

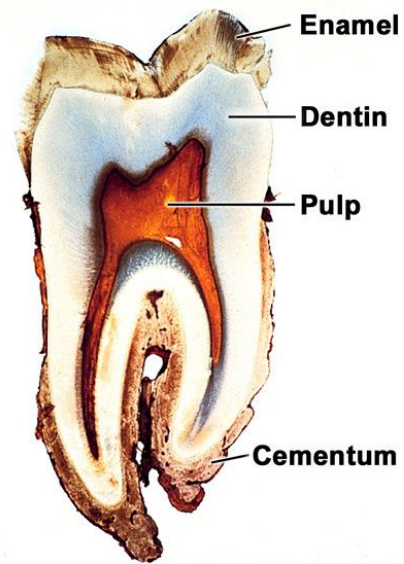
# Tandorganet

Introduktion af tandens væv

16. sep 2024



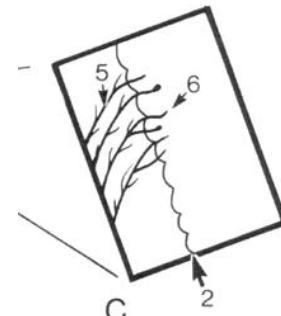
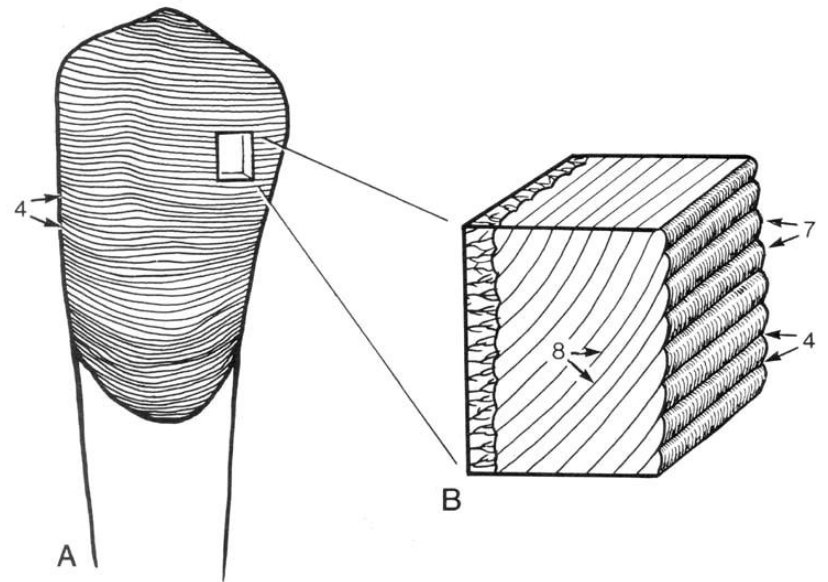
# TANDEN



# EMALJENS OVERFLADER



- YDRE
  - Emaljehinde
  - Emaljeoverflade
  - Perikymatier





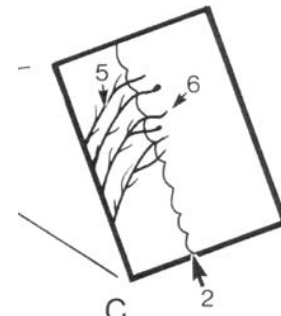
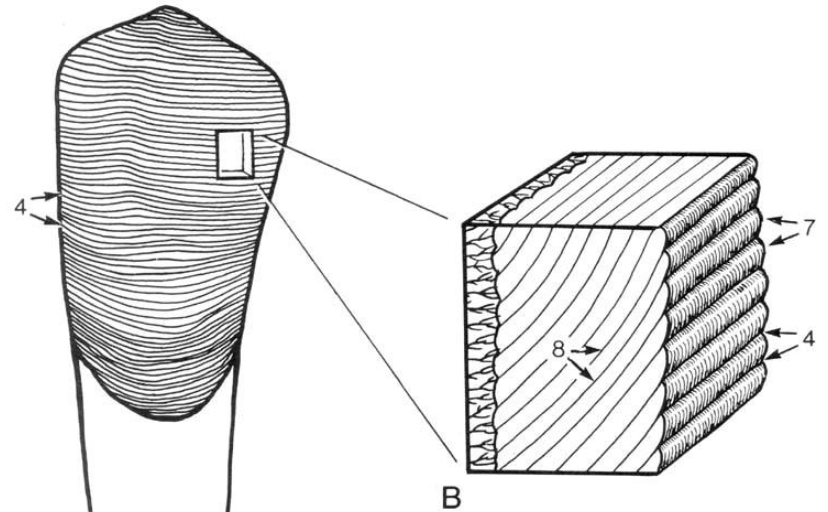
# EMALJENS OVERFLADER

- YDRE

- Emaljehinde
- Emaljeoverflade
- Perikymatier

- INDRE

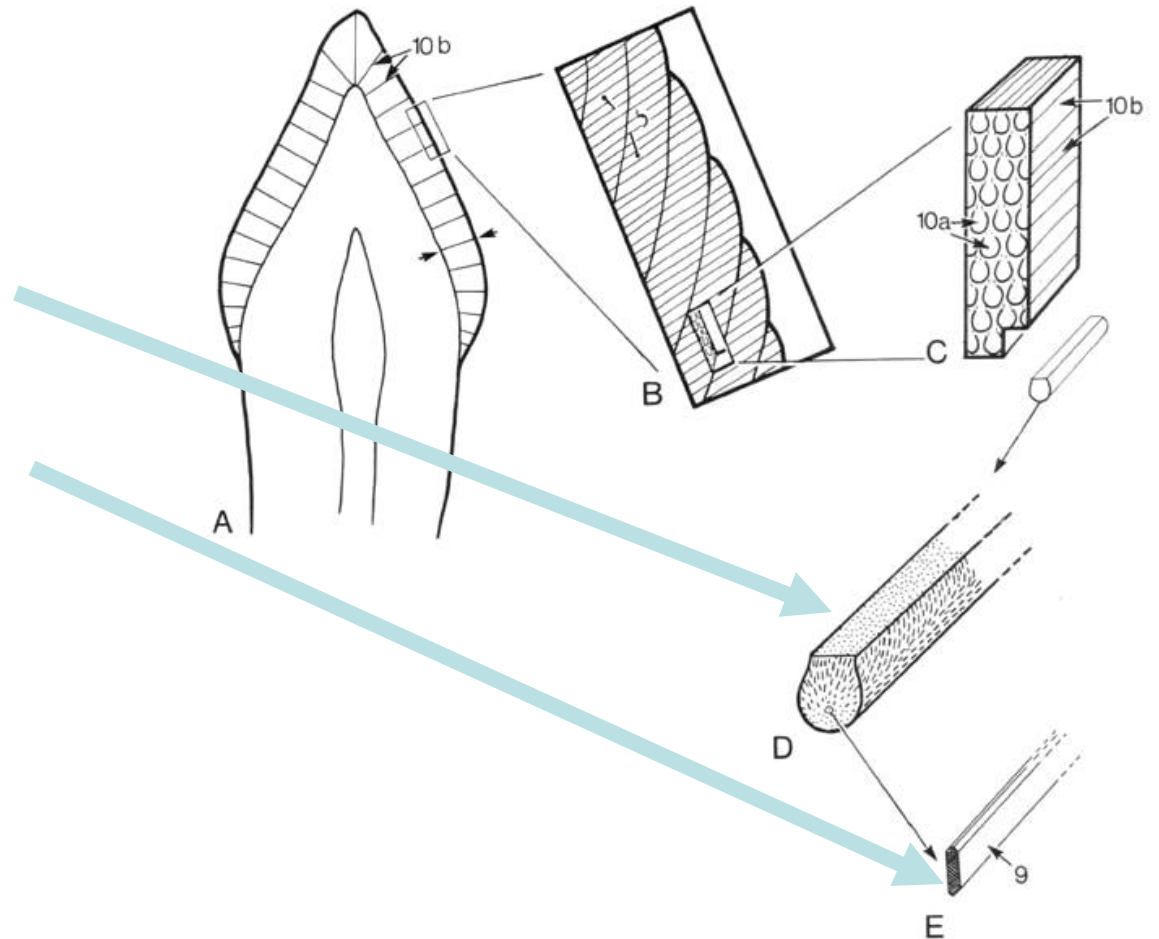
- Emaljedentingrænse
- Odontoblastudløbere fra dentin (emaljetene)



# EMALJENS MINERALISERING



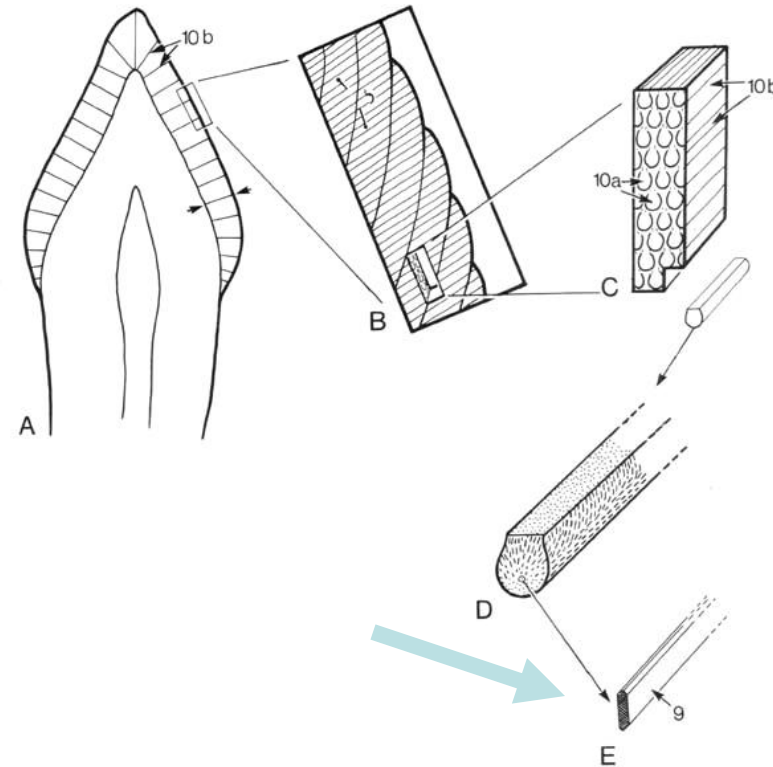
- Prismer
- Krystaller



# EMALJENS MINERALISERING



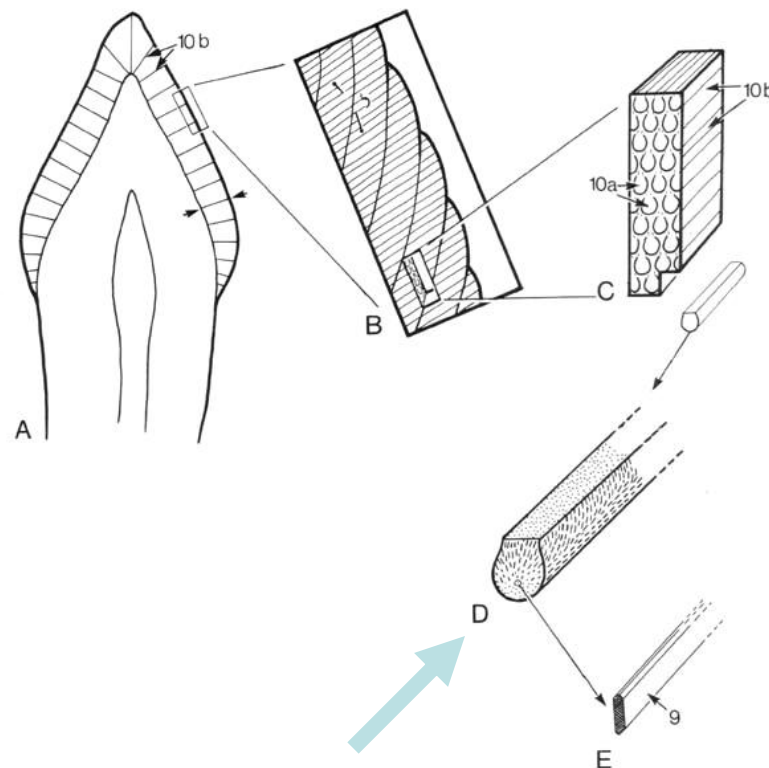
- Krystaller
  - Submikroskopiske (EM)
  - “Små krystalitter”



# EMALJENS MINERALISERING



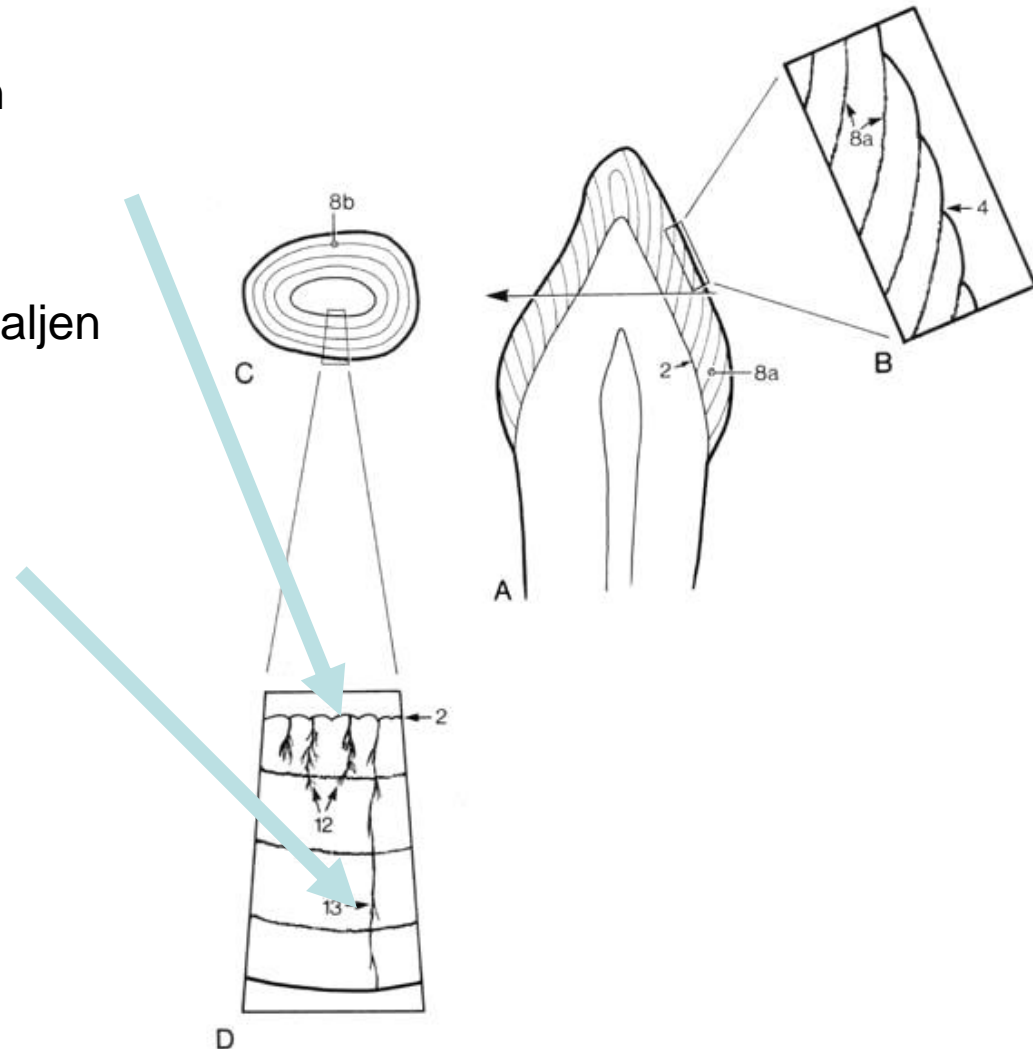
- Krystaller
  - Submikroskopiske (EM)
  - “Små krystalitter”
- Prismer
  - “Større enheder”
  - Stavformede og afrundede i tværsnit
  - 3-6  $\mu\text{m}$  i tykkelse
  - Tykkest mod ydre emaljeoverflade
  - Næsten vinkelret på overflader



# SPECIELLE EMALJESTRUKTURER



- Emaljebuske
  - Kort stykke ud i emaljen
  - proteinholdige
- Emaljelameller
  - Hele vejen igennem emaljen
  - proteinholdige

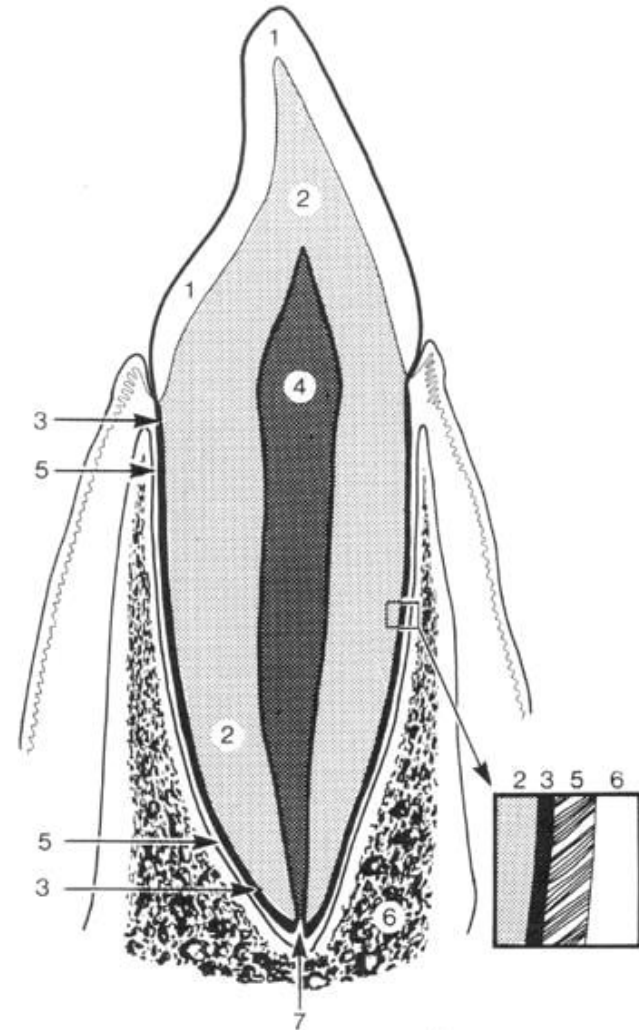




# DENTIN



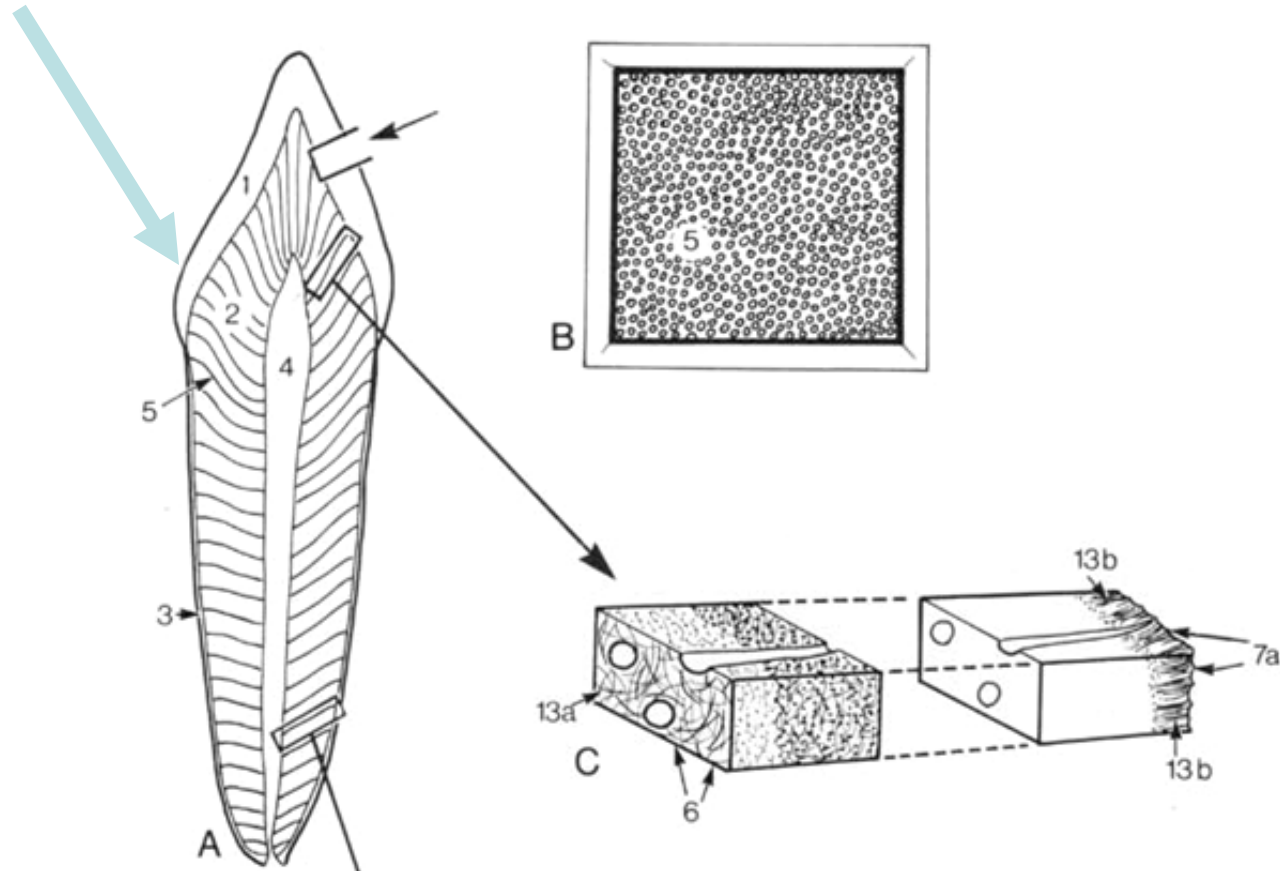
- Gullig, hård
- Støttevæv
  - kollagene fibriller
  - amorf grundsubstans
  - mineralsalte



# DENTINKANALER



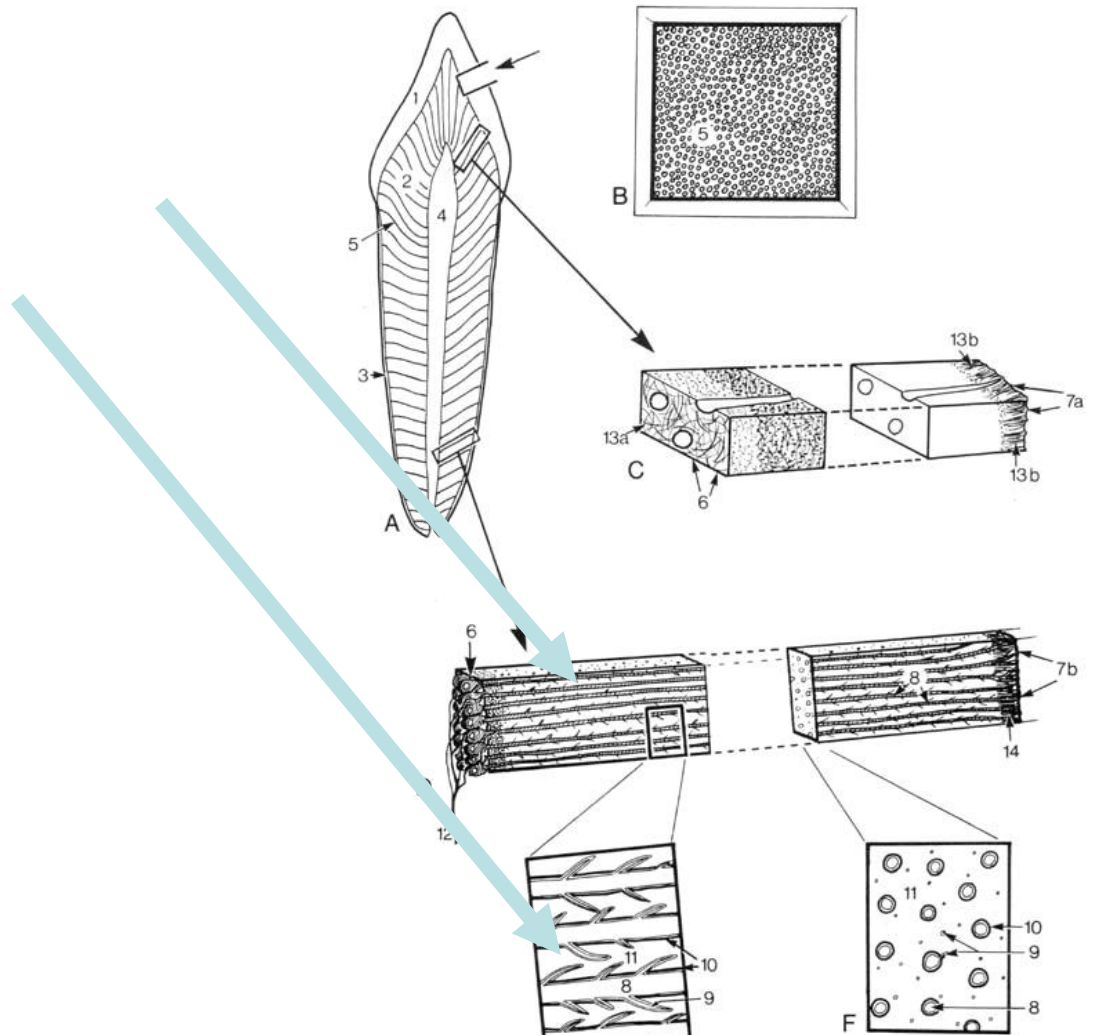
- S-formet forløb
- celleudløbere



# DENTINKANALER



- Indhold
  - odontoblastudløbere
  - ofte forgrenede
  - extracellulær væske
  - enkelte nervetråde

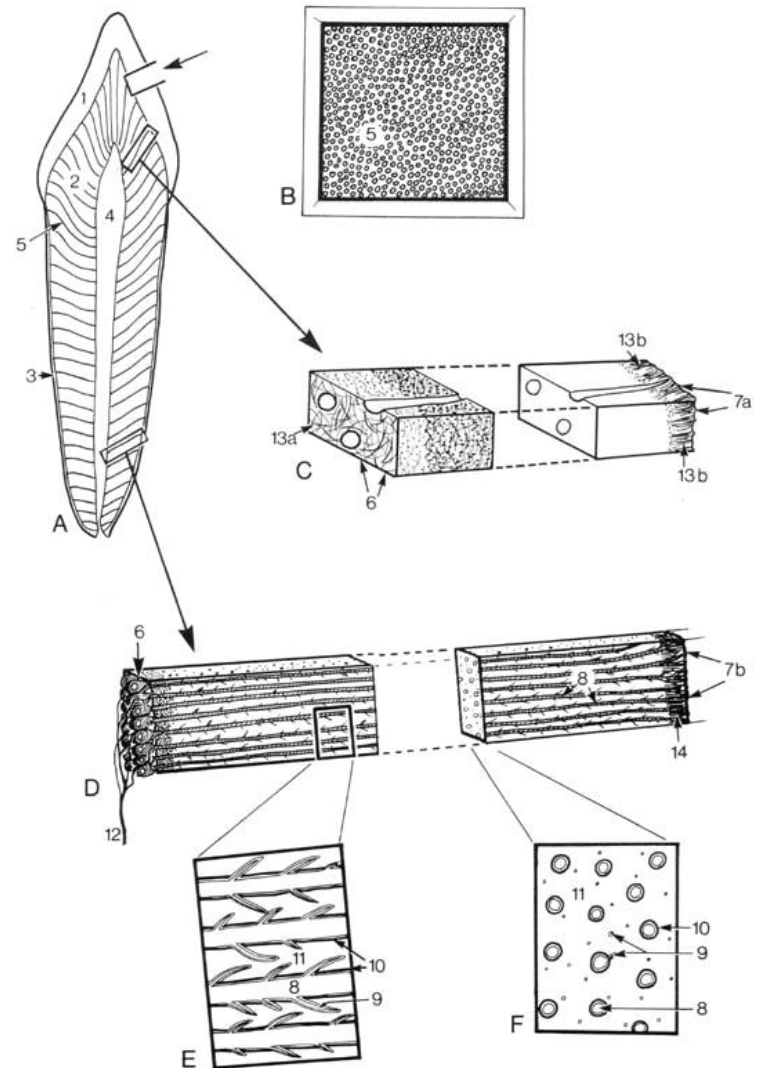


# DENTINKANALER

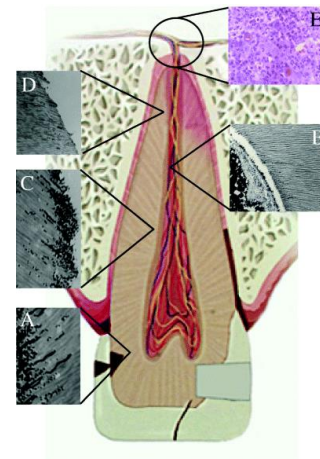


## Antal

- fra 12.500 / mm<sup>2</sup> (perifert)
- til 50.000 / mm<sup>2</sup> (centralt)
- mindre diameter i dentintubuli perifert



# //RISIKO FOR BAKTERIEL INVASION I DENTINKANALER



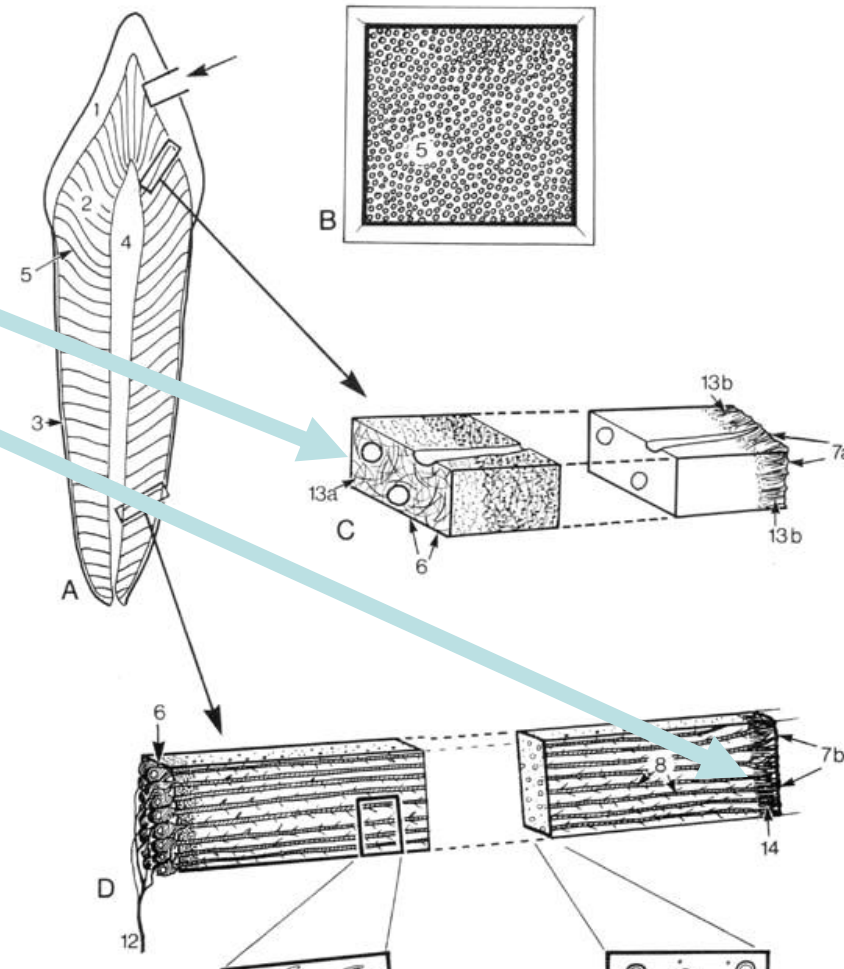
## Diameter

- størst nær pulpa ca 2-3  $\mu\text{m}$
- mindre perifert ca 1  $\mu\text{m}$
- bakteriestørrelse < 1  $\mu\text{m}$

# DENTIN



- Kollagenen er uorganiseret
  - parallelt med overflade (for det meste)
  - ydre kappedentin vinkelret på overflade

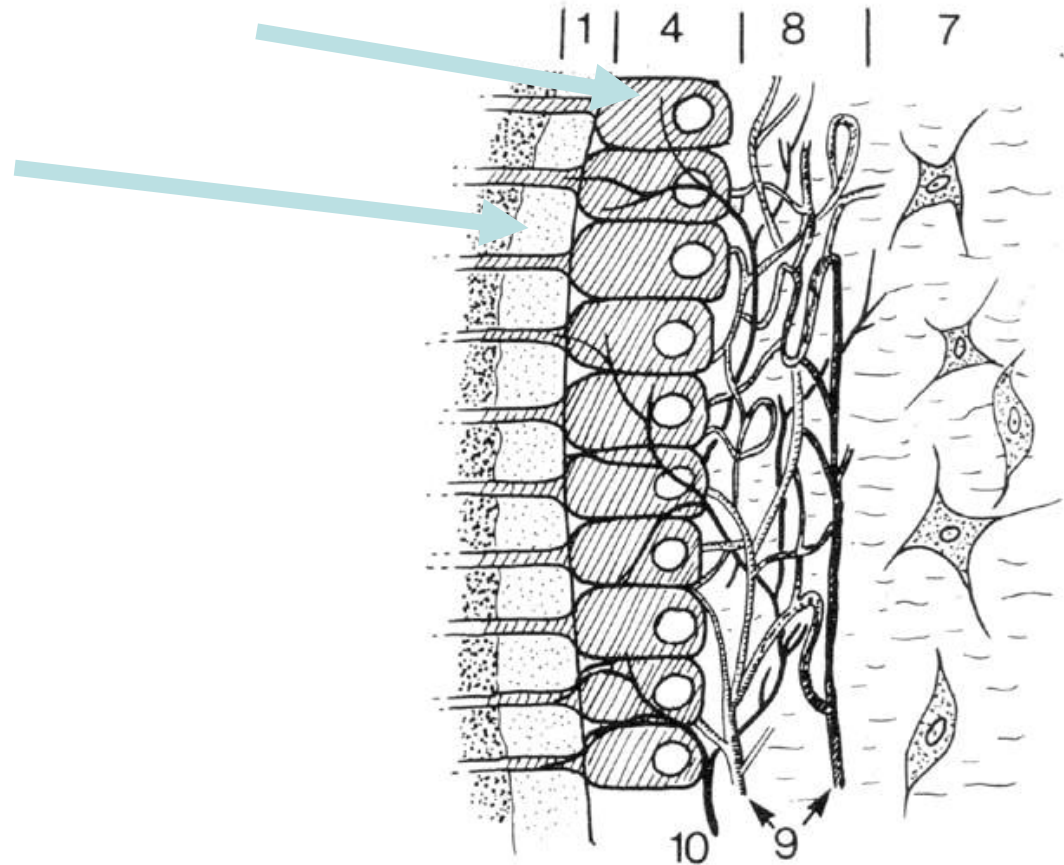




# DENTIN



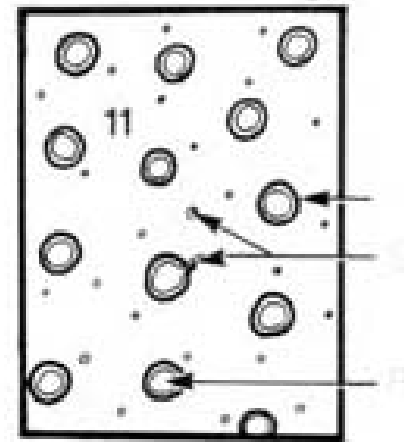
- lag af odontoblaster
- lag af prædentin
  - umineraliseret
  - tynd bræmme



# DENTIN



- peritubulær dentin
- intertubulær dentin

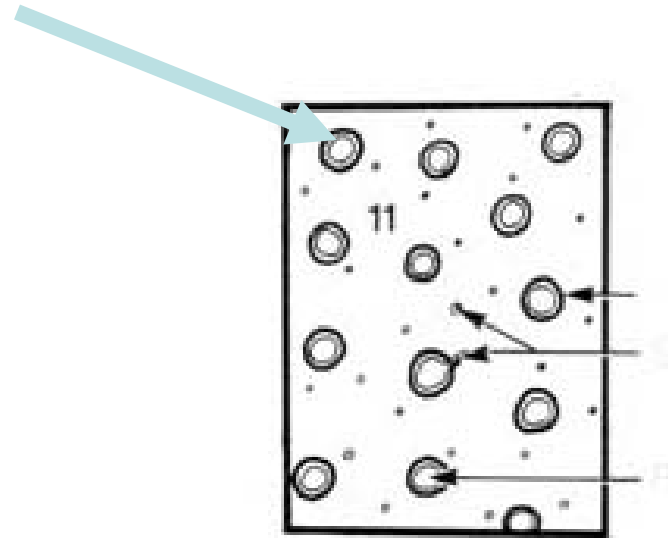




# DENTIN



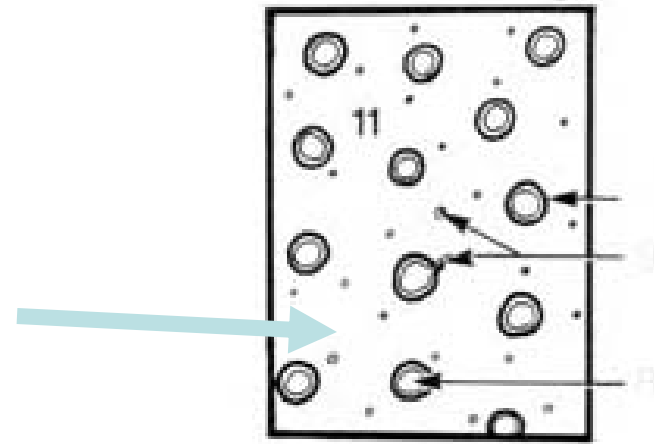
- peritubulær dentin
  - i væggen af tubuli
  - meget mineraliseret
- intertubulær dentin



# DENTIN



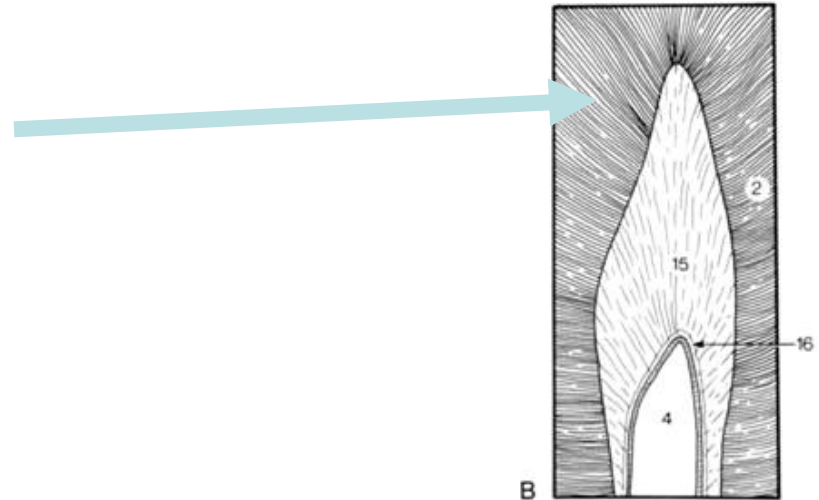
- peritubulær dentin
  - i væggen af tubuli
  - meget mineraliseret
  
- intertubulær dentin
  - mellem tubuli
  - flere kollagene fibriller
  - mindre mineraliseret



# DENTIN



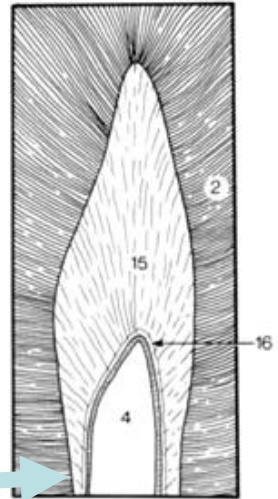
- primær dentin:
  - dannes indtil tand er færdigudviklet



# DENTIN



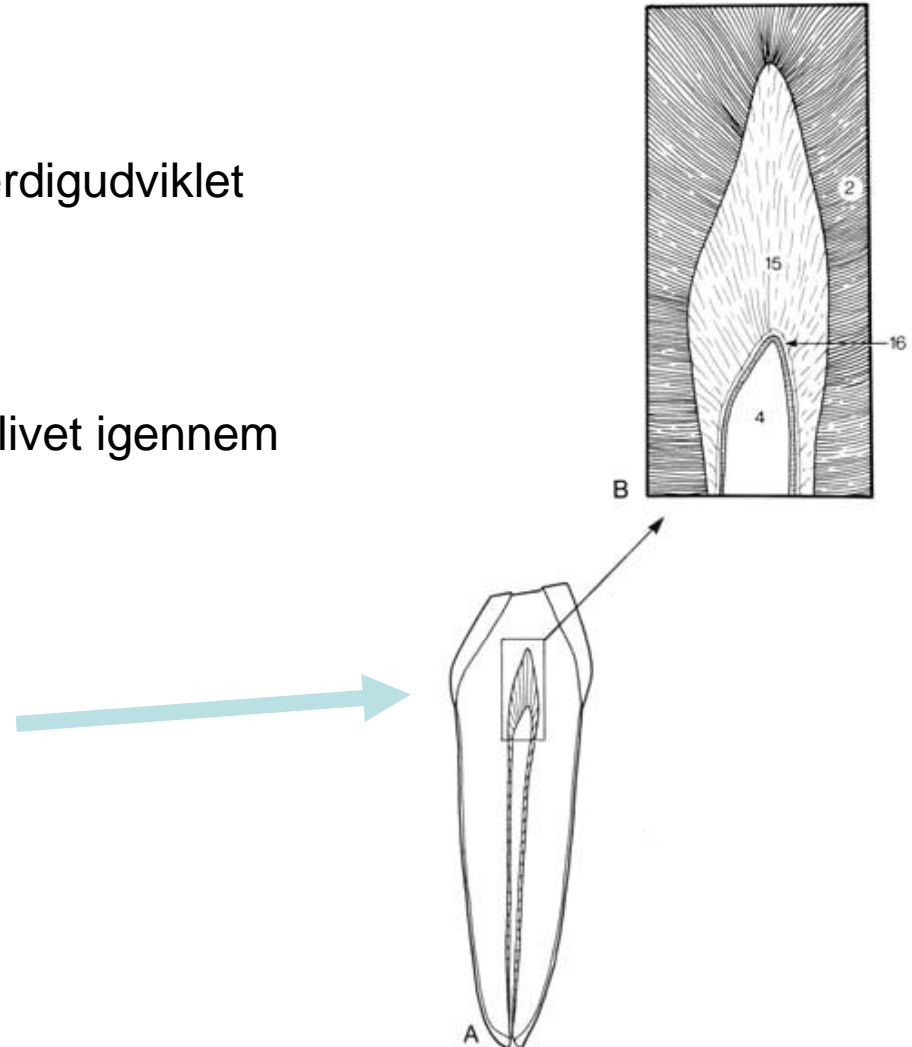
- primær dentin:
  - dannes indtil tand er færdigudviklet
- sekundær dentin
  - dannes fysiologisk hele livet igennem



# DENTIN



- primær dentin:
  - dannes indtil tand er færdigudviklet
- sekundær dentin
  - dannes fysiologisk hele livet igennem
- tertiær dentin
  - sv. t. 'irritationsdentin'
  - mere uregelmæssig

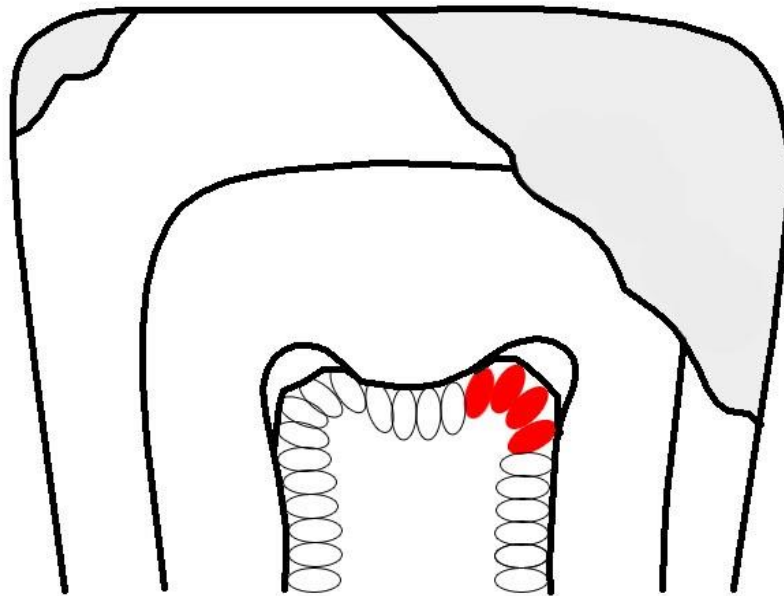


# DENTIN



Tertiær dentinogenese:

- reaktionsdentin (samme celler)
- reparativ dentin (nye celler)

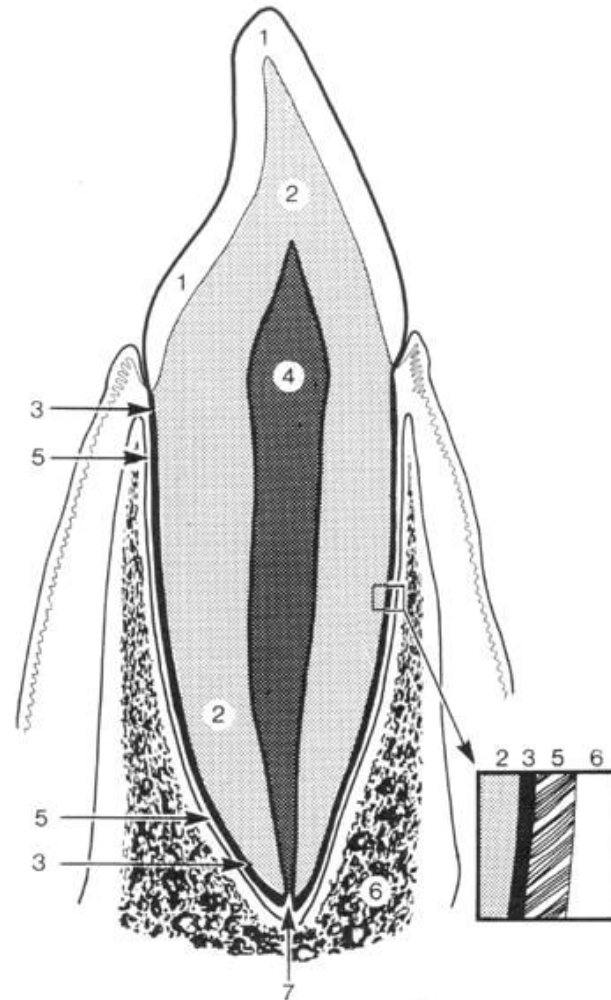


# DENTIN



## Dentin:

- har ingen kar
- indeholder ikke cellelegemer
- bliver ikke remodeleret



# Peerfeedback 2 og 2 - evt 3

## Tandvæv

Hvad er

- krystaller og prismer i emalje?

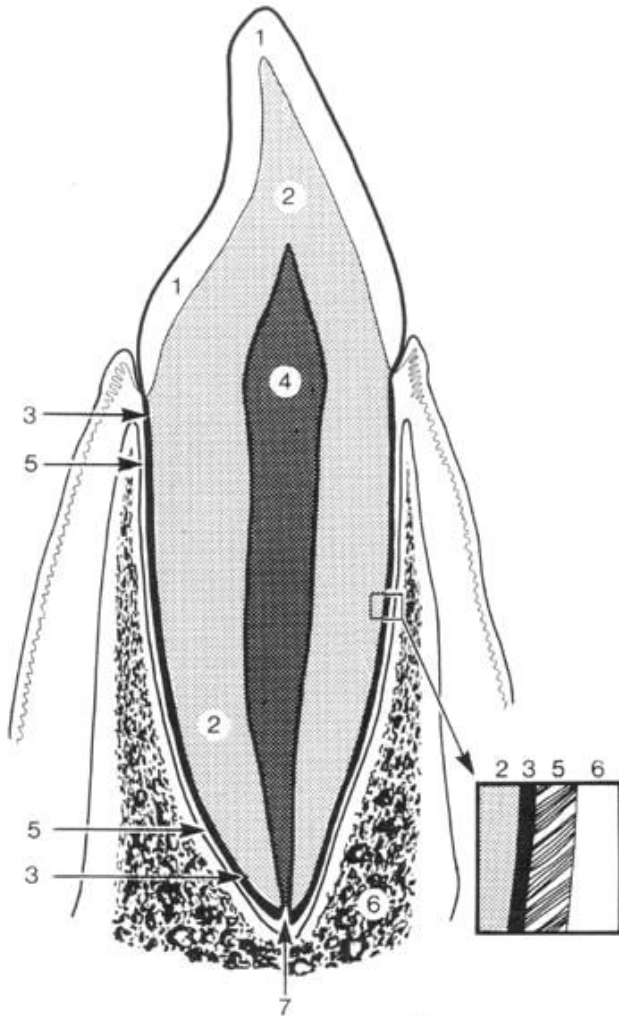
- dentin og prædentin?

- peri- og intertubulær dentin?

-



# Tandens støtteapparat

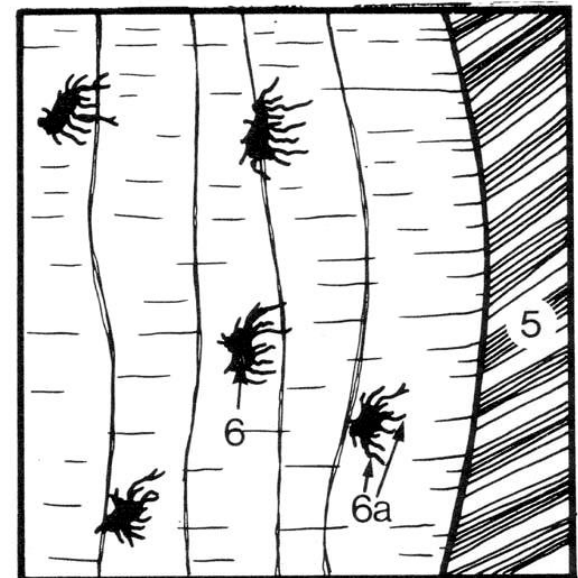


## Tandens støtteapparat

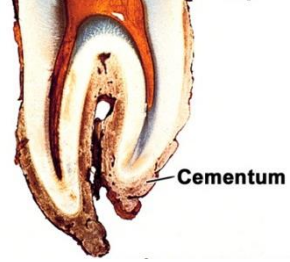
- Cement
- Rodhinde
- Alveoleknogle

# CEMENT

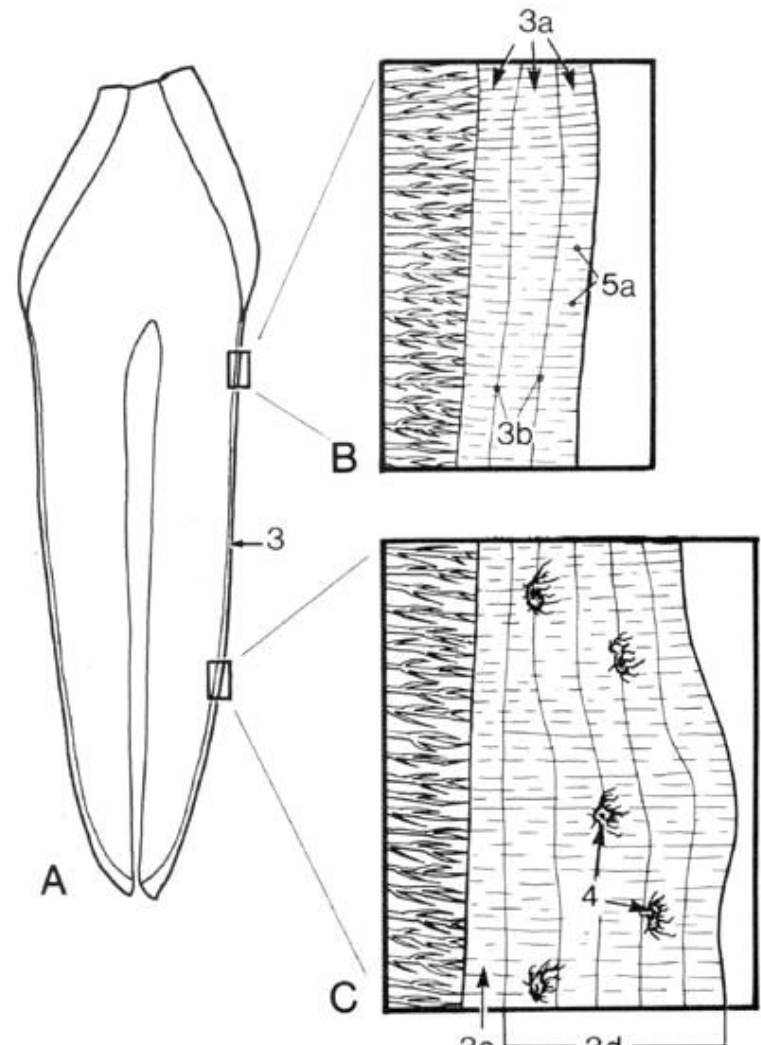
- gulligt, hårdt lag på roden
- fæster fibrilbundter fra rodhinde
- Sharpey's tråde (fibrilbundter)



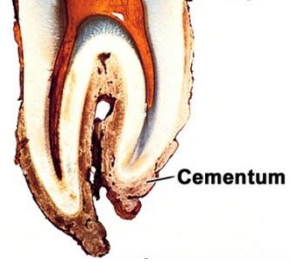
# CEMENT



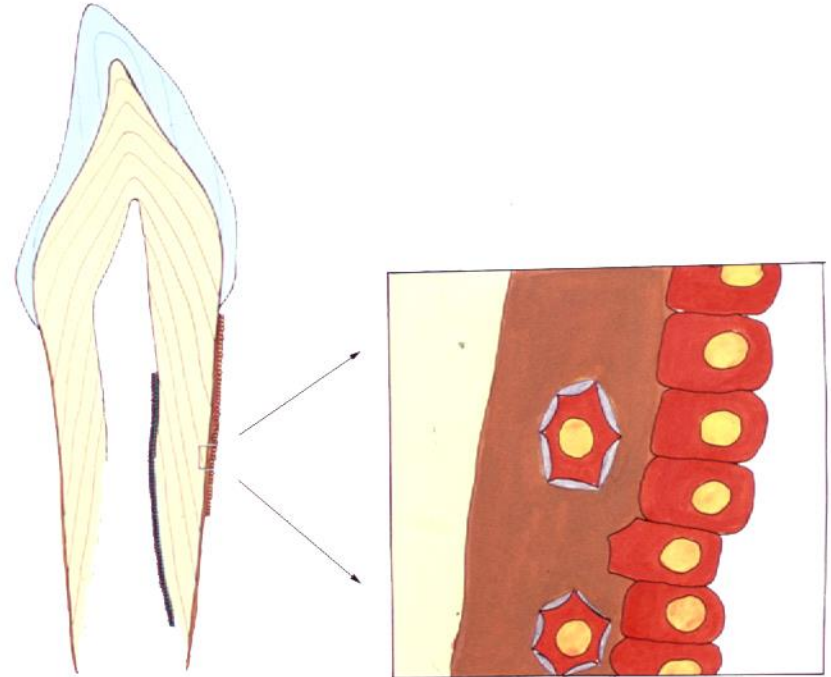
- cellefri cement
  - ind mod roddentinen
- celleholdig cement
  - udenpå flere steder
  - bl a i apikale 1/3
- cementlinier
  - er synlige vækstlinjer
  - sv t lameller i knogle



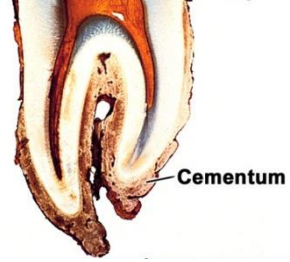
# CEMENT



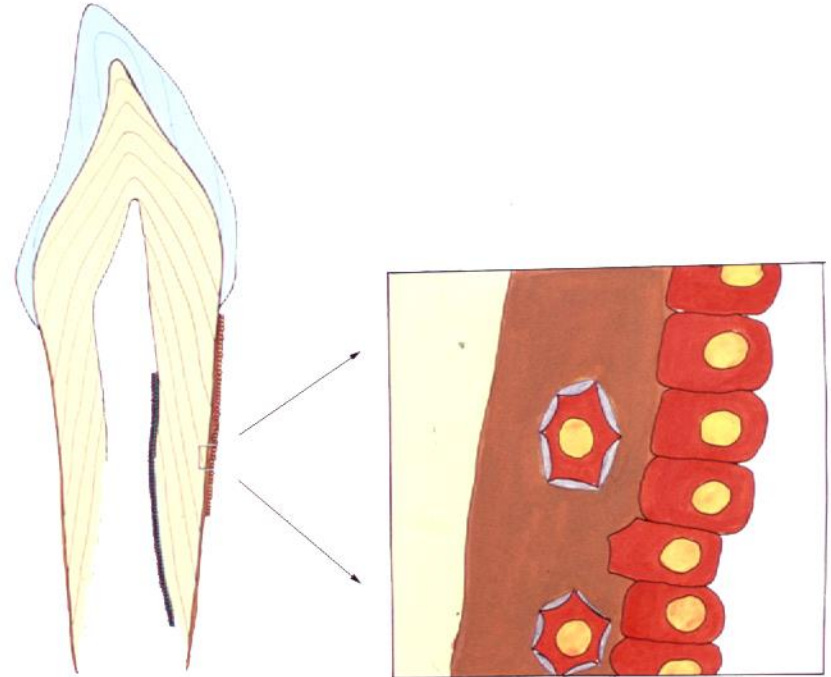
- cementoblaster på overfladen



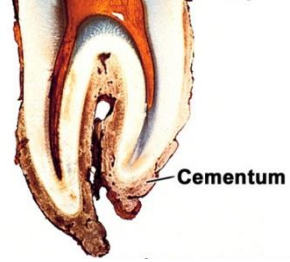
# CEMENT



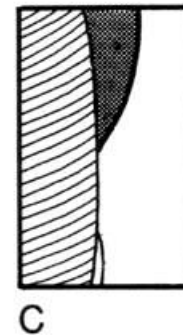
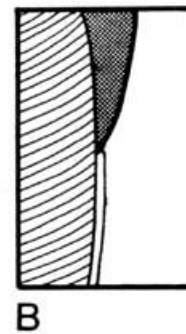
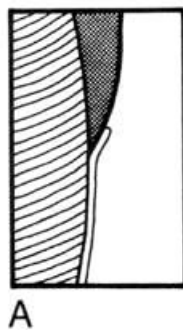
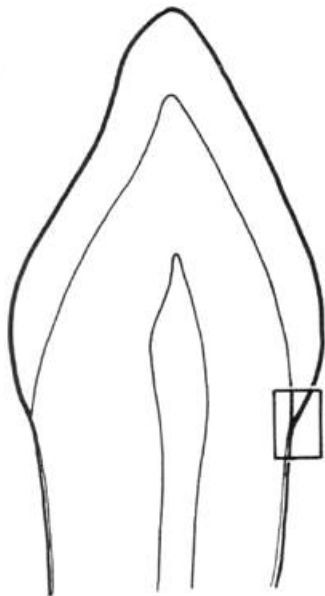
- cementoblaster på overfladen
- cementocytter indlejret i cement



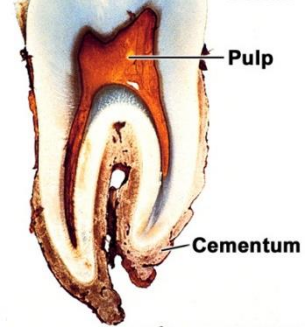
# CEMENT



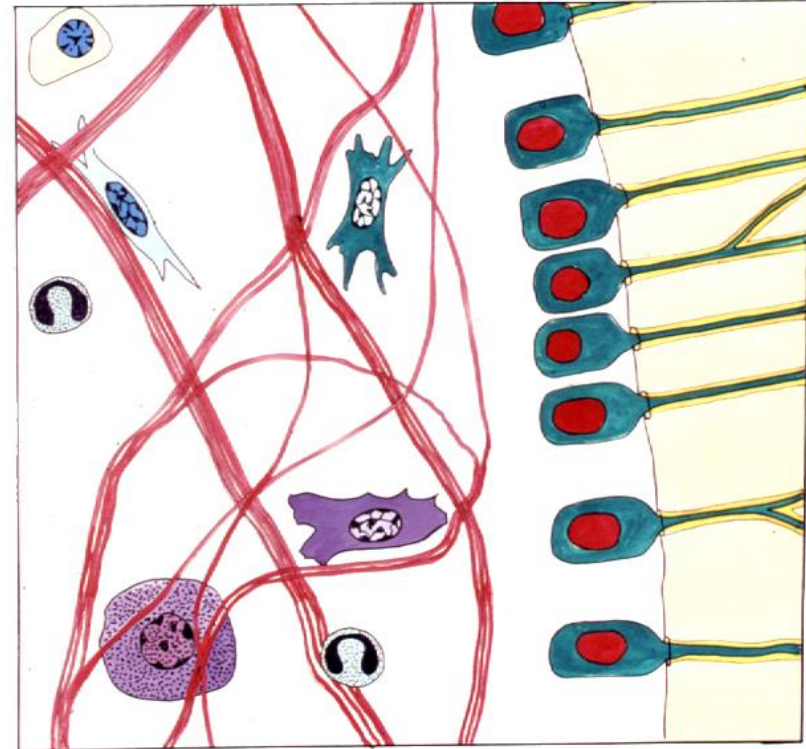
- undertiden mangler overlap mellem emalje og cement (det er følsomt for patienter)
- det skyldes at Hertwig's rodepitel persisterer



# PULPA

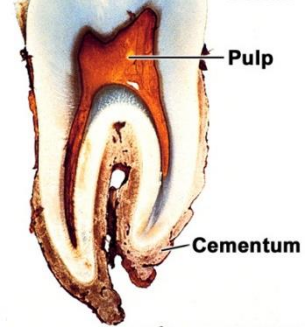


- Løst bindevæv
  - Celler
  - Kollagene fibriller
  - Amorf grundsubstans

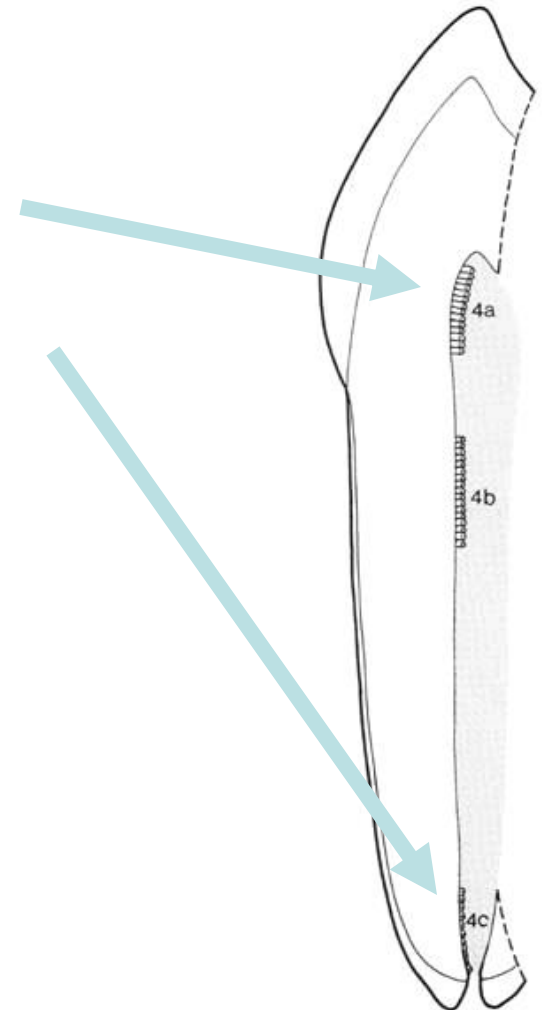




# PULPA

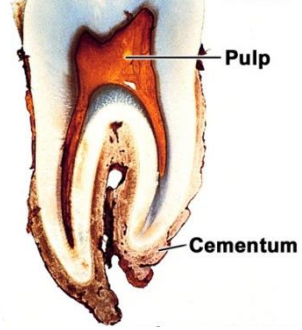


- Odontoblastlaget:
  - Prismatiske celler i kronen
  - Kubiske eller flade celler i roden

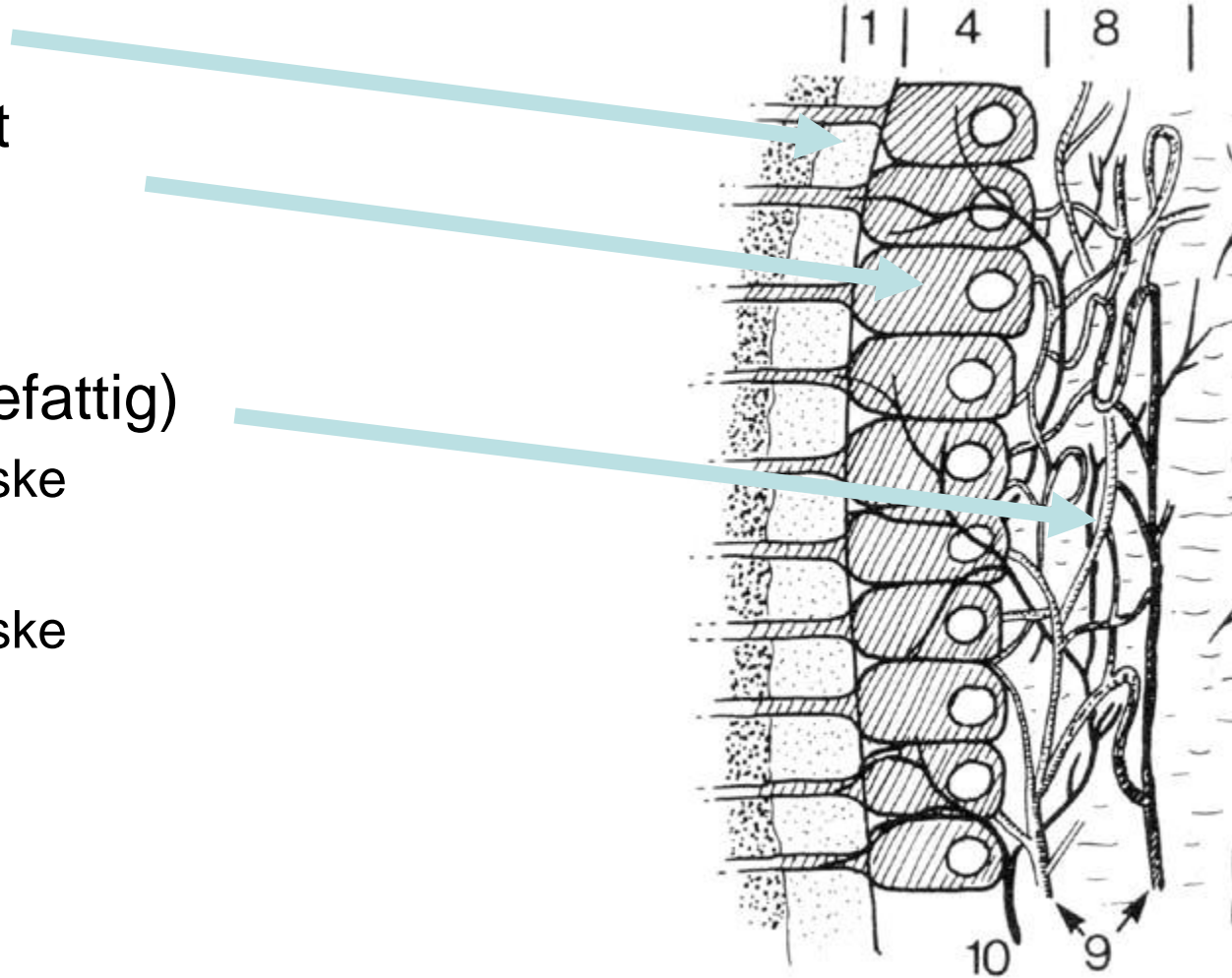




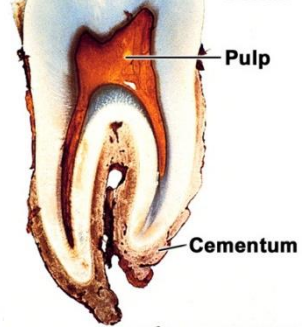
# PULPA



- Prædentin
- Odontoblastlaget
- Weil's zone (cellefattig)
  - subodontoblastiske kapillærslynger
  - subodontoblastiske nerveplexus

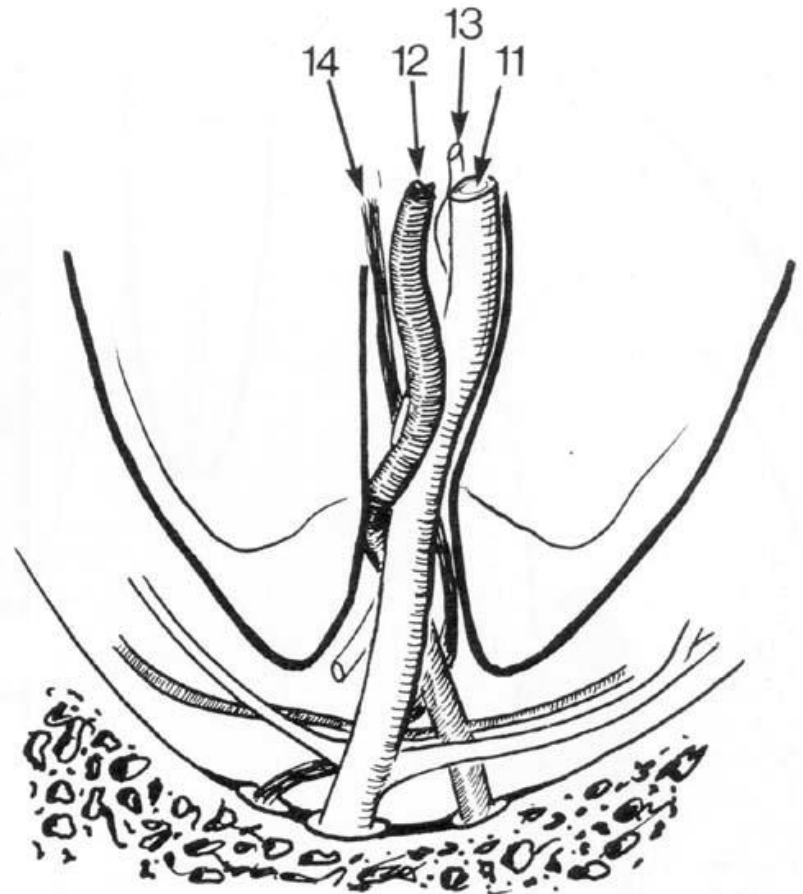


# PULPA

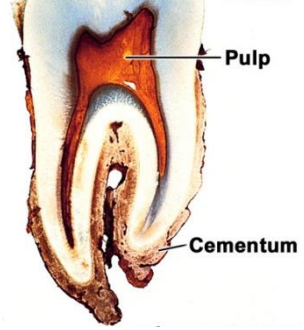


Karforsyning:

- Arterie
- Vener
- Lymfekar

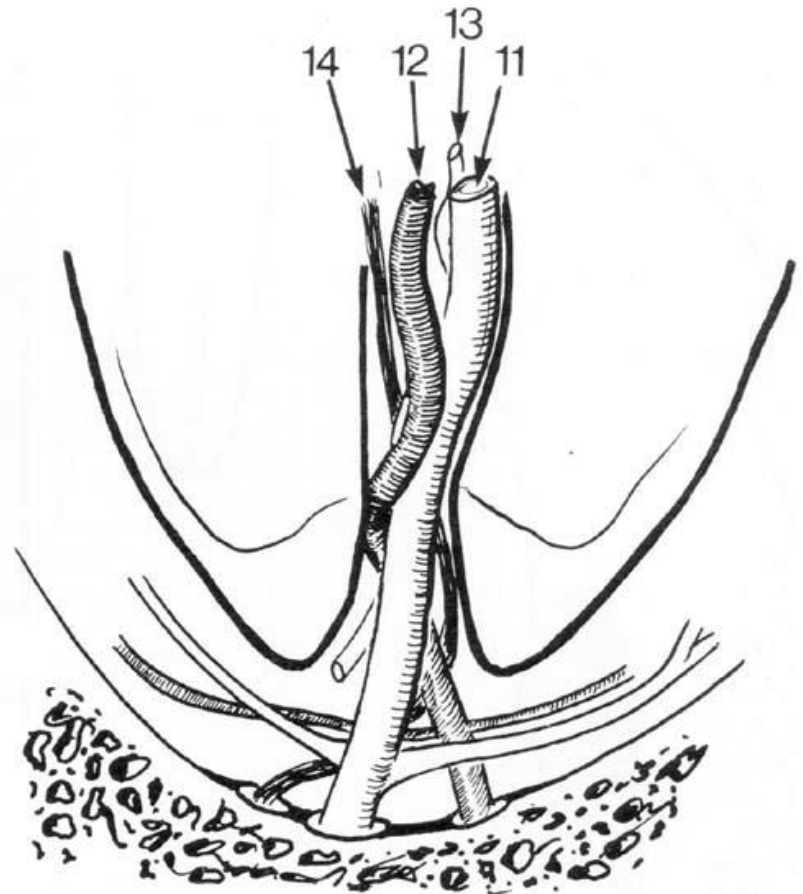


# PULPA

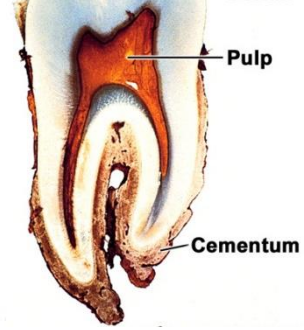


Nervetråde:

- 5-10 tynde  
nervetrådsbundter

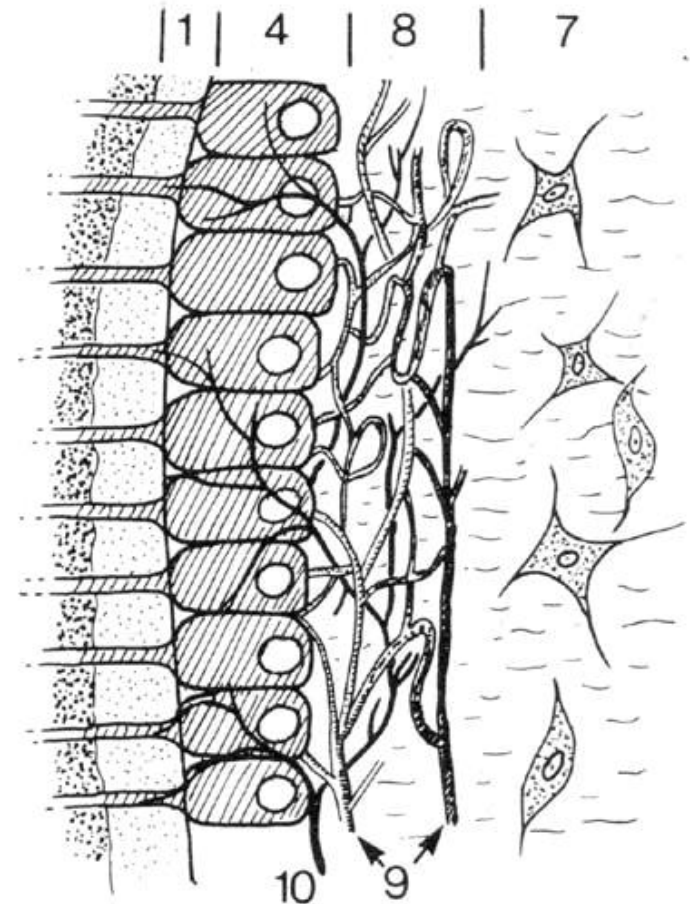


# PULPA

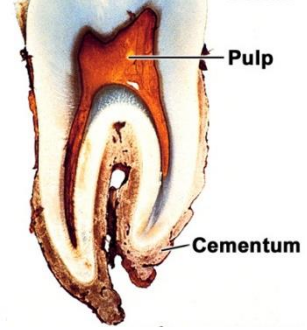


## Nervetråde:

- har alle frie nerveender
  - dvs ingen specialiserede receptorer
  - de fleste er sensitive (med/uden myelinisering)
  - resten er sympatiske tråde til kar (uden myelinisering)

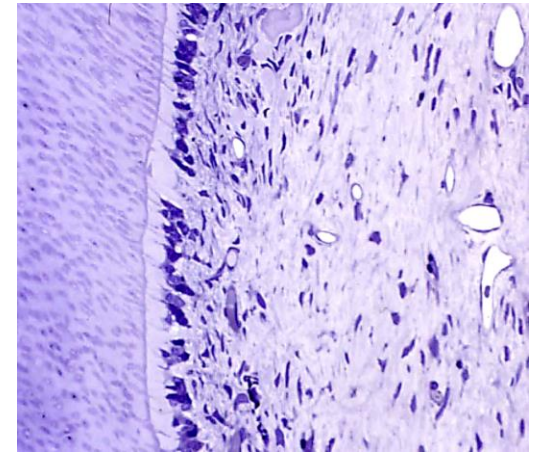


# PULPA



## Aldersforandringer:

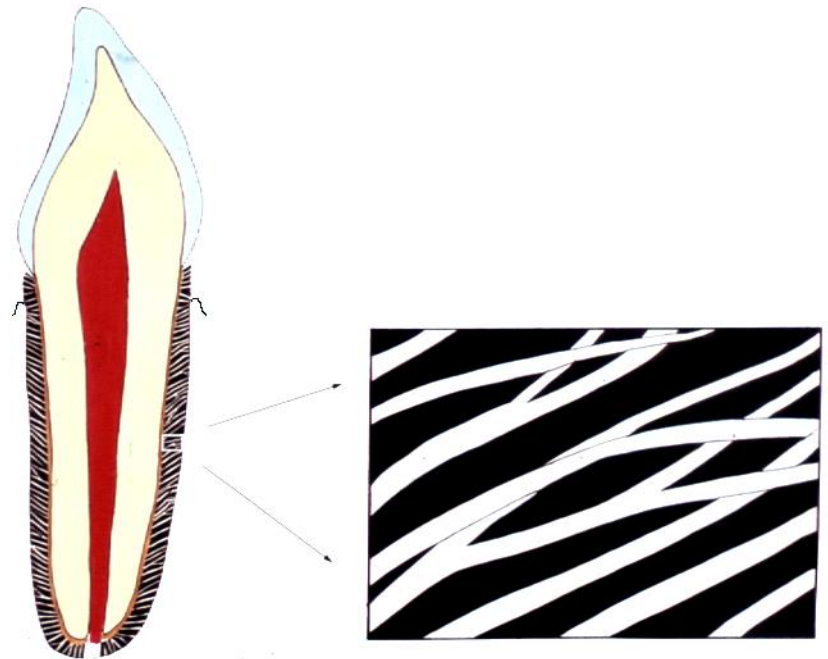
- Celletal falder
- Fibrilantal stiger
- Sekundær dentin mængde stiger



# RODHINDE

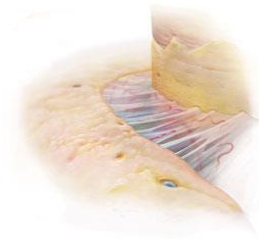


- Ligger i periodontalspalte
- Forbinder tandrod og knogle
- Er ca 0,25 mm tyk



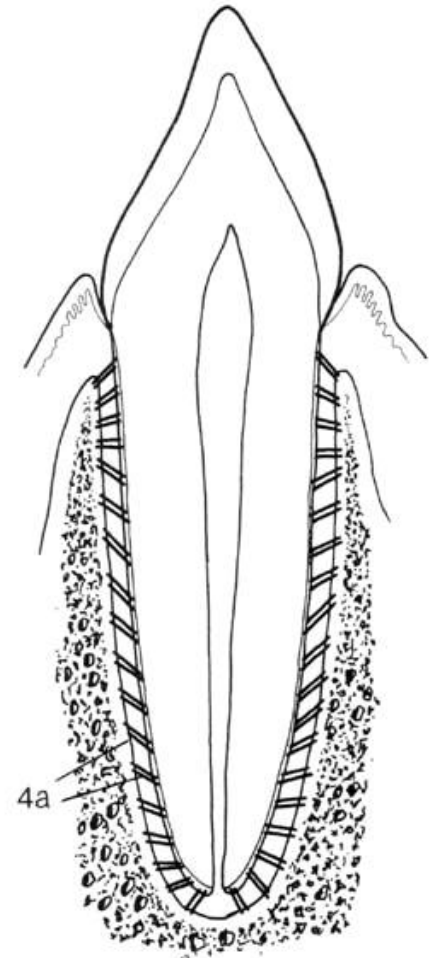


# RODHINDE

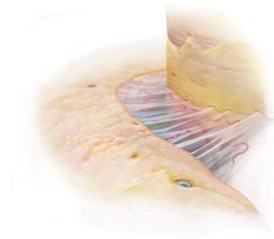


Nervetråde:

- Smerteførende
- Proprioceptive

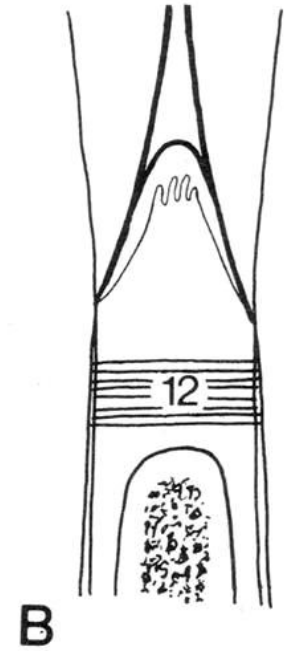
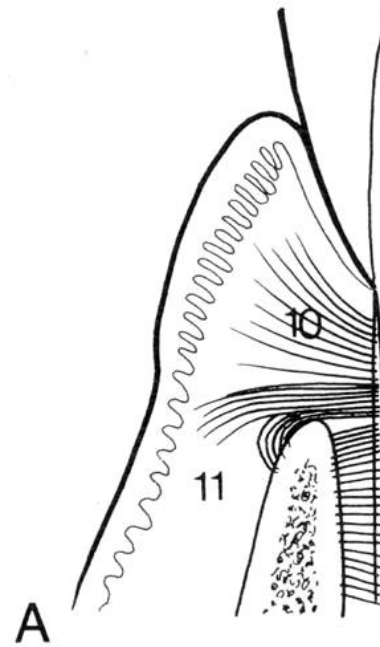


# RODHINDE



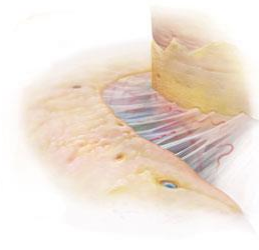
Fibre:

- Dentogingivale
- Dentoperiostale
- Dentoalveolære
- Transeptale

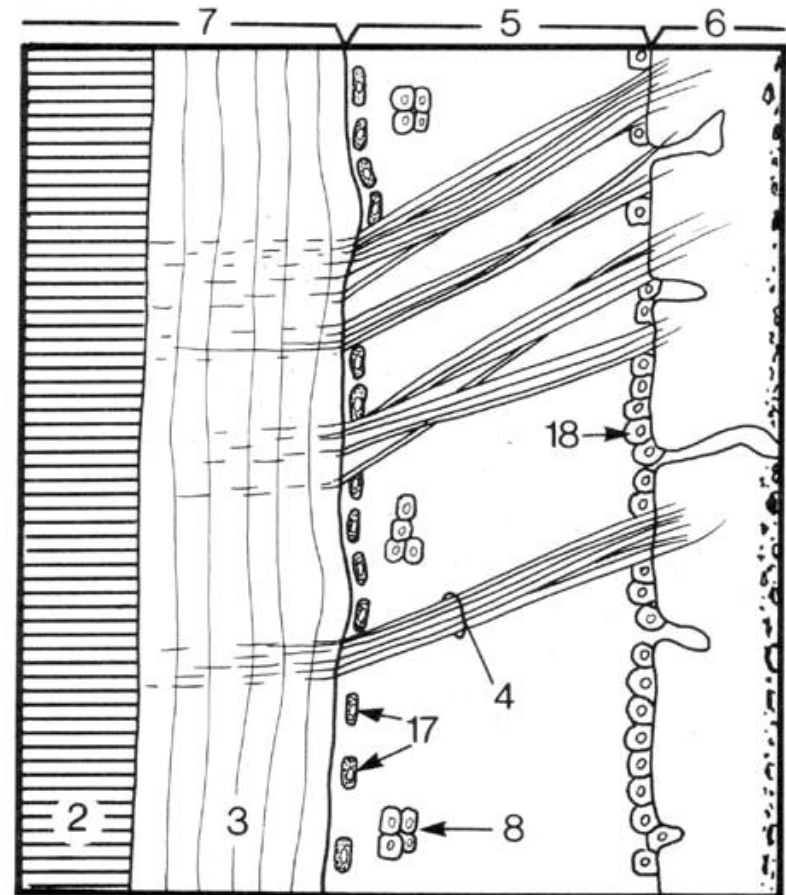
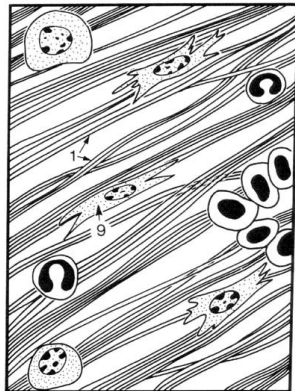




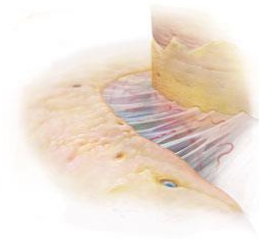
# RODHINDE



- stamceller i rodhinden kan differentiere til:
  - fibroblaster
  - osteoblaster
  - cementoblaster



# RODHINDE

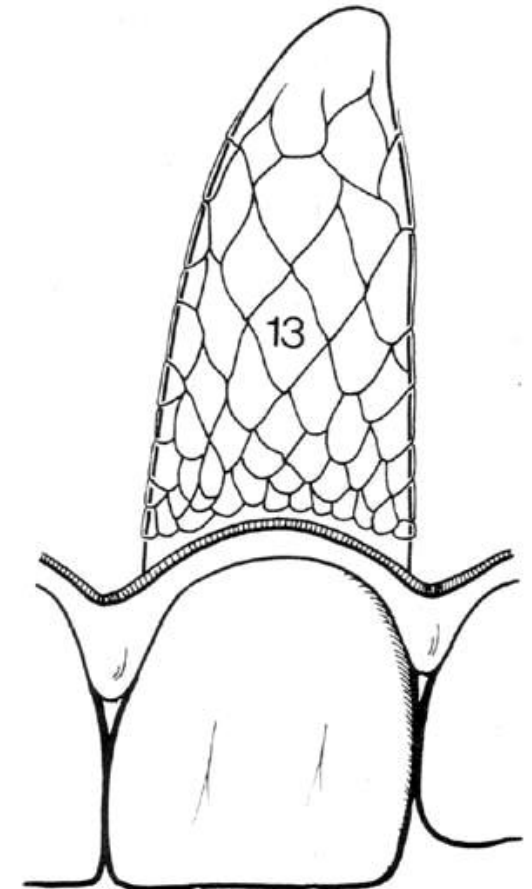


## Rester af Hertwig's rodskede:

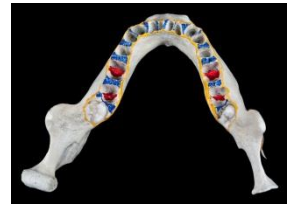
- Malassez epiteløer
- i den inderste del af rodhinde
- danner et net
- kan udvikles til cyster
- hvis det går tabt bliver det gendannet



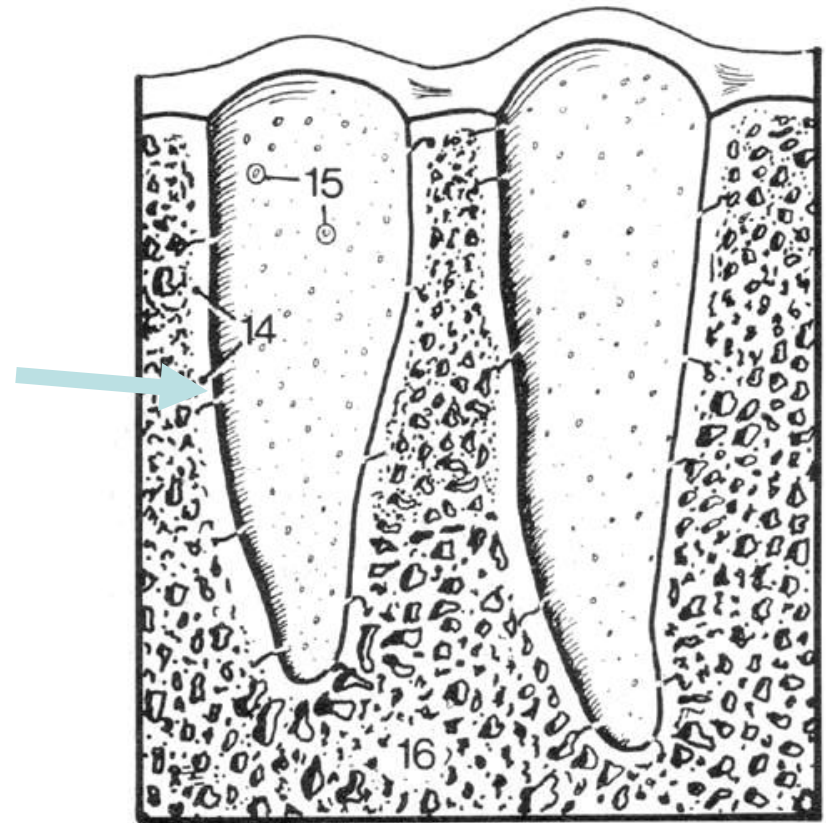
Rodhinde mellem tand og knogle



# ALVEOLEKNOGLE



- Substantia spongiosa
- Substantia compacta
  - har huller til mindre kar der forsyner rodhinden



# GINGIVA

- er rosa, mat, let nubret ("chagrineret")

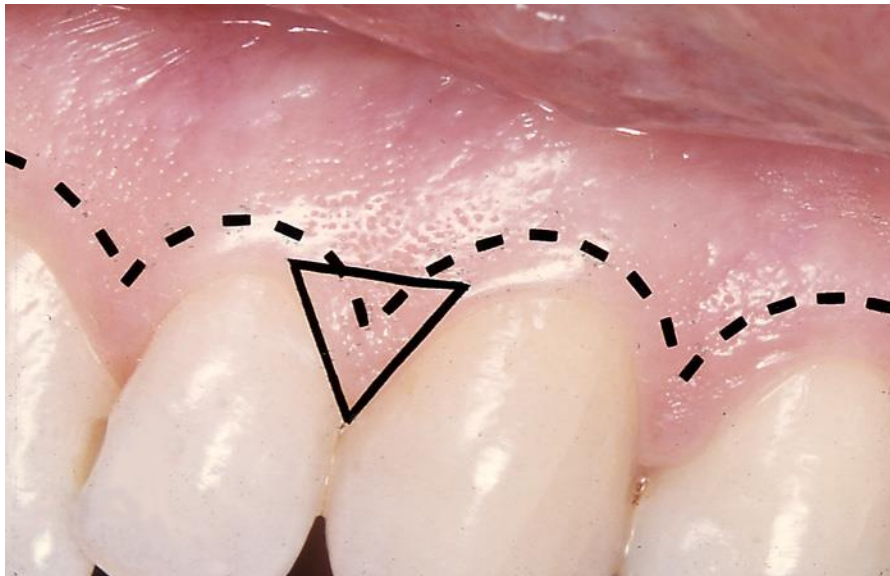




# GINGIVA

Stiplet linie afgrænser:

- Fast bundne gingiva
- Frie marginale gingiva

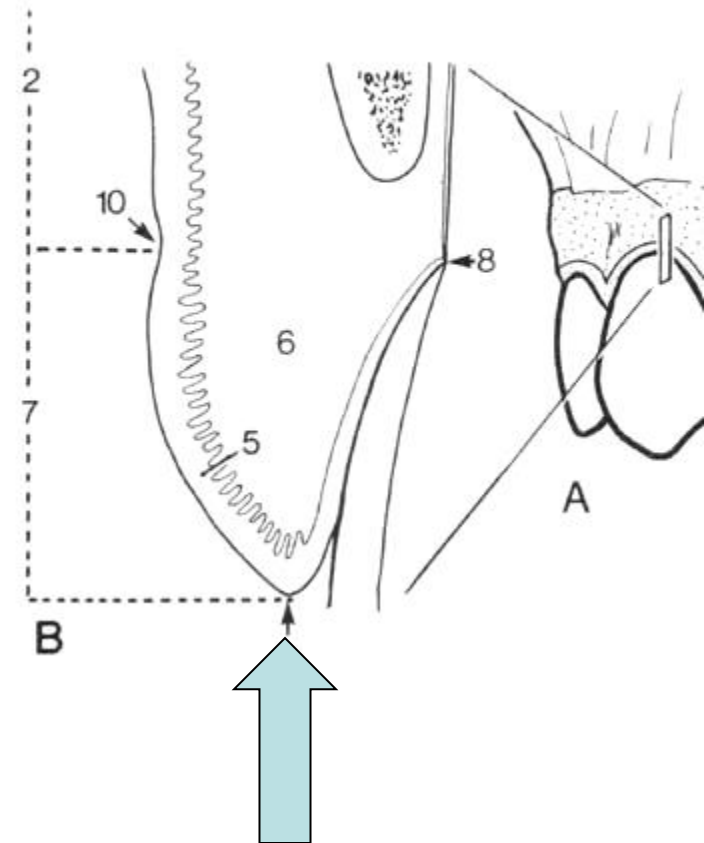




# GINGIVA



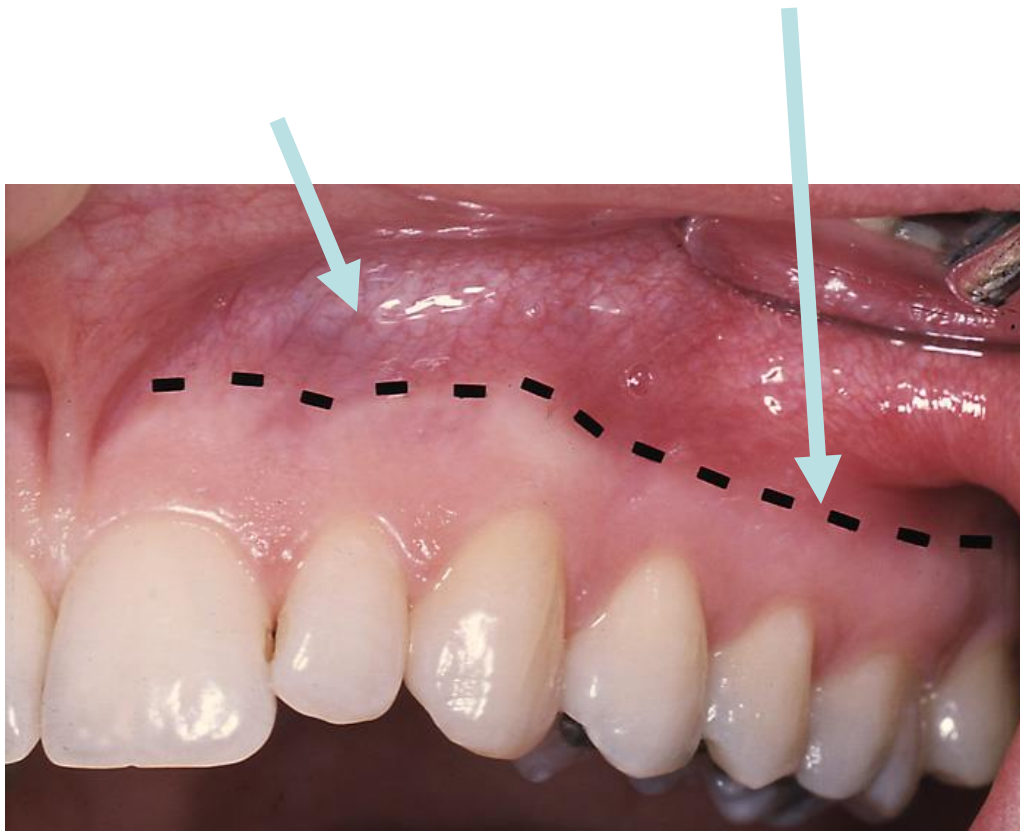
- Gingivalranden





# GINGIVA

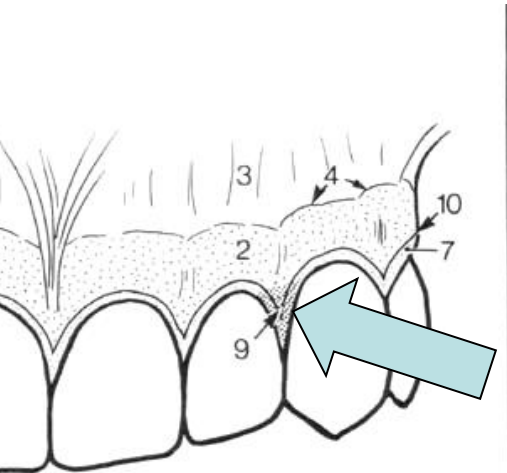
- Mucogingivale grænse
- Alveolære mucosa



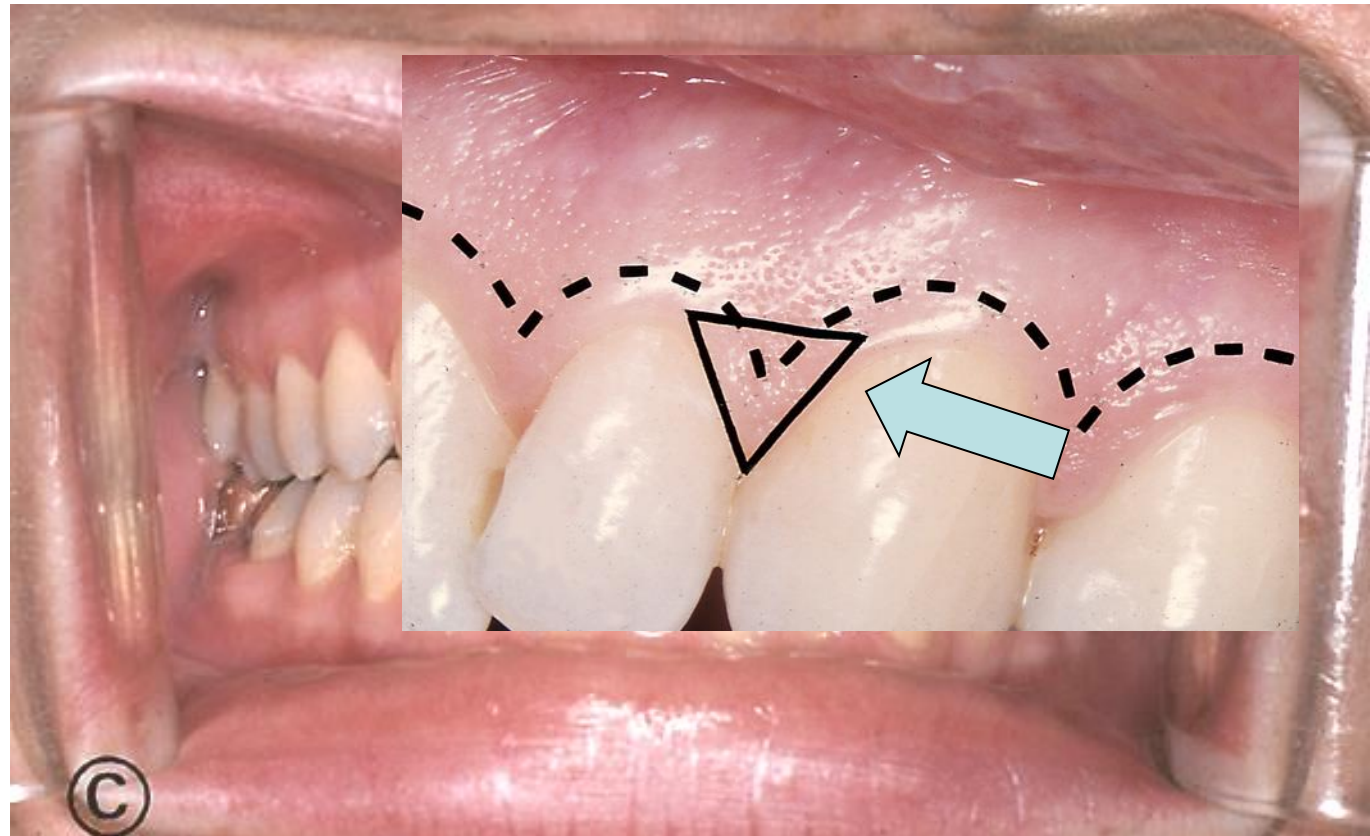
# GINGIVA



- Interdentalpapiller



IOOS, AU

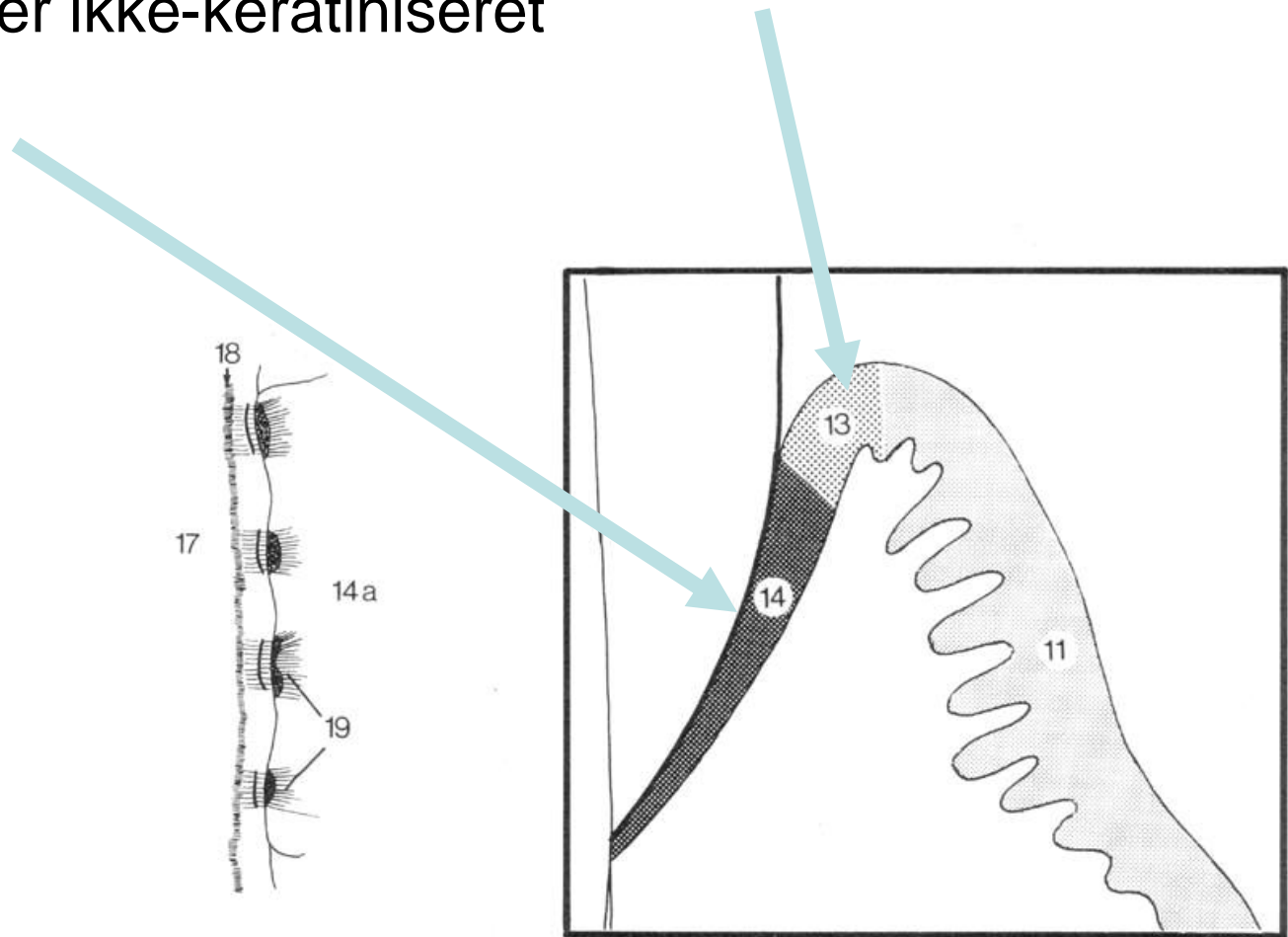






# GINGIVA

- Oralt sulcusepitel (ikke i tandkontakt)
- Kontaktepitel er ikke-keratiniseret

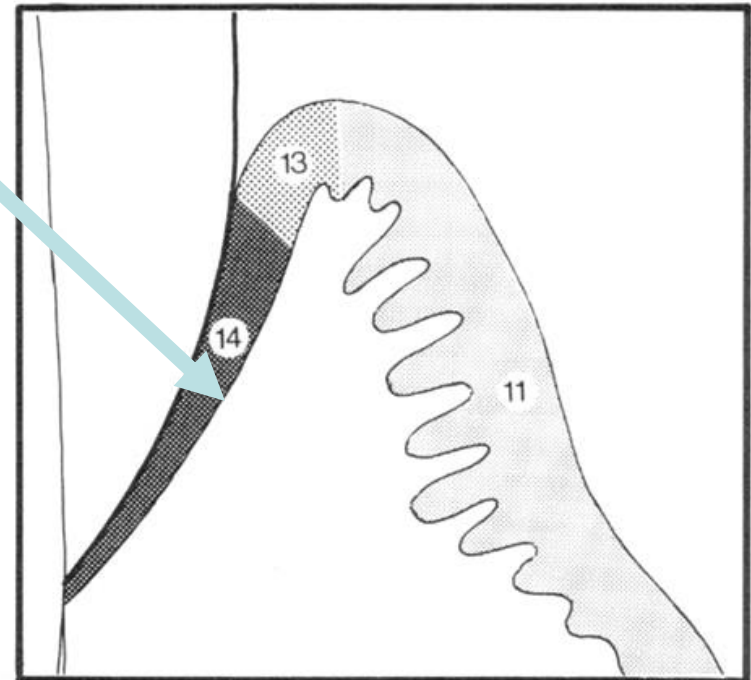




# GINGIVA

## Kontaktepitel

- har **ikke** lamina propria papiller
- få cellelag

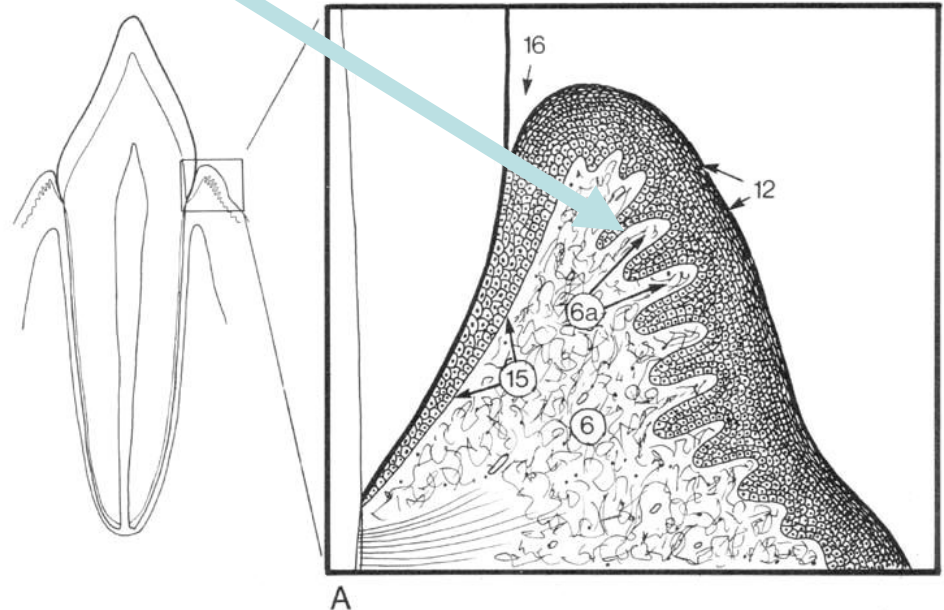


# GINGIVA



## Oralt epitel

- har lamina propriapapiller
- keratinisering:
  - orto-keratiniseret (uden kerner)
  - para-keratiniseret (med kondenserede pyknotiske kerner)

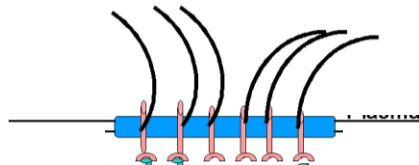
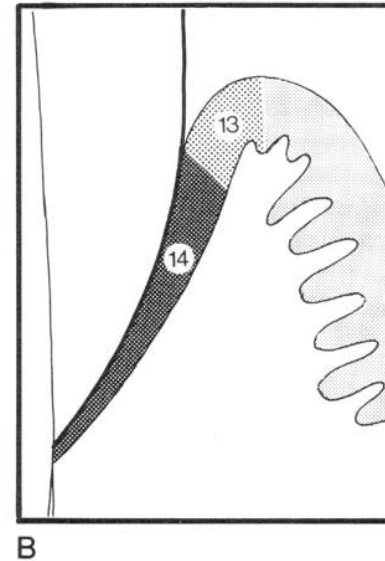
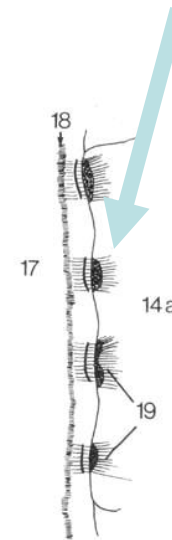


# GINGIVA



## Kontaktepitel:

- danner attachment
- hemi-desmosomer

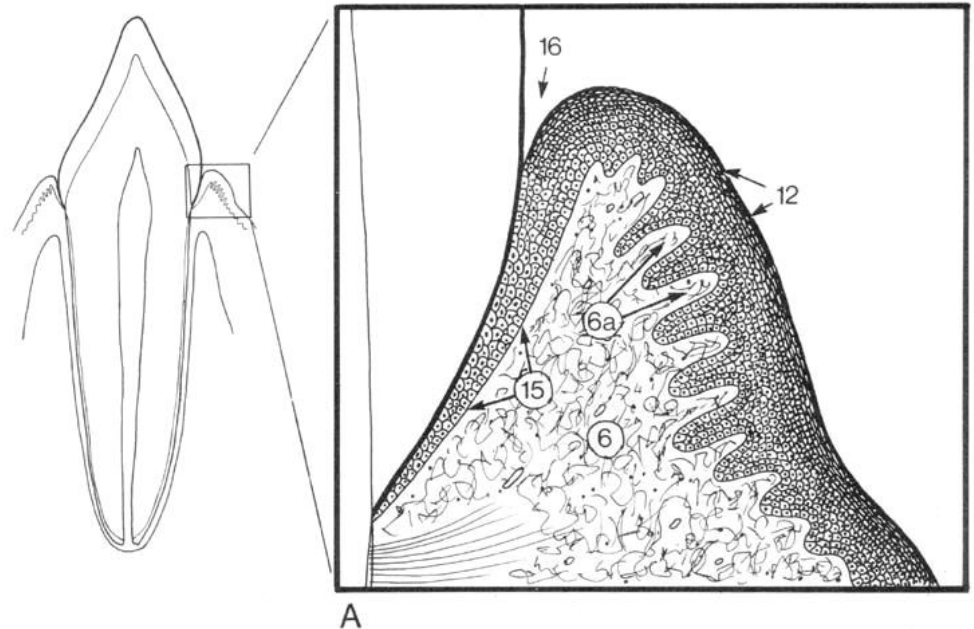


# GINGIVA



## Lamina propria:

- fibrillært, kollagent, fast
- uorganiseret, bindevæv
- mange papiller







# Mentimeter

