**Pedo sheet # 13**

**Dr hawazen**

**Done by haya hasweh and ola abu zir**

Choices of materials you have for restoring primary teeth

In the lab, u have taken the difference between primary and permanent teeth in terms of anatomy. It's important to be considered.

What are the choices or materials we have? And how to take the decision clinically? What to use?

We are going to spend 2 lectures talking about this topic. The current one is for anterior restorations, and the following will be for posterior. (That’s for simplicity)

Your reference will be the articles dr gave, recording the guideline of the materials and the evidence and importance of using such, finally when to use it.

Dr will give us a handout plus AAPT guide line in a very simple language concerning restorations of primary teeth.

Again, materials for restoring anterior primary teeth:

What's the ideal restorative material??

Ideally, the best is the tooth itself, that's why we always do the best thing when preserving tooth structure, and unfortunately sometimes we cannot, so we end up with restoration.

The material I want to use:

It has to be durable, simple to use, last life time of the tooth, painless while applying, acceptable in terms of taste and during the procedure itself, insensitive, and can tolerate the cavity u have.

There is no material has all of these, so that's why we are going to talk about each one to use on certain circumstances.

These are the dental materials available:

Amalgam and composite ( u already know them from cons)

The difference is GI cements, SSC, modifications of GI: RMGI and polyacid modified composite resin.

RMGI: is more GI than composite

Polyacid (compomer): is more composite than GI.

So it's a range between GI and composite.

Sometimes it's difficult and tricky to decide what to do and to choose, u need to look at other things, look at the tooth, that's why we do history and examination.

Ur management should go beyond the traditional surgical management, we talked about biological management of dental caries which is far away from the surgical. We understand caries process (demineralization and demineralization) we have to try as much as possible to preserve tooth and prevent loss of its structure, even arresting caries.

If I can remineralize the structure, I would prefer that.

We have talked about caries assessment which u must do for every patient, also to help u decide which type of restoration to use.

What does this involve?

Monitoring the pt, see if the lesion will be active (put a restoration)

 or to be arrested (manage it biologically, this is the preventive method).

What therapy to manage arrested lesion?

Prevention

So we are talking about prevention even though it's not a preventive lecture! It's very important aspect.

When we talk about restorative treatment, it's based on clinical examination, and it's part of comprehensive treatment planning like what u did in the lab, you have to consider all aspects ( prevention, restoration, surgery, if he needs space maintainer in relation to ortho) all test things have to be considered during comprehensive treatment planning.

U have to go beyond saying I want to do a restoration then to dismiss the pt, restorative treatment should be in relation to prevention.

In terms of pediatrics and ur child pt, what are the factors u have to consider in relation to ur restoration? Type of it

First of all, u look at the developmental stage of dentition, it leads roughly to the age.

U look at history of caries

Caries risk assessment

Cooperation of child (v. Imp and this will take time to deal with, and sometimes u have to change ur treatment plan if ur child isn't cooperative so it's v. Imp)

Parental compliance ( how often the parents will bring the child for recall visits).

So the developmental stages are roughly the age of the patient.

Chronological age and dental age are not always the same. U can use that as a guide.

Why is that important?

Because I'm going to replace a filling and I want to know how much that filling will stay in the mouth.

So how long that tooth stays in the mouth leads me to choose.

It's important in primary teeth because they are to exfoliate, so u have to know in terms of primary teeth, which u don't need in permanent.

Dr viewed a pic of a pt who is 9 years, has D, E, 6.

D exfoliates around 9-10

E exfoliates around 10-12

6 is a permanent tooth, so when placing a restoration, it should last a life time.

For D, 1 year to exfoliate

For E, 2-3 years, so we don't have to use SSC for these two teeth, since it's the most durable, no need for it ( it's used for a life time).

But 6 is a permanent tooth, so u have to make sure that all restorations are good and last for life time.

When u write the treatment plan and u have D, E, 6, so the most imp tooth to restore is the 6. So always consider this point.

Another thing to consider is the natural history of caries. We talked about bacteria and the most common route is transmission which is the vertical transmission (from the mother)

The earlier the child is colonized with cariogenic bacteria, the greater the caries risk.

So when u look at the mother’s caries risk, if she has lots of caries, higher risk for the child would be because of higher risk of transported bacteria from mom to the child, the result will be early childhood caries.

Dr. viewed a pic and asked what the first thing you will notice is?

The white chalky spots on enamel around the gingival margin (incipient caries) of demineralized areas, it's an early caries and doesn't need restoration. Only to be managed to prevent further damage to tooth.

U see the child is a high risk caries (signs of early caries that don’t need restoration).

Buccally and lingual surfaces are smooth surfaces and are easily available for prevention (arresting the caries) and improving OH.

 Buccal and lingual surfaces are smooth surfaces and managed by prevention.

If u have cavitated fissure or proximal lesion, usually u will need a restoration.

We talked about cavitation in relation to dentine.

Although cavitated fissure can be managed by sealing.

So without dentinal involvement, seal the caries to not be in risk.

The problem is only within the dentine m, if u reach it, then restore.

What we are trying to do is limiting the extent of caries progression, it's important to consider how fast this caries is progressing.

One of the difference between primary and permanent teeth is the thickness of enamel. It's thinner in the permanent so you will expect faster progression. It's written in the article that this is for the PROXIMAL enamel, means that enamel is thinner proximally in permanent tooth,so goes for faster progression

Do u have any idea about how much time does it need to progress? In enamel

They looked at different studies and found that 80% of caries in enamel was left after 1.5 years with pts who are high risk and not getting fluoride.

Pts with low risk and who are getting fluoride, it took 3.5 years to progress into the entire enamel.

So not every caries in enamel needed to be surgically managed, we can limit the progression.

3.5 years is a long time for a primary tooth, so u wouldn't do any restoration. So prevention is a good option regarding to time progression.

In a permanent tooth, it is faster, it takes more than 1 year, some studies say 1 year.

Recall: it's slower in primary and faster in permanent.

How to know if a lesion is active or arrested?

From color (arrested: dark/ black, while active: brown), texture (hard in arrested, soft in active).

Arrested caries is more demineralized than a tooth without caries, so more resistant to caries, so don't have to be restored. If I remove it I will destroy the tooth, so leave it and monitor to make sure no problems there.

In exposed dentine, it's brown and soft and need to be restored.

U have to consider parents as well. Are they going to bring child for recall visits? How aggressive they have to be in management? The attitude they have, it's very important to monitor the lesion (parental compliance)

Goal of caries risk assessment is choosing prevention or restorative management.

I know this patient has more or less caries risk helps me in choosing

Having more than one carious tooth, caries risk should be considered.

Most important part is past caries experience, if he has caries and E is erupted, the first thing comes into mind is to use fissure sealant on 6 because it's in risk.

Other things to look for in caries risk assessment: demineralization, mother’s caries activity, sibling caries activity, bacterial level, whether getting fluoride from water or not, sugary consumption, diet, dental home.

Dental home is the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated, and family-centered way. The AAPD encourages parents and other care providers to help every child establish a dental home by 12 months of age

What does this mean in caries risk?

High caries risk? the pt needs fluoride

Fluoride in tooth paste, varnish.

In children, we don't give a rinse (6-7 years). It's not advisable but tooth paste is fine.

In terms of restoration, fluoride in GI is the best in this aspect, it releases fluoride, and it's rechargeable, so acts as slow releasing device in the mouth. Which is beneficial.

The problem in GI is the retention and durability, it doesn't really last.

SSC: we like it because it covers the whole tooth so best seal and protection, when having MO caries then covering it by SSC, less chance to have DO with time. We really like SSC.

Cooperation of the child is v. Imp

Here is an example for how to teach a child to set in dental chair in case of very young patient, let the mother set and bring the child in her legs to control examination

Lap to lap technique ... a knee-to-knee exam where the child sits in his parent's lap and leans back into the lap of the dentist for examination. (Extra info)

Very young children are not cooperative so depend on this technique if they cry slit they open their mouth letting you see the oral cavity.

In terms of materials:

* GI is a good option (easy to use)
* Composite is useless (cooperation & isolation) it doesn't give cooperation in relation to etching and bonding it takes time.
* Amalgam needs retention but it's less sensitive than composite.
* RMGI is less sensitive too.
* Compomer u don't need to etch neither wash it dry , only place a primer, so it's a one-step less.

Parental compliance/ whether they come or not.

A parent that not likely to come back, if you don’t know it might best to open the carious fissure if there is enamel caries and make restoration, because the pt will not come back and will not follow the instructions.

Usually you monitor and fissure sealant

If the child in general has a large number of teeth that need a lot of polypetomy & SSC, it might be best to go for extraction.

According to AAPD…. If the child need 8 pulputomys & 8 SSCs, it might just best to go for extraction.

What we tend to do? …. If we are under GA, extract the Ds and try to maintain the Es, because the Ds in term of occlusion are not that important like Es.

So if the child has too much to work then EXTRACT.

For anterior teeth you can use:

1. Composite
2. glass ionomer
3. RMGI ( good option)
4. Polyacid modified glass ionomer
5. SSC
6. Strip crowns
7. Zirconia crown

**Composite**

Advantages:

1. Aesthetic
2. Adhesive
3. Good wear resistance

Disadvantages:

1. Technique sensitive
2. Chance of secondary caries
3. intolerant to moisture

**Glass ionomer**

Advantages:

1. Chemical binding to enamel and dentine, so sometimes if we don’t have an enamel, GI is a good option
2. Thermal expansion is similar to the tooth
3. It takes up and release fluoride (major advantage)
4. Decrease moisture sensitivity

Disadvantages:

1. Poor wear resistance (major disadvantage)
2. Poor tensile strength
3. Long setting time (so we put bond or varnish or Vaseline) … need to be protected while its setting

To overcome this disadvantages they modified glass ionomer to polyacid modified composite resin

**Polyacid modified composite resin**

It’s a composite resin with glass ionomer characteristics

Advantages:

1. East to use
2. Better mechanical properties than GI

Disadvantages:

1. Doesn’t release fluoride as much as GI (only 10% … which is very little)
2. Can’t be recharged by fluoride
3. Less wear resistance than composite ( because it has a little GI so it decreases the strength)

**Resin modified glass ionomer**

* There is a lots of studies on this material that shown that it has a good results in term of restoration of primary teeth.
* Conventional GI + Bi-GMA + photo initiator
* Commercial examples: Vitremer (3M) & Fuji 2 LC
* Available forms: Powder or capsule

Advantages: (combine both composite and GI)

1. Better aesthetic
2. Better strength (adhere to both enamel and dentine)
3. Less more sensitive

\*\*\*they found that success of RMGI for class III & V in primary teeth is quite high… so it’s a very good material to have.

>>> the previous materials are for intracoronal restoration

>>> the full coronal restoration … SSC, strip crown , preveneered crowns, …

**Class V**

Very common and very simple

Outline the form of the cavity > remove the caries and the decalcified areas to make sure that you have sound enamel.

To increase the retention you can have a small undercuts or retention grooves.

Class V is an ideal restoration to start the treatment with it because it’s simple and u don’t need to give LA… so you can use all behavior management like tell-show-do.

\*\*\* What the procedure that we don’t use Tell-Show-Do technique? In local anesthesia
**Class III**

The commonest restoration to fail …. Because of small crown, large pulp space and retention is a problem in this restoration.

To increase the retention:

1. Do a very small slot preparation
2. Do dove tail (as in class II) lingually or palatally or labially
3. Do a labial preparation (as veneer) , don’t prepare the whole tooth , just around the margin of the cavity so we will increase the surface area (less destructive technique than #1 and 2)

One of the challenging restoration in achieving good isolation and increasing retention.

**Full coronal restorations**

Indications of full coronal restorations:

1. Used when the child have multiple caries or multisurface caries
2. Incisal edge is involved
3. Extensive cervical decalcification
4. Following pulp therapy like primary molars because the tooth will be weaker and doesn’t have enough tooth structure.

Types:

1. Preformed that held on the tooth by luting cements
2. Bonded to the tooth (as a strip crown, which is basically composite and it’s very esthetic).

**Strip crown**

A celluloid crown which is made especially for primary anterior teeth

All what you do is like permanent teeth; you put composite inside the crown, place it, cure, remove the celluloid sheet & finish the composite

Very aesthetic

Sensitive technique because you are using composite

**Pedo jacket**

It’s a tooth colored copolyester material which is filled with composite resin and left on tooth after polymerization instead of removing it.

Disadvantages:

1. comes in one shade only …. Not aesthetic
2. You can’t trim or reshape or finish the crown

**SS crown**

A preformed crown

It’s held to the tooth by mechanical cervical creep of the tooth and held by luting cement

Disadvantage: not aesthetic ….. to solve this problem they made what’s called Open faced SSC ….

Place the SSC on the tooth, then remove the labial metal and then they add composite instead.

**Pre veneered SSC**

A SSC that come already with aesthetic facing

Bonded in facial surface

Attach mechanically with aesthetic facing

Very aesthetic

Problem with fitting it

Ex.: NuSmile, Kinder Krowns and Cheng Crowns

**Pedo perals**

Aluminum crown covered by epoxy resin

Not very aesthetic in terms of color

**Zirconia crown**

Very aesthetic

Difficult technique (need preparation of tooth with finish line that is subgingival)

a lot of tooth structure needs to be removed

sometimes you have to do pulp therapy because you will expose the pulp

more expensive than SSC

* Composite >>> good for class III, IV, V

(need good cooperation and isolation)

* GI & RMGI >>>> class III & V
* Full coverage >>> when I don’t have enough tooth structure