

## Emergency treatment and temporary restoration of fractured teeth with and without pulp Exposure

### Crown fracture

Sometimes trauma cause crown infraction. It is very common on enamel surface of the tooth and do not cross the DEJ, caused by direct trauma usually no treatment for it.

### Class I Fracture

Just smoothing the rough, tagged structure at the fractured site and we should observe the condition and re-examine the tooth for vitality test.

The patient should be re-examined at 2 weeks and again at 1 month after the injury because the tooth may be recovered at that time or periapical change may occur which effect the vitality gradually.

### Class II Fracture

The fracture involves enamel and dentin without pulp exposure. It requires immediate treatment to avoid further damaging of the pulp from thermal or bacteria which can transmitted to the pulp through dentinal tubules.

### There are factors which effect treatment:

- The time dentin has been exposed.
- The thickness of the dentin covering the pulp.



- The stage of the development of the root.

Little or no dentin is exposed, the fractured tooth and the fractured fragment etched and reattached with a resin bonding material. If only a small amount of dentin is exposed away from the pulp, it should be protected with  $\text{Ca}(\text{OH})_2$  before being etched but the dressing is removed before the fragment is reattached.

If a thick layer of dentin that covers that pulp is removed, a direct pulp capping is indicated to cover the dentinal tubule by  $\text{Ca}(\text{OH})_2$  and hold the medication by means of a retainer, we use an orthodontic band and fill the gap with cement and ask the patient to come after some time to check the vitality & the mobility and the band should stay 6-8 weeks if the tooth is still vital then we restore the tooth with either an acrylic crown which is good for esthetics or a stainless steel crown or a copper ring.

If the patient has a class II fracture near the pulp if the patient comes immediately do pulp capping. If the patient comes later on then we consider it as an exposure and do root canal filling because the thin layer of dentin left is not enough to protect the pulp from infection.

### **Class III Fracture**

Fractures involve enamel, dentin and pulp.

The objective of the treatment is to maintain the tooth vitality.

Treatment of vital pulp exposure there are 3 choices of treatment:

- I. Direct pulp capping.
- II. Pulpotomy.
- III. Pulpectomy.

### 1. Direct Pulp Therapy (Pulp Capping)

If the patient is seen with an hour or two after the injury, if the vital exposure is small and if sufficient crown remains to retain a temporary restoration to support the capping material and prevent the leakage of oral fluid then the treatment of choice is direct pulp capping.

$\text{Ca}(\text{OH})_2$  is material of choice for direct pulp capping. If final restoration need the use of pulp chamber or the pulp canal for retention, a pulpotomy or pulpectomy is the treatment of choice.

Even the pulp at exposure site has been exposed to oral fluids for a period of time, the tooth should be isolated with a rubber dam and the procedure should be done in a surgically clean environment. The healthy pulp may survive and repair even with a few bacteria the same as connective tissue.

The crown and the area of the actual exposure should clean with saline or with non-irritant solution. The pulp should be kept moist before placement of pulp capping material. The prime requisite of pulpal healing is an adequate seal against oral fluids. Therefore a restoration should be placed immediately

that will protect the pulp capping material until the healing process is well advanced.

## **2. Pulpotomy**

If pulp exposure in traumatized, immature permanent (open apex) tooth is large or even small pulp exposure exist and patient did not seek treatment for several hours or days after the injury, or if there is insufficient crown remaining to hold temporary restoration, the immediate treatment of choice is pulpotomy (shallow pulpotomy or conventional pulpotomy)

A shallow or partial pulpotomy is preferable if coronal pulp inflammation is not wide spread and if a deeper access opening is not needed to help retain the coronal restoration

conventional pulpotomy is indicated for immature permanent teeth if necrotic pulp tissue is evident at the exposure site with inflammation of the underlying coronal tissue.

After the apical closure, root canal filling is necessary to prevent an exaggerated calcific response that may result in total obliteration of the canal. Another indication of pulpotomy is trauma to mature permanent (closed apex) tooth that has caused both a pulp exposure and a root fracture.

## **3. Pulpectomy**

If patient has acute periapical abscess associated with a traumatized tooth, the trauma may cause small pulp exposure or the pulp may be devitalized as a

result of injury or severing of the apical vessels. A loss of pulp vitality may cause interrupted growth of the root canal and the dentist is faced with an open apex. The lumen of the canal of an immature tooth is largest at the apex and smallest in the cervical area and called blunderbuss canal.

If an abscess is present it must be treated first, if there is acute pain and evidence of swelling of the soft tissues, drainage through the pulp canal will give the child almost immediate relief.

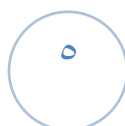
A conventional endodontic access opening should be made into the pulp chamber, if the pain is caused by the pressure required to make the opening into the pulp, the tooth should be supported by the dentist fingers, antibiotic therapy is also indicated.

### ***Apexification***

Therapy to stimulate root growth and apical repair subsequent to pulpal necrosis in anterior permanent teeth. It was found is highly effective in the management of immature necrotic permanent teeth.

The apexification procedure should precede conventional root canal therapy in the management of teeth with irreversibly diseased pulp and open apices. Apexification by introducing  $\text{Ca}(\text{OH})_2$  reaching the end of the root it will produce continuous growth of the apex and close the opening.

$\text{Ca}(\text{OH})_2$  introduce in the open apex either form a calcific barrier just below the apex or is enough to



cap formation or below the apex. After calcific bridge develops or the closure occurs or when calcific plug is observed. Endodontic procedure may be completed.

### **Class IV Fracture**

Root Fracture with or without coronal fracture of the crown.

### **Root Fracture**

Coronal fracture or cervical fracture Middle 1/3rd fracture Apical 1/3rd fracture.

### **Coronal or cervical fracture**

We usually remove the crown and if the remaining root is long enough we do root canal filling and then we do post and core and we cement it in the child mouth which is going to stay forever. Then we take an impression over all and then over that impression we make acrylic crown. If the remaining root is short do extraction.

### **Middle third Fracture**

If there is slight mobility we extirpate the pulp and do R.C.F with silver cone filling material in the future callus formation will occur. If high mobility we have to extract the teeth. Sometime mostly at the apical part, stay vital so inject  $\text{Ca(OH)}_2$  to interrupt the fracture line. New calcific body form by  $\text{Ca(OH)}_2$  in fracture line.

## Apical third Fracture

There is no treatment and we have to leave it as it is because fracture in apical third are often calcific repair without treatment Just observe the child in future and do devitalization of the pulp some time the fracture part become re-attached with the Root. X-Ray is important.

Root fracture of primary teeth is relatively uncommon because the more pliable alveolar bone allow displacement of the tooth rather than fracture. When root fracture occurs in the primary teeth it should be treated in the same manner as that described for permanent teeth.

