## Peedo sheet 3

# Pulpectomy

Pupectomy: removing irreversibly inflamed or necrotic radicular pulp tissue and then doing cleaning and shaping to the canals and filling the canals with a resorpable material that will resorpe at the same age that the primary teeth will be accidentally excluded.

Note that we don’t use gutta perca for opturation; because we need a non resorpable material in primary teeth.

Technique:

-we need good preoperative radiographs showing all roots and there apexes.

-LA,, rubber dam “ actually we don’t put rubber dam but we do a proper isolation”.

- removal of caries.

-De-roofing of pulp champer,, removing any remaining part of coronal pulp tissue using sharp excavator or large slow speed round bur.

Then we نقيم radicular pulp;

If there is perfuse bleeding,, most of the time we can do a one stage pulpectomy; we remove the radicular pulp, dry the canals and opturate them.

If it was necrotic, suppuration, canals can’t be dried then we need 2 stages pulpectomy.

-so removing pulp tissue, identify the canals, then :WL is estimated using preoperative x ray keeping 2 mm shorter to the radiographic apex.

\*the idea of pulpectomy is to lengthening the tooth life as we can..

-we use small size files, up to size 30, get into the canals straightly and gently.

-Irrigation of the canals using normal saline, chlorohexidine or sodium hypochlorite (which is the best).

-then you dry them using pre measured paper point keeping 2 mm from the apex.

\* if infection is present, canal exudate and or associated sinus you have to do 2 stage pulpectomy procedure; so you dress the canals with non -setting calcium hydroxide… we inject non setting CaOH as a temporary solution and then we put IRM on top and dismiss the ptn and complete your work next week.

- if canals can be dried with paper point, opturate the root canal by packing or injecting a resorpable material like;

1- zinc oxide eugenol (non re inforced) –not that used in IRM which is the reinforced one –

It takes longer time to set that’s why we don’t use it a lot in pediatric clinic, but we use it when doing root canal system because it is non -reinforced .

It has high clinical success rate.

The problem with this material is that \*\*it take a long time to be resorped; it may interfere with the eruption of the successor by causing deflection if zinc oxide still present.?

\*\*it is difficult to handle because it is powder and liquid.

-you can use it if you don’t have other options.

2- non setting CaOH paste

Has favorable antibacterial effect.

 Injectable; you know the canal length and you just inject

Easily rasorpe and cause no foren body reaction.

Has high success rate

 but the vitapex is better clinicly.

3-vitapex

Pre mixed CaOH and iodoform paste

-very high success rate and easy to use.

-lack of toxic effect

Radioopacity, resorpability

\*after opturation we complete our work like in pulpotomy;; we mix IRM paste on the top of the root canal filling and then we put a defenetive restoration preferably SS crown.. to provide a better coronal seal.

\*objectives

Following treatment the radiographic infectious process should resolve in 6 months, as evidenced by bone deposition in pre -treatment radiolucent areas, and pre-treatment signs and symptoms should resolve within few weeks. there should beradiographic evidence of successful filling without gross over extensions or under filling.

\* success rate: it has high success rate about 86% ?

Desensitizing pulp therapy

 You need it Sometimes when you are doing pulpotomy even if you do a good anesthesia, and the ID block is done well the ptn is in when you are near to the pulp وجع وليس دلع)).

Rationale: to reduce pulpal inflammation and all symptomsin order to facilitate the subsequent pulpotomy or pulpectomy procedure.

\*indecations:

The pulp is vital,, carious exposure but no signs or symptoms of loss of vitality.

1. The patient himself is not confined, or need desensitizing for further treatment.
2. The pulp is hyper algesic, adequate analgesia is not achieved.

\*procedure

LA, removal of caries

We use something called ledermix steroid+antibiotic ( steroidal antibiotic paste)

We put it in a small cotton in a place of the exposure that we did (directly over the exposure site).

It is very useful and comfortable to the ptn ,,but we don’t have it ☺

Then we close with well -sealed temporary dressing IRM without pressure over the area.

\*\* we don’t use the regular TF we use in cons, we use astronger one (IRM).

we put it as a secondary filling ! then the ptn come back after 7-14 days and we complete our work.

Most of the time it will be much easier to do. Depending on the clinical findings we do either pulpotomy or pulpectomy.

Pulp therapy for young permanent teeth

Mostly 6s and anterior teeth.

-in young permanent teeth root development and apical closure is not completed.

-closure of permanent teeth roots occurs 3 years after eruption.

-immature permanent teeth can be present in children from6 years ( eruption of 6s) to 2-3 years after the eruption of 3rd molar.

-after apical closure they are classified as mature teeth.

-when permanent teeth erupt only 2/3 the root is formed

-the formation of dentin will continue as long as the pulp is vital; that’s why it’s important to keep the vitality of the pulp (for deposition of dentin🡪 stronger tooth).

-young permanent teeth have a better healing potential than in mature ones; because of its cellularity.

-the degree of tooth development will determine what treatment to do, that’s why it’s important to take preoperative radiographs.

\*dentin deposition

-The apposition of secondary dentin in or around the pulp champer and root canal is a continuous process, physiological secondary dentin deposition after the formation of the root and apex closure occur in a much slower rate throughout the life of the tooth.

-tertiary dentin formation involved in wide range of responses to secretions to the regular tubular dentin to a very (can’t heare the word) effect in tubular dentin. These responses are a result of different cellular and collicular processes there stress rxns ranging from mild to severe stimulus.

-what determine if the tooth can deposit 3ry dentin or not is the remaining dentin thickness after removing caries with bur.

\*residual dentin thickness is the most critical factor determining the secretion of 3ry dentin.

\*maximum reactionary dentin was observed when the remaining thickness was between 0.5 and 2.5mm ,but if less than that, if we close the tooth most of the time it will not deposit 3ry dentin and become necrotic.

-maintaining pulp vitality whenever possible is important.

Ex.10 years old, if we look at his x-ray the root apex is closed the wall of dentin is thin, so we have to keep the pulp vital in order to increase dentinal root thickness.

-young permanent tooth has wide root canals, and dentin deposition prevent wall fracture- which is a common finding in pre -treated teeth with wide canals.

-that’s why the approach today even if we leave caries behind, we try not to go into dentin and make the tooth non vital.

\*pulp dentin complex

The pulp and dentin are closely related and usually looked as one unit. Also procedures performed in dentin have effects on the pulp.

\*the condition of the pulp dentin complex is the main determining factor in treatment planning, so you have to consider the state of the pulp , vital or not ,if there is exposure or not…

\* Pulp exposure in young permanent teeth can result from: caries, operative procedures or traumatic injuries.

1-caries

If carious exposure happened, the pulp and dentin are infected.

Here we don’t think of direct pulp capping because the pulp around the exposure site is usually infected, so we go for partial pulpotomy.

2-operative exposure

If during working, we remove all caries but at the end accidental exposure happened. Here only the dentine is infected and the pulp is vital and sometimes not even inflamed. In this case we do direct pulp capping.

3-traumatic exposure

Neither dentine nor the pulp at first are infected, the dentin isn’t infected and the pulp may remain vital and not infected if the initial request is immediately after the injury ( the ptn has fallen at the clinic door) you can do pulp capping.

But most of the time the pulp is exposed to oral cavity and became infected.

\*so in traumatic exposure we assume that the pulp is infected and we go for partial pulpotomy not pulp capping.

\*\* the most important and the most critical aspect in pulp therapy is determining the health of the pulp and the stage of inflammation.

-you should know the basics before you progress in work; take agood history,good examination, radiographs,.. sometimes with open pulp champer we can evaluate the pulp directly.

-history taking from the child, pain type; spontaneous🡪 the damage of the pulp is irreversible.

-sensitivity to percussion may indicate that pulpal damage is extended to the periodontal ligament causing extrusion from the socket; also it may be caused by a high restoration.

-sometimes food impaction can give symptoms of irreversible pulpitis condition; ex. Ptn has class 2 cavity and the food is impacted there, it may mimic irreversible pulpitis, so we have to take a good history combined with clinical examination.

-some times ptn complain of pain and the parents think that the problem is in D or E, put the cause is eruption of 6.

-\*most of the time children complain of pain during the eruption of first permanent molars, it may cause pericoronitis put it is rare.

- most of the time it causes operculum.

-the management of it will be: irrigation, OHI and follow up and usually it will go alone.

-usually the complaint is bitting on the operculum.

- careful extra and intra oral examination is needed to check for swelling, redness of the vestibules of the tooth with extensive caries, draining sinus tract,..

-any fractured restoration, increased mobility, tenderness to percussion.

-pulp testing should be carefully interpreted for 2 reasons:

1- you are dealing with young children, pulp test may be not reliable; it has a high false positive.

* 1. Immature teeth patently? Stimulation due to incomplete development of the innervation system.

\* we don’t use pulp testing in primary teeth.(important)

We can use pulp test in immature permanent teeth (lower anterior following trauma) but we have to be careful in order to achieve accurate result as we are dealing with young child and small teeth.

-radiographic examination

Radiographs are essential in diagnosis.

-we cant determine in immature permanent teeth if the radiolucent area because of incomplete growth or if it is a periapical lesion.

-ex. Tooth with caries extended to the pulp, open apex, here we can’t determine if the periapical area get infected or not.

\*antimere is a comparing radiograph used to compare the opposite side.

-the degree of tooth development, apical closure and the amount of dentin apposition should be compared with the contralateral tooth.

\*options of pulp therapy for teeth diagnosed with a normal pulp or reversible pulpitis:

1-indirect pulp treatment

2- Direct pulp cap.

3-pulpotomy.

1. Protective liner.

\*Protective liner

Is a liquid liner placed on pulpal surface of a deep cavity to act as a protective barrier between the restorative material or cements and the pulp.

-dentin bonding agents, glass ionomer cement or calcium hydroxide is at the discreation of the clinician.

-the liner must be followed by a well sealed restoration to minimize bacterial leakage from the restoration-dentin interface.

-so when bacteria and bacterially produced irritants have been removed by caries excavation and bacteria free? Restoration have been placed with a good seal, new bacteria is prevented from reaching the dentin.

\*indications:

Tooth with normal pulp when caries is removed for a restoration in deep areas of the preparation.

\*Opjectives

To preserve the vitality, promote pulp tissue healing and facilitate 3ry dentin formation.

\*indirect pulp therapy

If signs and symptoms are not go to irreversible pulpitis, the pulp is cellular and capable to heal , we must give it a chance to heal by

removing the caries from the walls, removing some of the caries in the floor and leaving some caries and cover it by a restoration.

* In tooth diagnosed with reversible pulpitis with a deep caries that may need endodontic therapy if the caries is completely removed.
* \*it is important to remove the caries from the DEJ and from the lateral walls of the cavity in order to achieve optimal seal between the tooth and the restorative material to prevent micro leakage.
* Rational of this treatment is based on the observation that the odontoplast will increase the secretory activity in response to reduced infectious challenge.
* So we reduce the infectious challenge by removing caries and doing a good seal, so adontoplasts will build up a layer of 3ry dentine bellow caries to protect the pulp and increase the distance between the affected dentin and the pulp.
* \*2 approaches:

1-Excavate as close as possible to the pulp, place a protective liner and restore the tooth without subsequent reentry to remove any remaining affected dentin (one visit), then you put a permanent filling.

\*risks:

1-unintentional pulp exposure

2-irreversible pulpitis; as we said if the residual remaining dentin is less than 0.5mm it may not be able to deposit 3ry dentin.

2-stepwise excavation of deep caries (2 steps)

Good to manage reversible pulpitis without pulpal exposure or endodontic therapy.

-dis adv ; it needs 2 steps.

\*Steps:

1- removal of carious dentin along the DEJ and excavation of only the outer most infected dentin leaving a carious mass over the pulp.\*using a large carbide round bur low speed is better than spoon excavation.( better control, less probability to make exposure)

2-after 6 months, removing of the remaining caries and placement of permanent restoration.

\*objectives

To change the cariogenic environment in order to decrease the number of bacteria, close the remaining caries from the biofilm of the oral cavity, and slow or arrest the caries development.

-the most common recommendation for the interval between steps is 3-6 months allowing sufficient time for the formation of 3ry dentin and definitive pulpal diagnosis.

-Critical to both steps of excavation is the placement of a well –sealed restoration.

-the decision to use one-appointment caries excavation or a step-wise technique should be based on the individual patient circumstances since the research available is inconclusive on the approach is most successful over time.

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