrinsic stains are classified as : Black, Green, Orange, Metallic elements, Nicotine

= Dental caries are a primary cause of pigmentation appearing either an opaque white or Gray

= Tooth colored restorations such as G.I. , Composite, acrylic can cause the teeth to look grayer and discolored as the restoration ages and degrades.



Dental caries and amalgam filling

= Opacities with clear margin

Grayish- Black Discoloration

= Arrested Caries - Dark Discoloration

= Acute Caries - Yellow Discoloration

+ Amalgam Discoloration ; amalgam can reflect discoloration through the Enamel + Green – Black Color

+ Oxidation Product

+Young Person Strong Discoloration



= O.H., - Overlapping - Rough Surfaces

= Food , Tea and Coffee

= Food & Medication

=Tea & Coffee - Brown or Black

= Nitrate Silver – Hypocalcification area : Yellow / Brown – Dark Brown

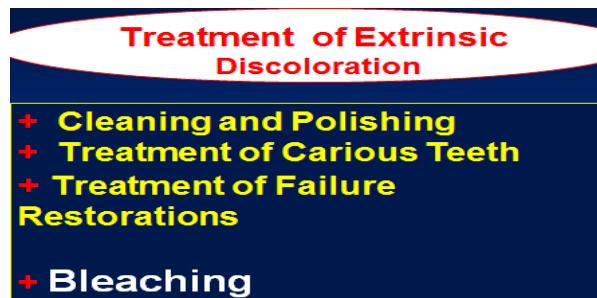
Nicotine is another cause of Dark Surface stains.

- = Smoking tobacco, Cigarettes, Cigars, OR Pipe produces a Yellowish Brown to Black Discoloration usually in the cervical portion of the teeth and primarily on the lingual surfaces.
- = while smoking mar iguana may produce sharply delineated rings around the cervical portion of the teeth adjacent to the gingival margins.
- = The Degree of staining is not related to the amount of tobacco consumed, but to local factors such as roughened enamel surface to which the tobacco products adhere.



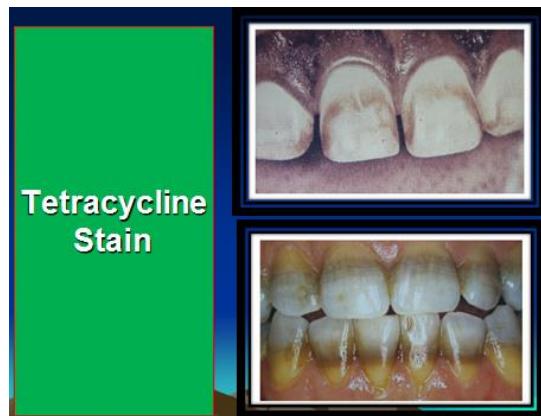
- = Black discoloration characterize from continuous Narrow Black line or band surround completely the teeth ,slightly above the gingival margin
 - = its unknown etiology, related with blennioid plaque which filtrated from chromogenic bacteria
 - = occurs in persons with good oral hygiene, and females has the ability to be affected more .
 - = the black stain it is firmly attached ,difficult to remove with toothbrush
 - = tends to recure after removal
2. = GREEN STAIN observed in the buccal surface of teeth at the gingival margin
3. ORANGE = rarely observed

- = it occurs in the cervical third of the upper and lower anterior teeth and mainly in children
- = Chromogenic bacteria is the common cause of orange staining
- = the stain tends to recur after removal
- = it is common in children, affecting boys more than girls
- = its unknown etiology. Many believe that green stain due to remnants of Nasmyth membrane which filtrated from blood decomposition products
- = it occurs in the cervical third of the upper and lower anterior teeth and mainly in children
- = Chromogenic bacteria is the common cause of orange staining
- = the stain tends to recur after removal



Intrinsic Discoloration

- **Tetracycline**
- **Fluorosis**
- **Enamel Opacities**
- **Non - Vital Tooth Discoloration**
- **Amelogenesis Imperfектa**
- **Dentinogenesis imperfecta**



= Teeth that are more Susceptible to tetracycline Discolorations during their formation, Beginning with the 2nd Trimester in utero and continuing to about 8 years of age

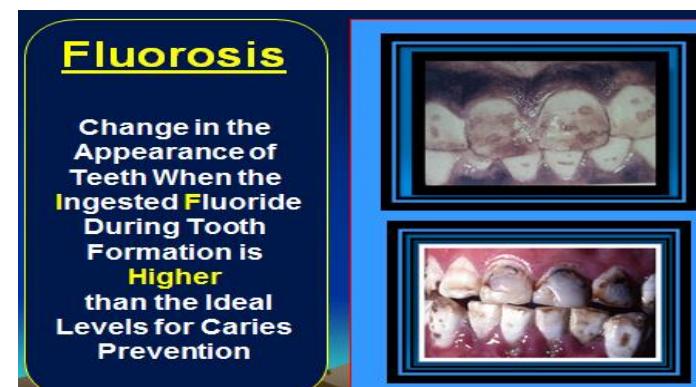
- Anterior teeth & 1st molars - Pigmented fluorescent band (Engagement Expose to day light become darker)

- Yellow to brown / Gray to dark

= Severity of discoloration : A. Type of Tetracycline administrated
B. Duration of use C. The dosage and D. The Stage of Tooth formation

- **Fluorosis** : Developmental Defects of Enamel Induced by Fluoride

- Fluoride is a Naturally occurring element that prevents tooth decay Systematically- when ingested during tooth formation.
-Topically - when applied to erupted teeth.



= **Non - Fluoride E.** Opacities: Disturbance In The Deposition Of Enamel Matrix During Tooth Formation And Calcification. It appear white, Yellow, reaching Brown with clear margin.



= **Amelogenesis** is Form of Enamel Hypoplasia

= Amelogenesis imperfecta is a rare hereditary conditions in which the Enamel structure is Defective

= the enamel of the primary and permanent dentition are affected



How it can be Corrected

(Treatment of Discoloration)

Treatment of Discoloration

Treatment options:

1. Removal of External surface stain
2. **Bleaching Techniques**
3. Operative Techniques to Mask underlying Discoloration

- Labial Veneers
- Full Crowns



Veneer

• Layer of Tooth Colored Material that is used to Cover an unsightly area on a tooth

- A. Direct Veneer Techniques.
- B. Indirect Veneer Techniques.

- Direct or indirect
- With or without enamel reduction
- Sort of gingiva ,at the same level or subgingivally



Bleaching

Lightening & whitening
Teeth
by using oxidizing material
such as
HP., CP.
&
Sodium Peroxide

= **Bleaching** it is the most conservative treatment for Discolored teeth

= Bleaching may offer an effective alternative to restoring Discolored Vital & Non vital teeth to a more normal Color.

= Bleaching provides a preliminary or supplementary lightening of teeth that masks other approaches, such a bonding or Veneering more effective

Bleaching

- + Teeth whitening has become the most requested procedure in Cosmetic Dentistry today.
- + More than 100 million Americans whiten their teeth one way or another;
- + Spending an estimated \$15 billion in 2010.
- + 96% use Home Bleaching Technique
- + 98% of patient are very satisfied

Due to the high income the Dental company provide in the market bleaching toothpaste , bleaching strips, bleaching ben, bleaching laser, home bleaching, office bleaching . From my experience I recommend

- home bleaching,**
- Office Bleaching**
- Laser light but not the disposable tray**



= Bleaching ----- Whitening

= External & Internal bleaching , if we go back to the causes of discoloration, it is intrinsic and Extrinsic discoloration and when we say external bleaching the tooth may be vital or non - vital but when we say internal bleaching, this mean that the tooth non - vital and the tooth must be endo. Treated before bleaching. I prefer the term Vital and Non-vital Bleaching.



Accepted Bleaching Techniques
1. Vital Bleaching : <ul style="list-style-type: none"> - Office Bleaching (30 -35% HP.) - Home Bleaching (10 -20% CP) - Office & Home Vital Bleaching
2. Non – Vital Bleaching <ul style="list-style-type: none"> - Office Bleaching internal /external (HP) - Walking Bleaching (Sodium Perborate) - Internal / External Home Bleaching (CP)

= In vital bleaching I recommend the combine office and home bleaching for faster result (with office bleaching we obtained perfect results within 10 minutes).

= for non- vital bleaching the tooth must be endotreated.

1. Vital Bleaching

- 1. In – Office Vital Bleaching.**
- 2. Nightguard Home Bleaching.**
- 3. Combine Bleaching.**
(Office & Home Bleaching)
- 4. Combine Treatment.**
(Bleaching & Veneer)

According to the severity of discoloration we follow the treatment.

+Bleaching: Vital – Tooth bleaching can be done in the office by the dentist using _High Concentration of Hydrogen Peroxide 30-35% (HP), or at home by the patient using Lower Concentrations of Carbamide Peroxide (CP)



= bleaching light with built in sensor for accurate temperature control of the bleaching light temperature, increasing or lowering it as needed

LAMP provide lightening and heat.

- Built in sensor allow for accurate temperature control of the bleaching light temperature increasing or lowering it as needed according to the feedback of the patient.

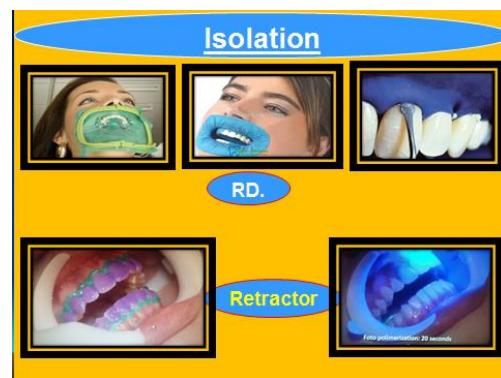
Mechanical Cleaning action of Hydrogen Peroxide effect the Discoloration agents 5-7 Micron E.S.	External Bleaching (Vital Bleaching)
<ul style="list-style-type: none"> • The Temperature of the Heating Element. • The Time of Heat application 	

Preparation for in Office Vital Bleaching (HP 30-35%)	
<ul style="list-style-type: none"> • Clinical Examination . • Discuss with the Patient. • X - ray . • Color photograph. • Clean & polish the teeth. 	

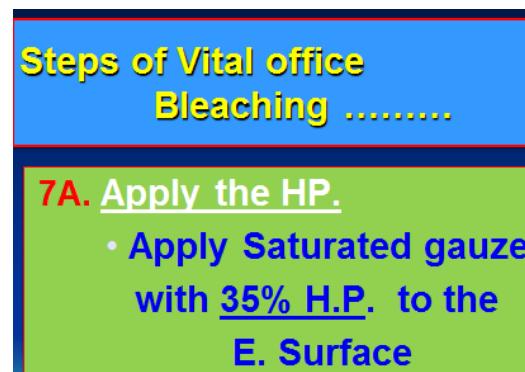
A.- **Clinical examination** of discoloration and cause ,caries ,2ndry caries, defect restoration, non - caries injuries

- radiograph for caries ,2ndry caries and pulp size and periapical lesion

- Baseline photograph.
- The teeth must be cleaned of surface stained and plaque, and ortho. Cement. Diamond instrument may be used to remove remaining composite.
- Discuss with the patient about the cause and if the case need bleaching alone or combine bleaching or combine treatment, Bleaching and Veneer, inform patient that sensitivity may occur but will disappear within 1-3 days



- + protect gingiva using : oraseal , petroleum gel , light cur resin
- + Etching with 35% Phosphoric acid.
- + Bleaching must be under RD isolation especially for HP. Solution.
- = for expert dentist and Bleaching Gel we can use retractor.



= Safety Glass should be provided for both the dental team and patient to protect from heat and light

- = Protect the patient hands & clothes from light and burn by the HP.
Using heavy plastic wrap.
- = No need for anesthesia during bleaching because we need the feedback if there is
 - leakage of HP. On tissue or if the
 - heat becomes too intense
- = Apply the Saturated gauze with the hydrogen peroxide to the labial surface
- = The Gauze should be cut long and wide enough to cover all teeth to be bleached
- = In case we don't use R.D. we place
- = Gauze in the floor of patient mouth
- = Hydrogen peroxide break double carbon bonds (color stain and molecules) into single carbon bonds, the single carbon bond reflect light and therefore make teeth appear brighter.

Steps of Vital office Bleaching

- + Teeth exposed to Bleaching Light
- + Remove the Gauze .
- + Wash with water.
- + Repeat if necessary.

Heating instrument or bleaching light

- = Position the Bleaching light approximately 30cm (13in.) from the teeth to be bleached

- = Application bleaching and light for 20 - 30minutes
- = change Gauze every 10 minutes
- = apply THE HP by Cotton swab or eyedropper
- = ask the patient continually if he feel sensitivity.

Steps of Vital office Bleaching

• 7.B. Apply Bleaching Solution

- + 1ml Hydrochloric acid 36% .
- + 1ML Hydrogen peroxide 30% .
- + 0.1-0.2 ML Anesthetic ether.
- to E. Surface
- For
- 3-5 Minutes

Vital Bleaching

- + Disk the area with fine Disc.
- + Repeat the application .
- + Neutralize the teeth with Sodium Hypochlorite.
- + Wash with water.
- + Polish the teeth .

7.C. Apply the Bleaching Gel

- + Mix HP. & Powder
- + Bleaching Gel
- + Apply to E. surface
- + Expose to Bleaching Light
8-10 Minutes.
- + Remove material
- + Repeat 2-3 times
- + Wash & Polish
- + Repeat after 3 Days
- + Instruction for O.H.

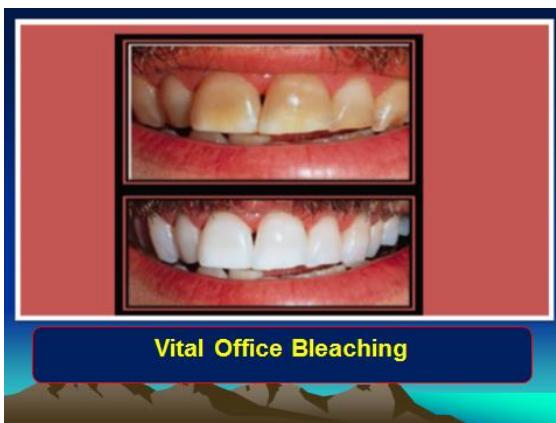
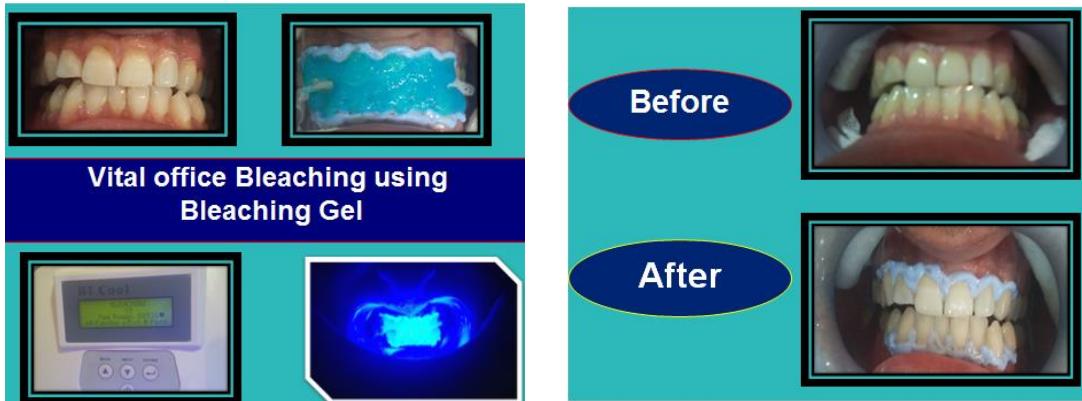


I prefer this technique : BLEACHING GEL. If course we apply gingival barrier first

INSTRUCTION FOR DAILY BRUSHING and no smoking or chromogenic food.

Sensitivity if occurs take analgesic and it disappear after 1 to 2 days.





Vital Office Bleaching

Vital Bleaching Contraindication

- + Extremely Large Pulp .
- + Exposed root Surfaces.
- + Severe Loss of Enamel .
- + Extensive Restoration.

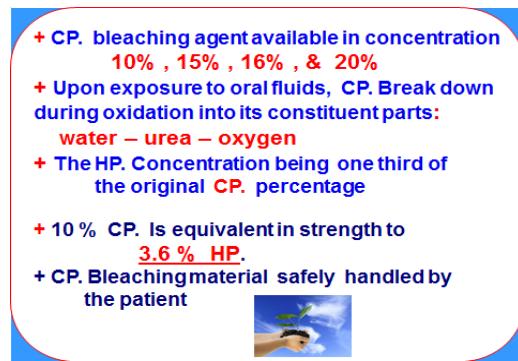
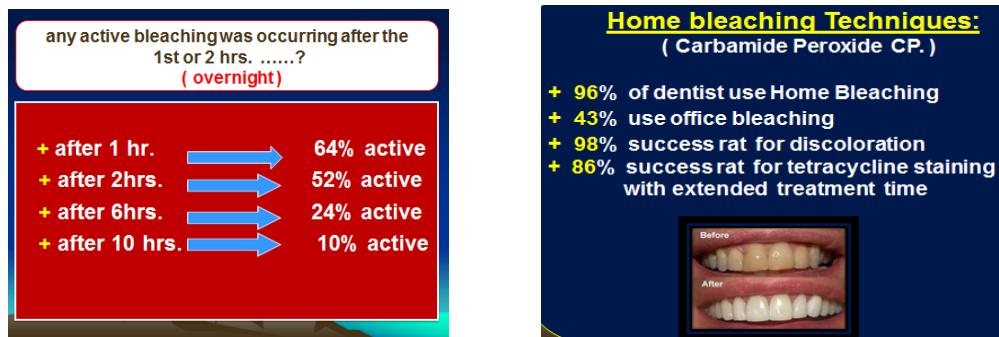
Vital & Non-Vital Bleaching Contraindication

- + Pregnancy & Nursing.
- + Peroxide allergy.





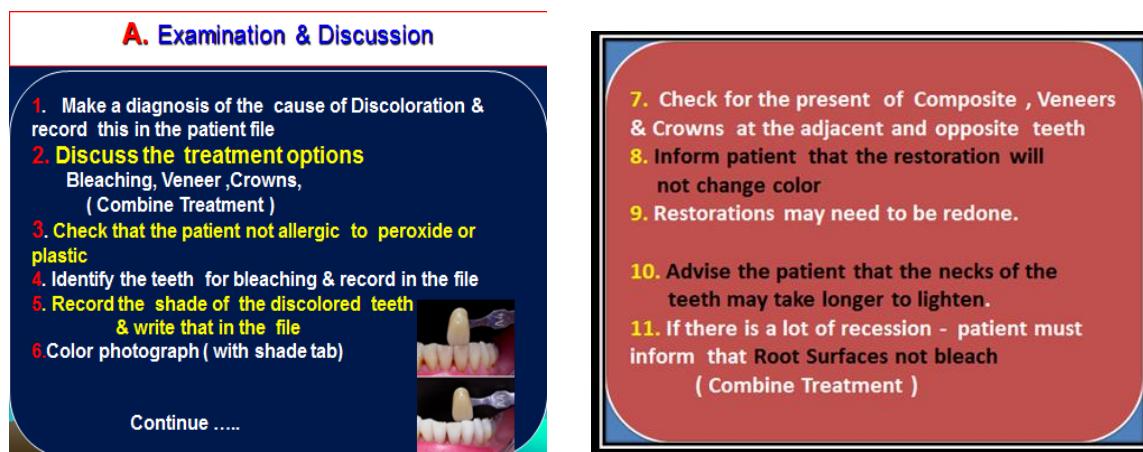
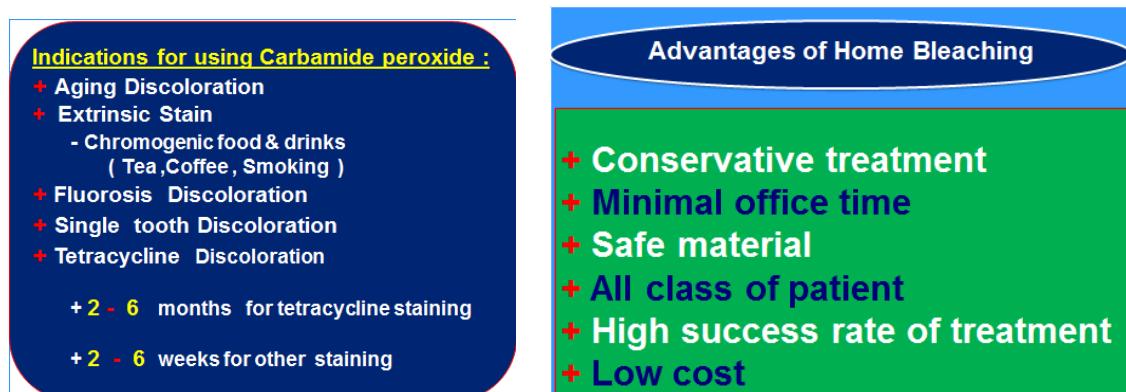
= Earlier objection to nighttime wear questioned whether any active bleaching was occurring after the 1st or 2nd hours. After 2hrs more than 50 percent of the active agent is available.



= = CP. is safely handled by Patient in relation to 35% hp. Use in office bleaching , following the instruction

= 3% HP. Concentration is milder than the 30% to 35% HP, used in office bleaching. CP. Its safe and effected to be use by the patient and should be used only under the supervision o a dentist.

= Several names used to describe the home bleaching technique :



12. Inform patient that satisfactory result it take 2-6 weeks

- Nicotine stain 1-3 months
- Tetracycline stain 2-6 months

13. Bleaching should not be taken whilst patient are pregnant or breast – feeding

14. White spots will become whiter in initial stages , but almost always revert



= First we have to discuss with patient that he want to bleach the teeth or only he is concern about the whit spots.

= if only the white spots we can restore it with composite with high success rate, and if the patient request bleaching we can do bleaching the adjacent area and in the 2nd step restoration.

+ combine treatment bleaching and composite: Bleach the adjacent enamel with bleaching tray with reservoir.

B. Steps of Night guard Home Bleaching Tray

- + Take alginate impression of arch to be bleached
- + Pour study models in dental stone
- + Place composite resin on the labial surface, short of gingival margins if using reservoirs
- + Make well adapted soft bleaching tray
- + Trim the soft tray to the level of gingival margin.
- + Check there are no sharp areas of the tray that might irritate the gingival margins
- + Check the tray in the patient mouth.
 - Good fit & Comfortable



= application spacer gel on the labial surface :Spacer resins are light cured color resin composite system apply it short of the incisal edge and short of the gingiva 0.5 – 1mm

= short of the incisal for proper seating the bleaching tray

= tray thicknesses is 0.020 – 0.035 for proper seating , and minimal effect on occlusion, esthetic and phonetics.

= may extend the edge of the tray 2mm from the gingival crest to the gingival tissue.



7- in the morning or after the day use remove



Amelogenesis Imperfecta



Sensitivity

- + Mild thermal sensitivity is a common side effect
- + Teeth can be sensitive for 24-48 hours (esp. after in office bleaching)
- + 55 - 75% of patient experience sensitivity
- + No report of Pulpal effect
- + No long – term effects in the literature

Sensitivity

- The two primary side effects that may occur during Home Bleaching :
- = Sensitivity of the teeth to cold
 - = Irritation of the gingiva

= according to the side effect of home bleaching ,Sensitivity related to bleaching material and bleaching tray.

Sensitivity may due to :

- A. Check for preoperative sensitivity :
- = Carious teeth
 - = Large pulp chamber
 - = Exposed root
 - = Defect restorations
 - = Non caries injuries

- B. Check Material & Tray :
- = Over wearing the tray
 - = Over load the tray with CP.
 - = Improper fit of tray
 - = High concentration of CP. Or HP.

= I have to check my case first is there any history of preoperative sensitivity in my patient , 2nd to check material and tray.

.= check the concentration of the material and reduce it (there is a big different between 15% CP. And 15% HP)

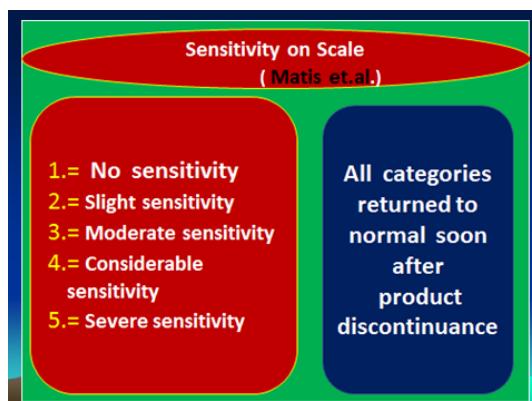
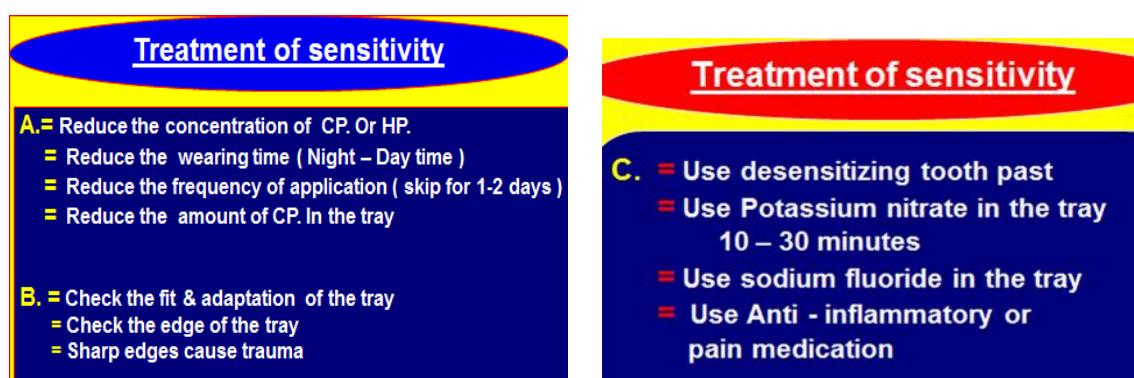
= reduce the wearing time from overnight to day use and from 2hrs tow time at day to one time

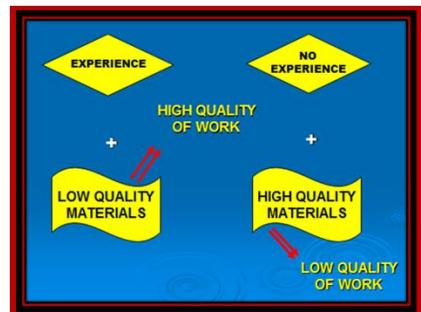
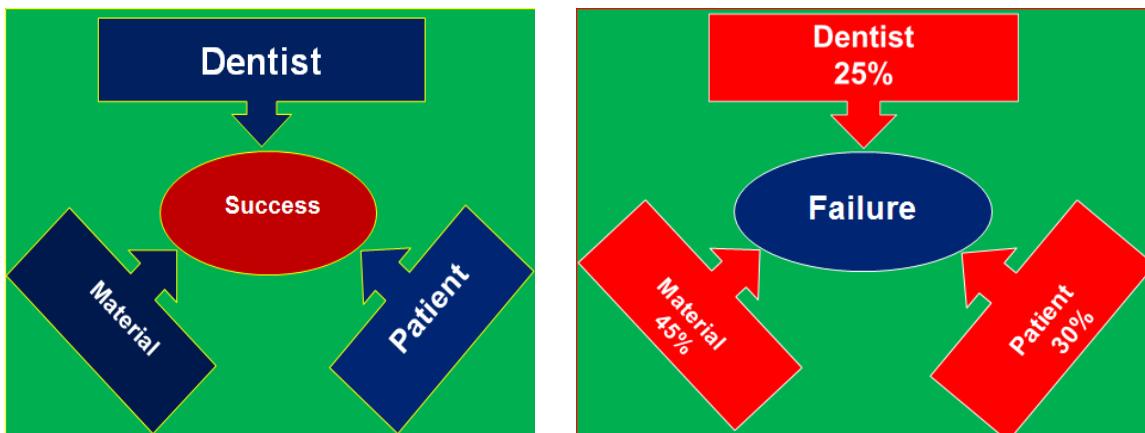
-= reduce the frequency of application stop one day and continue the 2nd day

= reduce the amount of bleaching material in the tray

B.= check the fit of tray on teeth and gingiva and will adaptation

= check the Sharpe edges of tray which cause trauma and with CP increase the defect. any defect of fitting or sharp edges fabricate new tray.





Internal Bleaching

Bleaching Pulpless Teeth

- + Why do teeth Discolored.
- + What are the most effected Bleaching Material .
- + What is the Relationship Between Bleaching & Cervical Root Desorption .
- + Why do Teeth Discolored Again .

Why a non-vital tooth discolor ...?

- Incomplete root canal therapy .
- Pulpal degeneration.

Trauma and not treated

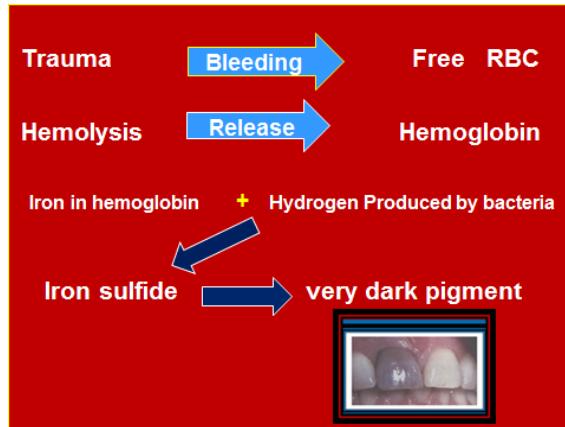
= Goldstein & Feinman have divided the reasons for non- vital tooth discoloration into 2 categories

-a. Incompleate root canal therapy

b. Pulpal degeneration

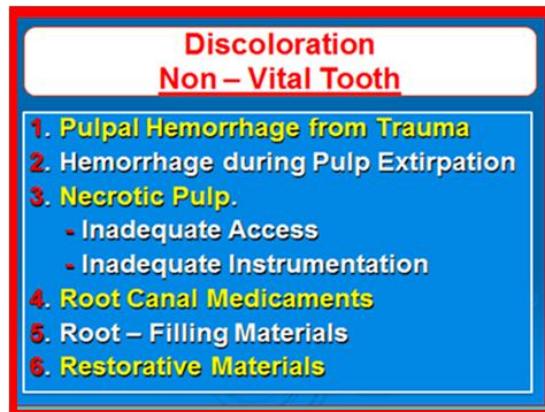
= Incomplete root cal therapy means that debris or endodontic materials remain in the pulp chambe , which cause discoloration or change in translucency Example ; 1. necrotic debris in the pulp horn 2. Filing material located in the pulp chamber .

3. Endodontic sealer lining the chamber walls



Grossman attributed the darkness to iron sulfide

- An injury cause bleeding into the pulp chamber- The red blood cells undergo hemolysis and release hemoglobin. Iron in the hemoglobin combines with hydrogen sulfide produced by bacteria to form iron sulfide , a vary dark pigmentation.



- = Hemorrhage in the dental pulp may result in the diffusion of blood pigment in the dentinal tubules, causing an initial pink discoloration followed by a reddish- brown discoloration
- = if the pulp dose not undergo necrosis, the crown will reform to its original color within a few weeks after injury.
- = Prolonged discoloration usually indicates pulp necrosis and localized enlarging pink spot on the enamel surface indicates internal resorption .

= restorative material containing silver and or zinc oxide – eugenol when kept in contact with the walls of the pulp chamber for long periods of time.

Non – Vital Tooth Discoloration



Most effective bleaching agent

Hydrogen Peroxide
(30 % - 35%)
Sodium Perborate

Methods of Internal Bleaching Endodontically teeth :

- + Thermocatalytic Bleach.
- + Walking Bleach.
- + Combination Bleaching
Thermocatalytic & Walking
- + External \ Internal Home Bleaching.

Thermocatalytic Bleaching technique

- The technique involve the placement of the oxidizing chemical 30 – 35% HP. In the pulp chamber followed by heat application either by :
 - 1. Electric heating device or
 - 2. Especially designed lamps

Walking Bleaching

- + The technique involve the placement a thick mix of Sodium Perborate and HP.
or
a mix of
Sodium Perborate with water in the pulp chamber followed by temporary seal
- + The bleaching process occur between appointment

Steps of Internal Bleaching (Non – Vital Bleaching)

1. Protect gingival tissues .
2. Isolation with RD.
3. Protection the patient & dental team.
4. Record the shade.



= = the access cavity must be cleaned by removing any remaining necrotic debris, root canal filling material, or endodontic sealers

= prepare the access cavity and remove unsupported enamel and necrotic tissue, and remove gutta-percha from the pulp chamber

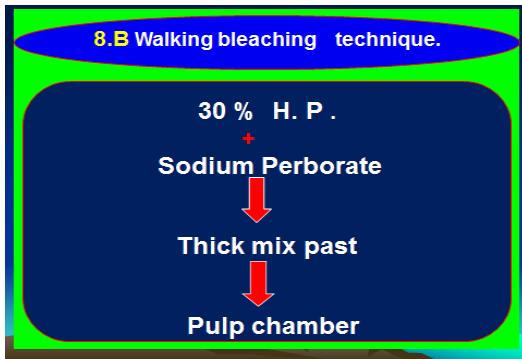
Steps of Internal bleaching (Non – Vital Bleaching)

5. Prepare the access cavity.
6. Place barrier material.
7. Introduce the bleaching solution.

8. A Thermocatalytic

- + Cotton pellet saturated with H.P.
- + Apply heat 2 – 3 minutes .
- + Repeat the procedure .
- + Remove the cotton pellet .
- + Rinse and dry .
- + Seal the cavity

= introduce bleaching solution : either place a cotton pellet saturated with HP. Against the labial wall or syringe fresh 35% HP. Into the pulp chamber to a level just inside the cavosurface margin.



Place a thick mix of sodium perborate and superxol or sodium perborate and water.

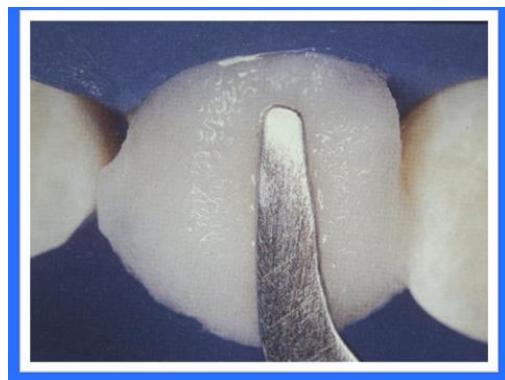
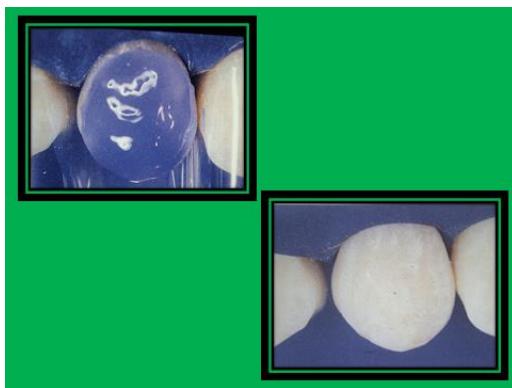
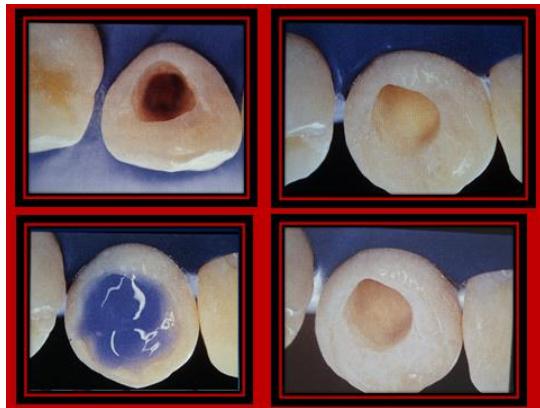
Internal bleaching (Non – Vital)

- 9 – Insert TF.
- 10 - Review the patient in 5 -7 days.
- 11 – Repeat if necessary.

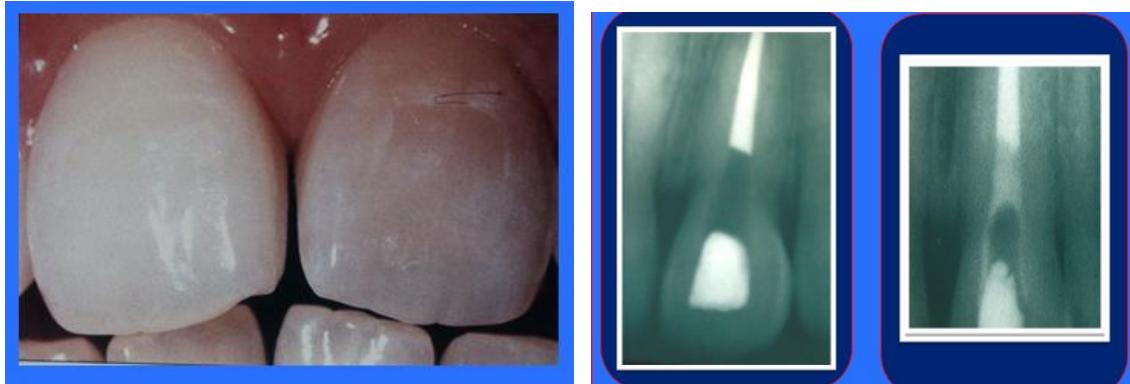
= insert a 2mm layer of

Cavit can be as a fast, easy and effective TF.

Thermocatalytic Technique (Non - Vital)

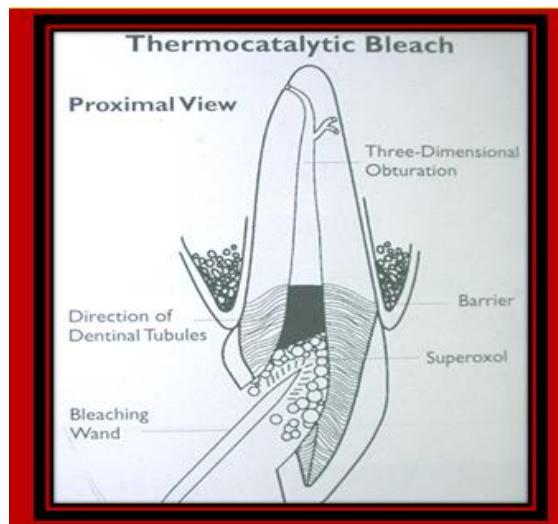
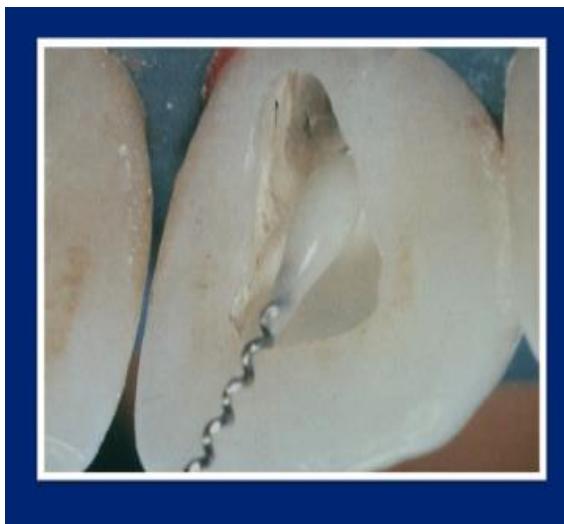


Combination Thermocatalytic & Walking Bleaching



= Application the GI. BARRIER and the U Shape

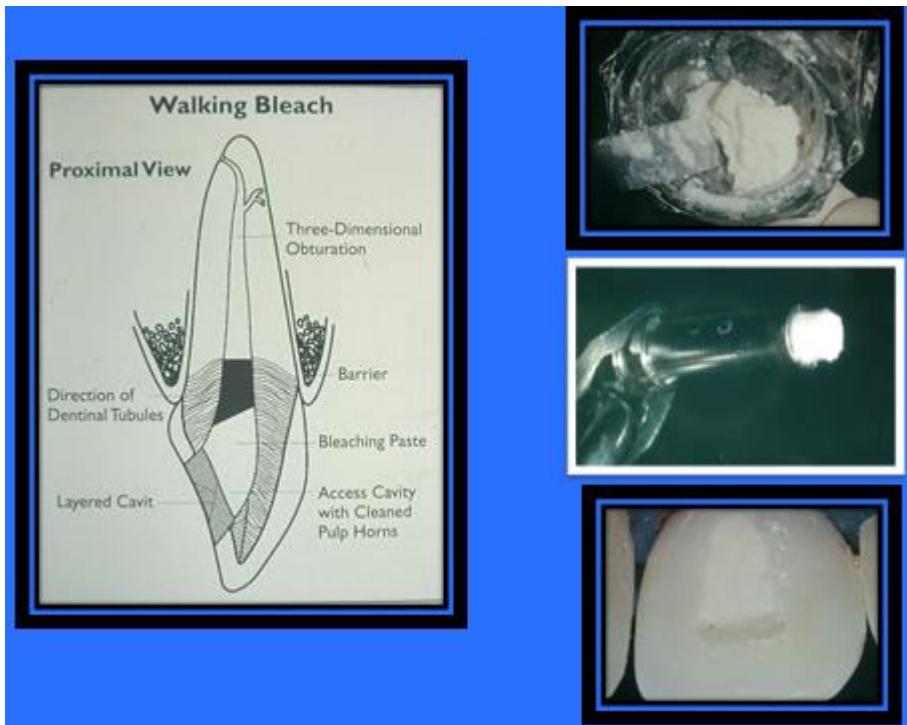
The best barrier material is Glass-inomer Cement.





= apply heating instrument to the HP. In the pulp champer, and HP. In the labial surface

= we can apply cotton pellet saturated with HP In the pulp



= thick mix of Sodium Perborat . Amalgam carrier, 2 mm of space left for Cavit temporary.



Acid etching and composite filling



Advantages of Bleaching

- + Low cost.
- + No tooth structure reduction.
- + No need for continuous replacement.
- + No chipping or fracturing.

Disadvantages of internal bleaching (HP. 30 – 35 %)

- + Endodontically treated teeth
- + Possibility of complication Resorption .
- + Brittle teeth

External root resorption



External resorption in the cervical area of upper central incisor

= pink color in the distogingival the upper right central incisor

= x-ray shown extensive root resorption.

Resorption

- + Age of patient.
- + Defect at the CEJ .
- + Bleaching barrier.

= The combination of bleach placed below the CEJ, A young pulpless tooth. And a defect at the cement enamel junction may allow the bleaching agent to diffuse through the dentinal tubules into the periodontal ligament below the epithelial attachment

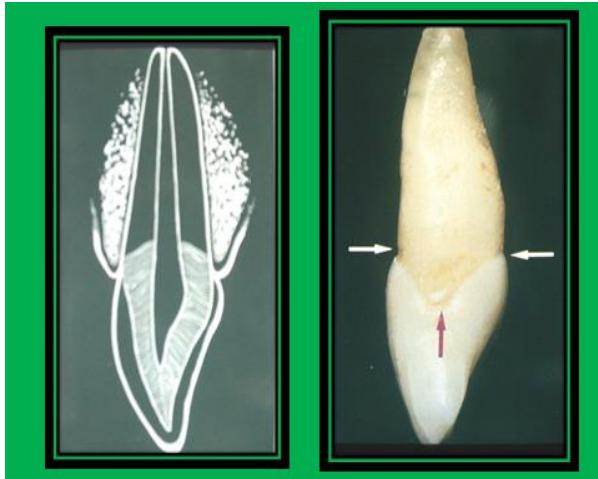
= this can initiate the inflammation that cause external resorption at the cervical area.

Barrier

- + What is the perfect Barrier... ?
- + Where should it be locate ... ?
- + What shape should it take ... ?
- + Which material is best ... ?

= the age of patient at the time the tooth become pulpless, and lack of a bleach barrier appear to be important in the cause of resorption.

=clinician have no control over the age at which a tooth becomes pulpless , but they have control over the barrier.

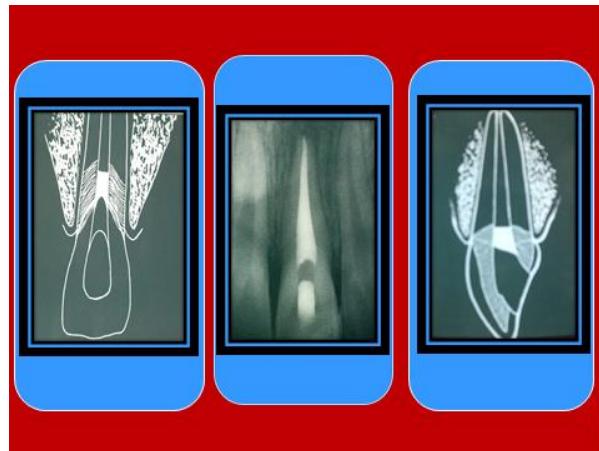


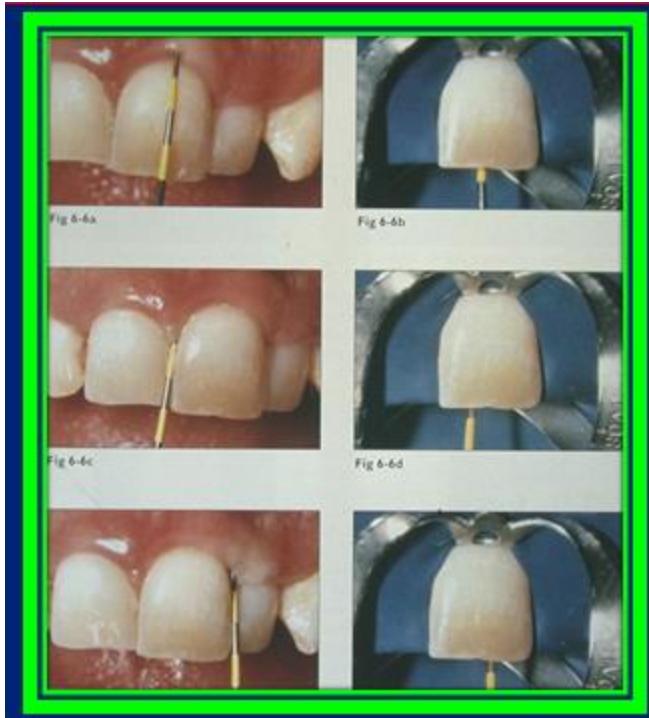
= many they use the labial CEJ as a guide for barrier placement under the bleaching material ?

= Dentinal tubules are oriented incisally.

= the proximal level of the CEJ. Curve in an incisal direction

= a flat barrier, level with the labial CEJ guide leaves a large triangle of unprotected dentinal tubules in the proximal portion.





= three periodontal probing

are made with a custom transfer periodontal probe.

- The periodontal probe curved to match the labial contour

First a labial recording is made ,followed by mesial and distal recordings.

= these probing are made to determine the position of the epithelial attachment from the incisal edge of the tooth

= the internal level of the barrier will be placed 1mm incisal to the corresponding external probing of the epithelial attachment.

= this will blocks the dentinal tubules that may communicate with the periodontal ligament appical to the epithelial attachment

= so that the bleaching material stay within the access cavity.

Bleaching without heat

Bleaching without heat

35 % HP.
Powder : Liquid
Gel mix

Walking Bleaching

Sodium Perborate
&
Water

Non - Vital Bleaching Risk

= External resorption :

- occur especially when used with the thermocatalytic technique (heated instrument within the pulp chamber)

= History found the incidence of resorption increased when associated with :

- Trauma (3.9 - 9.7%)
- Orthodontic treatment (24%)

Peg Shaped Lateral Incisor



DR. AWNI AL KAYED

Reshaping & Veneer

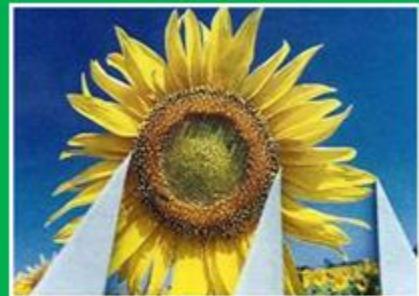


Dental Diastema





Thank you



بالتوفيق للجميع

أ. د. عوني الكايد