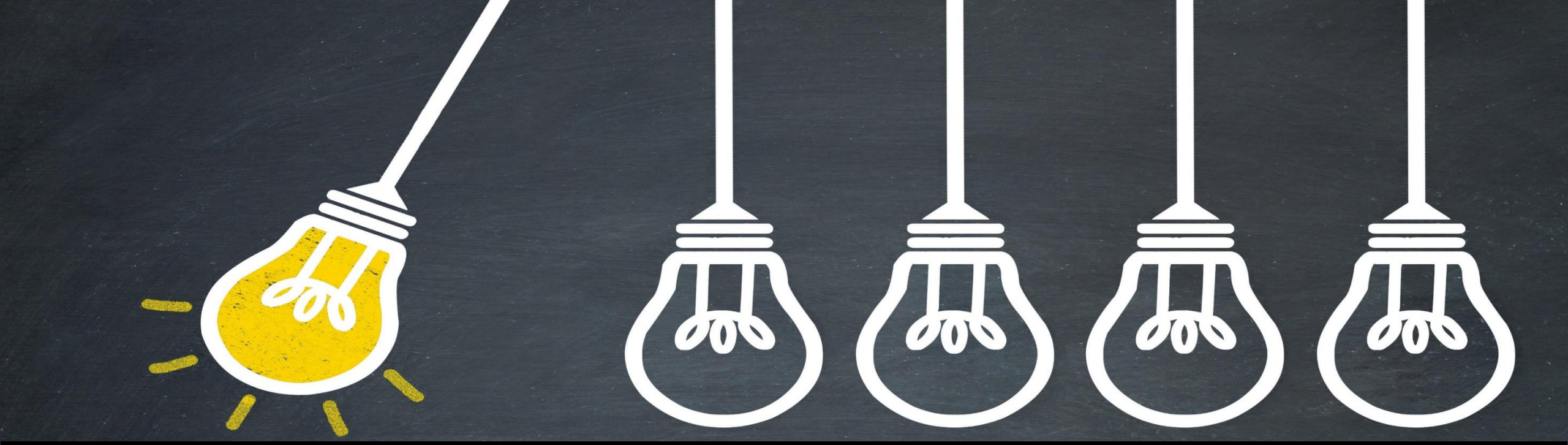
Lecture 17: Age Changes In Oral Tissues

By

Dr. Wafaa Alghonemy & Dr. Muhammad Shahzad



Learning Outcomes

- Define ageing process
- Describe age changes in dental hard tissues (enamel, dentine, cementum)
- Describe age changes in dental pulp
- Describe age Changes periodontium, oral mucosa, tongue, and salivary glands.

Introduction

- **Ageing**: is a part of the **continuous process** from the birth to death.
- It is a **multidimensional** process of **physical, psychological, and social** change.
- Generally normal aging is associated with a **reduction in functional reserve capacity** in tissues and organs.

Age Changes in Enamel

- **Physical Changes:** Most apparent change is **wearing of the occlusal surface and proximal contacts** due to mastication
- **Clinical manifestation:**

1- Appearance of small **polished facet** on the cusp tip or slight flattening of the incisal edges, progressing gradually with age

2- Reduction in the cuspal height and inclination and flattening of proximal contour.

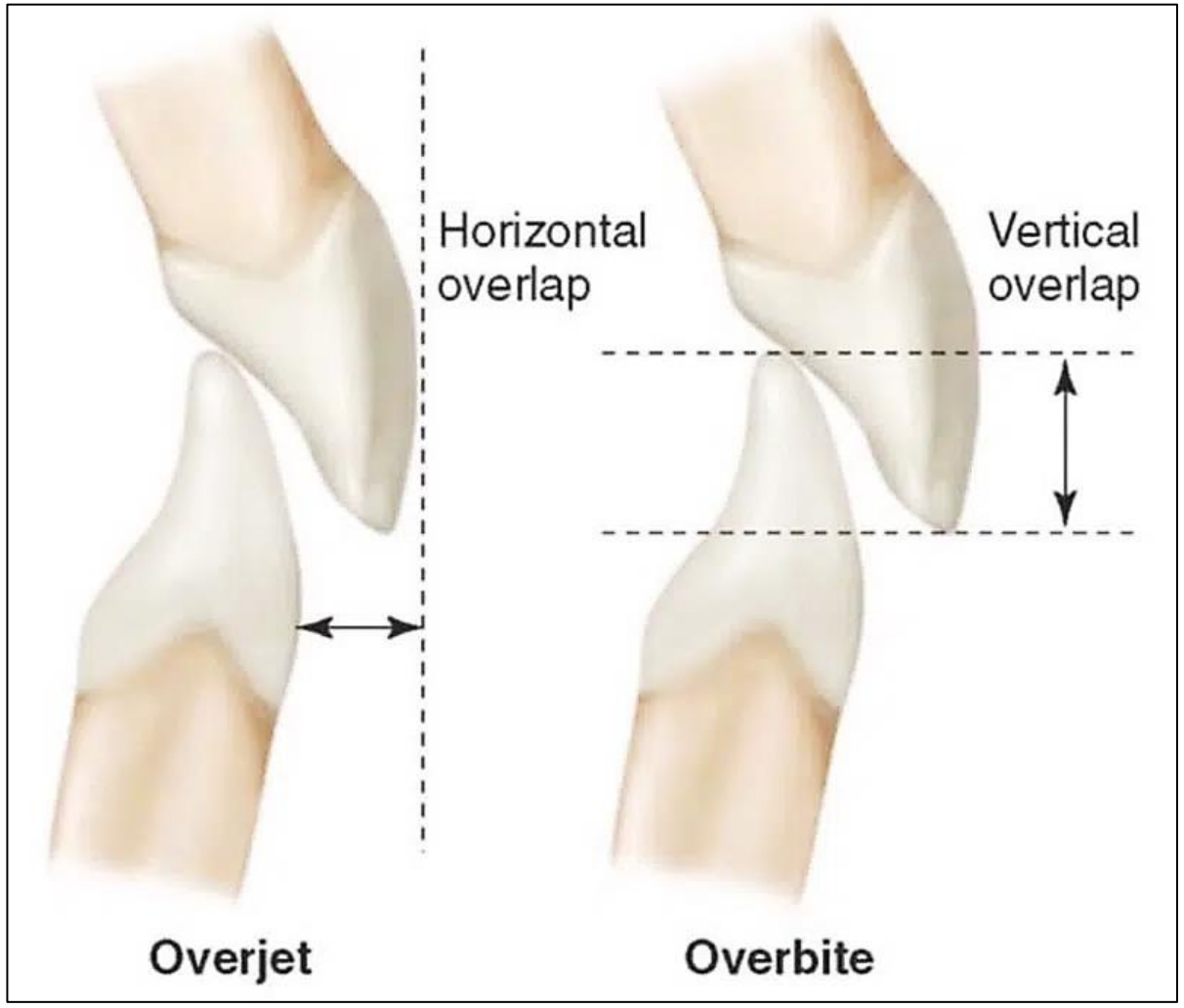
3- Loss of vertical dimensions ….(↓overbite)

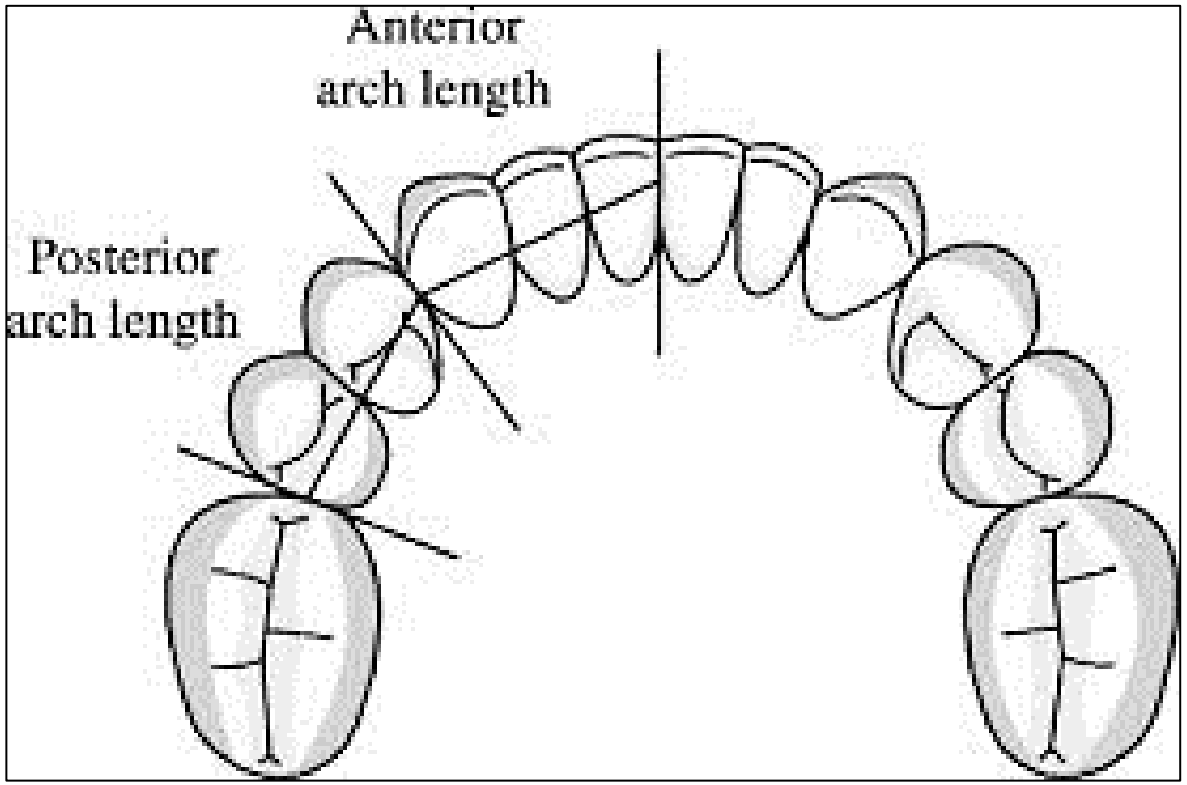
4- Reduced maxillary/mandibular overjet and so an edge-to-edge anterior relation exists

5- Shortening of the length of dental arch due to reduction in the mesiodistal diameters of the teeth by proximal attrition.

6- Enamel becomes **harder and brittle** with age.

7- Mesial shift of teeth


Horizontal
overlap
Vertical
overlap
Overjet
Overbite


Anterior
arch length
Posterior
arch length

- **Color changes: teeth darken with age due to:**

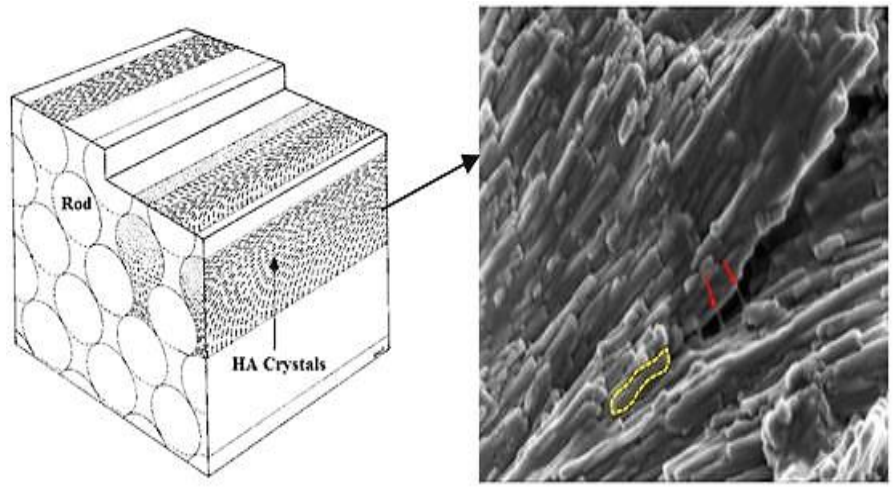
1- Addition of organic material to the enamel from environment

2- Deepening of progressively thickened dentin seen through thinned translucent enamel

- **Chemical Change:**

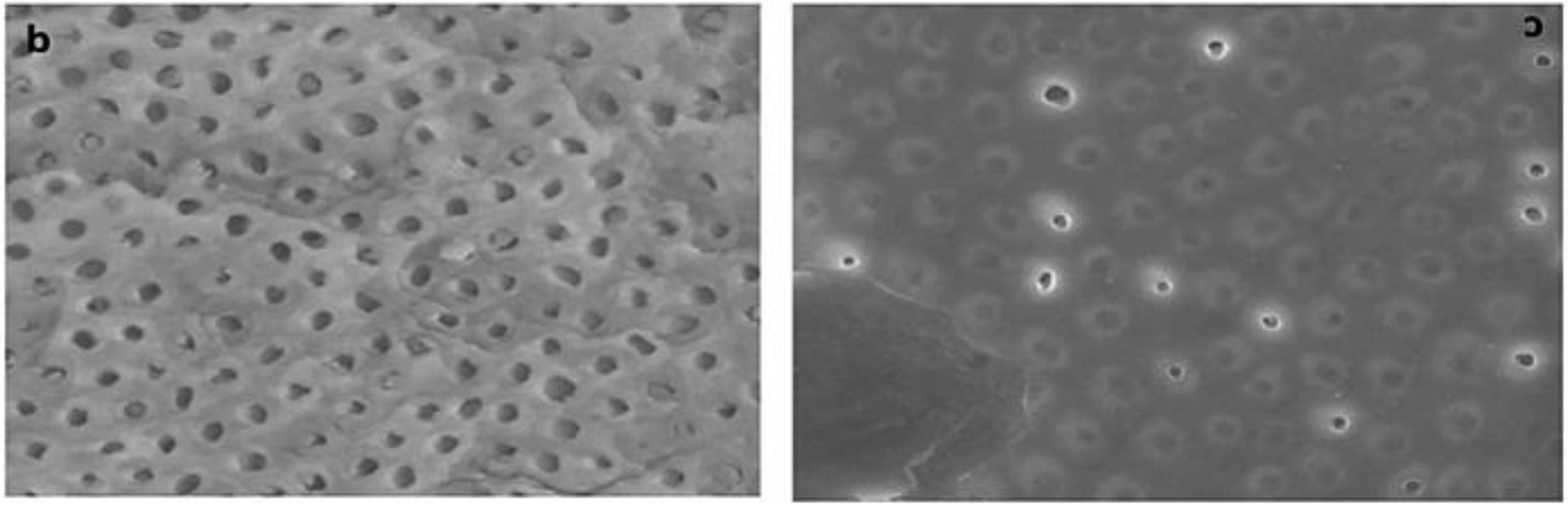
1- Increase in Nitrogen and Fluoride content (increasing caries resistance)

2- Increase in the size of the enamel crystal (due to ions acquired by it from the oral fluids)



Age Changes in Dentin

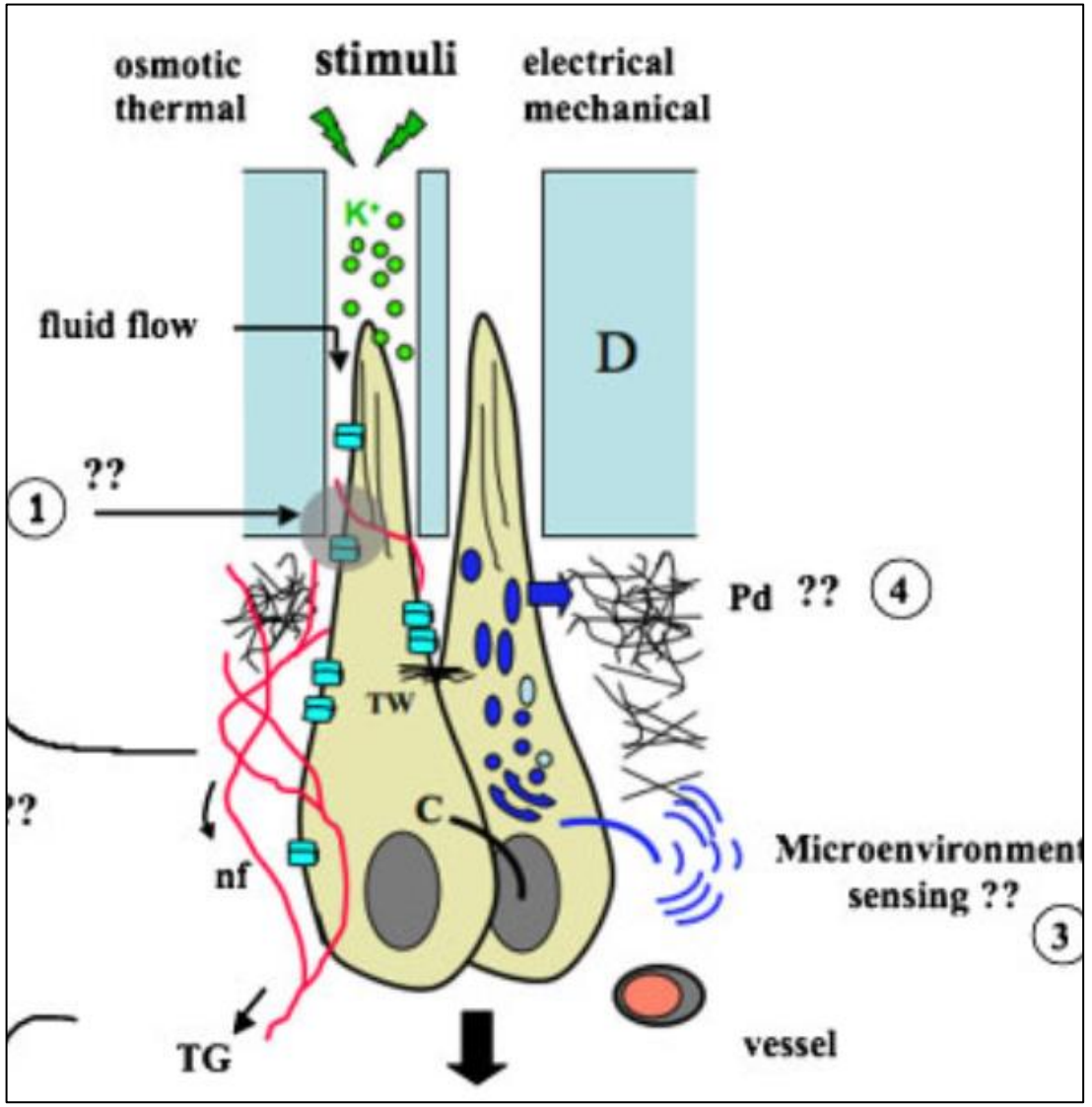
- Continuous **narrowing of the lumen of dentinal tubule**, increasing calcification (↑ Peritubular dentin)
- **Apatite crystals appear in dentinal tubules** the increased mineralization of the tooth



ageing

Age Changes in Dentin

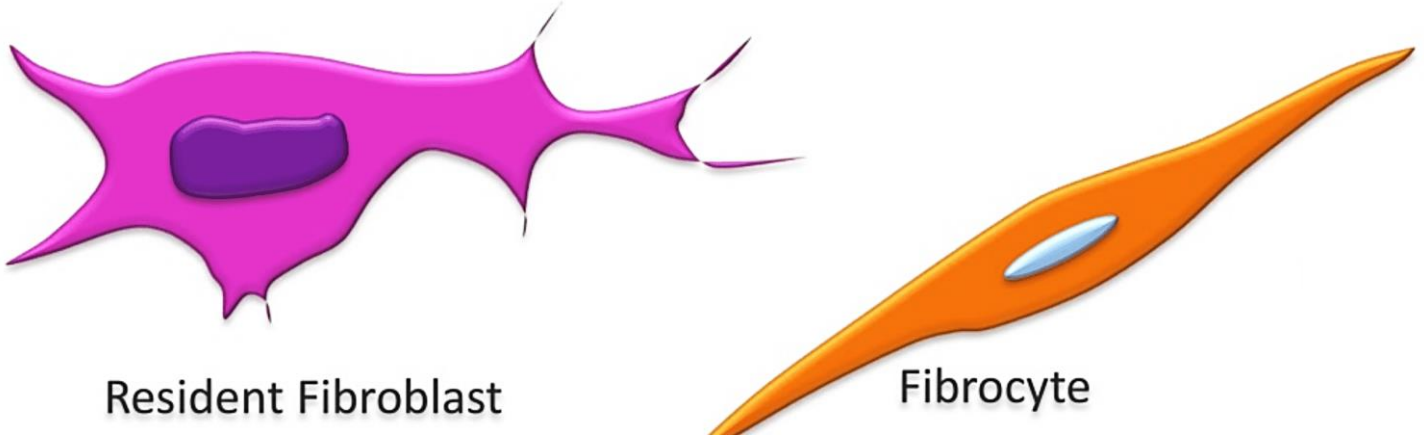
- **Decreases the conductivity of the odontoblastic** processes
- Reduction in the amount of **peritubular fluid**
- **Reduced sensitivity** due to formation of physiologic secondary dentin
- Pathologic effects of dental caries, abrasion, attrition, or erosion causes development of **dead tracts, sclerotic**, and **tertiary** (reparative-reactionary) dentin



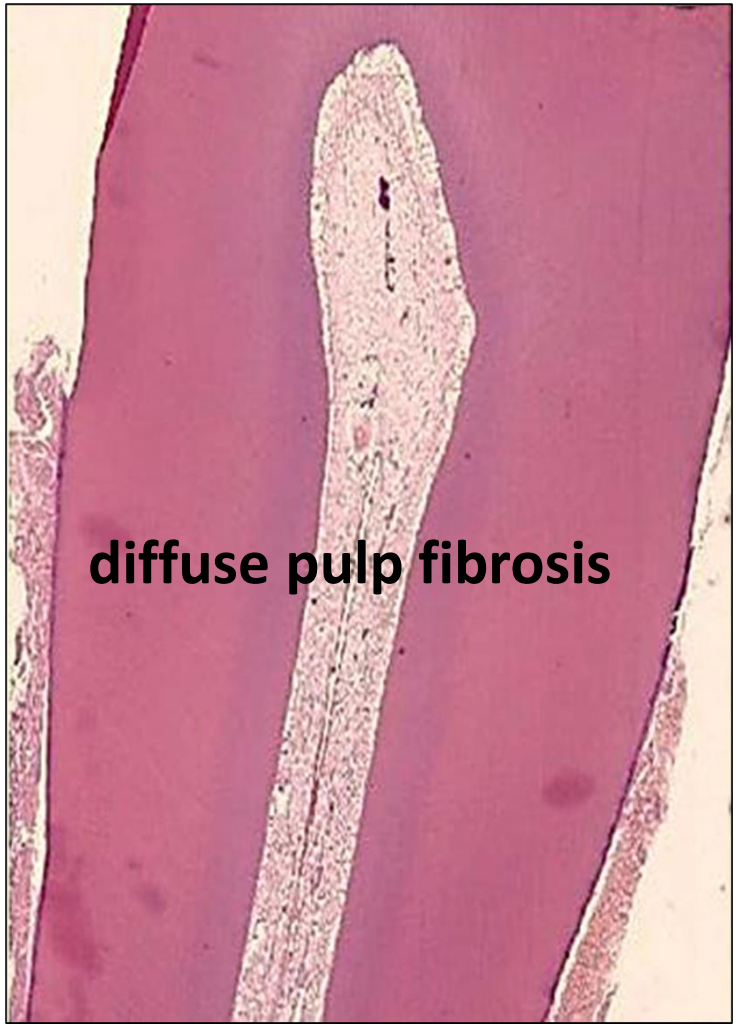
PAIN

Age Changes in Dental Pulp

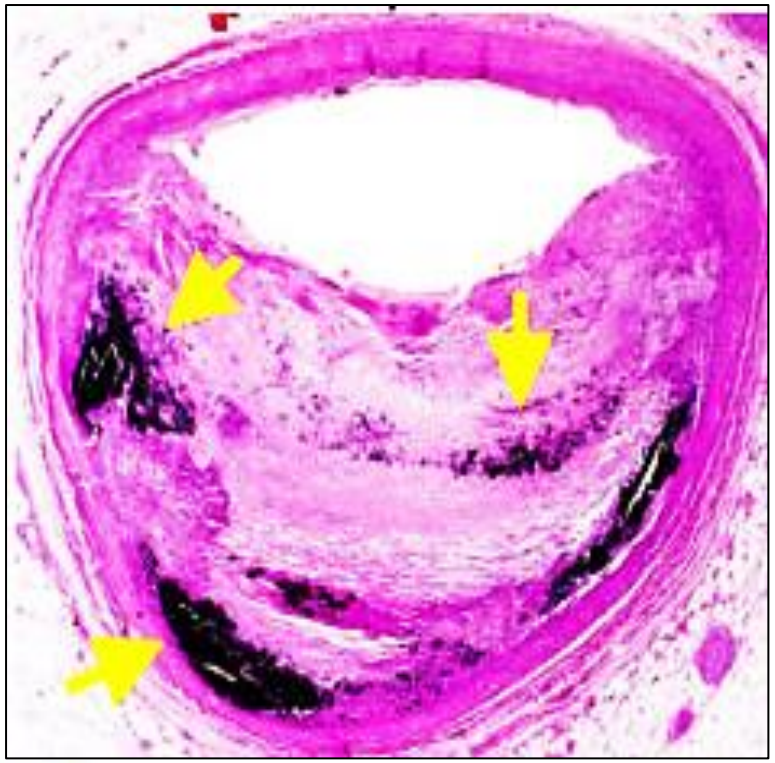
- **Cellular Changes: Number of cells and cell size,** decreases with age
- **Intracellular organelles** (Mitochondria and endoplasmic reticulum) are reduced in number and size
- **Fibroblasts** in aging pulp (**fibrocytes**) has less perinuclear cytoplasm with short, thin cytoplasmic processes

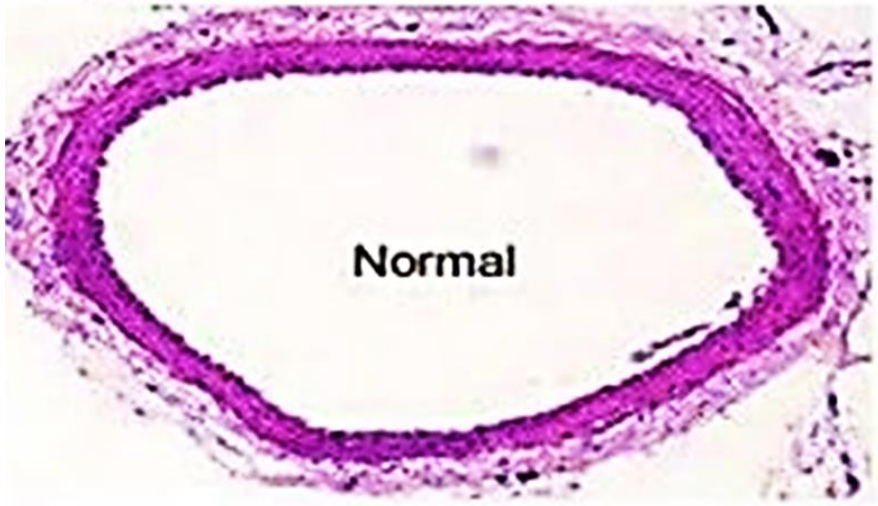


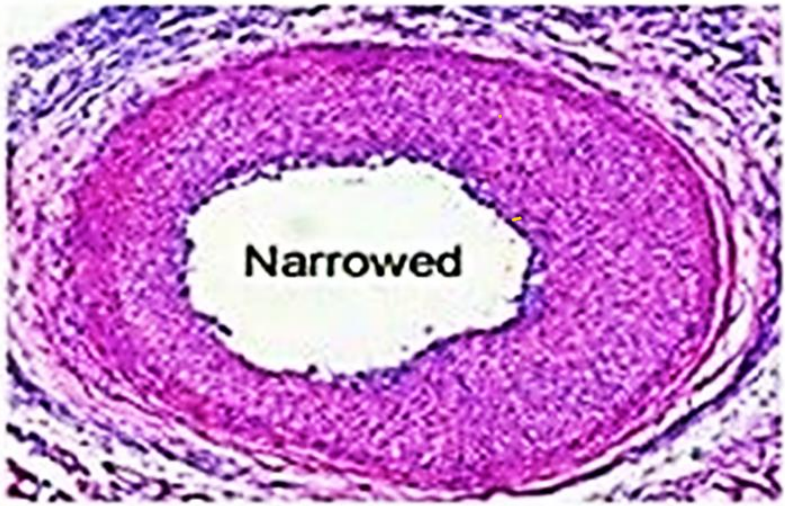
- **Fibrosis**: accumulations of both **diffuse fibrillar components and bundles of collagen fibres**
- Fiber bundles : **longitudinal in radicular pulp random in coronal pulp**
- With age there is **reticular atrophy** of the pulp (discrete vacuolization of the pulpal tissue and reduction in the number of cellular elements)
- The **volume of the pulp decrease** owing to the deposition of secondary dentin
- **All these changes decrease the regenerative capacity of the pulp**



- **Vascular changes:**
- **Blood flow decreases** with age,
- **Calcification** seen in the vessel wall near the apical foramen
- **Outer diameter of blood vessel becomes greater** due to increase in collagen of blood vessels wall.



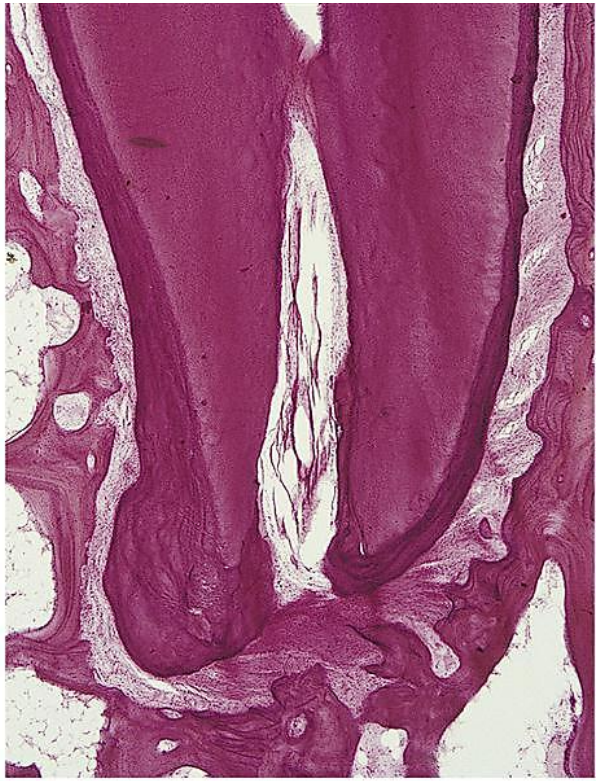




·Narrow lumen

Age Changes in Cementum

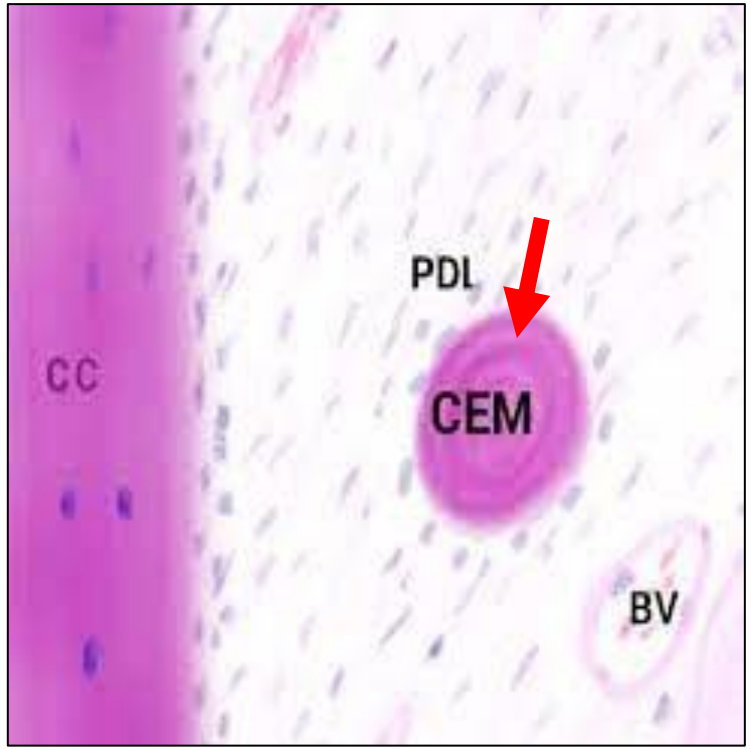
- **Increase cementum width** (at 76 years of age is nearly 3 times that of at 11 years of age)
- Cemental **irregularities** increase with age occurrence of small spikes or outgrowths of cementum on the root surface is observed, due to deposition of irregular cementum in groups of fibres of the PDL



Age Changes in Periodontal Ligament

PDL space decreases with age [due to ↑ in cementum thickness]

- The periodontal ligament **decreases in vascularity** through the aging process.
- Due to decreased activity of the periodontal ligament by age, it **becomes thinner**.
- **Cementicles**: **small foci of calcified tissue**, may be **free** / **attached/embedded** on the cementum surface and not larger than 0.2-0.3 mm in diameter

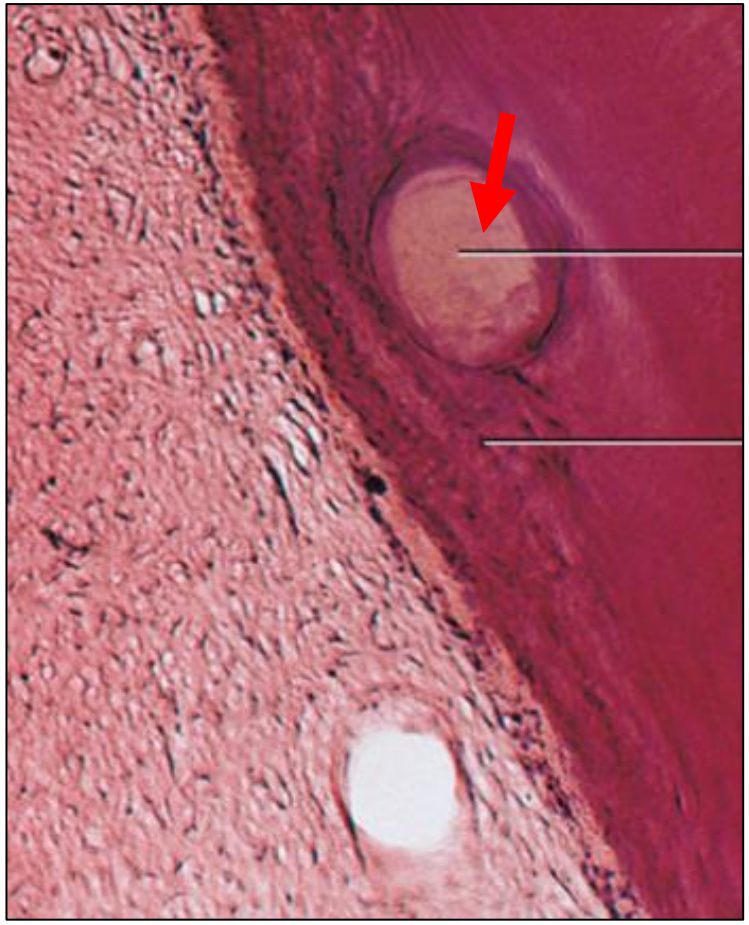


Free Cementicles

In PDL

Attached Cementicles

Attached to cementum

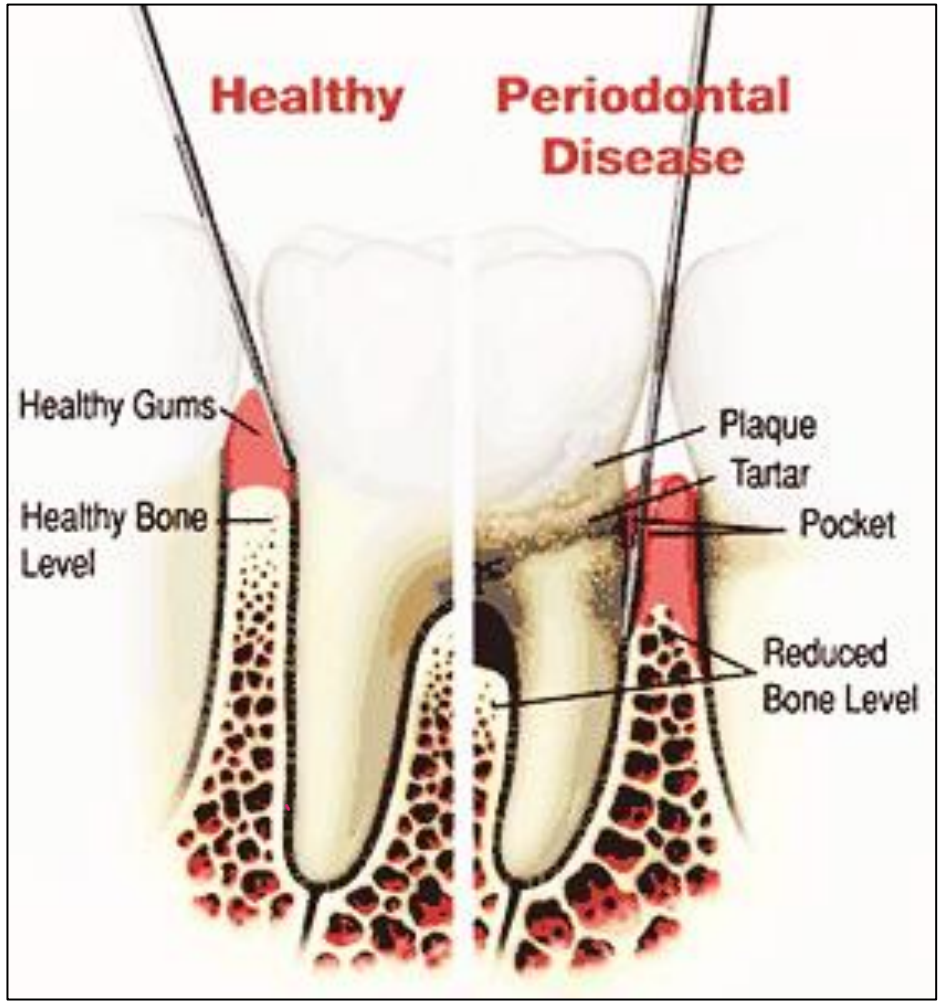


Embedded Cementicles

In cementum

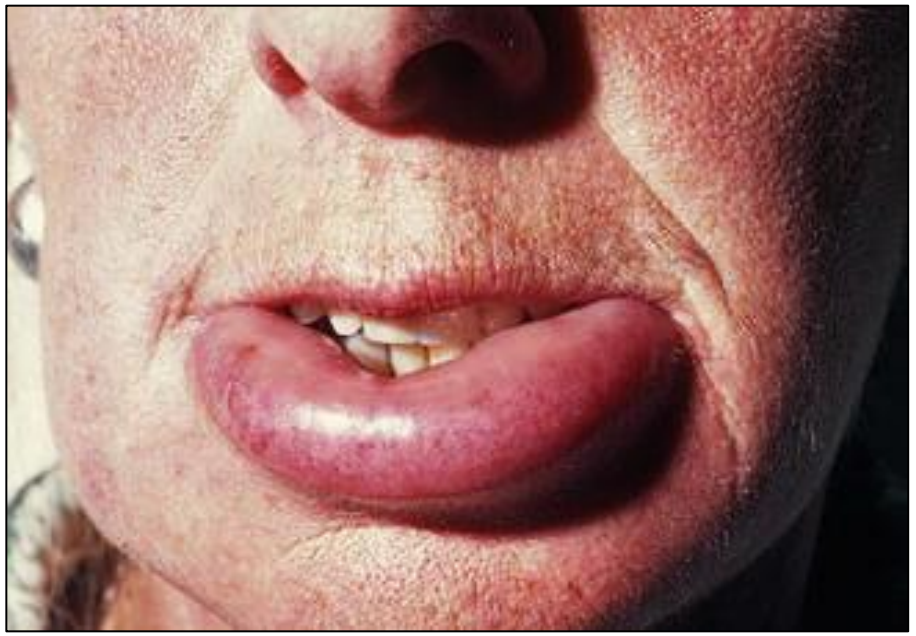
Age Changes in Periodontium

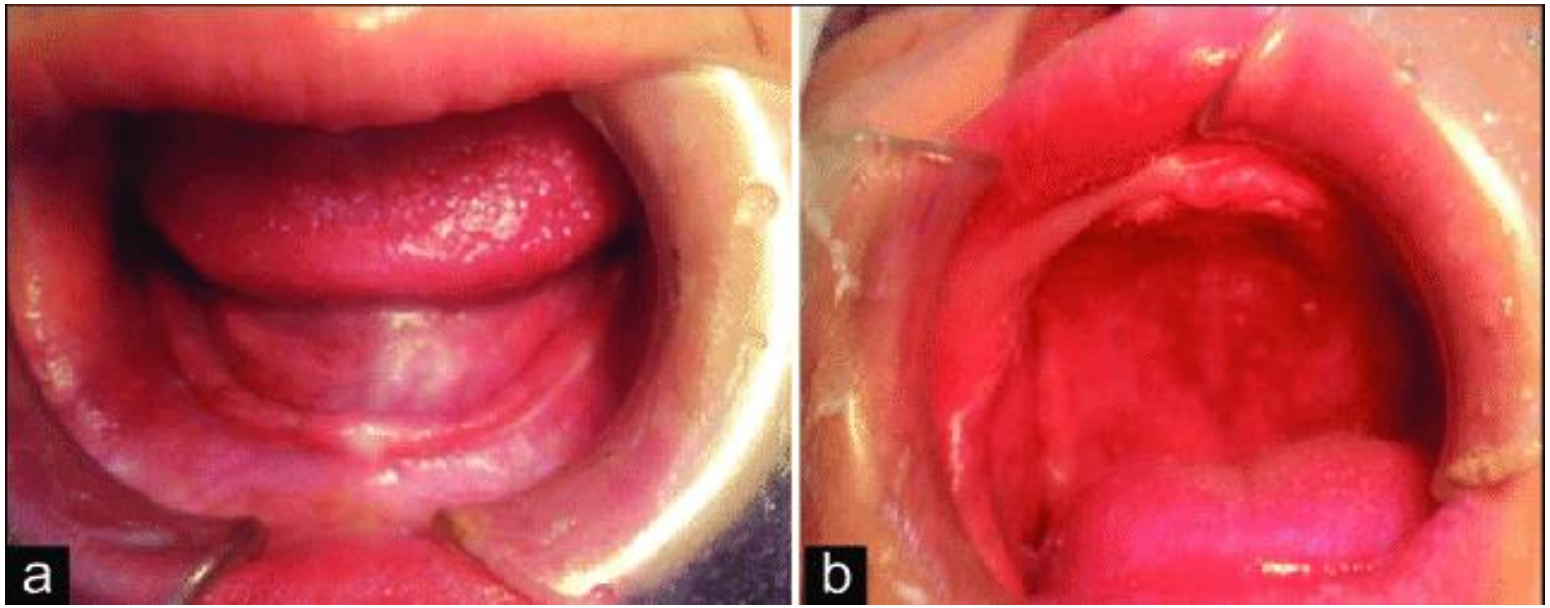
- With age degree of **periodontal breakdown increases**
- **Inflammation of the periodontium** develops more rapidly
- **Slower** rate of **wound healing**
- These effects are based on molecular changes in the periodontal cells, which intensify **bone loss** in elderly patients with **periodontitis**.
- The **bacterial composition of the periodontal pocket is altered** with increasing age as gram positive cocci increase and gram-negative anaerobic rods decrease



Age Changes in Oral Mucosa

- With age oral mucosa becomes **smooth and dry** due to **thinning of epithelium** due to reduction in the thickness of epithelial ridges and **decrease in salivary secretions**
- **Atrophy of the connective tissue, loss of elasticity**
- **Ectopic sebaceous glands** (**Fordyce's spots**) commonly seen in buccal and labial mucosa of old age persons





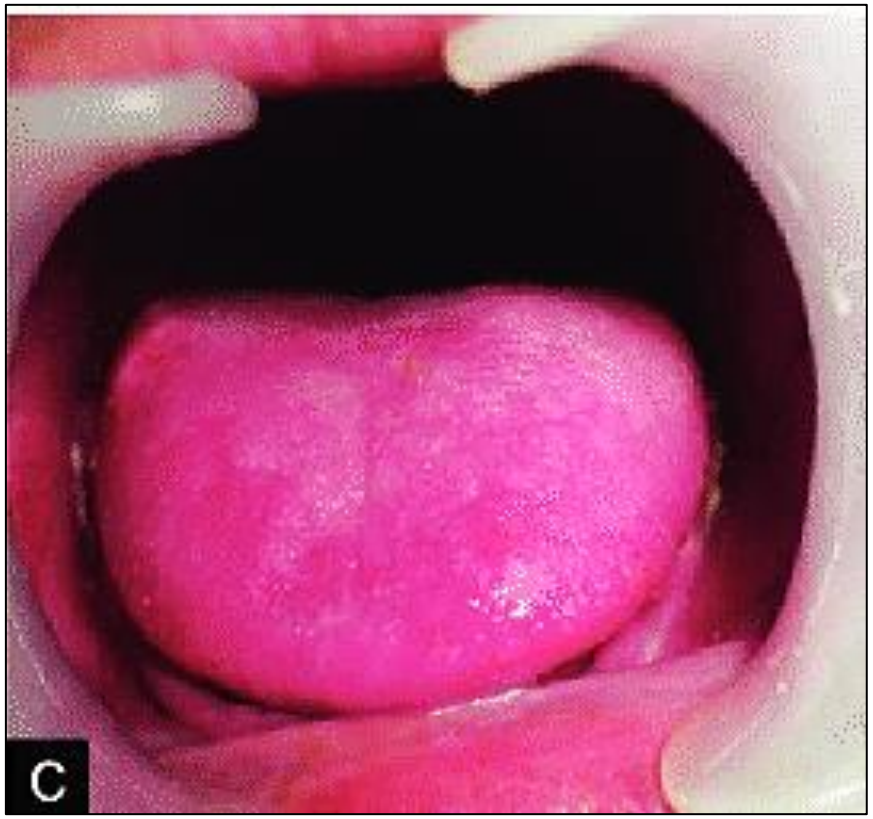
Smooth and shiny oral mucosa

Fordyce's spots

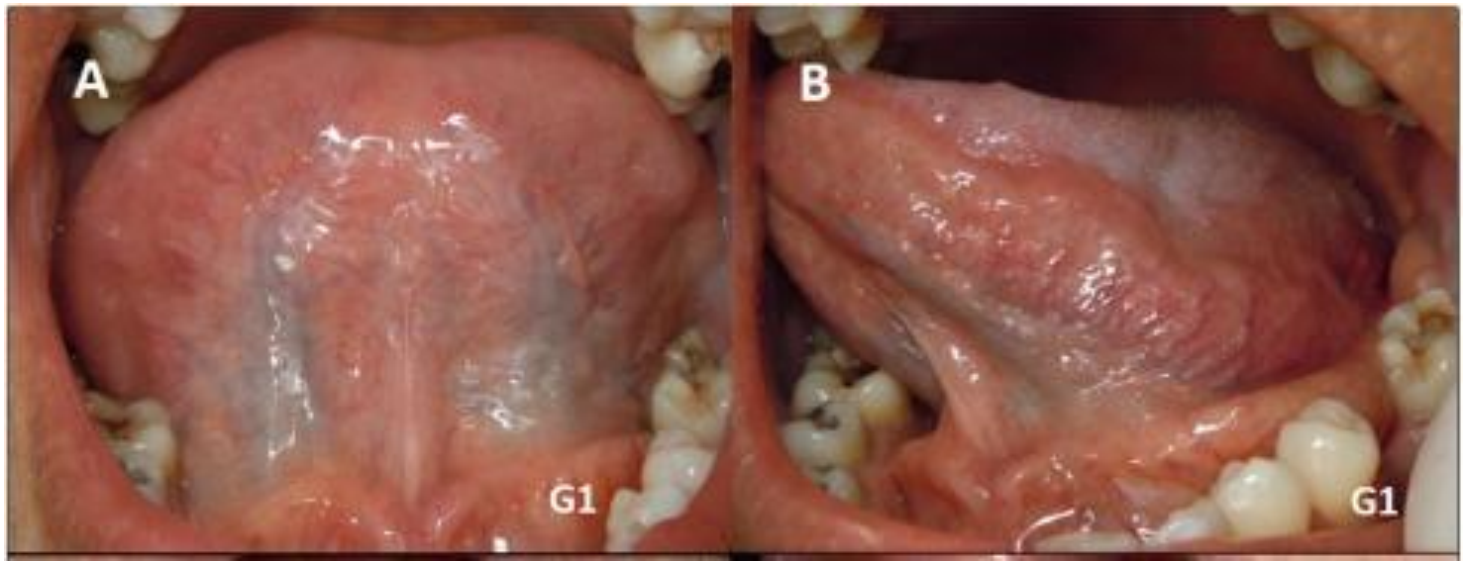
Age Changes in Tongue

- **The filiform papilla** becomes **reduced**, and the tongue appears **smooth** owing to reduction in the thickness of epithelium also due to nutritional deficiencies.
- **Varicose veins** seen on the ventral aspect of tongue known as **lingual varices** or **cavier tongue** (dilated tortuous veins).
- **Glossitis** (tongue inflammation), **geographic tongue, fissured tongue, and black hairy tongue.**

Normal Tongue

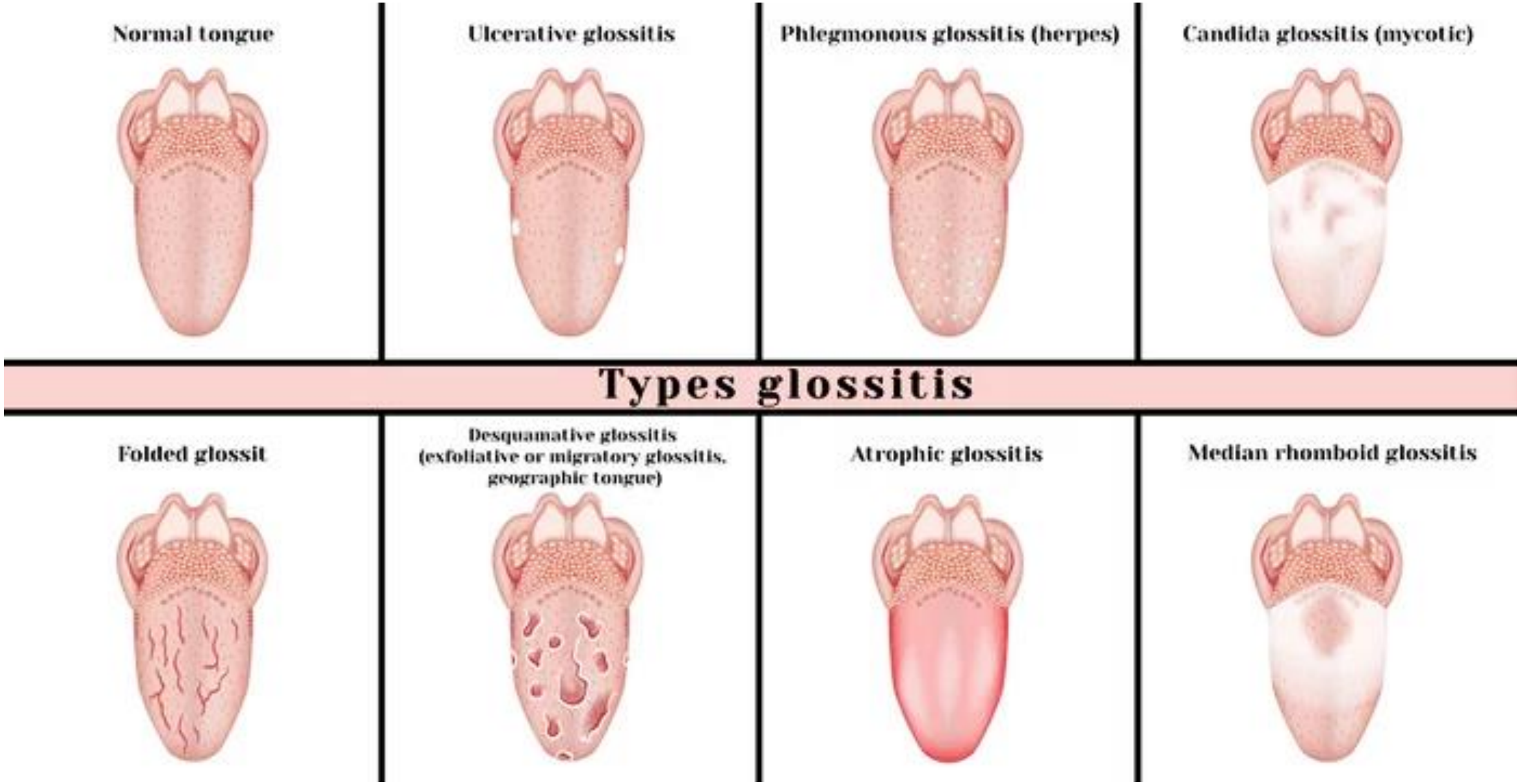


Loss of filiform papilla



Varicose veins

Types of Glossitis



geographic tongue: patches on the surface of the tongue are missing papilla (loss of keratinization in some areas)

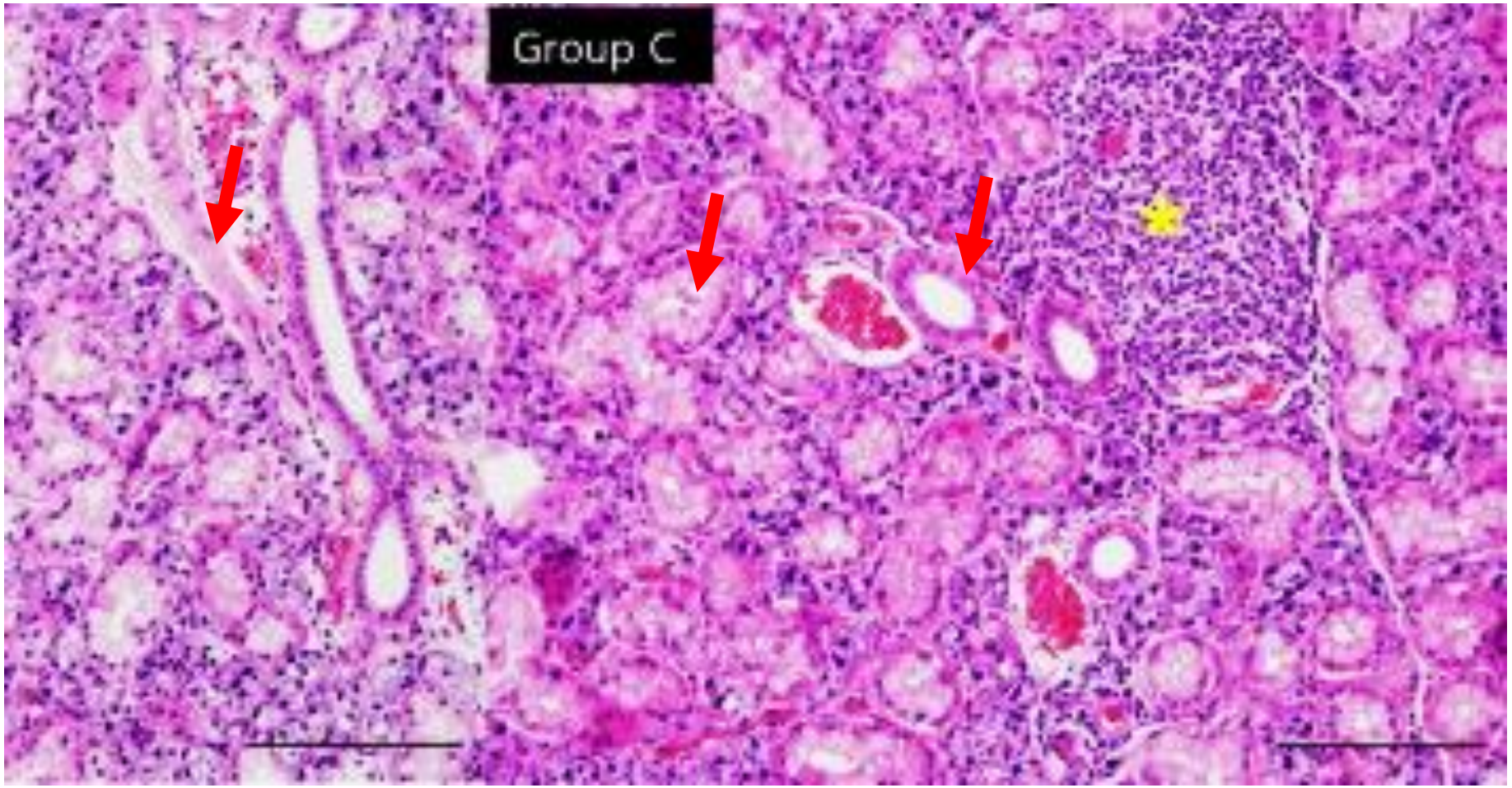
fissured tongue: multiple small furrows or grooves on the dorsal surface of the tongue

Black hairy tongue: a dark and hairy appearance due to increased keratin formation causing lengthening of the papillae, and staining from bacteria, yeast, food, tobacco or other substances in the mouth.

Age Changes in Salivary Glands

- Generalized **loss of gland parenchymal tissues**, with gradual loss of **acinar volume**
- Lost salivary cells are **replaced by adipose tissues**
- **Increased fibrous** connective tissue.
- **Increase number of the intralobular ducts, dilatation** of **extralobular ducts** with degenerative changes
- **Reduction of salivary flow:** (**Dry mouth or xerostomia**) can also contribute to halitosis, periodontal disease, increased caries, and sinus problems.

Bad breath


Group C

References

- Joci M : Essential of Oral Biology : Anatomy , Histology Physiology and Embryology (2010), I "edition CBS. Publisher New Delhi, Delhi, India
- Nanci A :Ten Cate Oral Histology: Development, Structure and Function (2017) ,9th edition , Mosby , Elsevier Publisher ,USA
- https://pocketdentistry.com/I0-physiologic-tooth-movement-eruption-and-shedding

Thank You