Operative Dentistry (lecture 2)

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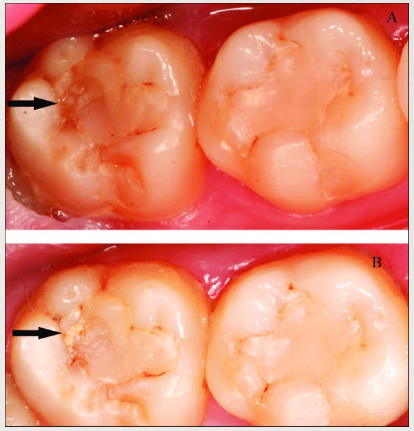
Patient Evaluation, Diagnosis and Treatment Planning: (part II)

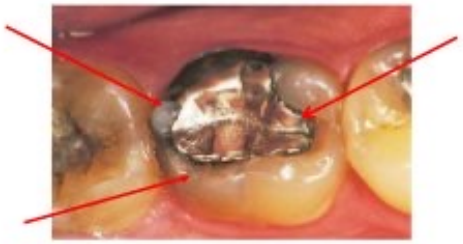
- ***D. Evaluation of existing restorations***

- ***The following criteria are used to evaluate existing restoration:***

1. Structural integrity: this evaluation involves determining whether it is intact or whether portions of the restoration are partially or completely fractured or missing.

- The presence of fracture line indicates replacement of the restoration.





Ditched amalgam with marginal breakdown

2. **Marginal opening:** for amalgam restorations the existence of marginal ditching does not indicate the replacement of the restoration; because the margins of amalgam restorations become relatively well sealed by the ***accumulation of corrosion products***, unless signs of recurrent caries are present.

- For composite restoration, the marginal gap should be considered for repair or replacement of the restoration.

- The presence of marginal gap is less critical for restorations with anticariogenic properties, e.g. **glass ionomer cement**.

- Because studies have shown that tooth structure adjacent to GI cement restorations is **less susceptible to caries**; replacement of the restoration is only **indicated** when tooth structure adjacent to the marginal gap becomes carious or when there is marginal staining (that is esthetically unacceptable) especially in anterior teeth.

3. Caries: the dentist must use a combination of **visual**, **tactile** and **radiographic** examinations to detect the presence of caries lesion.

- A **radiolucent** area surrounding a radiopaque restoration or the presence of soft tooth structure generally indicates caries and must be repaired or replaced.

4. Restoration-related periodontal health: examination of restorations must include an assessment of the effect that existing restoration have on the health of the adjacent periodontium.

- ***Problems commonly encountered in this area are***:

➢ Surface roughness.

➢ Interproximal overhangs.

➢ Impingement on the zone of attachment (**called the biologic width**) [the area approximately **2-3**mm in the apicocoronally dimension, occupied by the junctional epithelium and the connective tissue attachment].

- All three of these phenomena can cause **inflammation within the periodontium**.
- **Open** or **rough** subgingival margins can harbor bacterial plaque to generate an inflammatory response.
- Gingival inflammation around crown may also due to an **allergic reaction to material in the crown**.

5. Occlusal and interproximal contacts: all interproximal contacts should be assessed with thin dental floss by the dentist.

- Contacts should allow ***the smooth passage of floss***.

- Contacts that are open or excessively tight should be evaluated to determine whether pathosis, food impaction or annoyance to the patient has resulted.

- The occlusal contacts of all restorations should be evaluated to determine whether they are serving their masticatory function without creating a symptomatic or pathogenic occlusion.

- Restorations whose occlusal contacts are creating primary occlusal trauma should be altered or replaced to resolve the problem.

- Restorations that are in significant infra-occlusal may permit the super eruption of opposing teeth and should be considered for replacement.

6. Esthetics: some of the more common esthetic problems found in the existing restoration are:

a. Display of metal.

b. Discoloration or poor shade match in tooth colored restoration.

c. Poor contour in tooth-colored restoration.

d. Poor periodontal tissue response in anterior restoration.

- ***E. Evaluation of Occlusion and Occlusal Wear***
- The occlusion can have significant effects on the restorative treatment plan.

- ***The following factors should be evaluated during occlusal examination***:

✓ Occlusal interferences between the occlusion of centric relation and that of maximum intercuspation.

✓ The number and position of occlusal contacts as well as the stress placed on the occlusal contacts.

✓ The amount and pattern of attrition of teeth and restorations resulting from occlusal function.

✓ The interarch space available for placement of needed restoration.

- The number and position of occlusal contacts strongly influence the selection of restorative materials as well as the design of the preparation and restoration.

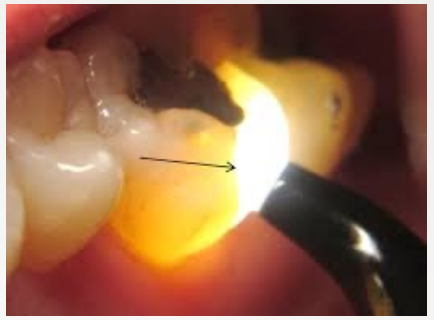
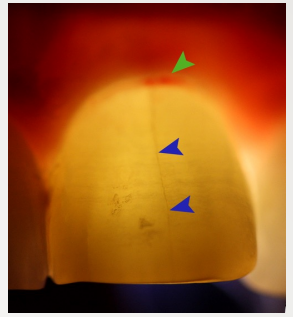
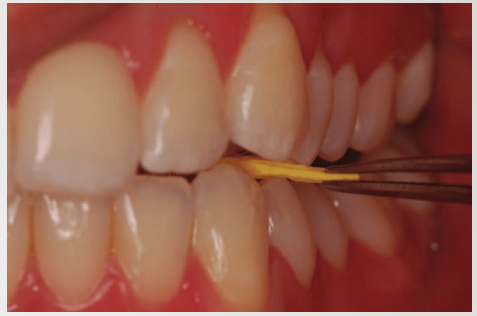
- ***Attrition:*** excessive occlusal wear caused by occlusal parafunction (**bruxism**).

- In these instances, facets on opposing teeth match well.

- Prevention is accomplished with use an occlusal resin appliance (**night guard**, **bite plane**), and education of the patients.

Cracked Tooth Syndrome

- ***F. Evaluation of tooth integrity and fractures***
- ***Cracked-tooth syndrome:*** is a fairly common result of incomplete tooth fracture.
- Patients suffering cracked tooth syndrome often experience **cold sensitivity** and **sharp pains of short duration** while chewing.
- The cusps most commonly fractured are **the nonfunctional cusps**.
- Often patients with multiple cracked teeth have **parafunctional habits** or **malocclusions**.
- Cracked- tooth syndrome is an **age-related phenomenon**, the greatest occurrence is found among patients between 33-50 years of age.

- This syndrome is often <u>difficult to diagnose</u>.
- The patient is unable to identify the offending tooth and evaluation tools such as **radiograph**, **visual examination**, **percussion** and **pulp tests** are typically <u>non diagnostic</u>.

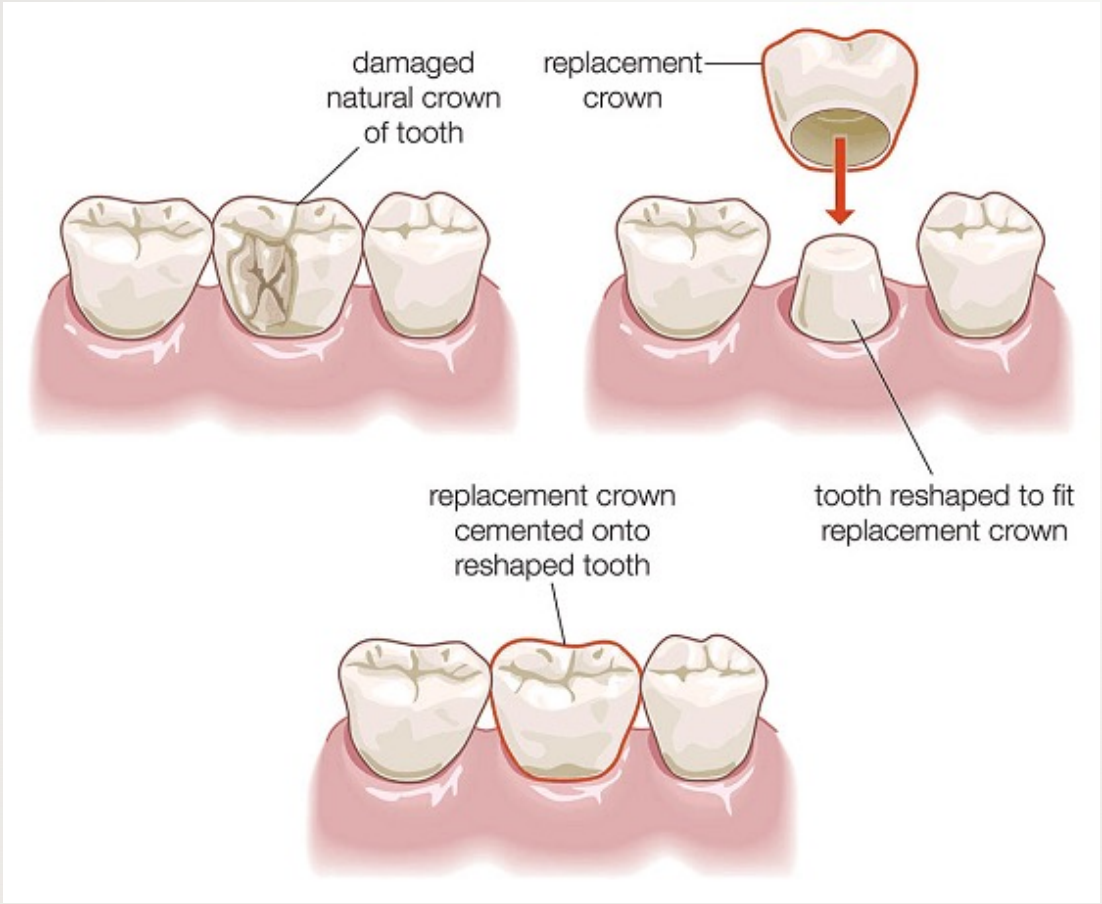
- ***The two most useful tests are***:

❖ **Transillumination:** when a tooth with a crack is transilluminated from either the facial or lingual direction, light transmission is interrupted at the point of the crack. This results in the portion of the tooth on the side away from the light appearing quite dark.

❖ **Biting test**: it is the most definitive means of localizing the crack, by having the patient bite a wooden stick, rubber wheel; the dentist will be able to reproduce the patient's symptom and identify the fractured tooth.

- In treatment of incomplete tooth fracture, the tooth sections are splinted together with a cuspal coverage restoration.

- This may include the use of an **amalgam** or **composite** restoration, a **crown** or indirectly fabricated **onlay**.


damaged
natural crown
of tooth
replacement
crown
replacement crown
cemented onto
reshaped tooth
tooth reshaped to fit
replacement crown


How can I treat my cracked tooth?
Treatable
Not Treatable
Treatment and outcome for a cracked tooth depends on the type, location and extent of the crack
Not all teeth can be treated
If you suspect you have a cracked tooth, come for a consult to check on its restorability!
MySmileDental

- ***G. Esthetic Evaluation***
- In addition to an esthetic evaluation of existing restorations, an assessment of the esthetics of the entire dentition should be completed.

- ***Commonly encountered esthetic problems that are related to restorative dentistry include:***

1) Stained or discolored anterior teeth.

2) Unaesthetic contours in anterior teeth (length, width, incisal edge shape or axial contour).

3) Unaesthetic position or spacing of anterior teeth.

4) Carious lesions and unaesthetic restoration.

5) Unaesthetic color and/or contour of tissue adjacent to anterior restorations, this includes: excessive gingival display occasionally referred to as the (gummy smile).

- The restorative treatment of esthetic problems may range from conservative therapy such as **micro abrasion** or **bleaching** to more invasive care such as the placement of **resin veneers**, **ceramic veneers**, or **complete coverage crowns**.

- Additionally **periodontal**, **endodontic** or **orthodontic** procedures may be helpful depending on the nature of the problem.

2. EVALUATION OF THE PERIODONTIUM:

- From a restorative dentistry perspective, the periodontium must be evaluated for two reasons:

➢ To determine the effect that the periodontal health of the teeth will have *on the restorative dentistry treatment plan*.

➢ To determine the effect that planned and existing restorations will have *on the health of the periodontium*.

- Evaluation of periodontium consists of a clinical assessment of **attachment levels**, **bony support**, **tooth mobility**, **qualitative assessment of tissue health**, and **radiographic evaluation of supporting bone**.

- The most consistent clinical indicator of inflammation is bleeding on probing.

- Any bleeding by gentle probing should be noted.

- The qualitative assessment of periodontal tissue health includes **tissue color**, **texture**, **contours**, **edema** and **sulcular exudates** are noted.

- The presence of specific local factors such as plaque, calculus and their relationship to tissue inflammation should be noted.

- During examination of periodontium, the dentist must estimate the location of margins for future restorations and their potential to impinging on the biologic width.

3. EVALUATION OF RADIOGRAPH:

- The radiographic examination is an essential component of the comprehensive evaluation.

- ***Clinical situations for which radiograph may be indicated includes***:

✓ Previous periodontal or root canal therapy.

✓ History of pain or trauma.

✓ Large or deep restorations.

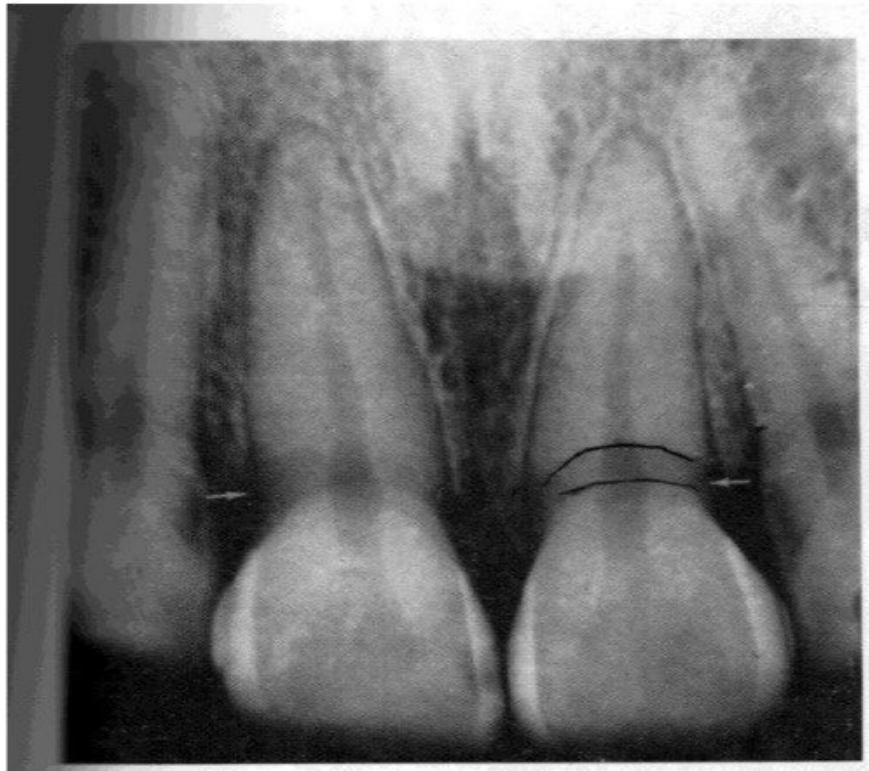
✓ Deep carious cavity.

- ✓ Swelling and mobility of teeth, fistula or sinus tract infection.
- ✓ Abutment teeth for fixed or removable partial prosthesis.
- ✓ Unusual tooth morphology or color.
- ✓ Missing teeth with unknown reason.

- In evaluating radiographic findings for restorative purposes, the dentist should note **open interproximal contacts**, **marginal openings**, **overhanging restoration**, **periapical radiolucencies** within the bone of the tooth.

- The dentist must interpret abnormal radiographic finding with caution.

- For example when the clinician evaluates **radiolucencies** that appear to represent carious tooth structure but may in fact represent non-pathologic processes as in a radiographic phenomenon known as (**burnout**) which is a radiolucency not cause by caries, it occurs when x-ray beam traverses a portion of the tooth with less thickness than surrounding areas most commonly seen in cervical area of the tooth.



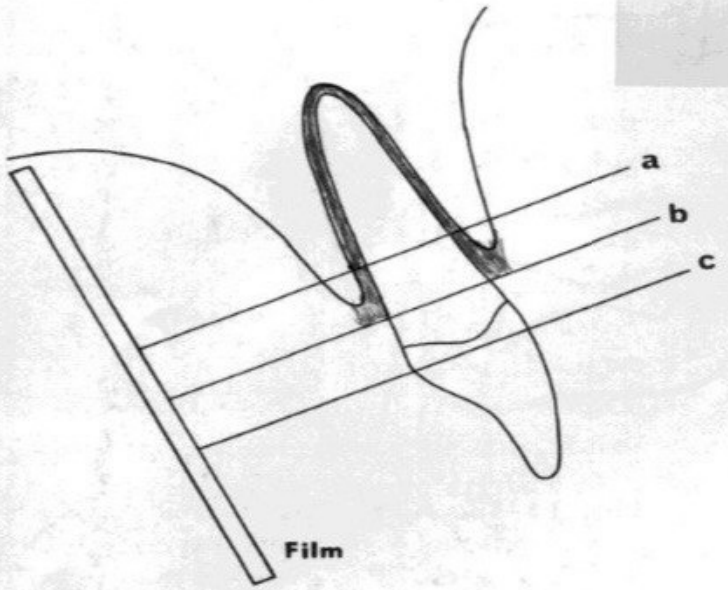


Fig. 15-12. Cervical burnout. A radiolucency can be observed, particularly in the necks of the maxillary central incisors, running across the entire width of the tooth. Such burnout is the result of a decrease in total structural thickness and/or a change in the hard tissue composition. The accompanying diagram illustrates this concept. Lines *a* and *c* penetrate more or more dense tissue than does line *b*.

- So the dentist must be careful not to mistakenly diagnose as demineralized tooth structure.

- Also the dentist must be **cautious** in diagnosing caries beneath existing restorations because certain radiolucent dental materials have a radiographic appearance similar to that of carious tooth structure.

4. EVALUATION OF DIAGNOSTIC CASTS:

- The dentist can gain valuable information through an evaluation of diagnostic casts.
- The dentist can see areas that are visually inaccessible during the clinical examination.
- Facets and marginal openings that may be difficult to see intraorally are readily visible on the diagnostic casts.
- Also cases involving multiple missing teeth need the evaluation of casts mounted on a semi-adjustable articulator.
- This enable dentist to assess the occlusal relationship and to plan restorative treatment.

- ***Treatment Plan***

- Having completed a comprehensive examination, the dentist lists the problem related to restorative dentistry.

- ***Planning the restoration of individual teeth requires the consideration of four factors***:

1. The amount and form of remaining tooth structure.
2. The functional need of each tooth.
3. The esthetic needs of each tooth.
4. The final objective of the overall treatment plan.

- ***Treatment Sequence***

- When the completed treatment has been visualized and the design of the restorations required has been established the final step in establishing the restorative dentistry treatment plan is sequencing the treatment.
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- Restorative treatment aimed at the control of active disease generally consists of direct restorative procedures using **amalgam**, **resin composite** or **glass ionomer material**.

- ***The sequence of treatment within the disease-control phase is dictated by three considerations***:

a) Severity of the disease process (i.e. the most symptomatic tooth, the tooth with the deepest lesion, or the most debilitated tooth is restored).

b) Esthetic needs.

c) Effective use of time.

- At each appointment, treatment is rendered in the area in most acute need of restorative treatment.

- When possible the restorations should be completed **quadrant by quadrant** to optimize the use of time.

Thank you