**occlusal caries diagnosis**

the earlier u detect the disease the better the outcome ,we know that the dentistry start as profession where all what u can do is extraction then it became a profession where u removed the diseased tissue & place a restoration(with the advances of drills & anesthesia) ,now its a profession where we can prevent the disease .

**today if u look at dentistry it's a medical rather than surgical Tx .**

**not always we start with drill,u need to think.**

**secondary prevention :is the early detection of the disease(caries for example ).the earlier u detect the better the result u can stop its progression or treat it earlier rather than wait until RCT is needed.**

so how u diagnose the caries ?

it's a complicated process not a one thing u can do .

 history & clinical Ex., supplementary test (radiographs).

 **ideally what we want ??**

**We want a diagnostic method to detect the caries early from early demineralization to cavitations, we don't want to wait until the caries on the top of the pulp.**

**we see decline in proximal caries due to fluoride application(works well on smooth surface, it doesn't reach the fissure )so more occlusal caries than proximal .**

**because of the increase level of occlusal caries**  the methods we used to use for diagnosis were good for proximal caries but not so good for occlusal caries basically the fissure .

\*\*problems of occlusal caries:

-caries in the fissure wall is not easily to be seen(not open) as in smooth surface.

-we might detect it too late ,cuz of the use of fluoride u don't see cavitations , caries progress (dentin demineralization) & u get late cavitations & that what we call "hidden caries "

so that is the idea of PRR we don't want to be in this situation.

& this is what we see in the clinic : U6 u suspect a certain area so u check it & u find quite a lot of caries .

**methods of diagnosis:**

**1-visual**

**2-tactile(probe/explorer) just to check**

**3-bitwing radiograph**

**these are the methods that we used in our clinic but there is another methods:**

**4-electronic caries monitor (ECM)**

**5-laser fluorescence(Diagnodent)**

**6-enhanced visual**

when we look at any kind of test for anything we look at test of **accuracy**

when they test any system they look at :

sensitivity :true positive (correctly identify the presence of caries )

specificity: true negative(correctly identify that the caries is not present)

when we look at the **visual & tactile** u need to have a cavitated tooth to actually see it visually.

**probe**: u need to have a catch

**bitewing** :good for proximal caries (very clear in the bitewing ).

in pediatric :if the contact is closed & u can't see, u are in doubt so take a bitewing.

but in occlusal caries the bitewing are not very sensitive cuz they may be obscured by B or L cusps . the caries has to be deep to be clear in the bitewing ,

**when we deal with 1ry teeth it's a bit different from permenant, when u want to check if it's vital :**

**1ry :interradicular area "**when we see broken ridge we know that there is a caries u need to check the **extent of caries ,root, interradicular area"**

**permanent: periapical area**

- they found that bitewing & visual are accurate at diagnosing cavitated occlusal caries.

-poor detection of noncavitated lesion (that what we need to detect in order to prevent the progression)

-radiograph (concern about exposing to radiation ).

-ECM :basically measures the resistance within the tooth ,if the surface is sound it will not conduct electricity (the reading on the device is zero)

 ,if the tooth has caries "demineralized & porosity" that allow the tooth to conduct electricity .

they did research comparing ECM & visual Ex. & using bitewing in vitro on early noncavitated lesion on molars & they found :

-ECM perform better than the other method .

**Diagnodent:**

**-laser based system**

**-use of differential fluorosence of sound & carious enamel.**

**-so u will have a stylus(pin) & u r going to scan the fissure with laser (the more fluorosence means more caries)**

problems with diagnodent :

-confused by staining or hypominerlization so u might get a false +ve results.

|  |  |  |
| --- | --- | --- |
| ECM | Diagnodent |  |
| 0.75 | 0.80 | Sensitivity |
| 0.88 | 1.00 | Specificity |
|  | Perform a bit better,it was superior for occlusal caries diagnosis  | Conclusion |

easier than ECM & Diagnodent is **the Enhanced visual Ex "set by Ekstrand" :**

-it's a meticulous(very detailed) examination.

-visual scoring system so u give a # to what u see.

the idea behind Enhanced visual Ex is if u see a white spot lesion on a wet tooth surface its more porous & deeper than one that is visible only after drying .

-it has to do with the refractory index(RI) of enamel (1.62) ,water(1.33) & air(1.0)

|  |  |
| --- | --- |
| Clinical appearance  | Score  |
| U see nothing either on wet or after drying . | 0 |
| White lesion on dry surface but u don't see it when the tooth is wet (so it's demineralization that is limited to the outer 50% of enamel  | 1 |
| If u see white lesion without drying, so its deeper ,deminerlization of 50% of enamel &1/3 of dentin  | 2 |
| Localized breakdown of enamel ,could be with grayish discoloration (unsupported enamel) ,affecting the middle third of dentin  | 3 |
| Cavitations ,u see caries with exposed dentin ,demineralization affect the inner third of dentin  | 4 |

when comparing ECM & enhanced visual Ex :

enhanced visual Ex done really well ,good Specificity & sensitivity .that's why it's important to dry the tooth to diagnose the caries .

enhanced visual Ex. also give u an idea about the management:

score 1,2 : prevention (FS, plaque control)

score3,4:restoration (PRR , normal filling )

you might actually see more & more of means to diagnose the caries ,u want to make sure that everything is supported by evidence .

**Microdentistry (air abrasion ):**access to the caries without destroying the tooth structure (no burs cuz u might remove sound tooth structure with them)

- it depends on the use of **very fine aluminium oxide powder** through small syringe & by that u just removed onnly the disesed tissue (less destruction).

**Ozon therapy :**use to kill the bacteria ,u can make the lesion inactive without giving anesthesia .

-very usefull in very young pt.or pt. with problems(fair of anesthesia or drilling)

-still need more evidence to be used routinely.

**fluoride absorption-release:**

-its one of the advantages of some material:

**1-GI**:release fluoride for longtime,studies looking at GI in saliva of preschool children (GI stay for 1 year after restoration)they started with concentration of 0.04 ppm then after 3 weeks its incresae to 0.8 ppm & its maintaine at 0.3 ppm even after 1 year.

-its rechargeable:by using fluoride toothpaste ((slow release device ))

How its release the fluoride??

1- Dissolution of the whole material that will release parts of the material (one of them is fluoride)

2-Diffusion: fluoride itself in combination with other ions .

**2-RMGI:**similar to GI

**3-compomer:**release of fluoride is minimum comparing with GI & RMGI

Best of luck

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