

# Pulpal Pathology in Children

## Pulpitis:

- ☐ Pulpitis is the inflammation of the pulp tissue
- ☐ Usually caused by caries penetrating the dentin
- ☐ Most common manifestations are tooth ache increased sensitivity to hot & cold
- ☐ Pulp inflamed > pressure build ups on pulp cavity > pressure on nerves & surrounding tissues > pain Causes of Pulpal Inflammation

### 1. Mechanical Cause

- Traumatic accident
- Iatrogenic damage for dental procedure
- Attrition
- Abrasion

### 2. Thermal Cause

- Uninsulated metallic restoration
- During cavity preparation
- Polishing

### 3. Chemical Cause

- arise from erosion
- or inappropriate use of acidic dental material

### 4. Bacterial Cause

Can damage pulp through toxins secreted by bacteria from caries



## Classification

1. Based on Severity of Inflammation
  - i. Reversible

- Symptomatic (acute)
- Asymptomatic (Chronic)

- ii. Irreversible
  - a. Acute
    - abnormally responsive to cold
    - abnormally responsive to hot
  - b. Chronic
    - Asymptomatic with pulp exposure
    - Hyperplastic
    - Internal resorption
- iii. Pulp Degeneration
  - Calcific
- iv. Pulp Necrosis

## 2. According to Involvement

- i. Focal / subtotal /partial pulpitis (inf. Is confined to a portion of pulp)
- ii. Total / generalised pulpitis (most part of the pulp is involved)

## 3. According To severity :

- i. Acute
- ii. Chronic

## 4. According To presence or absence of direct communication b/w pulp & oral environment:

- i. Pulpitis aperta (open)
- ii. Pulpitis clausa (closed)

## Reversible pulpitis

- ☒ Mild to moderate inflammatory condition of pulp
  - ✓ Caused by noxious stimuli
  - ✓ Pulp is capable of returning to un-inflamed state
  - ✓ Following removal of stimuli
- ☒ Pathogenesis:
  - ✓ Stimuli of short duration
    - e.g. Cutting dentin

☒ Causes: Agent capable of injuring pulp like:

- Trauma
- Disturbed occlusal relationship
- Thermal shock

☒ Clinical Features

- ✓ Sharp pain lasting for a moment
- ✓ Often brought on by cold than hot food or beverages and by cold air
- ✓ Does not continue when the cause has been removed
- ✓ Tooth responds to electric pulp testing at lower current

#### Histopathological features:

☒ Histopathological features:

- ☒ Ranges from hyperemia to mild to moderate inflammation of the affected area.
- ☒ Reparative dentine
- ☒ Dilated blood vessels
- ☒ Edema
- ☒ Presence of immunologic response

#### Management

- ✓ Prevention
- ✓ Periodic care early insertion of filling if a cavity has developed
- ✓ Pulp capping (direct or indirect)
- ✓ Removal of noxious stimuli

#### Focal reversible pulpitis

- Earliest form
- Also known as pulp hyperemia
- Excessive accumulation of blood within pulp tissue
- Leads to vascular congestion

#### Clinical Features

- ✓ Sensitive to thermal changes
- ✓ Particularly to cold

- ✓ Application of ice or cold fluids to tooth result in pain
- ✓ Disappears upon removal of thermal irritant or restoration of normal temperature
- ✓ Responds to electrical test stimulant at lower level of current
- ✓ Indicates lower pain threshold than that of adjacent normal teeth
- ✓ Teeth show:
  - Deep carious lesion
  - Large metallic restoration
  - Restoration with defective margins

### Management

- ✓ Removal of irritants before the pulp is severely damaged
- ✓ Carious lesion should be excised & restored or defective filling is replaced.
- ✓ If primary cause is not corrected, extensive pulpitis may result in death of pulp.

### Histopathologic features:

- Dilation of pulp blood vessels.
- Edema fluid collection due to damage of vessel wall & allowing extravasations of RBC or diapedesis of WBC.
- Slowing of blood flow & hemoconcentration due to transudation can cause thrombosis.
- Reparative or reactionary dentin in adjacent dentinal wall

## Chronic Hyperplastic pulpitis

- ✓ Also called as pulp polyp or pulpitis aperta
- ✓ Overgrowth of pulp tissue outside the boundary of the pulp chamber as protruding mass.
- ✓ a form chronic pulpitis
- ✓ Occurs either as a chronic lesion from onset or as a chronic stage of a previously ACUTE PULPITIS



### Clinical Features:

- ✓ Children & young adults with high degree of tissue resistance & reactivity & respond to proliferative lesions.

- ✓ Pulp - pinkish red globule of tissue protruding from chamber & extending beyond caries.
- ✓ Most commonly affected are deciduous molar & 1st permanent molars.
- ✓ Pulp is relatively insensitive because there are few nerves in hyperplastic tissue.
- ✓ Lesion bleeds profusely upon provocation.
- ✓ Due to excellent blood supply, high tissue resistance & reactivity in young persons leads to unusual proliferative properties of pulp.
- ✓ Some cases, gingival tissue adjacent, may proliferate into carious lesions & superficially resemble hyperplastic pulpitis.

### Histological Features:

- Hyperplastic tissue is basically granulation tissue, consisting of delicate CT fibres & young blood capillaries.
- Inflammatory infiltrates – lymphocytes, plasma cells & polymorphs.
- Stratified squamous type epithelial lining resembles oral mucosa with well formed rete pegs.
- Grafted epithelial cells are believed to be desquamated epith. Cells, which are carried by saliva.
- Origin of these cells is unknown. They are degenerated superficial squames, which 've lost dividing capacity.
- When pulp polyp is present for a long time, persistent rubbing of buccal mucosa may help in grafting of epith. Cells

### TREATMENT & PROGNOSIS:

- Extraction of tooth or
- RCT.

## Pulp stones

Also **denticles** or **endoliths**<sup>1</sup> are nodular, calcified masses appearing in either or both the coronal and root portion of the pulp organ in teeth. Pulp stones are not painful unless they impinge on nerves.

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<sup>1</sup> *Mosby's Medical Dictionary (9th ed.). Elsevier Health Sciences. 2013. p. 507. ISBN 0323112587. Retrieved 10 February 2016.*



They are classified:<sup>2</sup>

A) On the basis of structure

- 1) True pulp stones: formed of dentin by odontoblasts
- 2) False pulp stones: formed by mineralization of degenerating pulp cells, often in a concentric pattern

B) On the basis of location

- 1) Free: entirely surrounded by pulp tissue
- 2) Adherent: partly fused with dentin
- 3) Embedded: entirely surrounded by dentin

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<sup>2</sup> Goga, R.; N. P. Chandler; A. O. Oginni (2008). "*Pulp stones: a review*" (PDF). *International Endodontic Journal*. **41**: 457–468. doi:10.1111/j.1365-2591.2008.01374.x. Retrieved 3 August 2012.