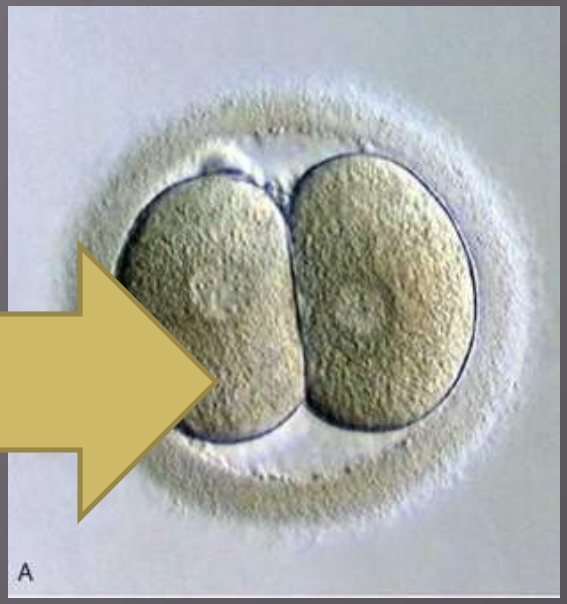
EMBRYOLOGY and oral histology

Senior lecturer
Dr Sura Talal Kadhim
Department of prosthodontics technology
Lab

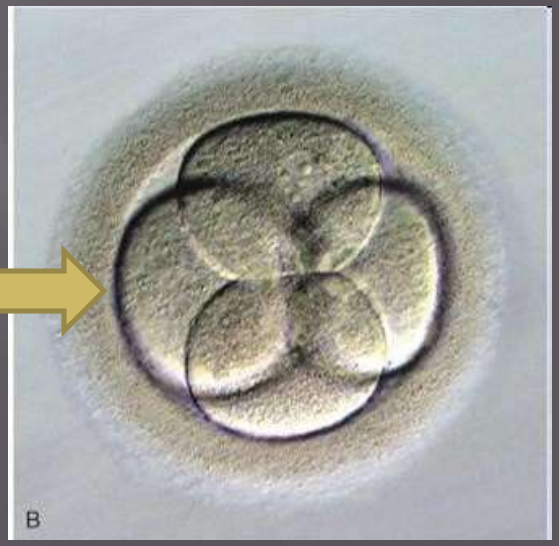
Fertilized egg (zygote)



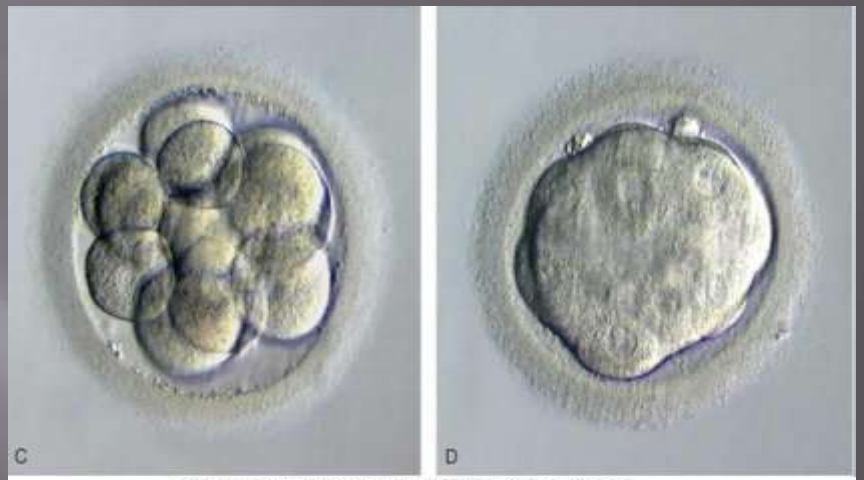
Individual cells = blastomeres



Still in zona pellucida

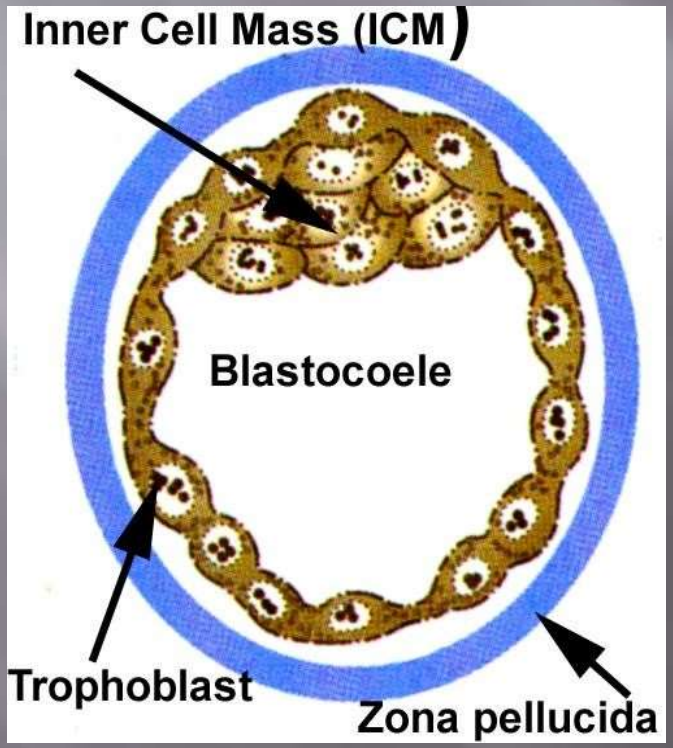


morula

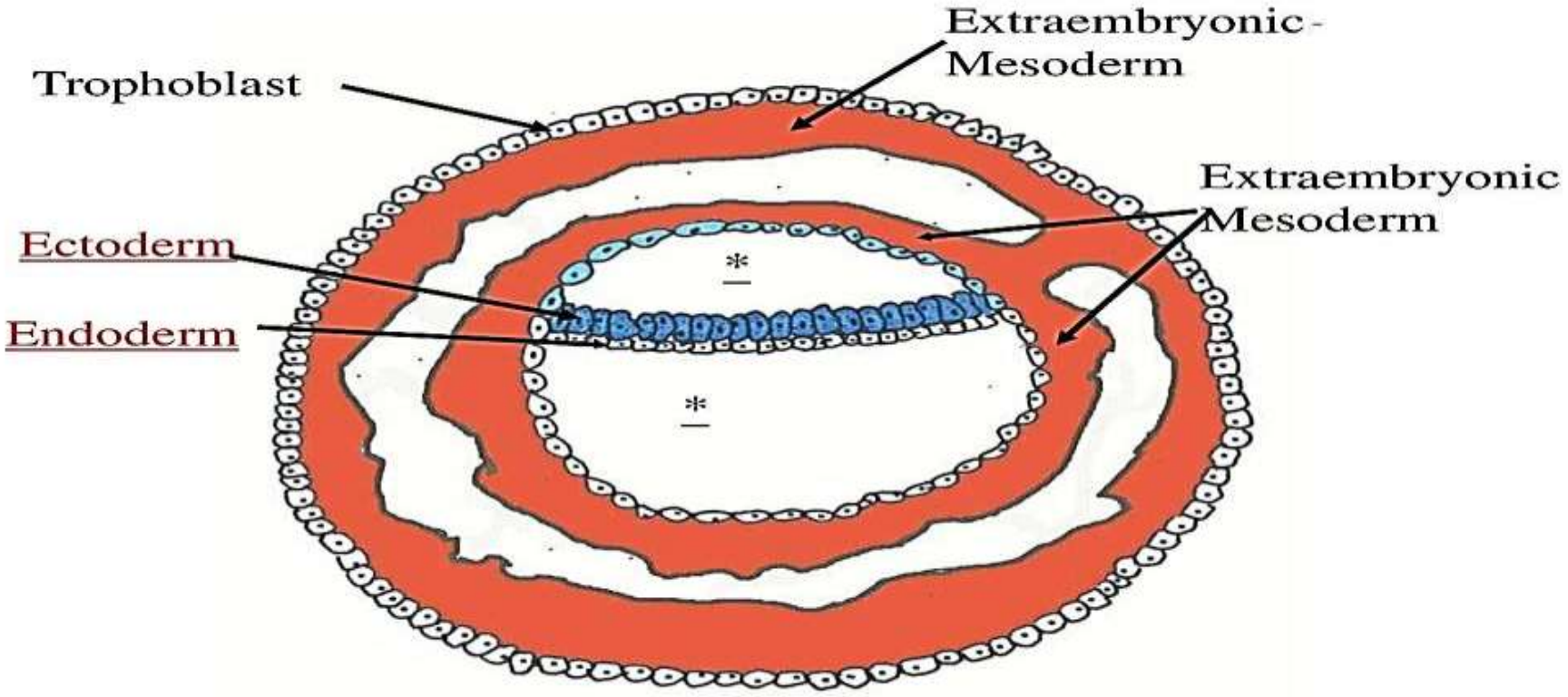


Carlson: Human Embryology and Developmental Biology, 4th Edition.
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- Zygote → Morula →
  - Blastocyst
    - Trophoblast
    - Embryoblast

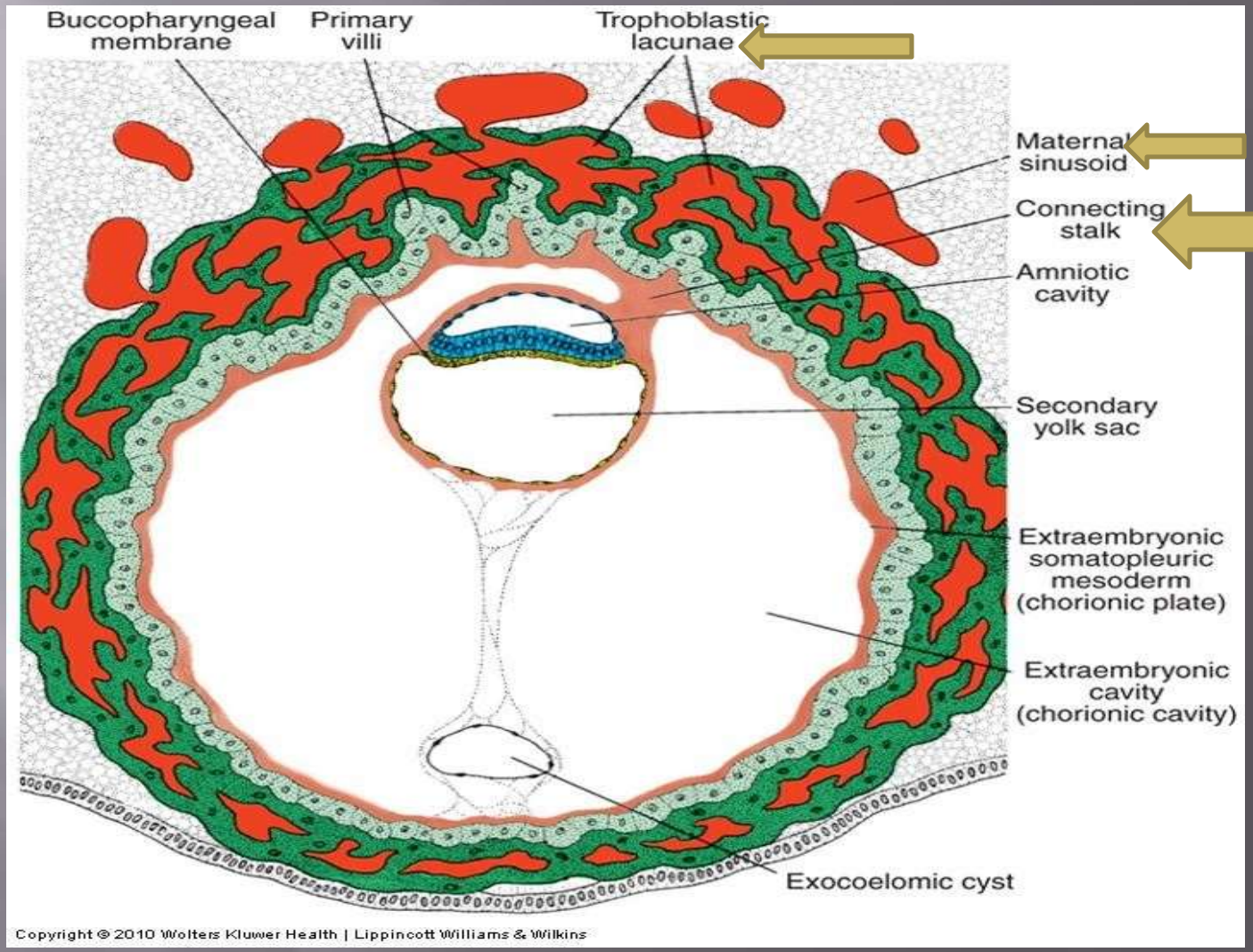


Second week of development

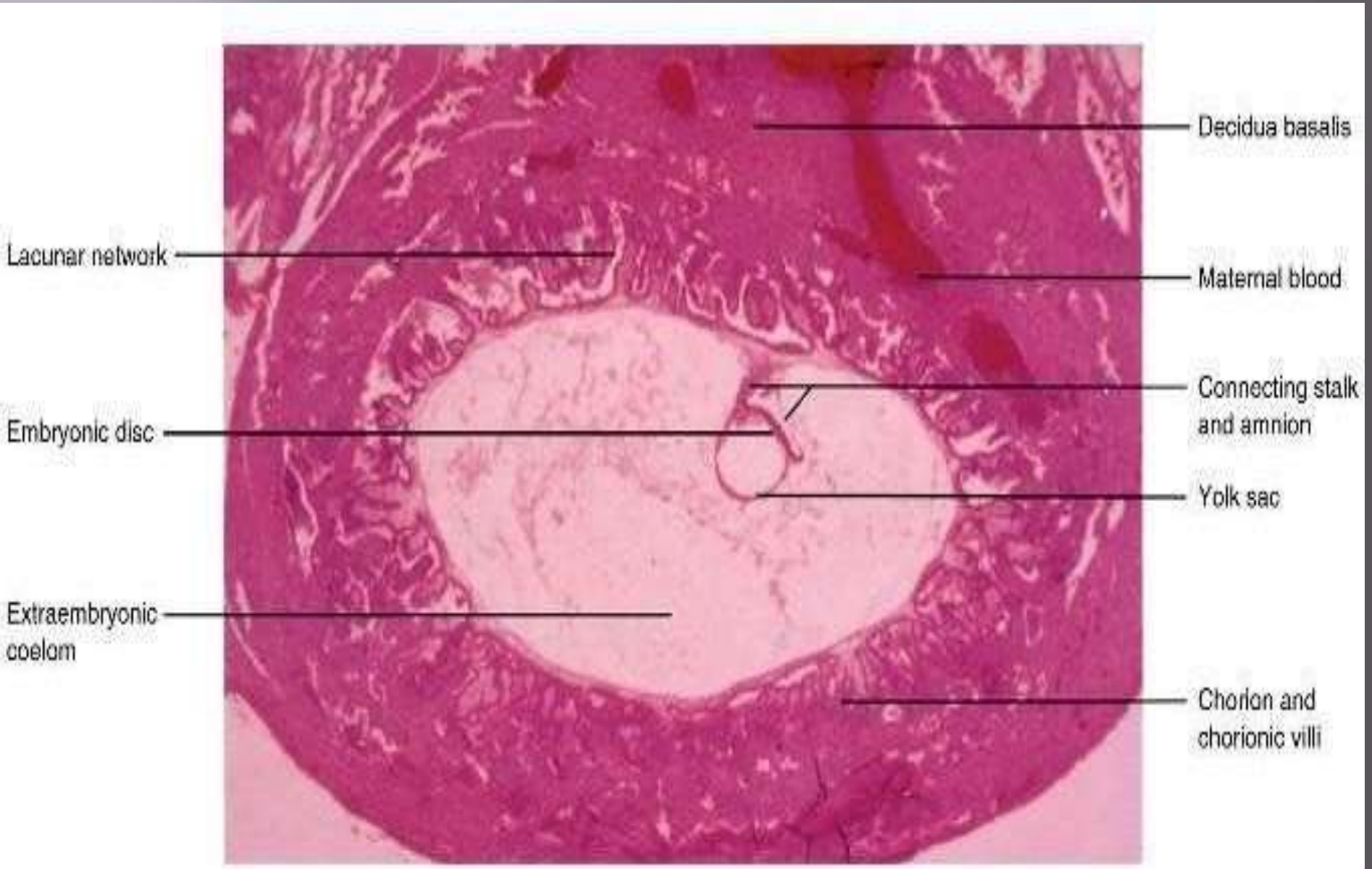


***the amnion cavity and yolk sac*

Implantation and placentation (day 13)

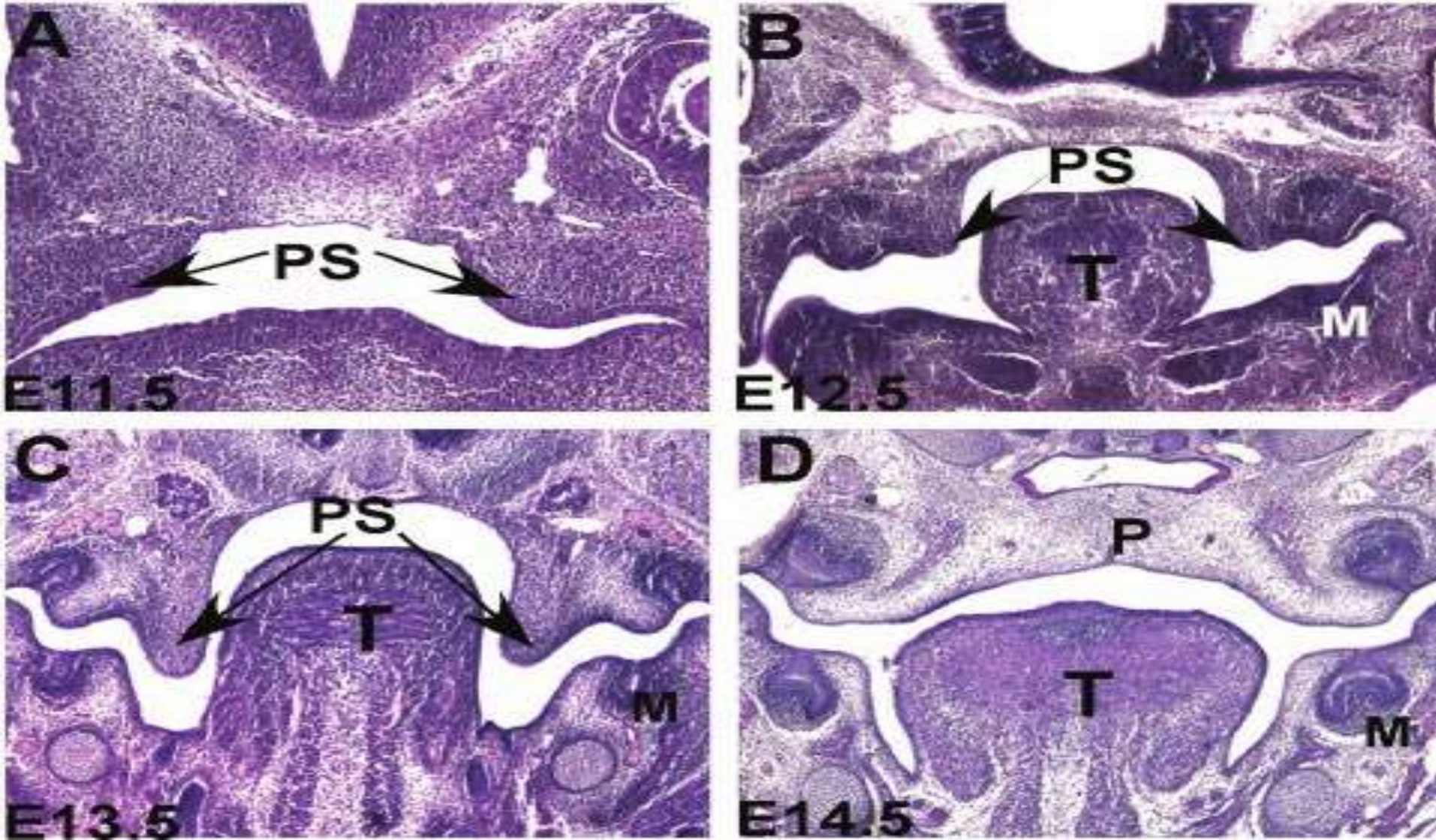


A 13-day human blastocyst. Trophoblastic lacunae and the uteroplacental circulation has begun



Mudoogo Edgar

Development of palate



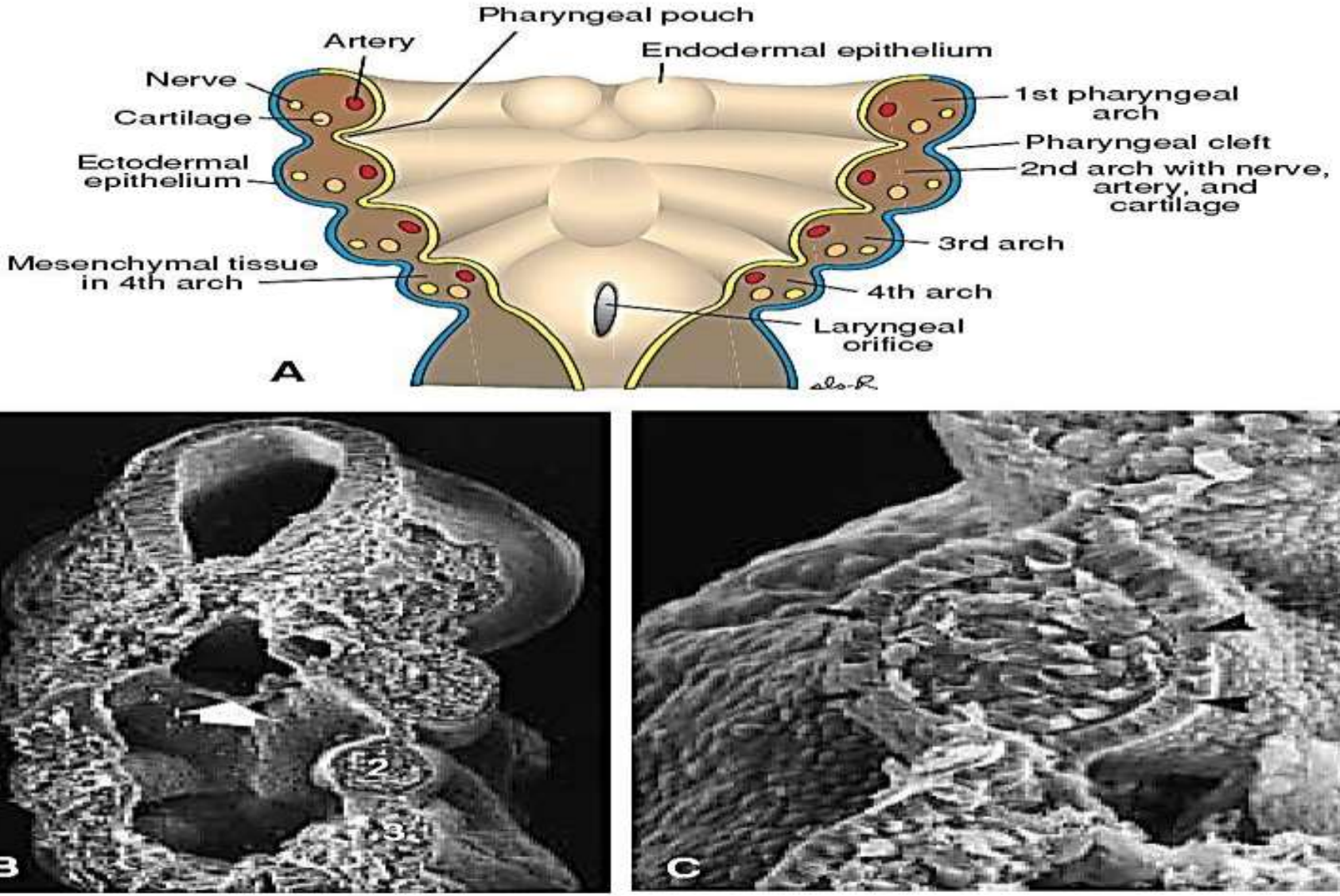
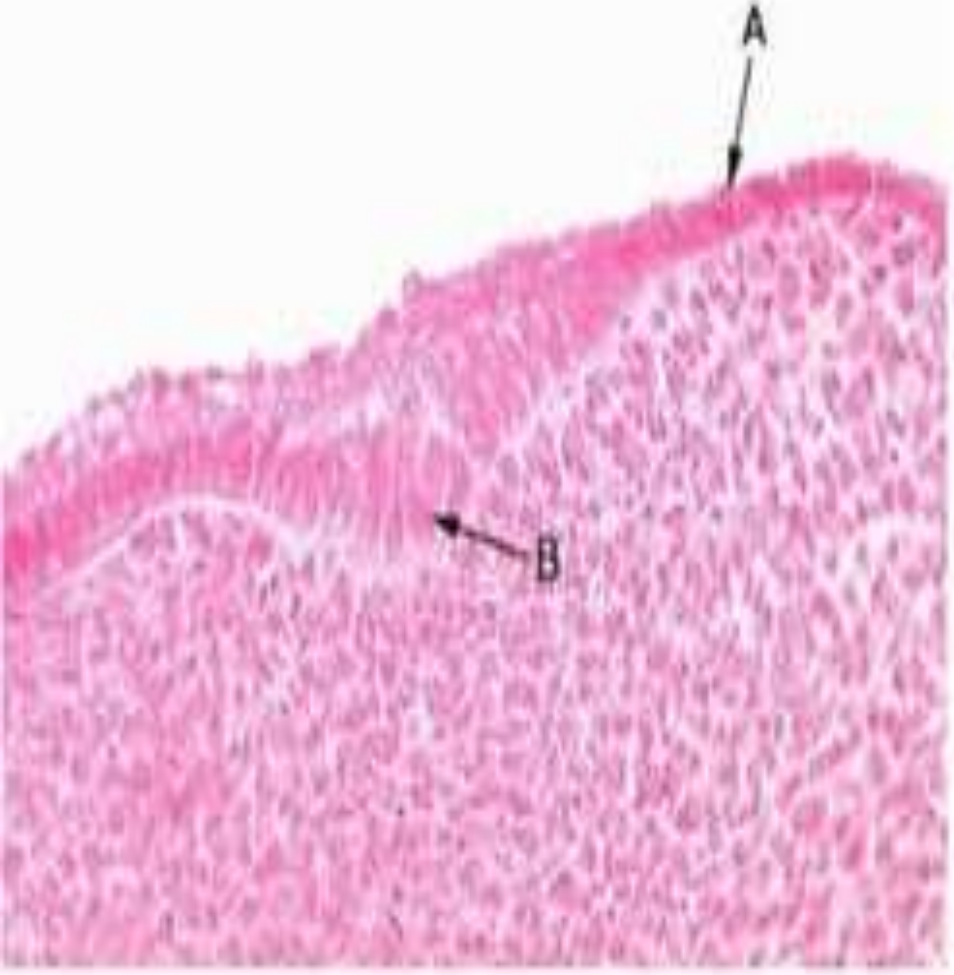


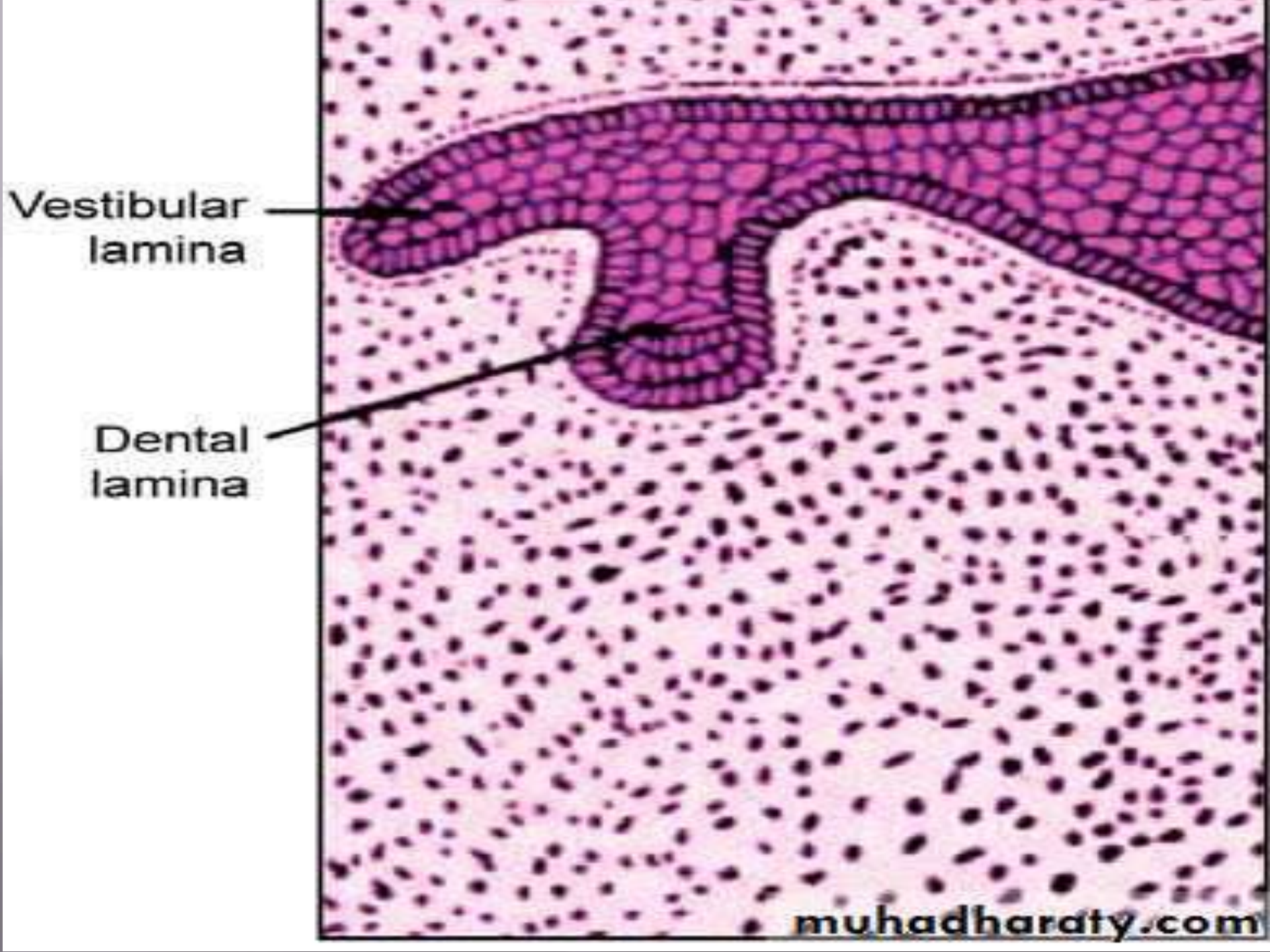
Figure 15.6 A. Pharyngeal arches. Each arch contains a cartilaginous component, a cranial nerve, an artery, and a muscular component. **B.** Scanning electron micrograph of the pharyngeal region of a mouse embryo, showing the pharyngeal arches, pouches, and clefts. The first three arches (I, II, and III) are visible. A remnant of the buccopharyngeal membrane (*arrow*) is present at the entrance to the oral cavity. **C.** Higher magnification of the pharyngeal arches of a mouse embryo. Pharyngeal arches consist of a core of mesoderm lined by endoderm internally (*arrowheads*) and ectoderm externally (*arrows*). Pouches and clefts occur between the arches, where endoderm and ectoderm appose each other.

A - oral epithelium
B - primary epithelial band

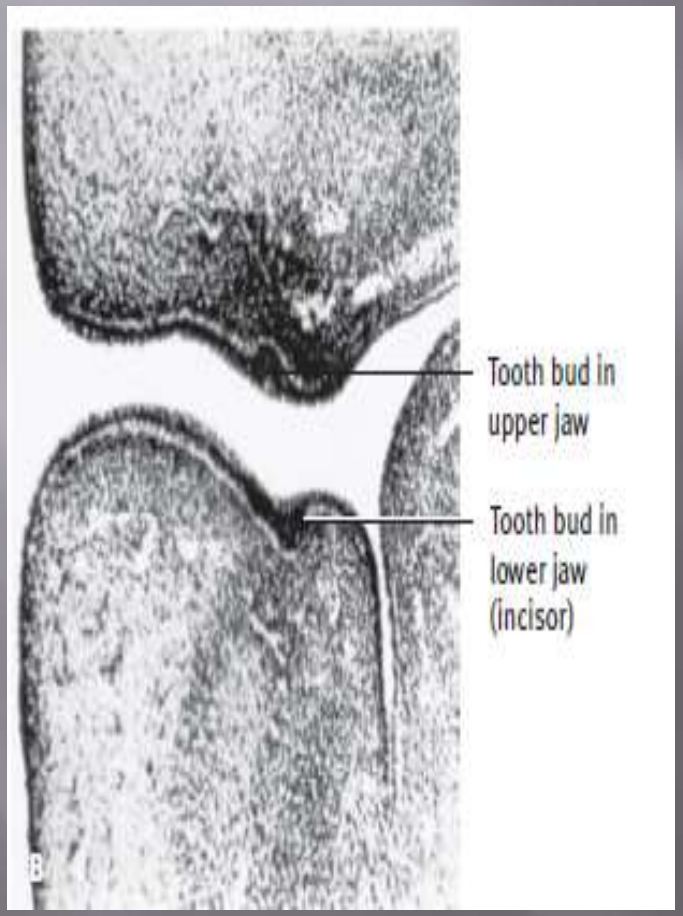


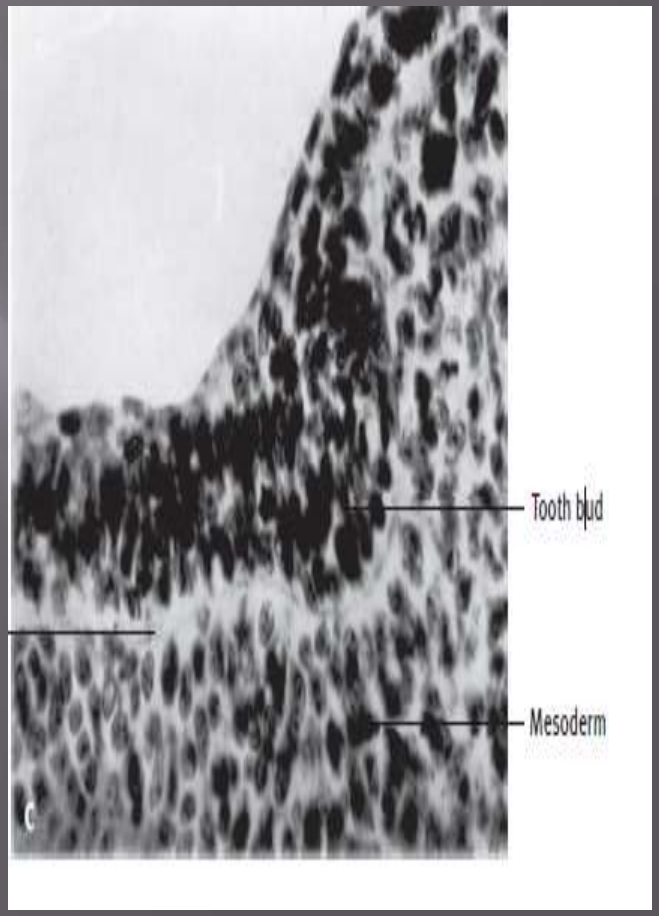
A - primary epithelial band
B - dental lamina
C - vestibular lamina

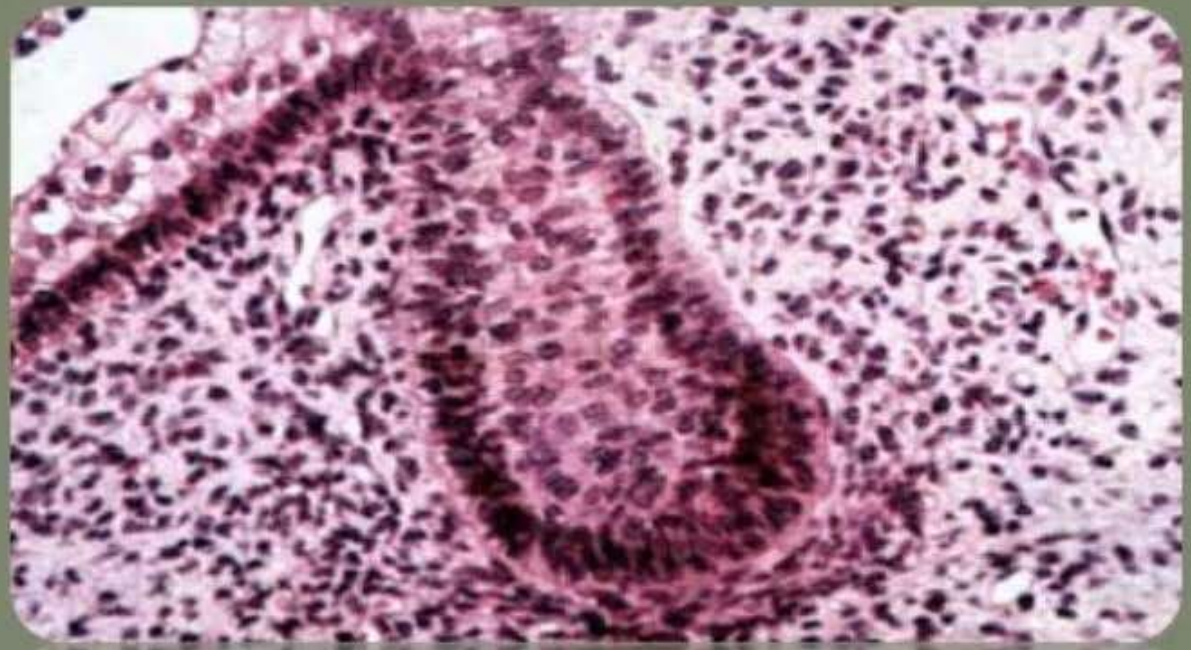



Vestibular lamina
Dental lamina
muhadharaty.com

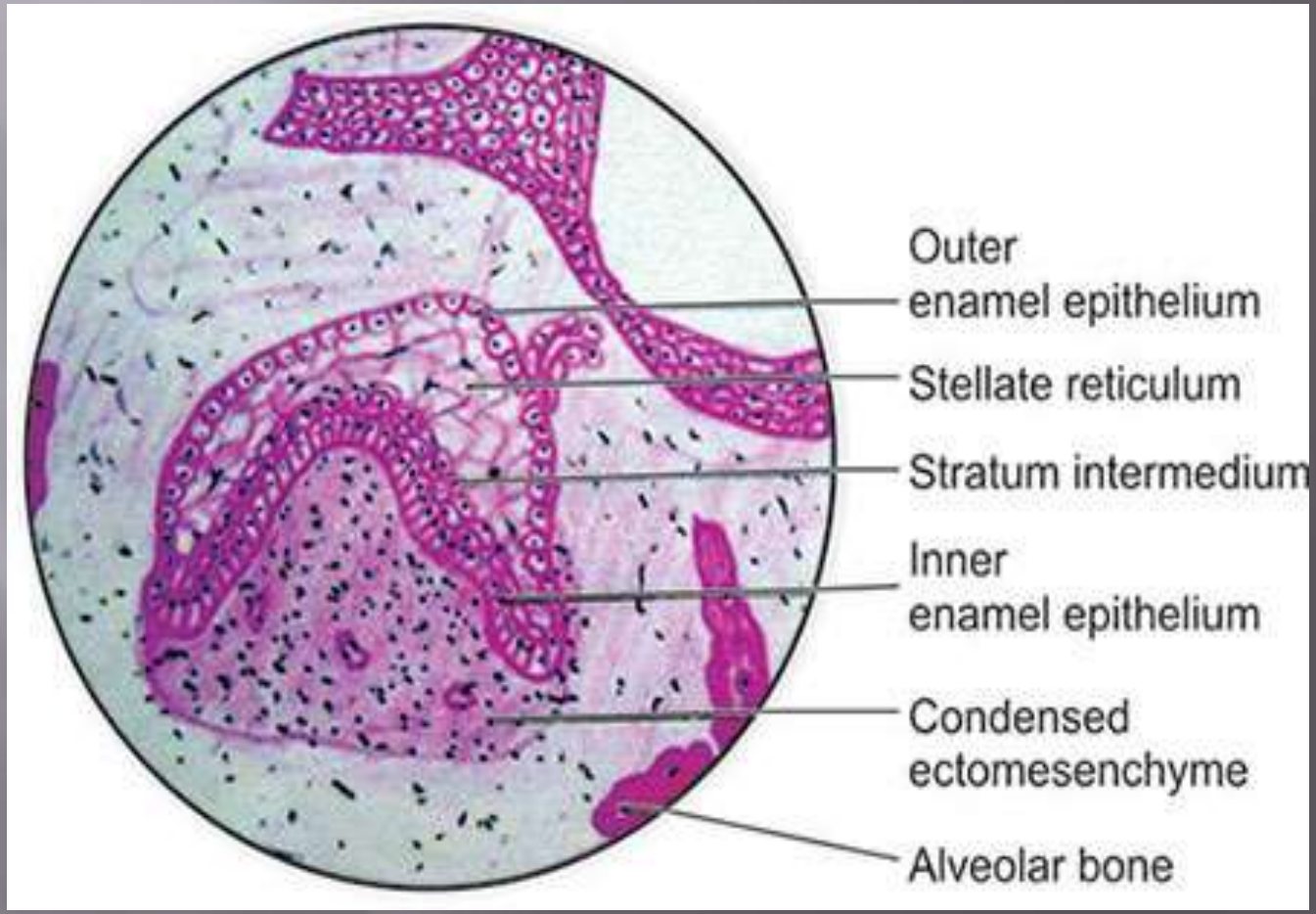
Bud stage


Tooth bud in upper jaw
Tooth bud in lower jaw (incisor)


Tooth bud
Mesoderm

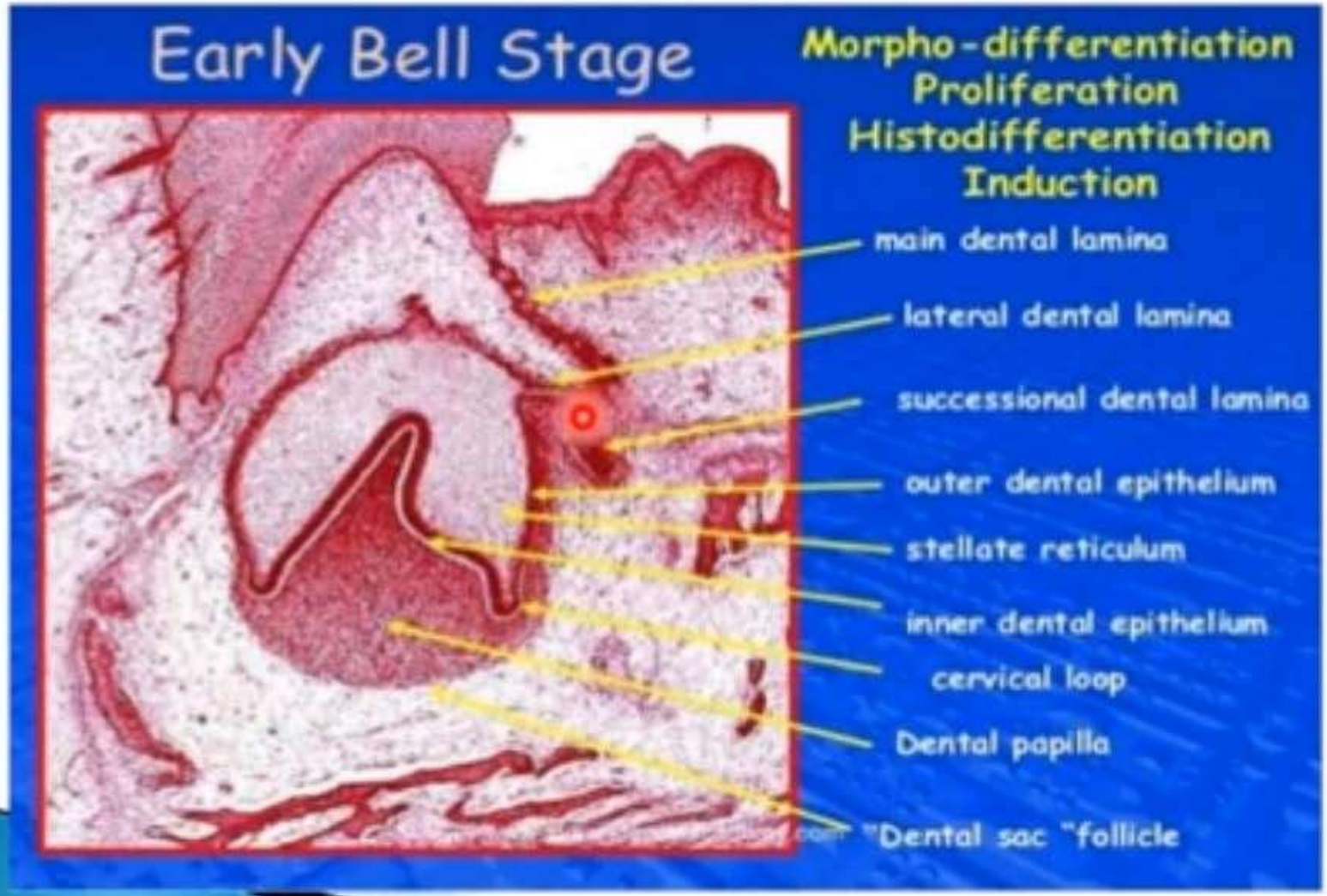


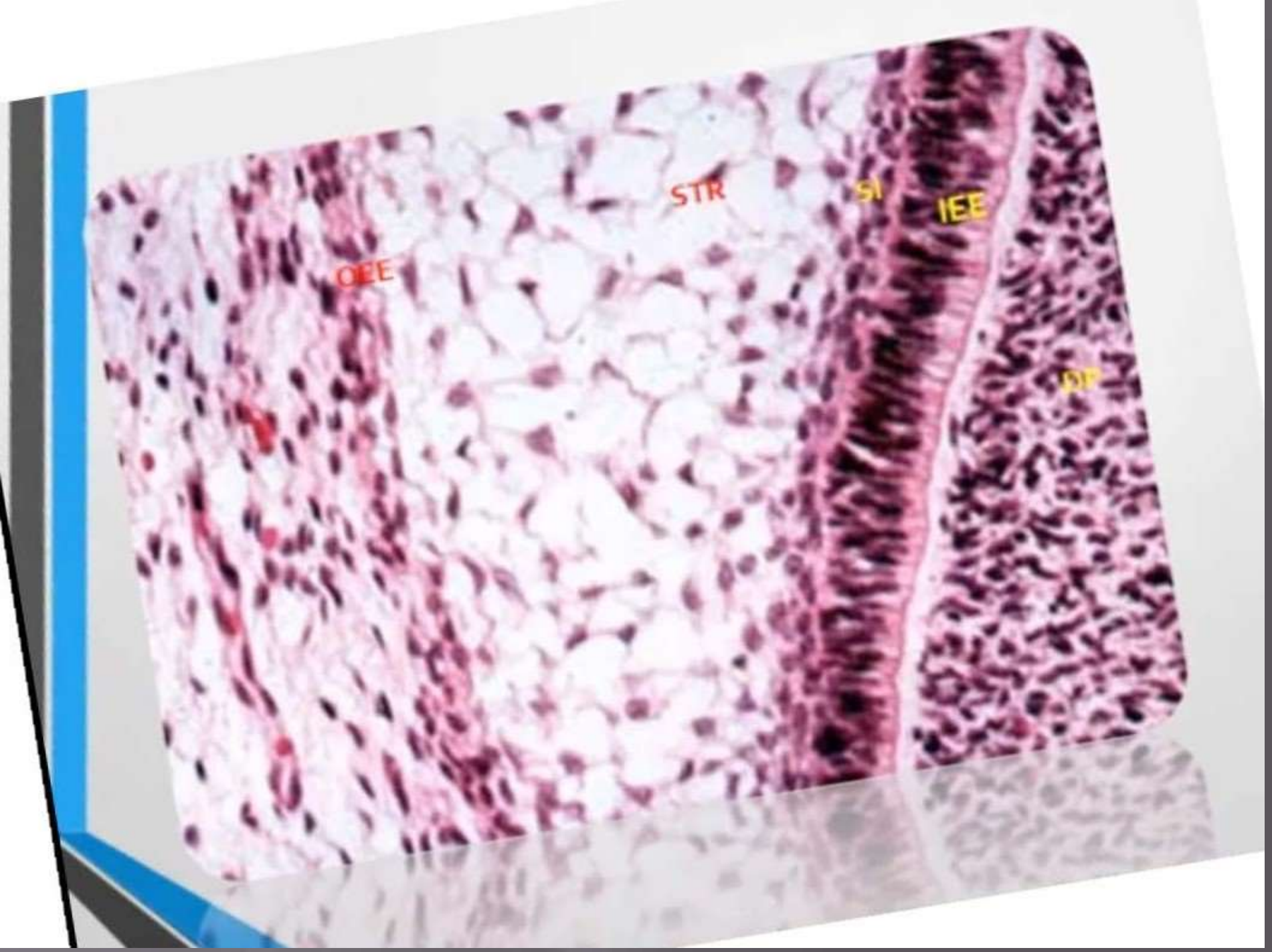
In the bud stage, the enamel organ consists of peripherally located
low columnar cells and centrally located polygonal cells

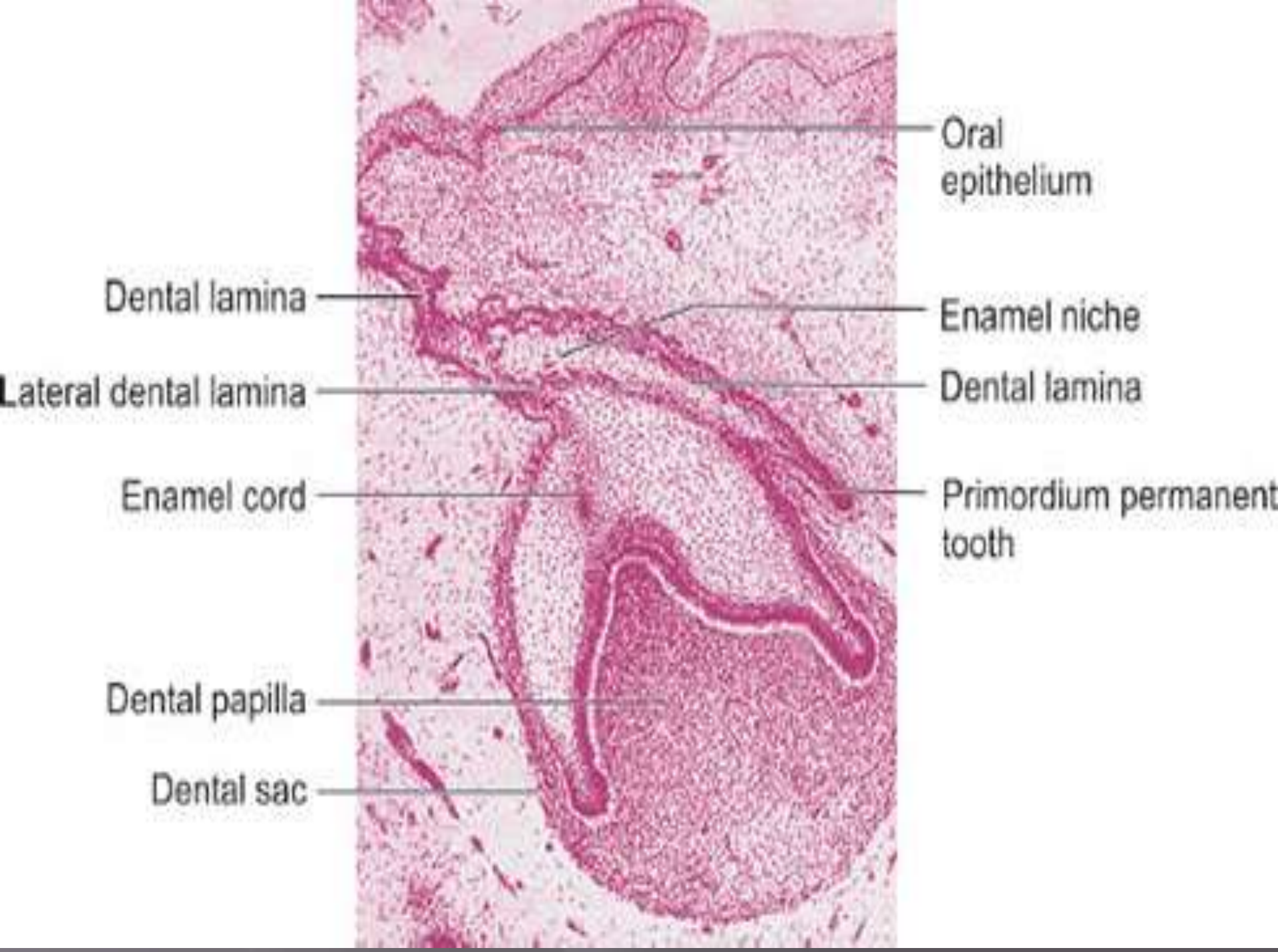

Outer
enamel epithelium
Stellate reticulum
Stratum intermedium
Inner
enamel epithelium
Condensed
ectomesenchyme
Alveolar bone

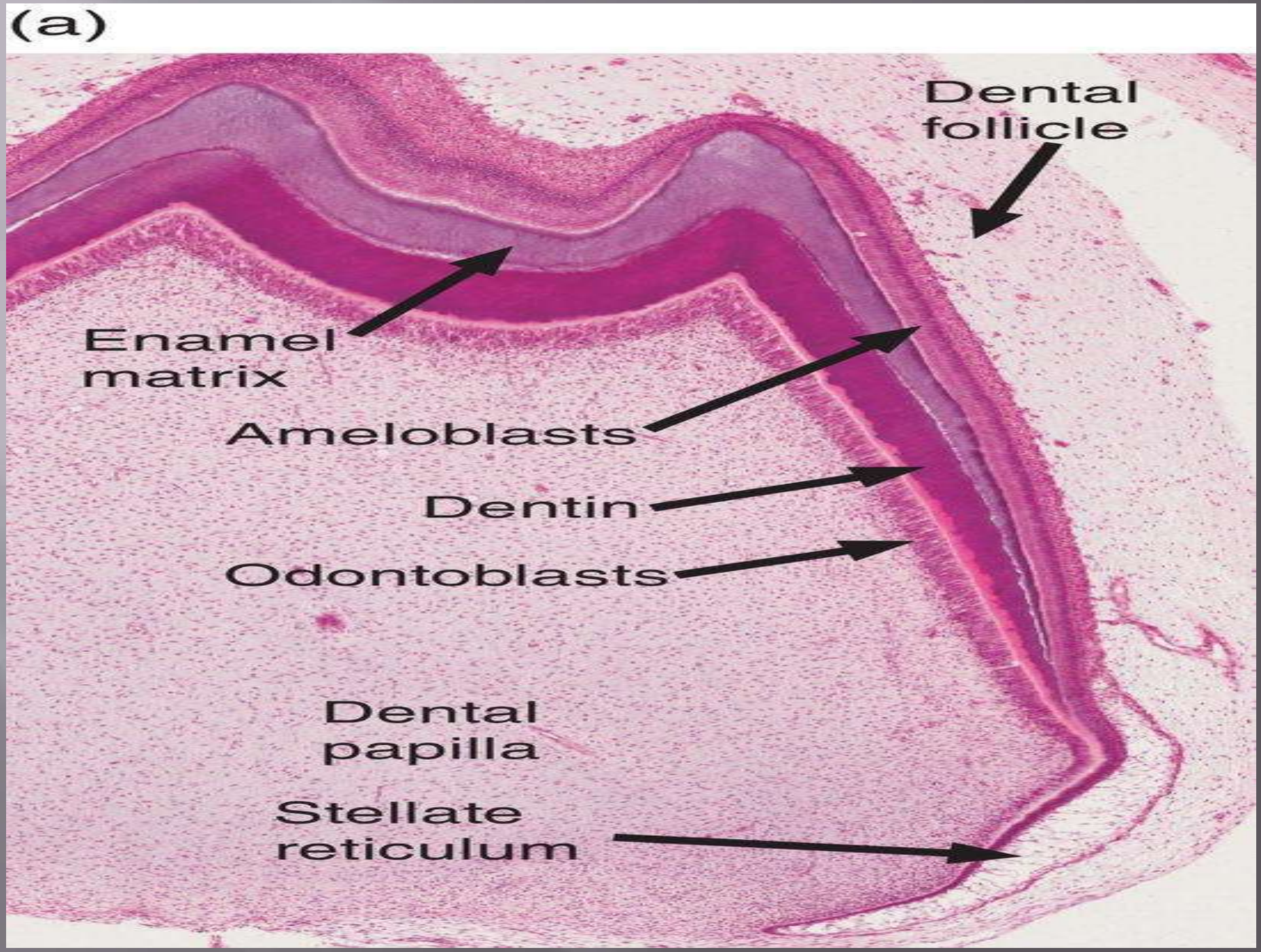


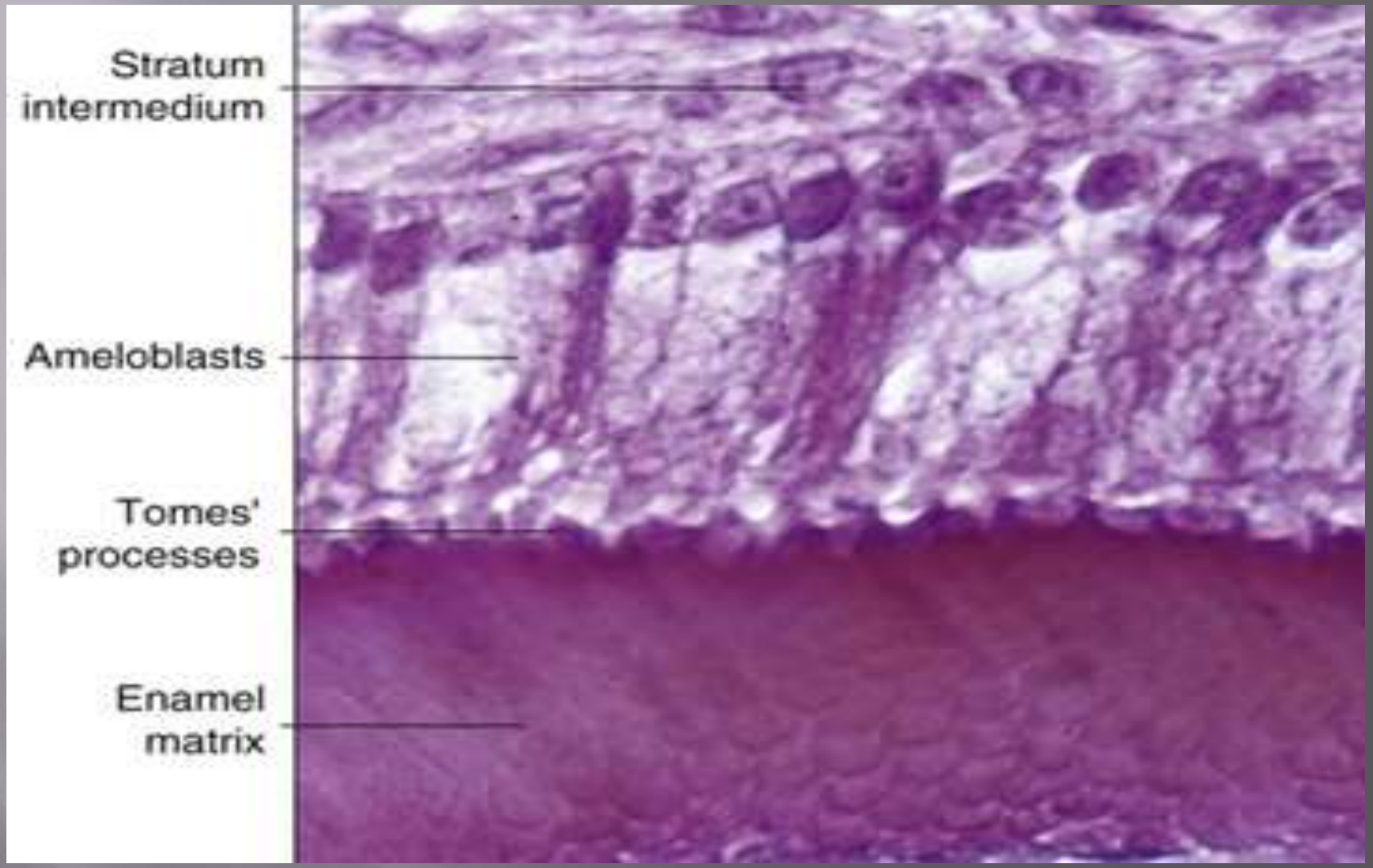
Cap Stage

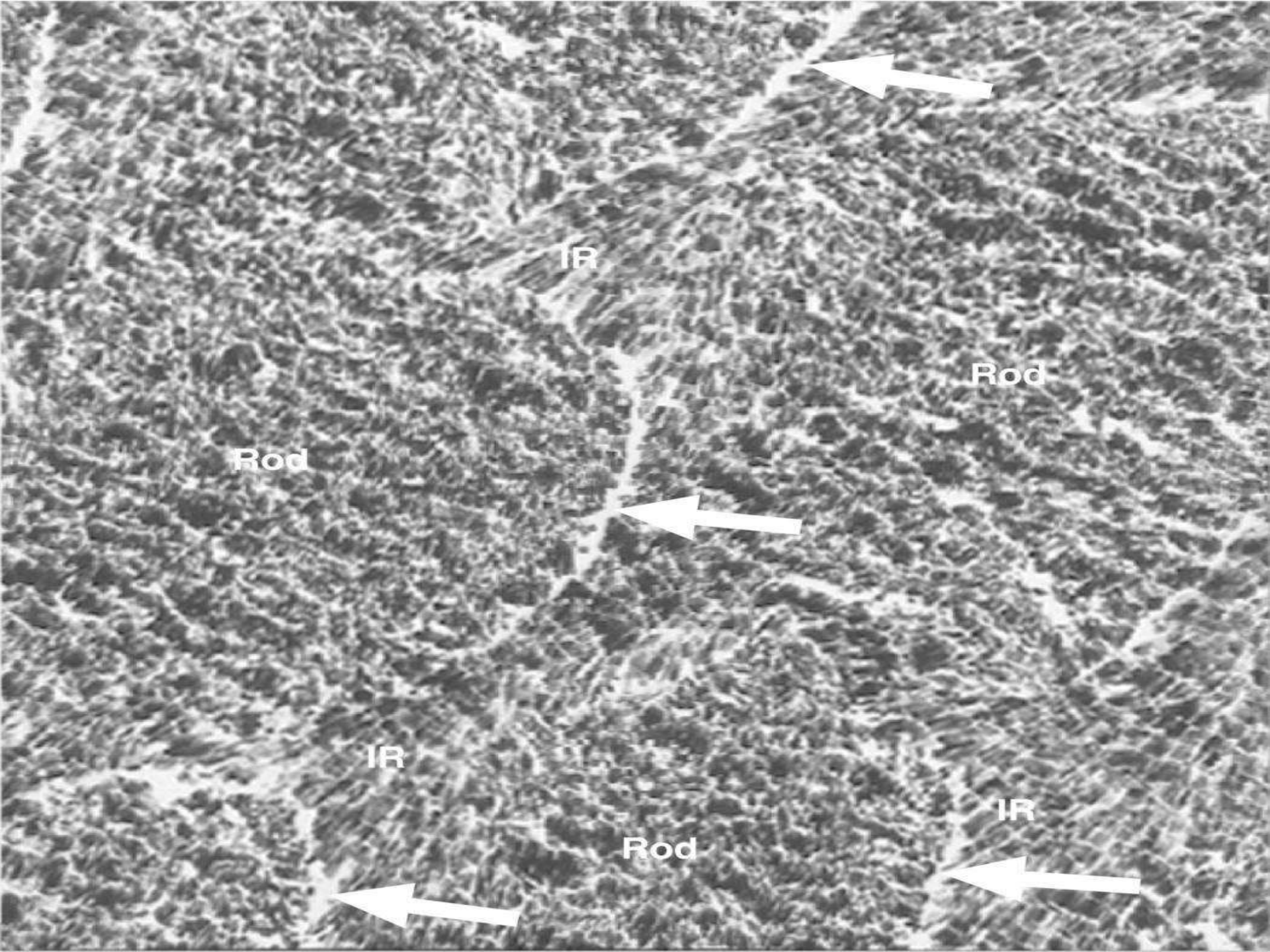

Early Bell Stage
Morpho-differentiation
Proliferation
Histodifferentiation
Induction
main dental lamina
lateral dental lamina
successional dental lamina
outer dental epithelium
stellate reticulum
inner dental epithelium
cervical loop
Dental papilla
"Dental sac "follicle

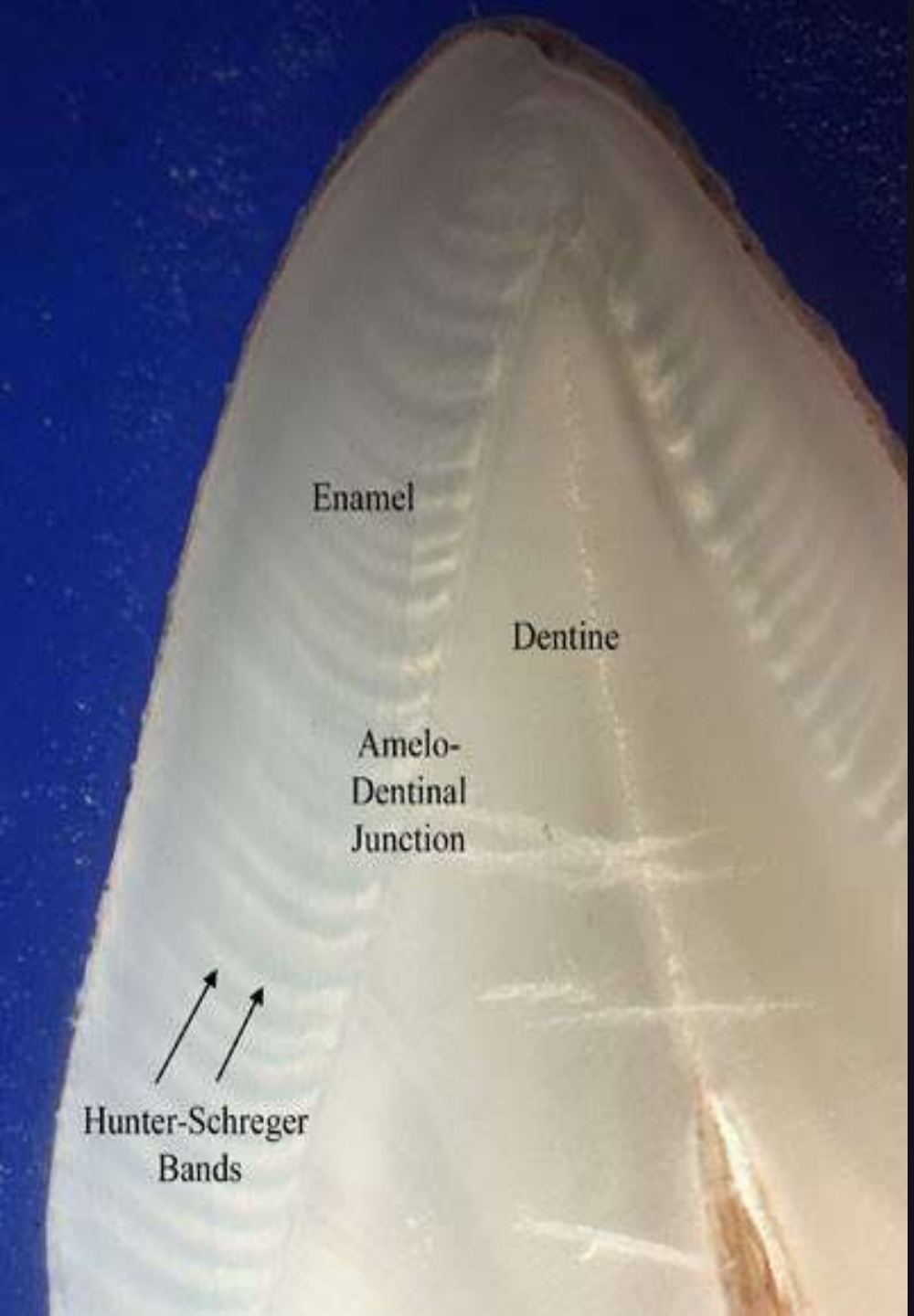

STR
SI
IEE
OEE

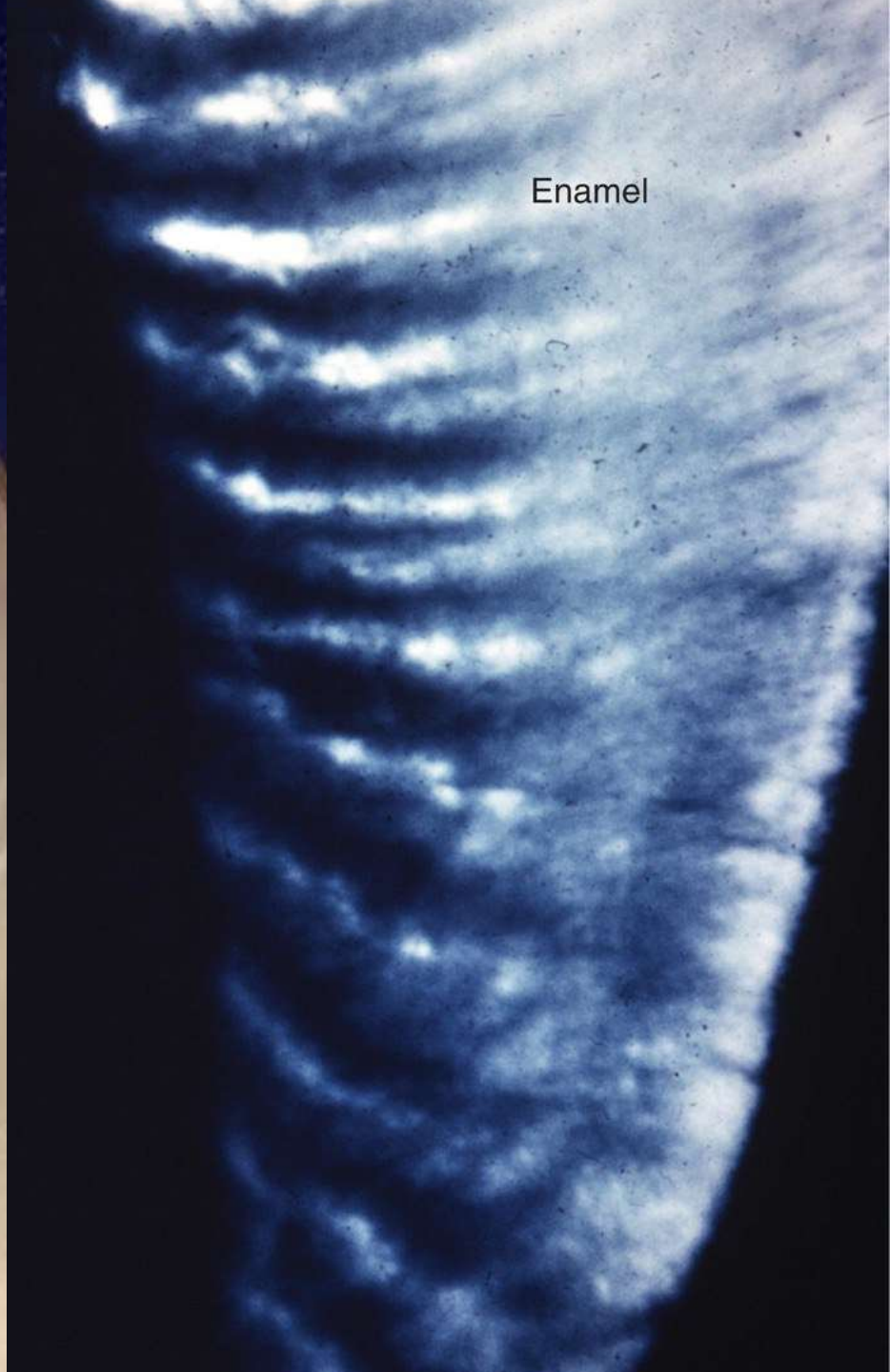

Oral epithelium
Dental lamina
Enamel niche
Lateral dental lamina
Dental lamina
Enamel cord
Primordium permanent tooth
Dental papilla
Dental sac

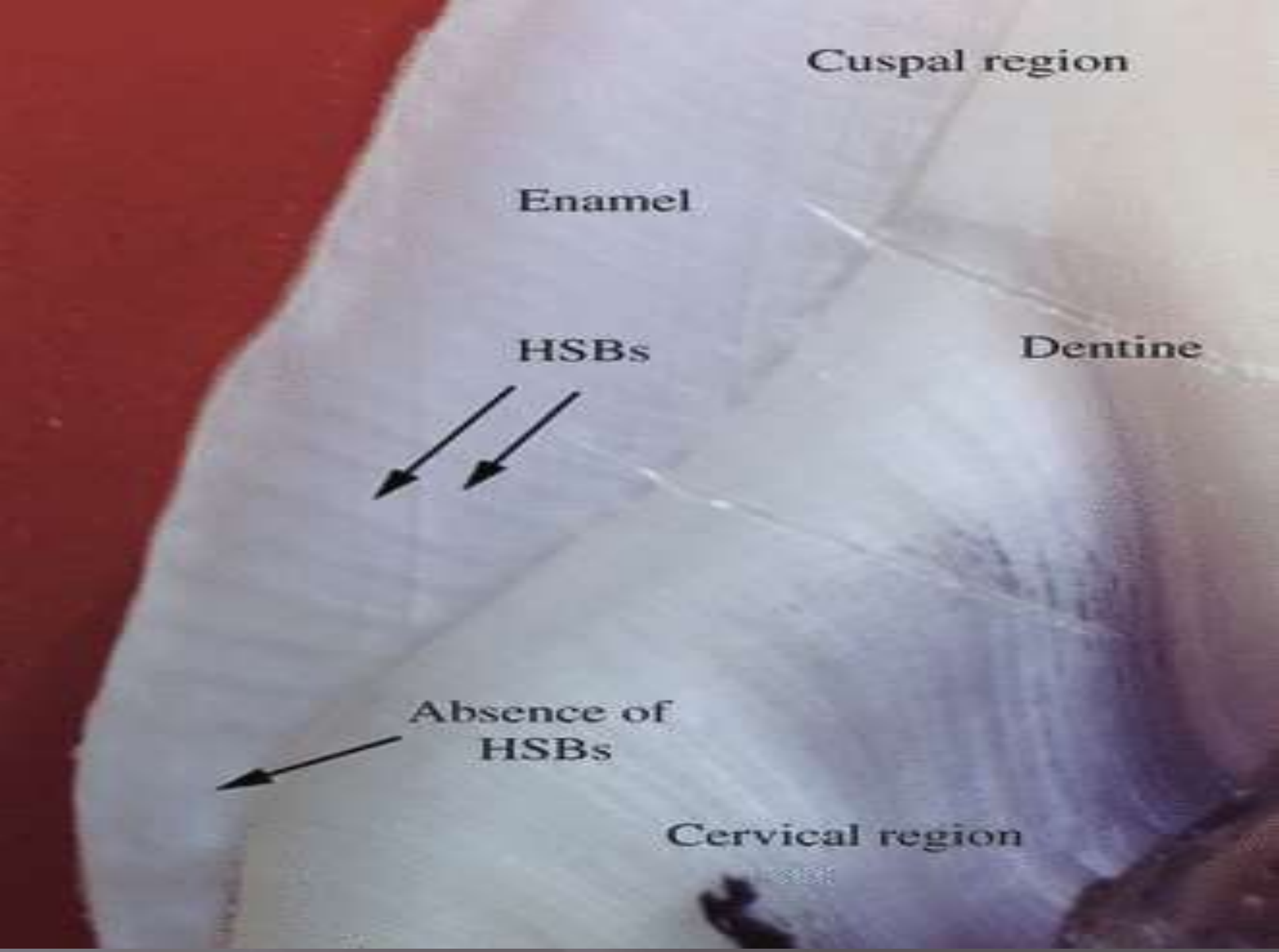

(a)
Dental follicle
Enamel matrix
Ameloblasts
Dentin
Odontoblasts
Dental papilla
Stellate reticulum

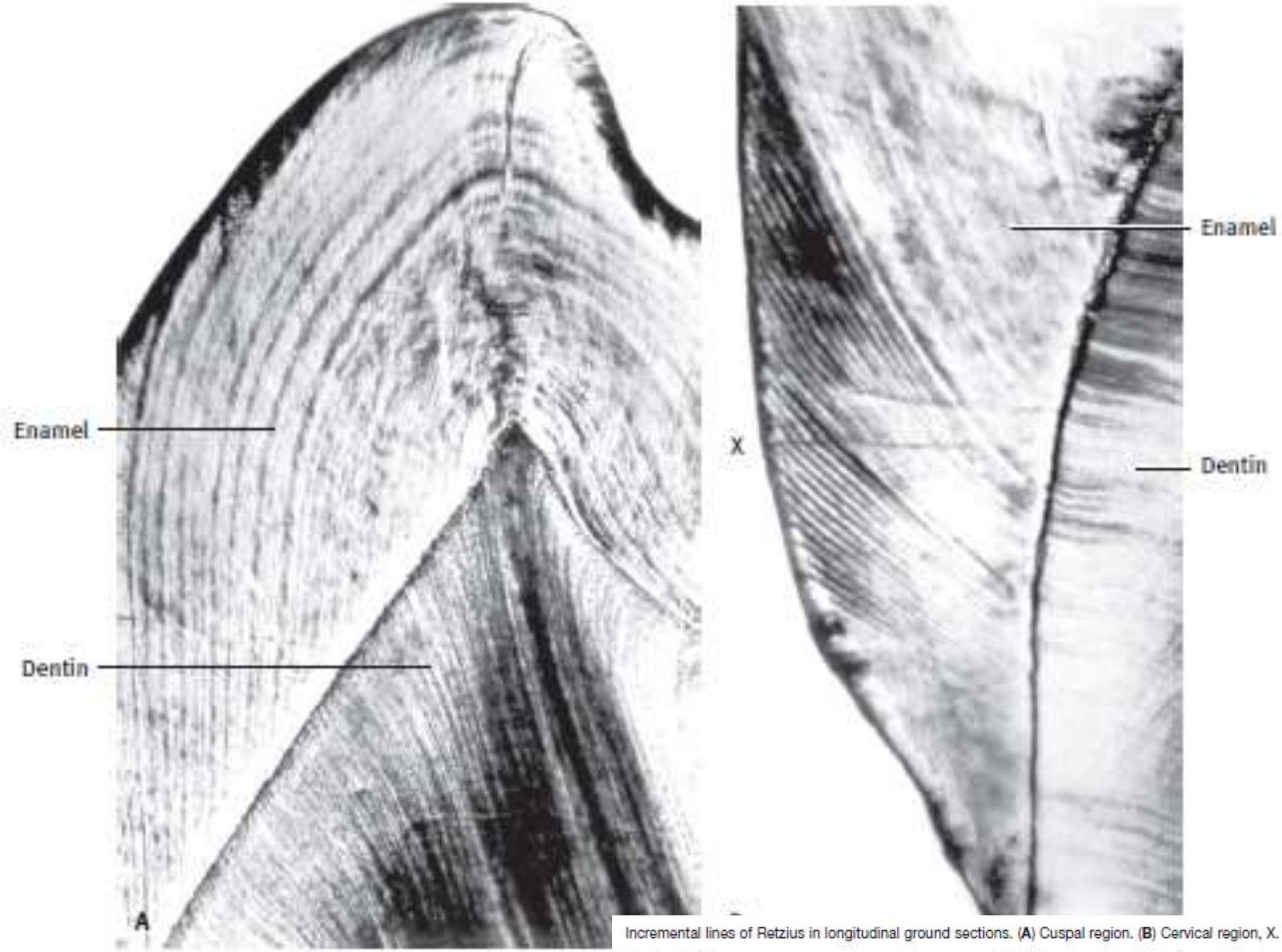

Stratum intermedium
Ameloblasts
Tomes' processes
Enamel matrix


IR
Rod
Rod
IR
Rod
IR

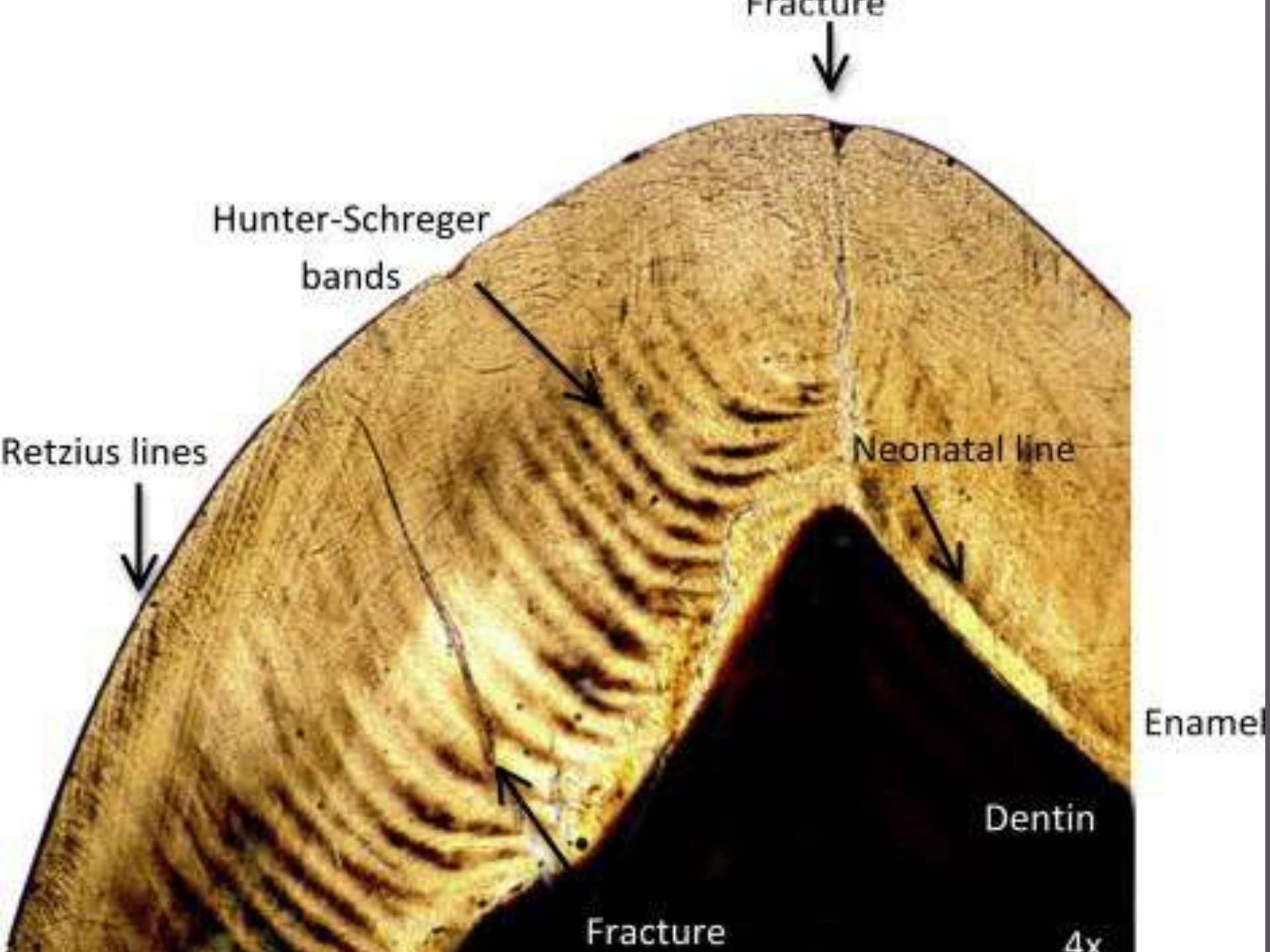

Enamel
Dentine
Amelo-
Dentinal
Junction
Hunter-Schreger
Bands

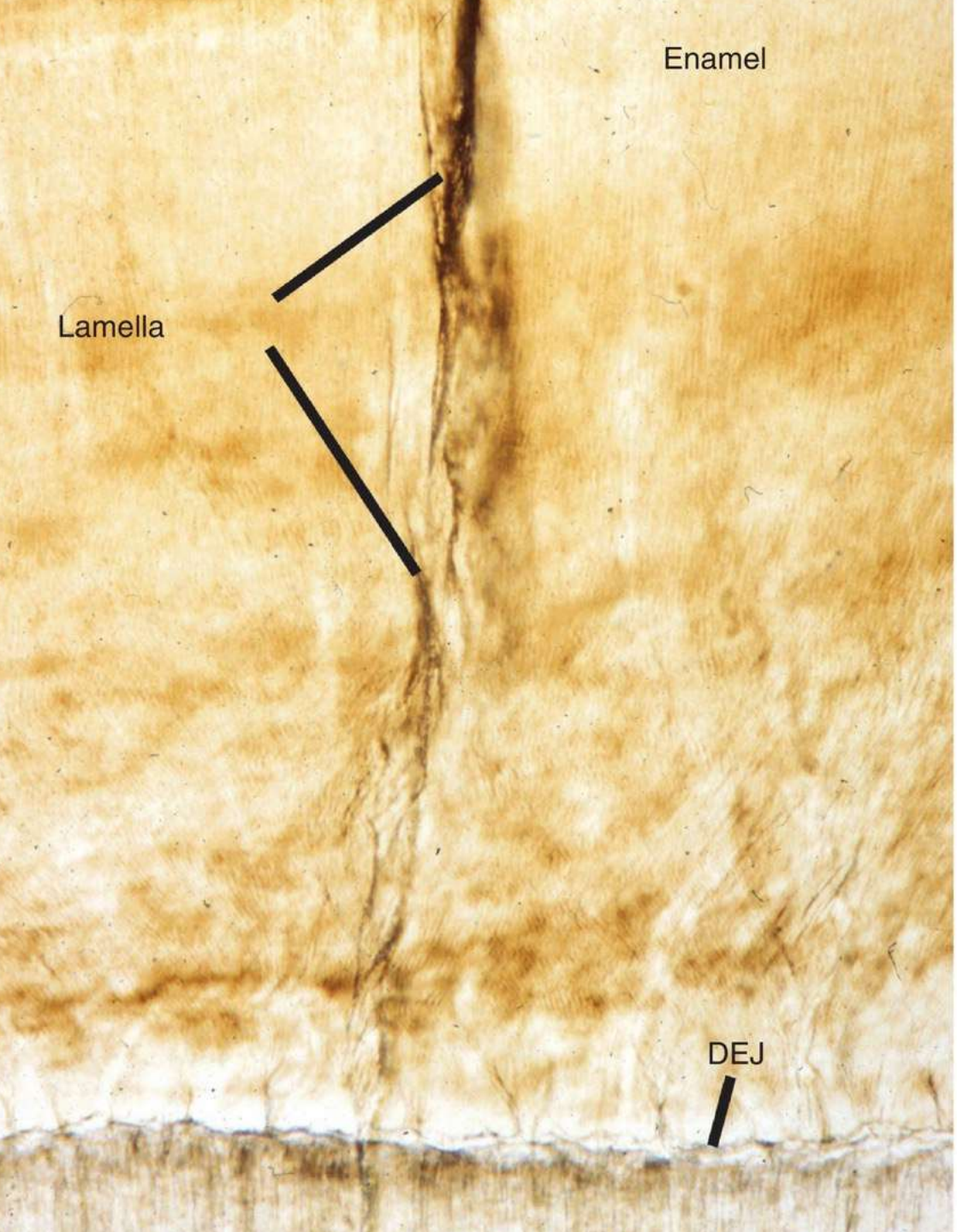

Enamel

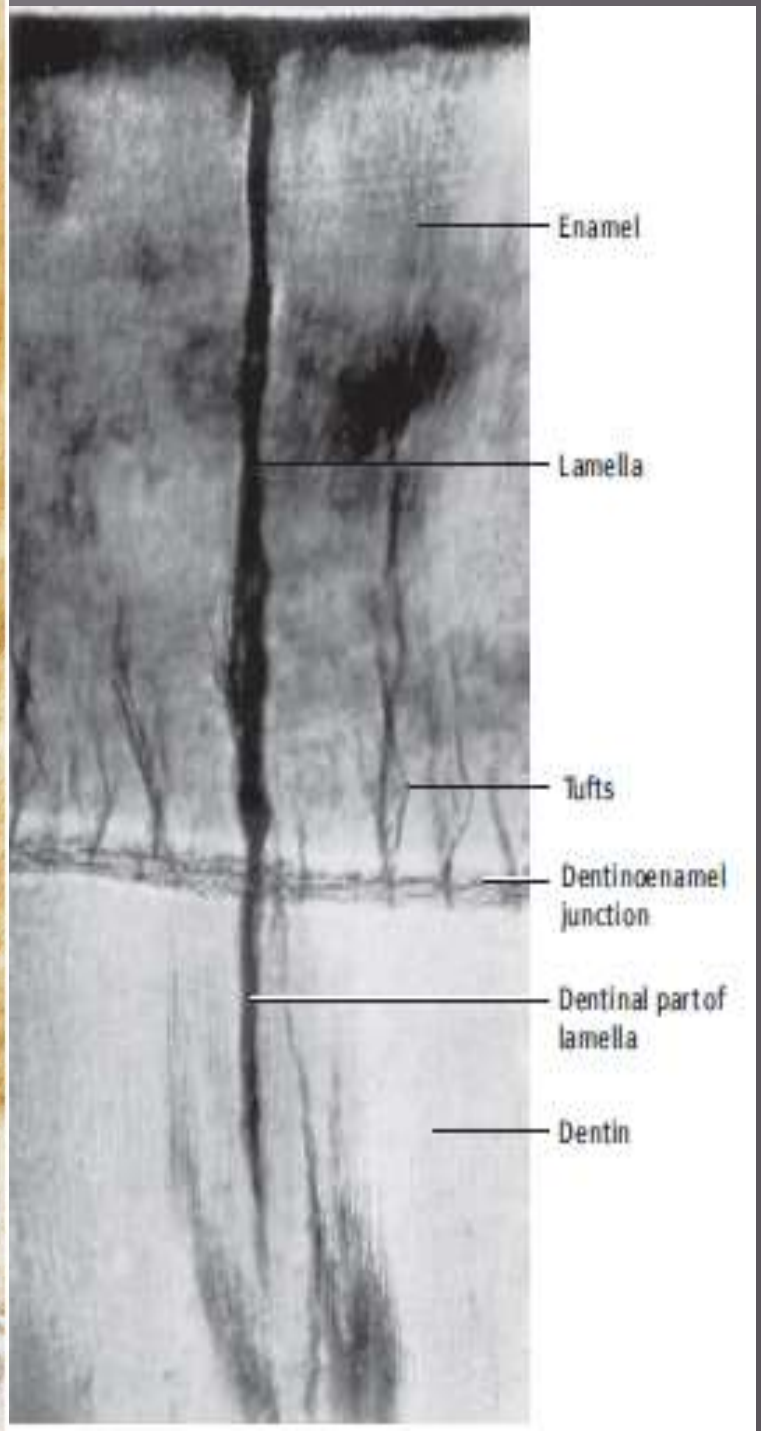

Cuspal region
Enamel
HSBs
Dentine
Absence of
HSBs
Cervical region

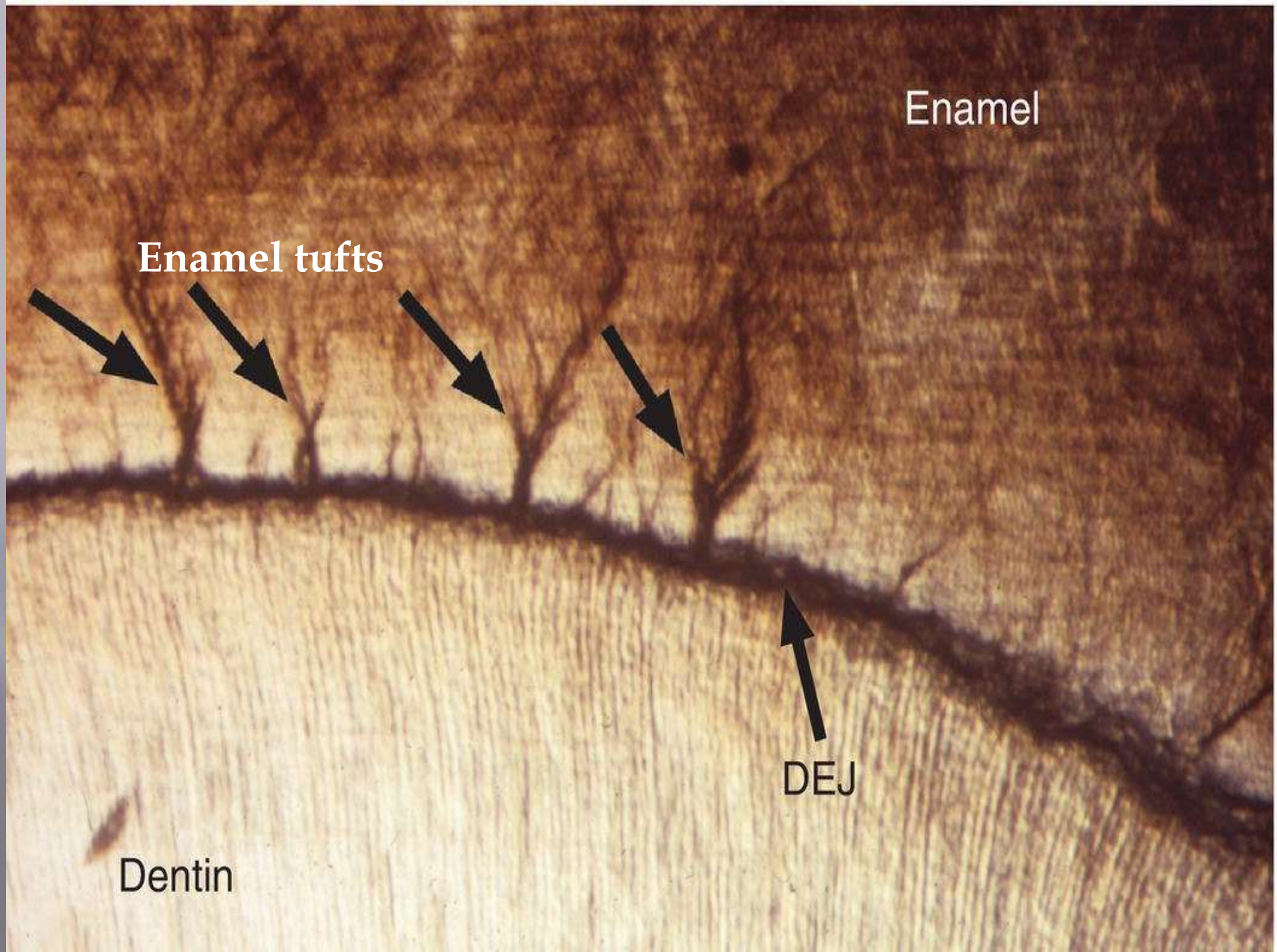


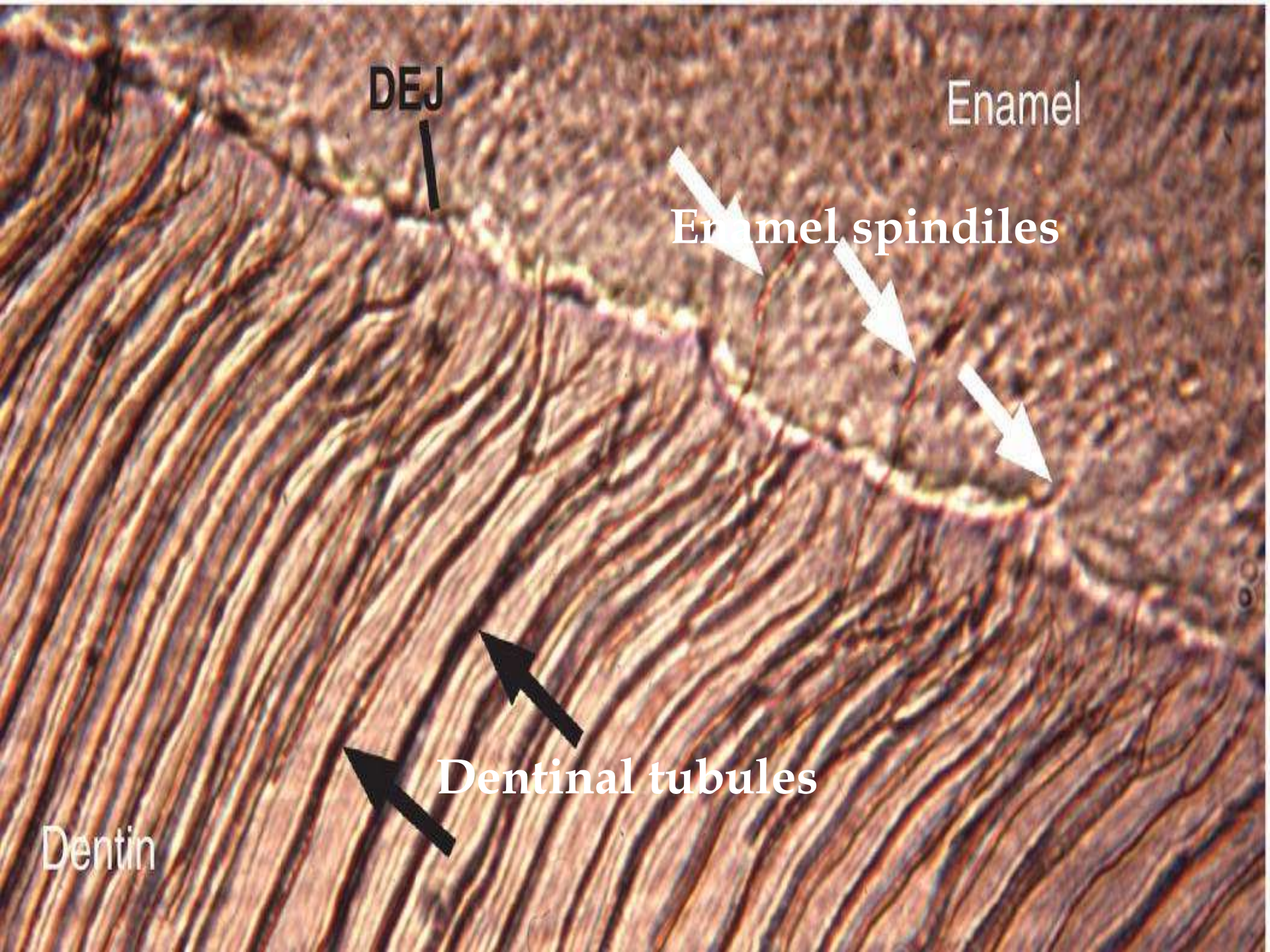
Incremental lines of Retzius in longitudinal ground sections. (**A**) Cuspal region. (**B**) Cervical region, X.


Fracture
Hunter-Schreger bands
Retzius lines
Neonatal line
Enamel
Dentin
Fracture
4x


Enamel
Lamella
DEJ


Enamel
Lamella
Tufts
Dentinoenamel junction
Dentinal part of lamella
Dentin


Enamel
Enamel tufts
DEJ
Dentin


DEJ
Enamel
Enamel spindiles
Dentinal tubules
Dentin


Thank you