Toppersnotes
Unleash the topper in you

NEET - MDS

MASTERS OF DENTAL SURGERY

BY NBE

NATIONAL ELIGIBILITY CUM ENTRANCE TEST

Volume – 2

Dental Anatomy & General Microbiology

SIERRA INNOVATIONS

CONTENT

DENTAL ANATOMY, EMBRYOLOGY & ORAL HISTOLOGY

GENERAL MICROBIOLOGY & PATHOLOGY

Dental Anatomy & Histology

Enamel => Hardest Non-Vital tissue / Hardest tissue

Q. Which is the hardest ~~non~~ supporting structure of Body
a) Enamel b) Cementum ~~c) Dentin~~ d) Bone

Vitality
- Formative - No cells → → ENAMEL i.e. why it is Non vital
- Nutritious - No
- Preservation - No

Vascular - Enamel
Cementum

No Nerve supply - Enamel
Cementum

Hardest tissue - Enamel

Enamel

1) Colour - 1° Classic White
2° Epoxy white, grayish white, Yellowish White
2) Hardness - ↑ ss with age
3) Colour - becomes Dull with age
4) Surface finish - young tooth dull
old tooth ~~dull~~ Shiny
5) translucency - Increases with increasing wavelength

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porosity :- Enamel is more ... semi-perm
pore Volume of Heavily Emptied tooth.

pore Volume ↑ with Age.
porosity are due to water Content in Enamel.

Q. As enamel will appear more translucent when?
a) Hydrated b) dehydrated c) etched d) Same tot

Thickness

Constant in Primary dilution — 1 mm throughout
Variabl " Permanent " — 2.5 mm - Iko (2.5 mm)

Thickness does not ↑ due to absence of formation ever.

Brittleness — Sea Mineralized — Modulous to elasticity — V. High
Brittle — Resiliency — (Stress & Strain in Elastic region)

Density in resilient → Visco-elastic

Brittle in Enamel under compression

So dental ... the enamel at prevents
his fracture.

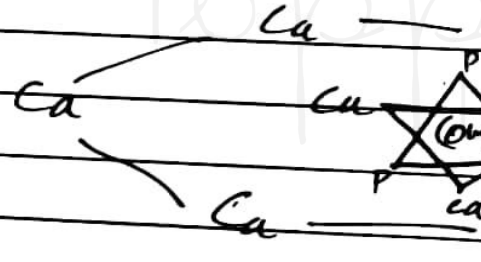
Hydroxyapatite crystals :-

Smallest constitutional unit of any hard tissue

formula:	$Ca_{10}(PO_4)_6 \cdot (OH)_2$ or $Ca_4(PO_4)_2 \cdot Ca(OH)_2$ or $Ca_5(PO_4)_3(OH)$	or $3Ca_3(PO_4)_2 \cdot Ca(OH)_2$
$Ca_{10}(PO_4)(OH)_2$		
$Ca_4(PO_4)_6(OH)_2$		

I > II > III

Structure Hexagonal crystals



$\Rightarrow [3Ca_3(PO_4)_2 \cdot Ca(OH)_2]$

From

⇒ Structure of Enamel

Shape - Hexagonal rod shaped] ⇒ Shape of Enamel crystal

[Weakest Pt. – Axis of crystal (0 1 1)

Acid Persistent - Position of Hydroxyapatite crystal is surface / bodies

Smallest Constitutional unit of Enamel is prism.

" " " " prism is Hydroxiapatite

Minor Constituents

Most important ion – Carbonation CO_3^- – 30.2%

Major – O_2, Ca^{++}, Phosphorus [O_2, Ca^{++}, P]
Minor – CO_3^{--}, Mg^{++}, Na^{+} Carbon [CO_3^{2-}, Mg^{2+}, Na^{+}, C]

Major

O_2 – 43.3% [O_2 = 43.3%, Ca 36.5%, P = 17.6]

Ca^{++} – 36.6%

Phosphorus – 17% approx

H_2 = Least Amount

Carbonate

CO_3^- – 3.2% (anionic)
Mg^{++} – 0.2% (Cationic)

Magnesium can replace Calcium which is undesirable

Cationic Soils. which is undesirable is weak)

Magnesium Carbonate can substitute hydroxide, Phosphates)

Q. What is the relative density of Enamel comparel to water

(a) 1.4 (b) 2.84 (c) 5.6 (d) None

Hydroxyapetite Crystal

Size	75nm wide
	25nm thick
	10-100nm length

Ans Shape of newly formed Hydroxyapetite Crystal
a) Hexagonal c) Plate
b) Irregular d) Spherical

Largest Hydroxyapetite Crystal is of Enamel.

300 times bigger than that of Dentin.

(Shape of Hydroxyapetite Crystal of Dentin is plate like

Prism - Rod enamel Rods

HA - Crystals combine to form Rode (Prism)
↓
under last
resurcepy

Rods

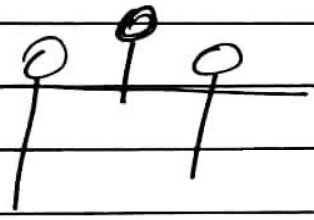
Forming cures - Ameloblasts.

Parts - Head & Tail => Rod + Head, Rod + Inter rod.
or
Rods & Inter rods (earlier thought is to be a cementing substance b/w 2 rods)

Upper I C Molar = 20 million rods

Enamel rod is small structural unit of Enamel
i.e.
Enamel Prism (Under L/M)

Pattern



- 2 head + 1 tail

Rod Sheath :- High organic content.
covering of rods.

Intermixing over 1 w. 2 rods
Composed of Organic component.

Protien found in rod sheath - Sheathlins

New name for Sheathlins - Amelloblastin

[One more name was suggested Aimelins]

Protien most commonly found in natural enamel in high concentration is known as the amelobastin

Rest lines

I
N
C

Daily Rest Line or 24 hrs Rest line

Daily disposition of enamel ——

distance b/w 2 cross straintion ——

hypocalcified dentanis no. ——

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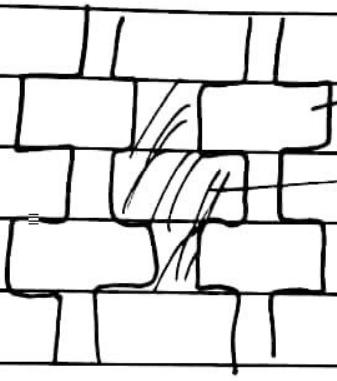
Q How does it diff. from Rest of the Enamel
Ans a) Less Crystals → Less crystal
b) hypocalcified → hypocalcified

⇒ Involved in less mineralized less ordered & non organic nature
⇒ Light will be deflected at an diff angle from the Rest.

Core Striations in light microscope are seen as dark lines

In electron microscopes Con strations / Rest lines will be seen as → Mod Constricted
→ Outer Mod (tail - Expanded)



Rest lines
→ Rest mineralized crystals
forms prisms Contracts

Chemically - (Less number of Crystals)

Striae of Retzius are more commonly seen in

(a) 1° with (b) 2° with (c) both (d) Varies

Ans Perikymata are seen more in
a) Initial 1/3rd b) middle of 1/3rd
c) Cervical 1/3rd d) same difficulty everywhere

Hunter Schreger bands (best seen in TS ground section)

- Optical phenomenon due to criss crossing of E rods
- seen in inner 4/5 >>> 2/3
- Seen in reflected light
- in longitudinal section in ground section.
- width - Dark band - 50 µ
  - Light band - 50 µ
- Range 10-20 Mods per band
- Width of 11.5 bands 500 µ

dark zone - Parazone
light zone - Diazone
} Only Diff. is b/w LRD rods is their orientation.

- resist similar to Enamel

Crowded Enamel

Heavily crowded Rods converge at one pt. having
- Min crossing of Enamel Rods in
the region of Occlusal edge & Cusp tips.

- Many Rods are converging at one pt.
Mechanically very strong - high cable
resistant adaptation to high occlusal load.

Once enamel rods have a tendency to deviate
towards
~~a) Occlusally~~ c) do not deviate & remain horizontal
b) Cervically d) cannot be predicted

⇒ Enamel Cuticle [Surface to DET]

Hypocalcified leaf like structure extend
radially and longitudinally provide highway
for the bacterial ingredient thereby making
bath carries praise.

Type	A	B	C
1. Foundin	both	in unemplid	in emplid
2. Composition	unmineralized cell	degeneralid cell	debins
3. Extent	Restricted to enamel	can pisteud to deletier	Cell extent to dentium
Prevalence	2	3	1
Cavities	Moderate	last mass digestate	most lov...
What are they	thin enamel rod	thick enamel Cordal	Crack ↓ Surface defect
Do they Follow Direction of E R Enamel Rods	Yes	Yes	No

Ans Do they follow genical direction of enamel
Ans - No

- External bands, tufts as Hunter Schreger Bands

Surface Structures

① Perikymatic => External / surface Manifestation of Lamellations.

- Imbrication lines of thickness.
- Ridge & furrow [Grooves & Ridges
- May at neck region
- Newly erupted tooth -> Irregular

↑ Res	V Res
Colour	Port Size
Shine	Caries Acid
Hardness	thickness
Crystal size	Recent.

Age Changes :-

Colour darker	Permeability ↓	pore size ↓
thickness ↑es	crystal size ↑	caries incidence ↓
shine ↑es	hardness ↑	

Acid etching

type I
highly susceptible
Selective removal of core of the rod
→ Up shaped
- most common
- Selective removal of the core of the rods.

type II
Removal & core is spared
→ Cone shape

type III
Etching pattern
- least common

→ Crystals ⊥ to enamel surface are most vulnerable.

differentiation of ameloblast => dental papa.

dental formation starts in the end => Distance of organising stage.

production

disintegration of membrane performation

formation of secretory stage.

ameloblasts → formed from - membrane preformation dentoblast.

nutrition of ameloblast

=> neuro nutrition Develop properly.

Immediately after formation of predentist.

transient nutrition before the collapse.

of enamel Organ - inter cellular albumin

[Stellate reticulum]

then enamel collapses to lining one develop are blood vessels. Close to ameloblasts => Dental lack & Vessel

after the formation of Predentin

Dental sac will provide nutrition to ameloblast - maturation.

III Formation stage -> Microdontoplus.

- Enamel matrix - contains

- enamel protein are formed by

- golgi bodies & RER.

Golgi bodies a, Rer

↓

Transport vesicles

↓

tomes process

↓

Extracellular space

- There is no storage period.