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| Lecture | Peads #11 |
| Doctor | Mohammed Hamdan |
| Done by | Ameer Frangieh |
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PediatricsII

**University of Jordan**

**Faculty of Dentistry**

**5th year(2015-2016)**

We finished talking in the last lecture about the introduction to trauma; history, clinical examination and radiographic examination, then the classification of traumatized teeth, in this lecture we're going to talk about the management of these traumatized teeth and we're going to mention one by one starting from the simplest to the most complicated.

1. Crown craze/crack:

- It's the incomplete fracture of the crown.  
- you can diagnose it using the light cure, by positioning it palatally along the long axis of the traumatized tooth and you can detect the cracks labially.  
- these are the simplest cases and most of the times they remain un-noticed and need no management but a follow-up.

\* The follow-up of a trauma case is at least for a two years period; having the first recall visit within the first month then three months and six months, and remember that we have to tell the parent or the guardian if anything appears -a sign or a symptom like any discoloration, pain, sinus tract or swelling -they should attend the clinic immediately.

- Presented as horizontal or vertical craze lines that don't require immediate treatment.

- Sensibility tests should be carried out periodically as mentioned earlier.

- The most severe type of pulp injury often occurs in traumatized teeth that suffer the least severe type of injury, also the severity of trauma doesn't depend on the amount of tooth structure lost; just a small concussion sometimes will precipitate a dangerous complication, this can be explained by the following; in such cases, the energy of trauma will be absorbed by the periodontal tissue and the pulp tissue later manifesting as a severe complication, while if a fracture occurs, the whole energy will be released with the fracture piece reducing further injury precipitation, especially in cases of enamel and enamel-dentin fractures.

1. Enamel fracture:

- Chipping of enamel.  
- Management is by smoothening the corner or area where chipping occurred.  
- occurs when frontal impact energy exceeds the shear strength of enamel and dentin.  
- smoothening is done by discs or stone to prevent irritation to soft tissues.  
- If chipping is bigger at the distal slop of one of the incisors, we do corrective grinding to the other central for aesthetic purposes, but on the mesial side this is difficult so we do composite filling.

- Sensibility tests should be carried out periodically.

3. Enamel-dentin fracture:

- Class II fracture.  
- Needs restoration by using composite filling incrementally.  
- Best finish line to use is the chamfer because it's easily done and gives strength for the composite.

- We use calcium hydroxide to cover dentinal tubules.  
- The most feared thing in composite that might cause death or degeneration of the pulp is the lack of enough curing because of the residual monomer, that's why we do it in increments, because curing it as a whole single block will only cause the surface to be cured leaving the deeper areas.

- We can use cellulose strips.

- Finally we finish and polish the restoration.

- Lack of restoration of the tooth will lead to deterioration of the pulp, rotation of the tooth and over-eruption of the lowers.

\* Why is it important to restore the anatomy of the crown?  
1. To prevent labial protrusion or displacement.  
2. To prevent drifting.  
3. To prevent over-eruption of the opposing teeth.  
4. To maintain the vitality of the tooth.  
5. To restore esthetics.

- Exposed dentin is not a simple thing, as here we have the tubules exposed, and with cyclic exposure to cold and heat plus the continuous ingress of bacteria, might lead to pulpal degeneration.

- What's important in these cases is to ask the patient if he has a broken piece, as we can re-attach this piece or solder it by composite.

\*Re-attachment of a broken fragment:

- It's performed in class II fractures or even sometimes in class III (with exposure).  
- Take an appropriate x-ray.  
- perform sensibility testing and percussion; percussion is done to detect the signs and symptoms of percussion, if the patient feels pain (a symptom) it means there is tearing in the periodontal ligament, fracture in the root or concussion of the tooth, and if the sound was abnormal (a sign), manifested as a dull sound not a normal metallic sound, means there is a problem in the periodontium; tearing or mobility.  
- We have to try the broken piece if it fits well and no other missing parts.  
- It's difficult to hold the broken part by your hand as you might easily lose it, so what we do is that we fix it on a piece of green stick or sticky wax to make it easy to handle the piece.  
- We apply acid etch on both the tooth and the fragment.  
- Wash the two parts.  
- Bonding; you can either mix the bond with the normal composite to get a flowing mix or use the flowable composite; apply on the two parts.

- Approach the fixed part by the sticky or green wax until a complete approximation or attachment occurs between the tooth and the piece.  
- Cure both labially and palatally.  
- Remove the excess composite with a knife or a scalpel.   
- Until now the cementation is very weak and can break easily, so what we do is that we get a small size round bur with low speed or even high speed and along the fracture lines buccaly and palatally we do grooves but each at a time (buccally then palatally) to prevent re-fracture of the piece, then we acid etch, bond and apply a compatible shade composite then finish and polish.

- To mention here is that when tha parent tells you about a tooth fracture of his child, tell him to look for the piece and put it in any wet medium; saliva or water or anything to prevent its dehydration and change in color, as with dehydration it becomes very whitish as in fluorosis.  
- A new adhesive is available in the market called Scotch Bond Multi-Purpose Plus from 3M company.

4. Fracture of enamel and dentin with pulp exposure:

- Class III fracture.  
- Here we either perform direct pulp cap or pulpotomy depending on three factors; 1.size of exposure 2.time 3.condition of apical area  
- Direct pulp cap is performed in pin point exposures as in lateral and central incisors (spot of bleeding) or even without bleeding when having a very thin layer of dentin overlying the point of blood (called tin-hinge).

- Direct pulp cap is performed within 12 hours of exposure (few hours), the longer the time, the more we go for pulpotomy.  
- With an open apex, even with pin point exposure and within a short time, most of the time we'll go for pulpotomy and not pulp cap, we do this as a safe margin, because in pulp cap we can't ensure there's no ingress of bacteria, while in closed apex, the decision between pulp cap

and pulpotomy is not that problematic, as if we chose pulp cap and bacterial ingress caused pulpal degeneration, we can easily perform pulpectomy for the tooth. **With open apex, we always go for pulpotomy.  
\***What happens histopathologically when a pulp exposure occurs? (VIVA question).  
1. Area is covered with fibrin.  
2. Zone of acute inflammation immediately subjacent to the exposure site.  
3. After two days, proliferative changes occur (pulp polyp and not gingival polyp).  
4. If luxation or sublaxation present, reaction is modified by ischemia and autolysis.

**\***Materials used for pulp capping : 1.Calcium hydroxide.  
 2. MTA.  
 3. Biodentin.  
Calcium hydroxide is preferred to be non-setting because its alkalinity reaches 12.5 which stimulates better healing, some people inject the non-setting calcium hydroxide and above it hard setting calcium hydroxide.  
- The more the alkalinity, the better the stimulation for reparative dentin.  
- Ideally, all is done under rubber dam isolation.

- Regarding pulpotomy, also ideally under rubber dam, if not applicable, we isolate using cotton rolls, you have to remove 1-2 mm from inside the pulp chamber.  
- Do a box shape after the pit exposure with a fissure bur, then remove pulpal tissue using an excavator or round bur with water spray.  
- You MUST stop or arrest the bleeding before you proceed, you can use cotton pellets with/without sodium chloride and not sodium hypochlorite! inside the box, you can also use the anesthetic solution with adrenaline over the exposure site or calcium hydroxide powder.  
- Wait for 5-10 minutes and don't keep changing the cotton pellets!

Good Luck!