قالوا سبحانك لا علم
لنا إلا ما علمتنا إنك
أنت العليم الحكيم

آية رقم 32 سورة البقرة

Traumatic injuries to young permanent teeth

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How frequently you will see it……

- Falls during play
- Children engaging in contact sports
- Teenage years automobile accidents
- Children with seizure disorders

Accounts for most injuries to young permanent teeth.

More statistics

Peak incidence among general population

- 2-4 year olds: 30 -35%
- 8-11 year olds: 17 - 22%
- Male : Female = 2:1 Likelihood of attendance:
  - 60% initially seen by general dentist

(Maguire et 2000, complicated crown fractures)

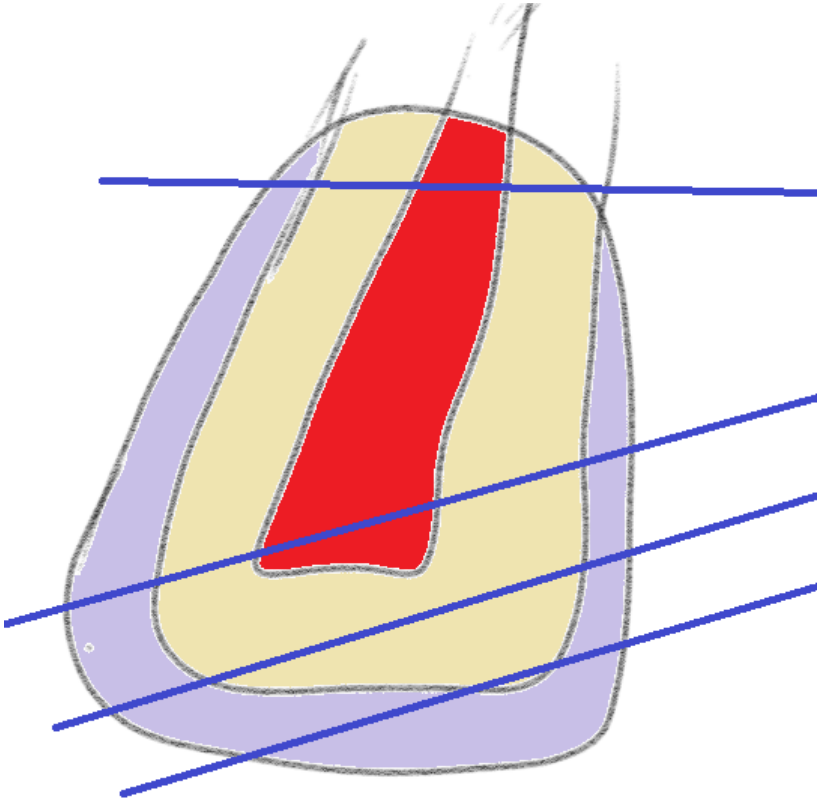
More stats

1. U.I - 70
2. L.I - 10/20
3. UL - 5/10
4. LL - 5

(basic) Ellis classification

(there is more than one modification for this classification)

- Most of the crown
- Enamel, dentin and pulp
- Enamel and dentin
- Enamel only or enamel with little dentin



Class 4

Class 3

Class 2

Class 1

Andreasen classification

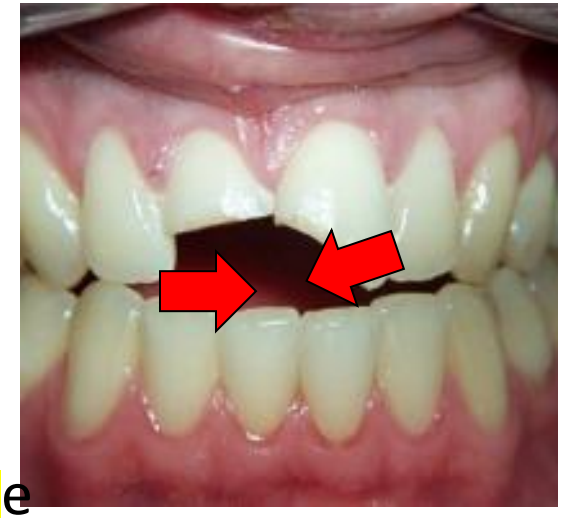
- Crown infraction (Ellis class zero ☺)
- Uncomplicated crown fracture (Ellis 1 and 2)
- Complicated crown fracture (Ellis 3 and 4

Andreasen owns “dentaltraumaguide.org” ☺

What is our aim?

1. Save the PULP.

2. Save the SPACE.



only few days are needed to lose some space between the centrals after the contact is broken.

E - Zero
A - Infraction

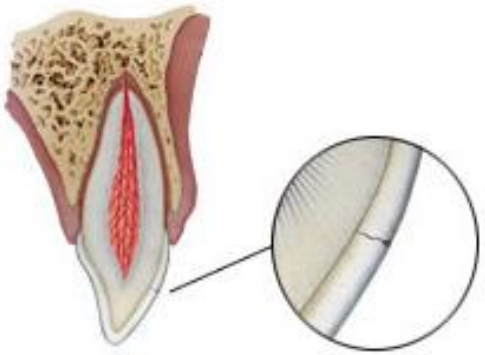
Infraction

Treatment…
Etch, bond and seal. or make small cavity and fill according to the size of the damage

Description

An incomplete fracture (crack) of the enamel without loss of tooth structure.



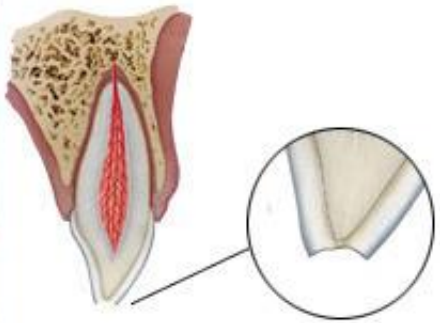

Careful observation, watchful follow up and Inform parents about Possible consequences

Enamel Fracture (Ellis 1)

A - Uncomplicated

Description

A fracture confined to the enamel with loss of tooth structure.



Treatment…

Smoothen or do composite according to size of the damage.

Careful observation, watchful follow up and Inform parents about Possible consequences

Enamel Dentin Fracture

E - Class 2
A - uncomplicated

Description

A fracture confined to enamel and dentin with loss of tooth structure, but not involving the pulp.

Treatment…
Glass ionomer indirect pulp cap then build up with composite or do FRAGMENT restoration.

Careful observation, watchful follow up and Inform parents about Possible consequences

What is fragment restoration?

- The Japanese art of KINTSUGI ☺

In Japanese culture any broken "*thing*" deserves a second chance.
They practice the art of reassembling broken items bonding the fragments with gold. Our fragment restoration is close to that art but the fracture line **Should not be noticeable.**

We do practice KINTSUGI when we try to mimic carious grooves on a porcelain crown

The beauty of imperfections and defects.

Fragment restoration

Advantages
Exact original shape.
Exact original shade.
Fragment acts as a mega filler for composite resin.

Manipulate the fragment with a wax stick.

You need to etch, rinse and apply adhesive bond to the fragment which is difficult if you hold it with your fingers. Try holding it with a softened wax stick

Sometimes the trauma causes the fragment to get a brighter shade than the rest of the tooth.

Still you can use the fragment and then do full labial composite resin veneer to mask both the color difference and the fracture line. Kintsugi fracture line is unacceptable here ☺

Enamel-Dentin-Pulp (Ellis 3)

A - Complicated

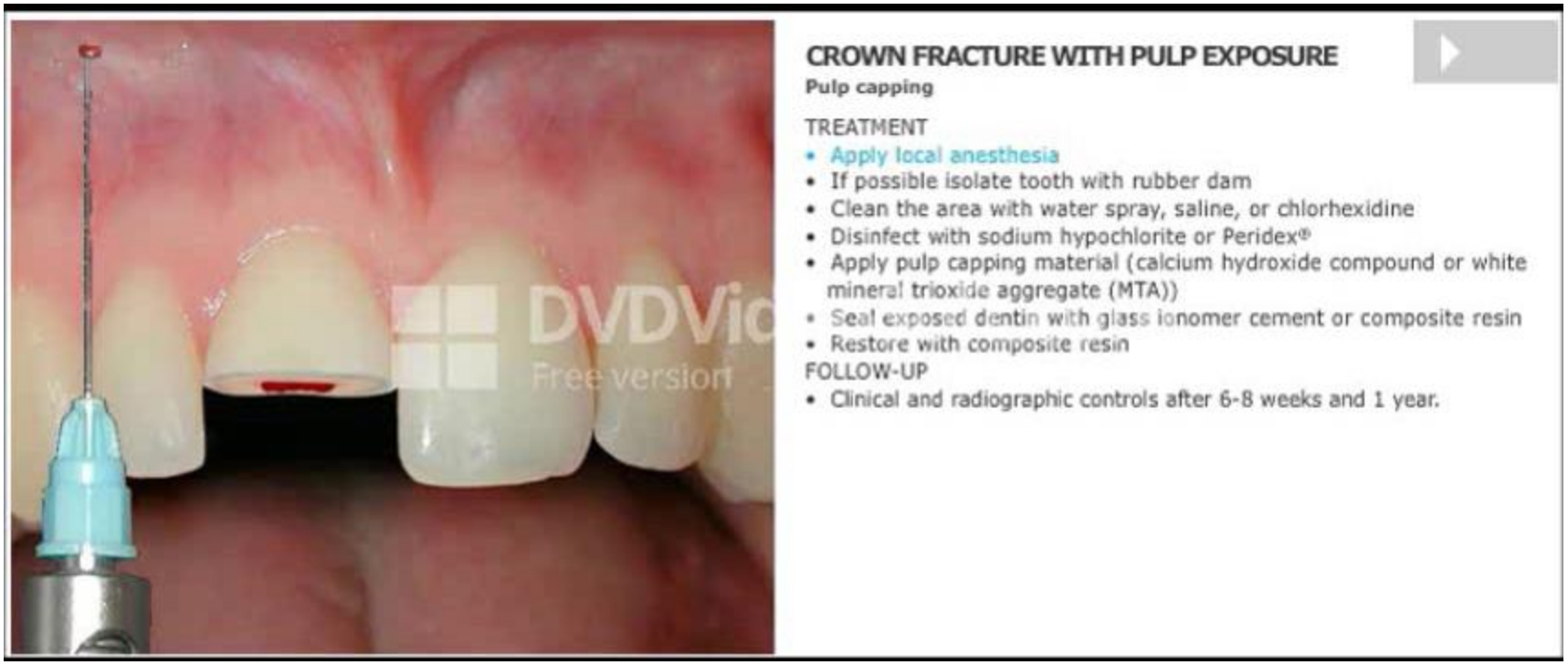
Description

A fracture involving enamel and dentin with loss of tooth structure and exposure of the pulp.





Video showing direct pulp capping procedures



Option 1: Pulp capping

Video showing pulotomy procedures

CROWN FRACTURE WITH PULP EXPOSURE

Pulpotomy

TREATMENT

- Apply local anesthesia
- If possible isolate tooth with rubber dam
- Clean the area with water spray, saline, or chlorhexidine
- Disinfect with sodium hypochlorite or Peridex®
- Perform pulpotomy to a depth of 2 mm. using a round diamond bur and water or saline spray
- Place a saline moisted cotton pellet upon the pulp wound until bleeding has ceased
- Apply pulpotomy material (calcium hydroxide compound or white mineral trioxide aggregate (MTA))
- Seal exposed dentin with glass ionomer cement or composite resin
- Restore with composite resin

FOLLOW-UP

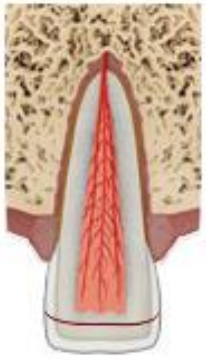
- Clinical and radiographic controls after 6-8 weeks and 1 year.

Option 2: Pulpotomy

Crown-root fracture without exposing the pulp

Description

A fracture involving enamel, dentin and cementum with loss of tooth structure, but not exposing the pulp.



Which class is that?

(Class 2 Ellis)
(Complicated fracture according to Anreasean)

Video showing extraction of loose fragment and restoration of the crown remaining

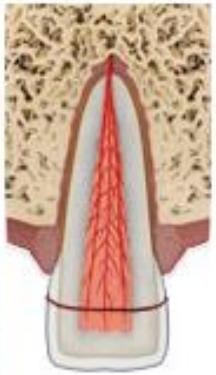
……Or do fragment restoration using direct adhesive cement.

KINTSUGI

Crown-Root Fracture with pulp exposure

Description

A fracture involving enamel, dentin, and cementum with loss of tooth structure, and exposure of the pulp.


Treatment of Crown-Root Fracture with pulp exposure

1. Fragment removal then pulpotomy
   (already saw a video same as in Ellis cl3 treatment).

2. Extraction (of the whole tooth).

3. Orthodontic extrusion.

4. Surgical extrusion.

5. Coronectomy. (will discuss that later ☺)

Video showing Orthodontic Extrusion procedure

CROWN-ROOT FRACTURE WITH PULP INVOLVEMENT

Orthodontic extrusion of apical fragment

TREATMENT

- Apply local anesthesia
- Fragment removal with forceps
- Clean the area with water spray, saline, or chlorhexidine
- Suture gingival lacerations if present
- Perform pulpotomy or pulp extirpation
- Adapt steel arch wire to the anterior region
- Prepare sites for arch wire and for bracket with acid etching
- Fixate the arch wire with resin
- Fixate bracket with resin
- Apply elastic traction

FOLLOW-UP

- Splint removal and clinical and radiographic control after 4 weeks
- Clinical and radiographic controls after 6-8 weeks, 6 months, 1 year and yearly for 5 years.
- Tooth restoration implying pulp extirpation, root canal filling and a post-retained crown after labial gingivectomy

Video showing surgical extrusion procedure

CROWN-ROOT FRACTURE WITH PULP INVOLVEMENT

Surgical extrusion of apical fragment

TREATMENT

- Apply local anesthesia
- Remove coronal tooth fragment with forceps
- Extract and reposition of apical fragment, 90° or 180° rotation may sometimes offer an advantage with regards to the position of the root in the socket
- Clean the area with water spray, saline, or chlorhexidine
- Suture gingival laceration if present
- Perform pulp extirpation
- Apply a flexible splint for 4 weeks

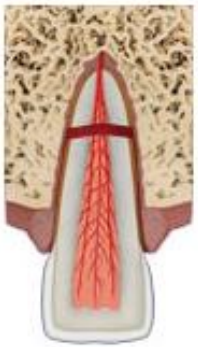
FOLLOW-UP

- Root canal treatment initiated 3-4 weeks later
- Splint removal and clinical and radiographic control after 4 weeks
- Clinical and radiographic controls after 6-8 weeks, 6 months, 1 year and yearly for 5 years.

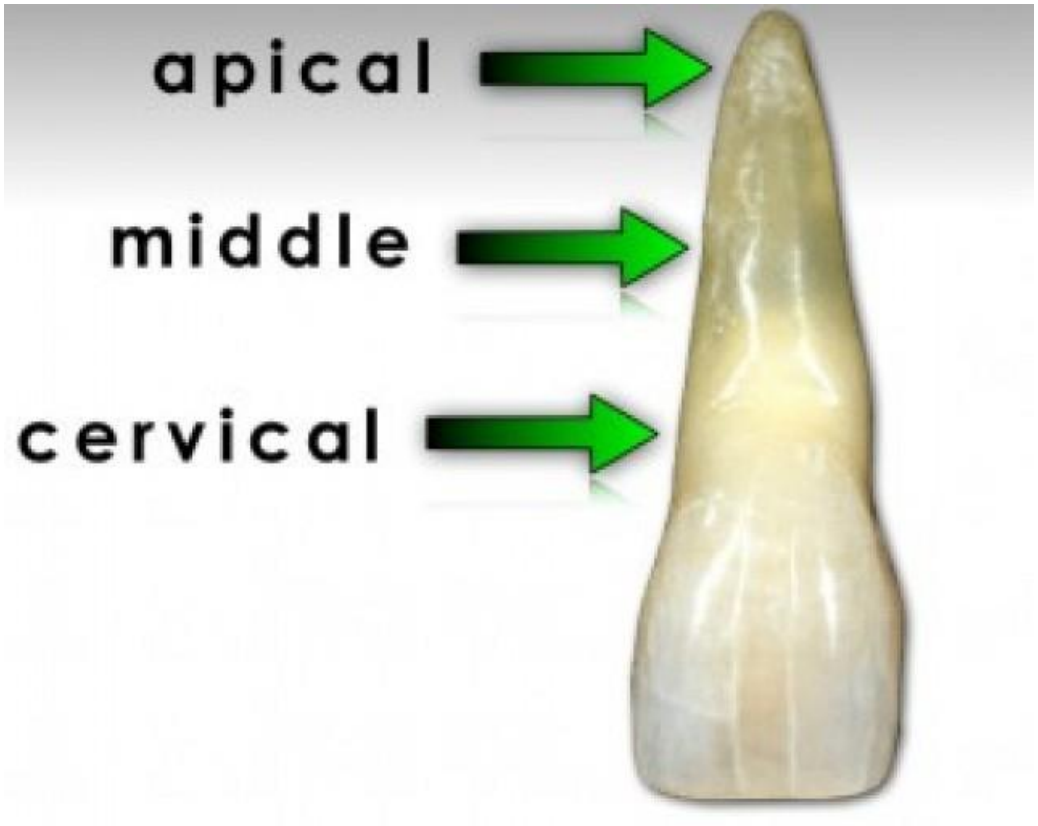
Root Fracture

Description

A fracture confined to the root of the tooth involving cementum, dentin and the pulp. Root fractures can be further classified by whether the coronal fragment is displaced (see luxation injuries).

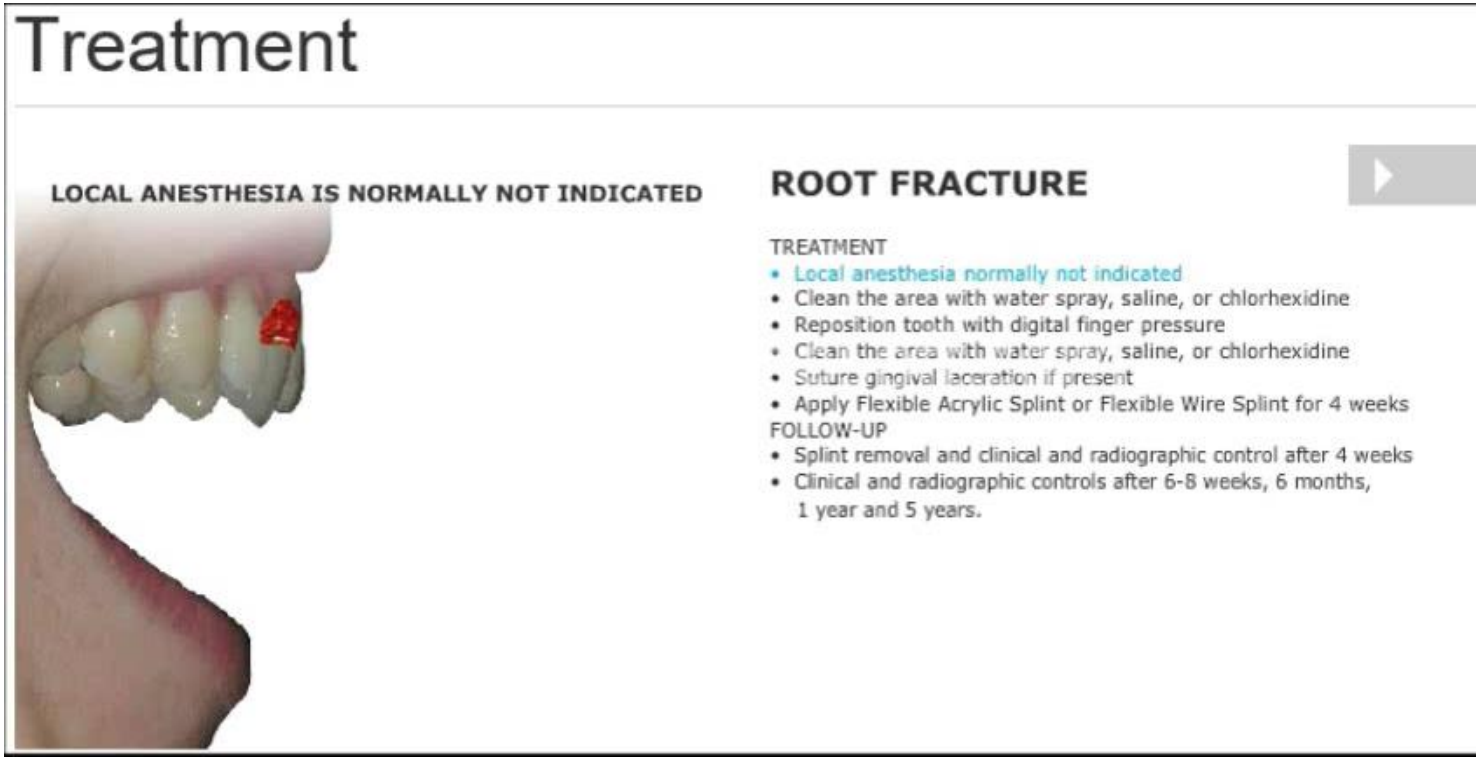

Prognosis of root fracture



BETTER

BAD

Video showing procedures for Root Fracture managment



Splinting which might be rigid or NON rigid…. Later we will know the advantages of each

Thank you

- Next lecture we will discuss possible scenarios if the kinetic energy of the trauma was not consumed in breaking the crown☺