Dental Anatomy of Primary Teeth



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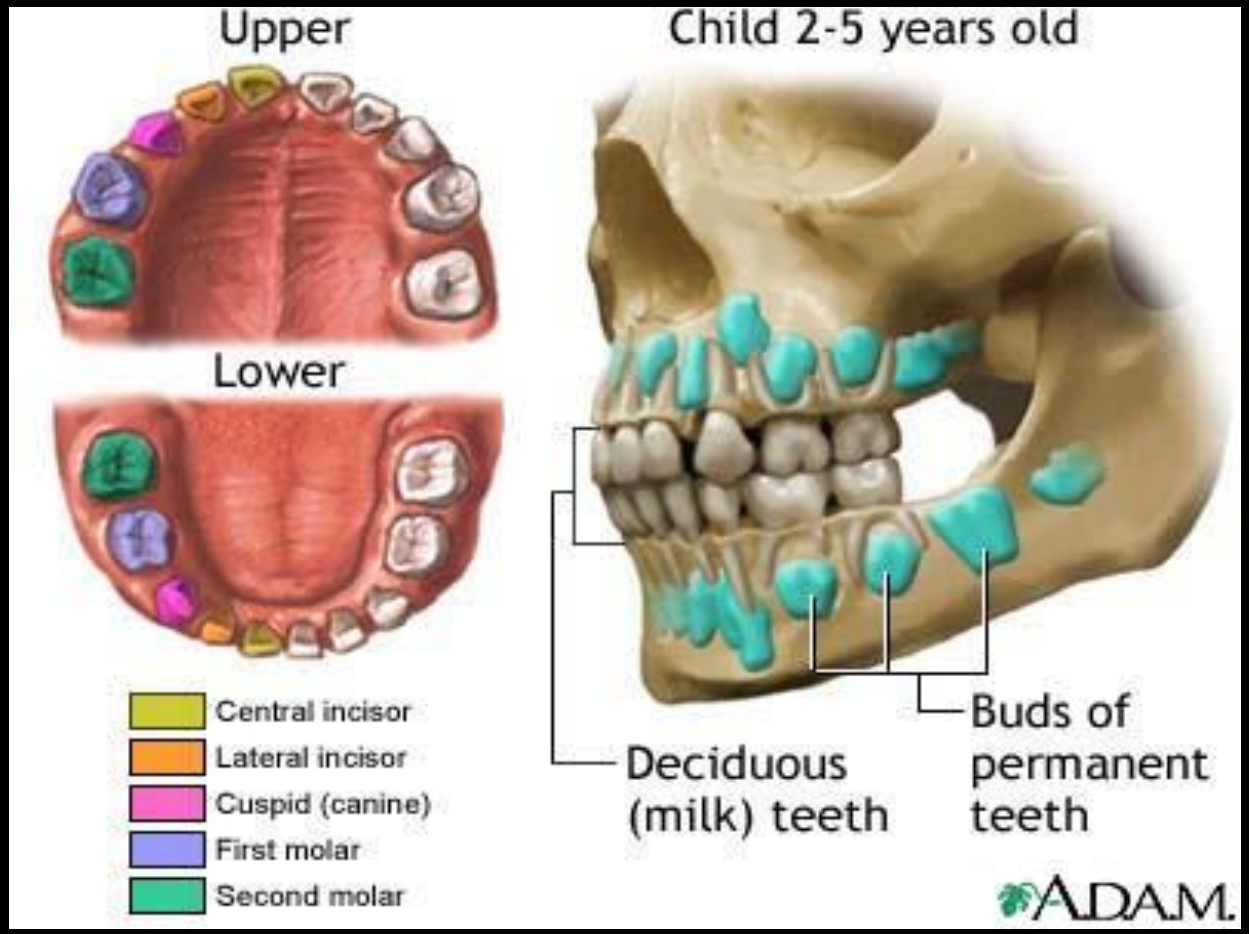
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Objectives

- To understand the importance and functions of deciduous teeth
- To understand the essential differences between deciduous and permanent teeth
- To recognize whether the tooth is primary or secondary
- To identify the various deciduous teeth
- To compare the dental anatomy features of deciduous teeth and also to their permanent counterparts

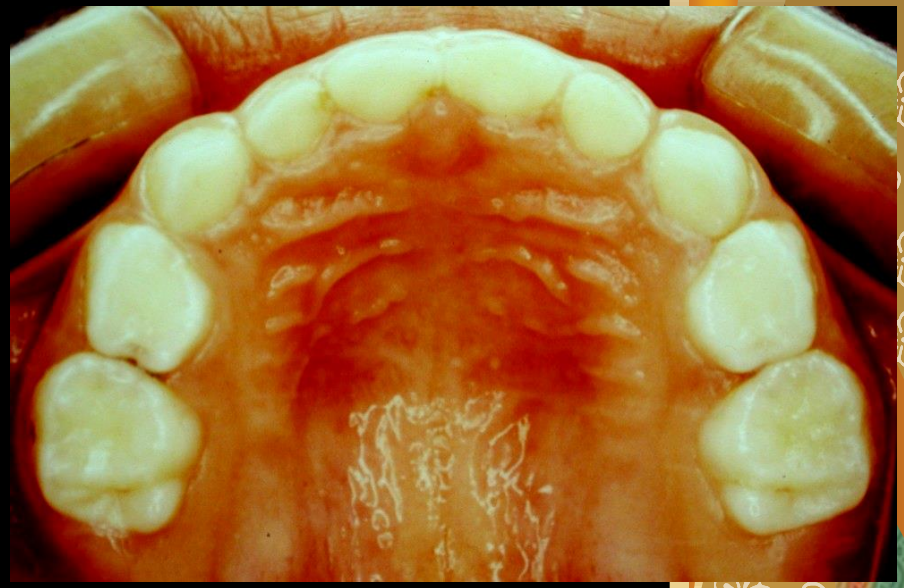


Primary dentition (Deciduous dentition)



Primary dentition

6 months – 6 years







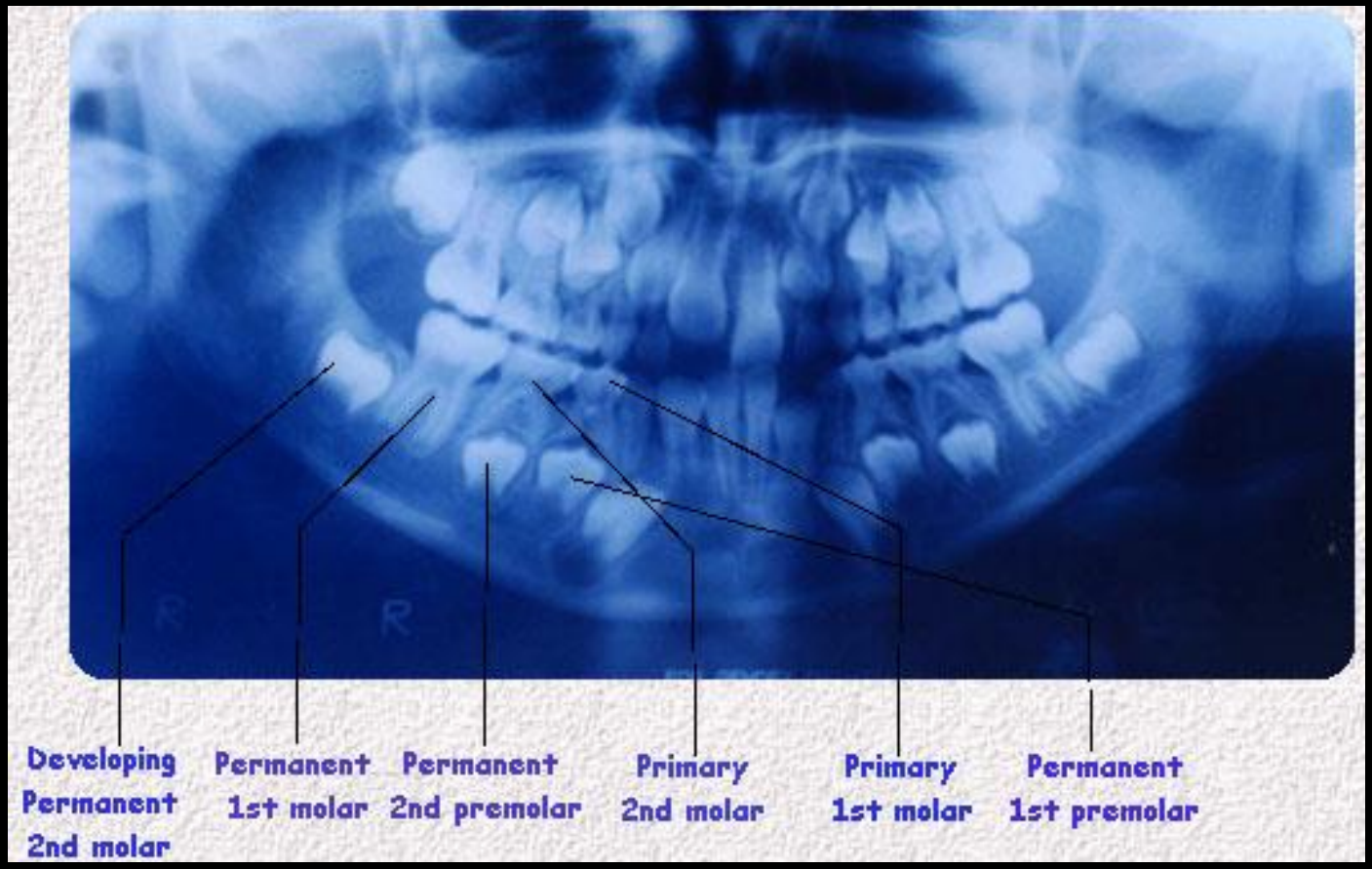
Primary dentition – Mixed dentition

- Deciduous teeth are *shed* and then *replaced* by their *permanent successors.*
- This process, called *exfoliation,* begins a year or two after deciduous root is completely formed.





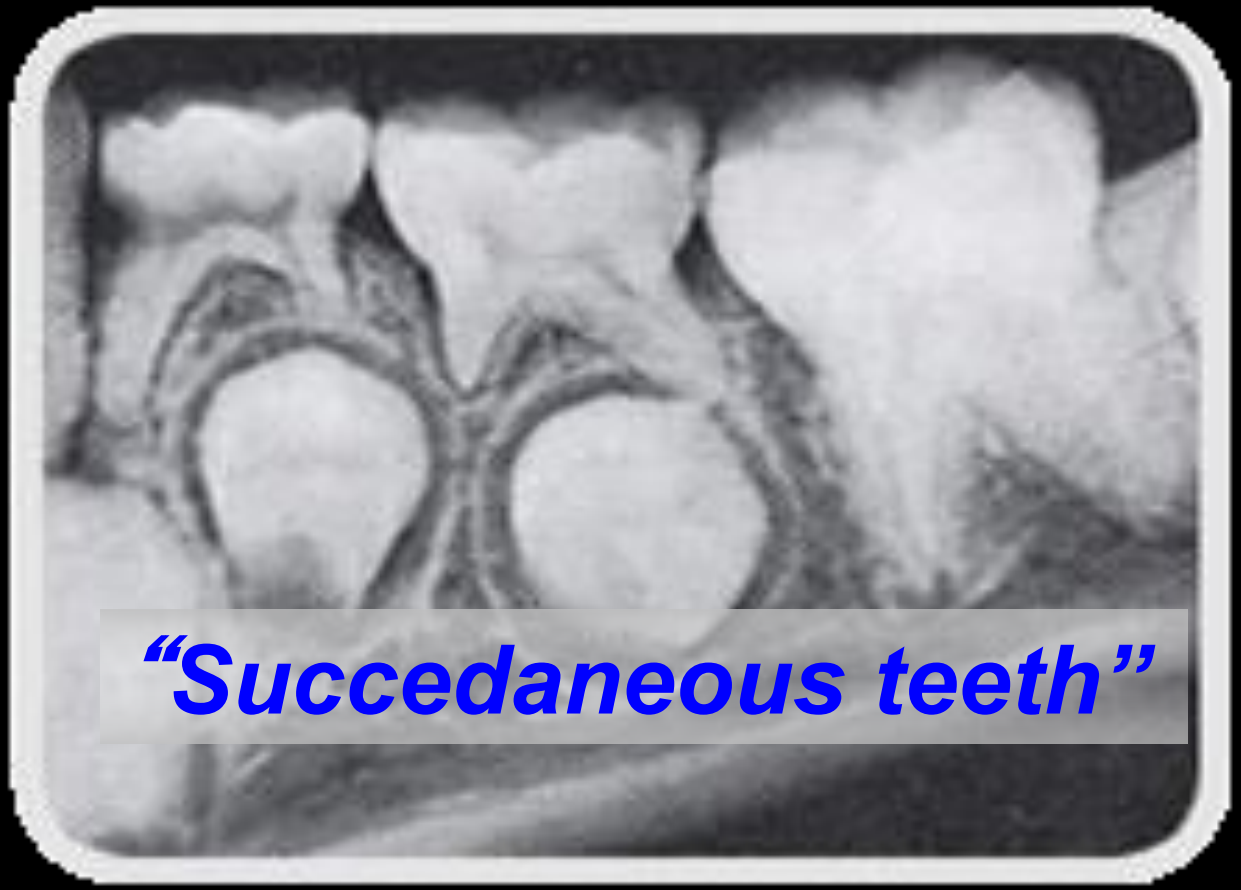
Mixed dentition



The root begins to resorb at its apical end, and resorption continues in coronal direction.

Mixed dentition

6 years – 12 years



Permanent dentition

12 years -



Primary teeth,

Deciduous teeth,

Milk teeth,

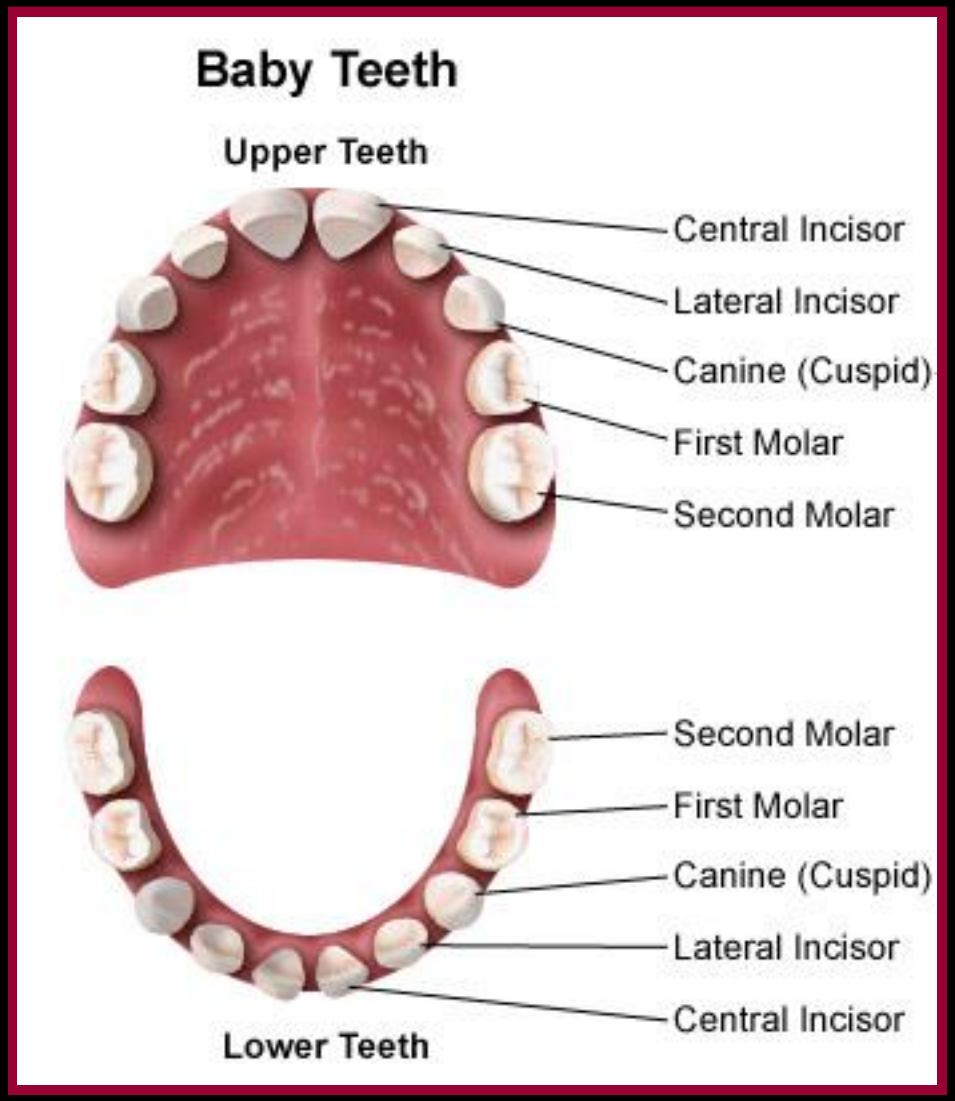
Baby teeth







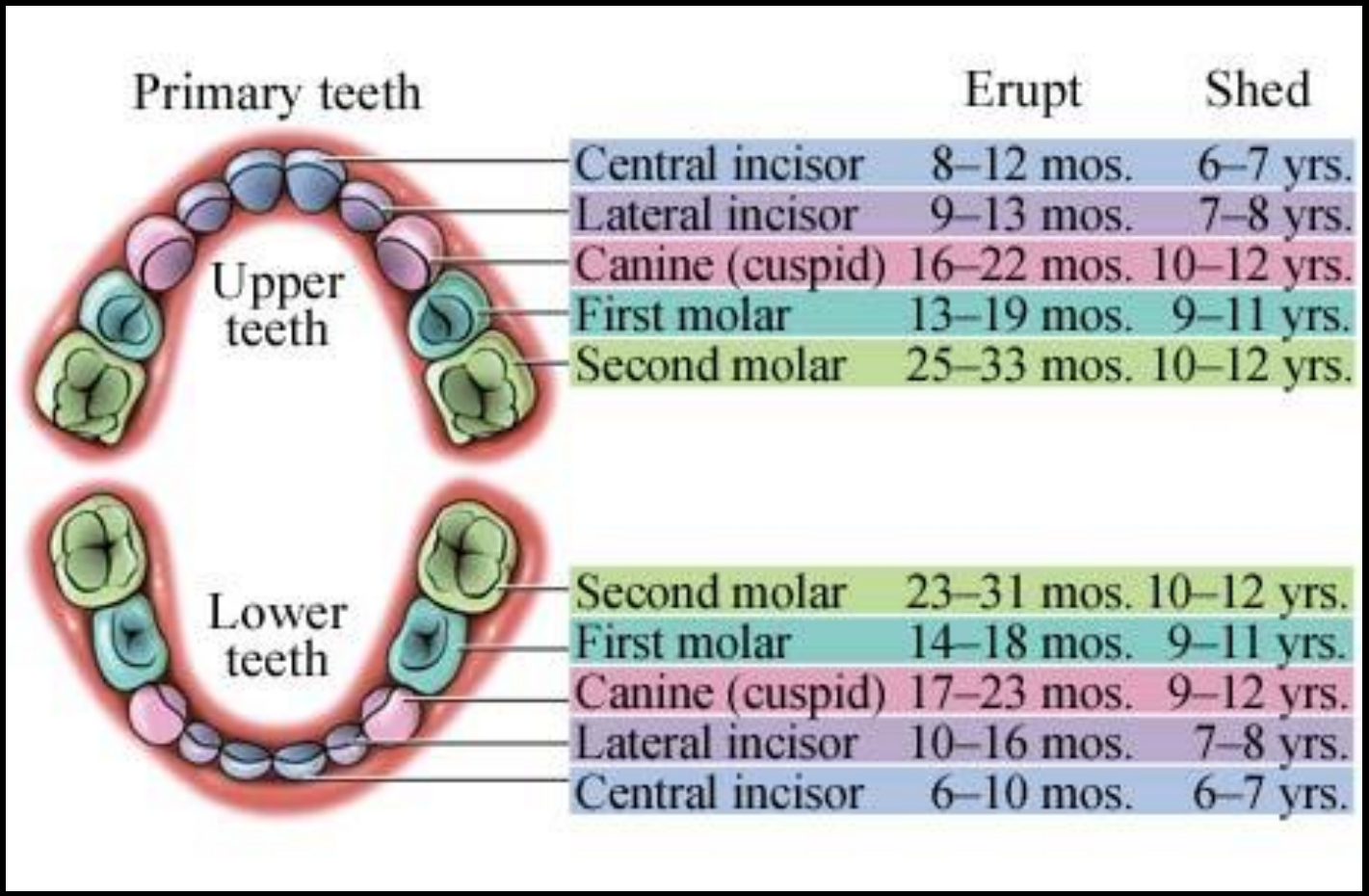
Primary Teeth

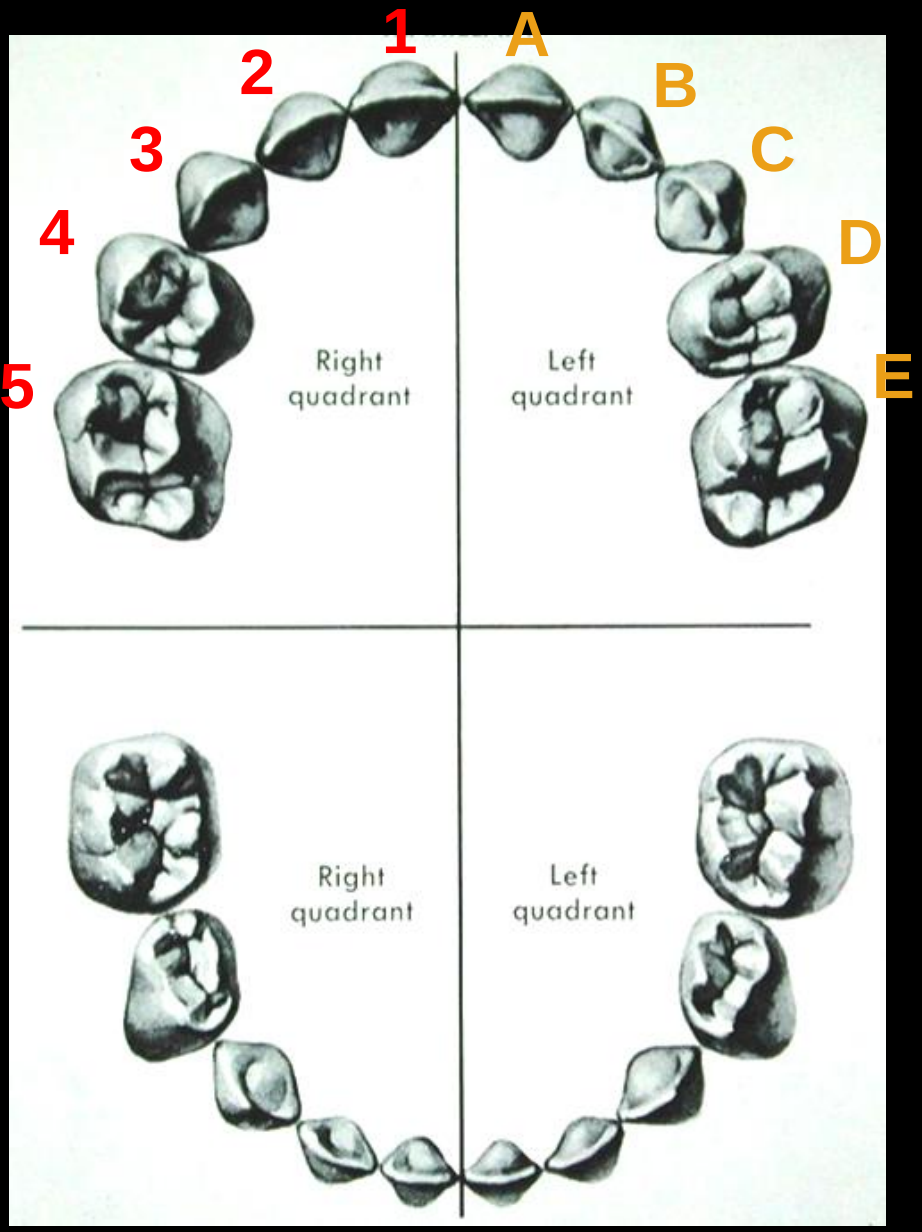


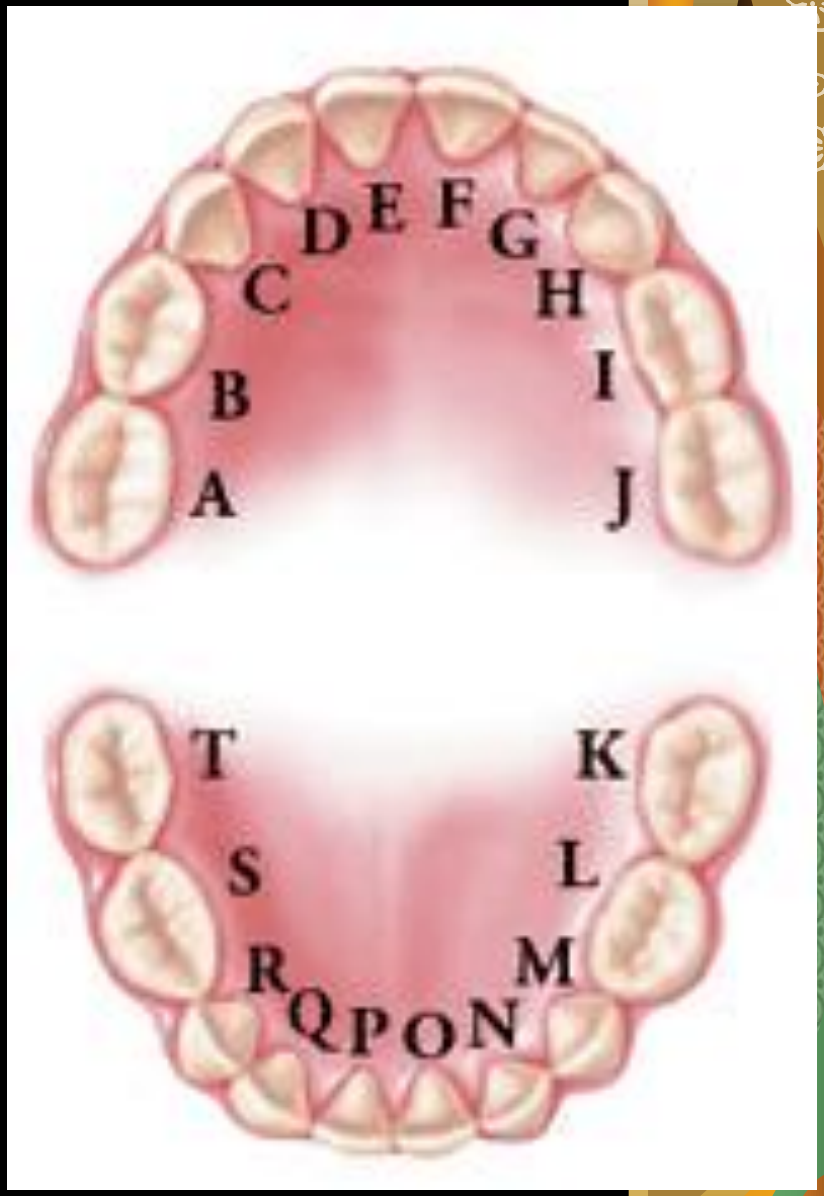
20 teeth

8 incisors
4 canines
8 molars

Primary Teeth




1
2
3
4
5
A
B
C
D
E
Right quadrant
Left quadrant
Right quadrant
Left quadrant


A
B
C
D
E
F
G
H
I
J
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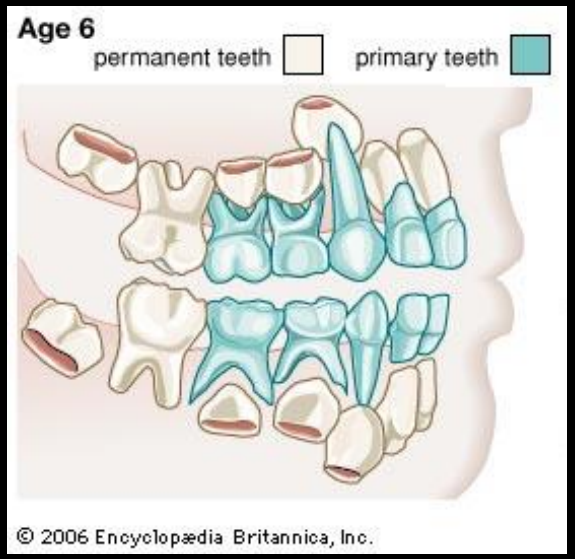
Importance of deciduous dentition



- Mastication
- Phonetics and speech
- Esthetics and smile
- Maintenance of normal facial appearance
- Normal swallowing pattern and habit
- Proper arch development and location for permanent dentition

Proper arch development and location for permanent dentition :

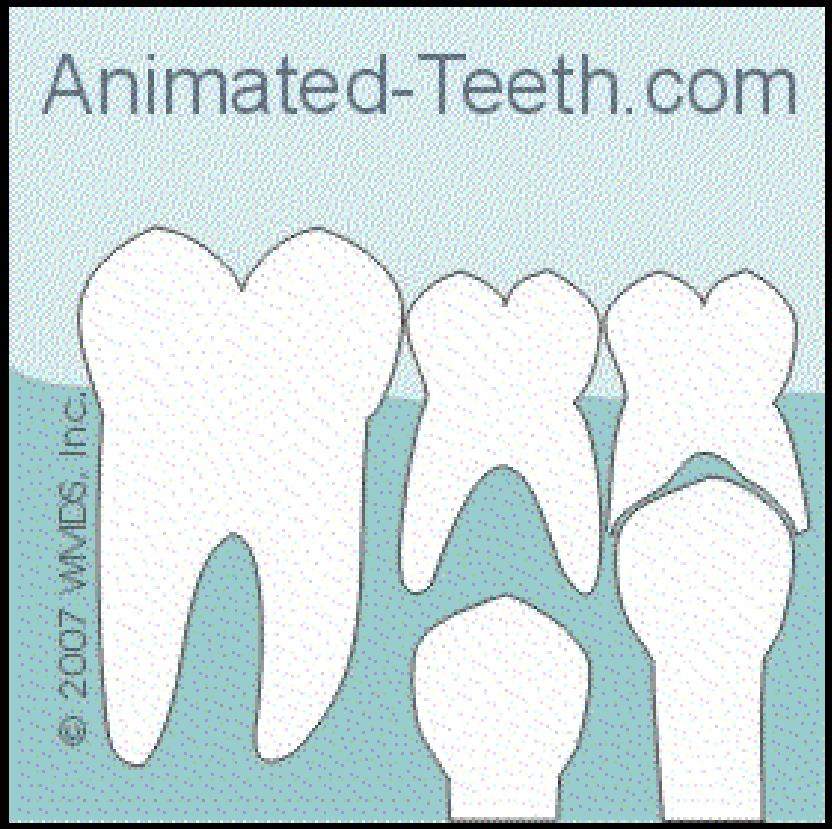
- *Function of deciduous teeth allows for bone growth of dental arch*
- *Keep space for permanent successors*
- *Resorption of deciduous roots guides their erupting permanent replacements into proper locations*







Proper development and location for permanent dentition :





Space maintainer

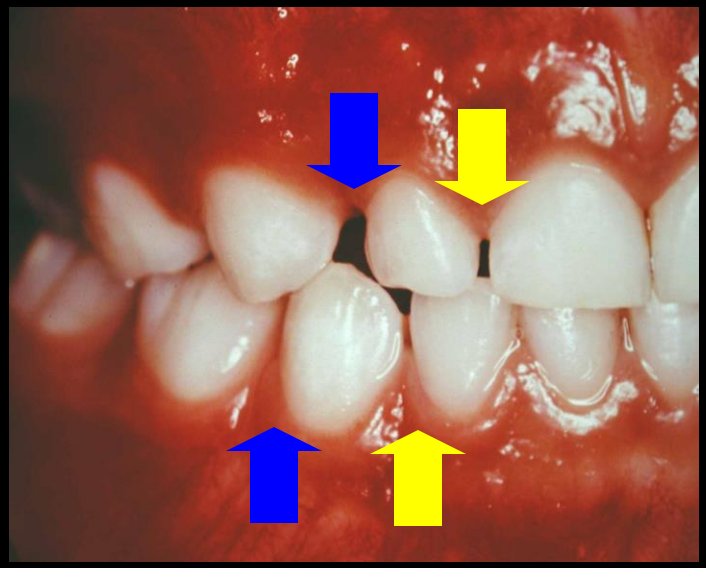


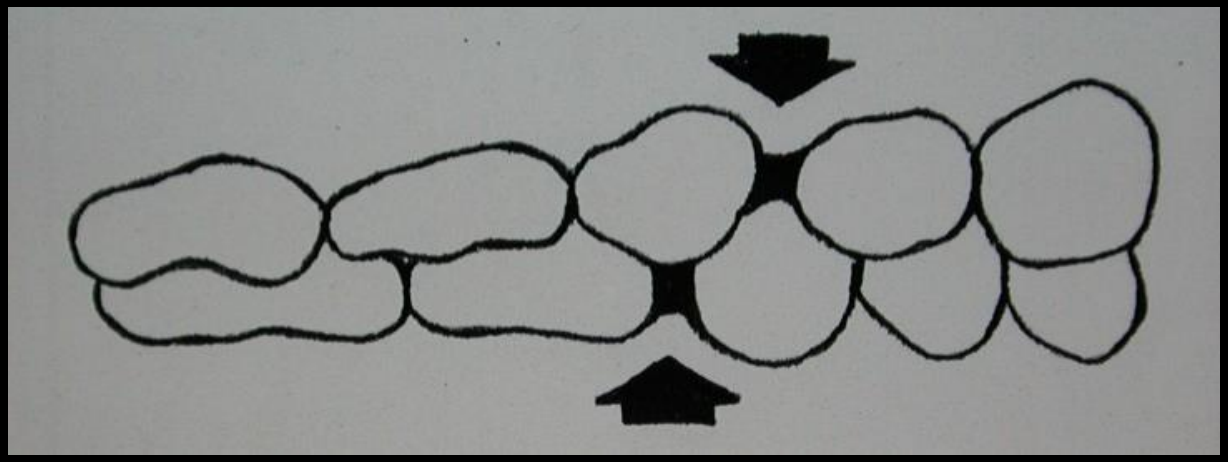






Primate space
& developmental space





Essential differences between primary and secondary teeth :

1. Smaller size
2. Usually lighter in colour, “ milky white ”
3. Crowns are shorted occlusocervically, relative to total tooth length
4. *Primary anterior teeth :* crowns are wider mesiodistally, compared to their crown length than are the permanent teeth
5. *Primary anterior teeth :* roots are narrower and longer compared to the crown width and length



Essential differences between primary and secondary teeth :

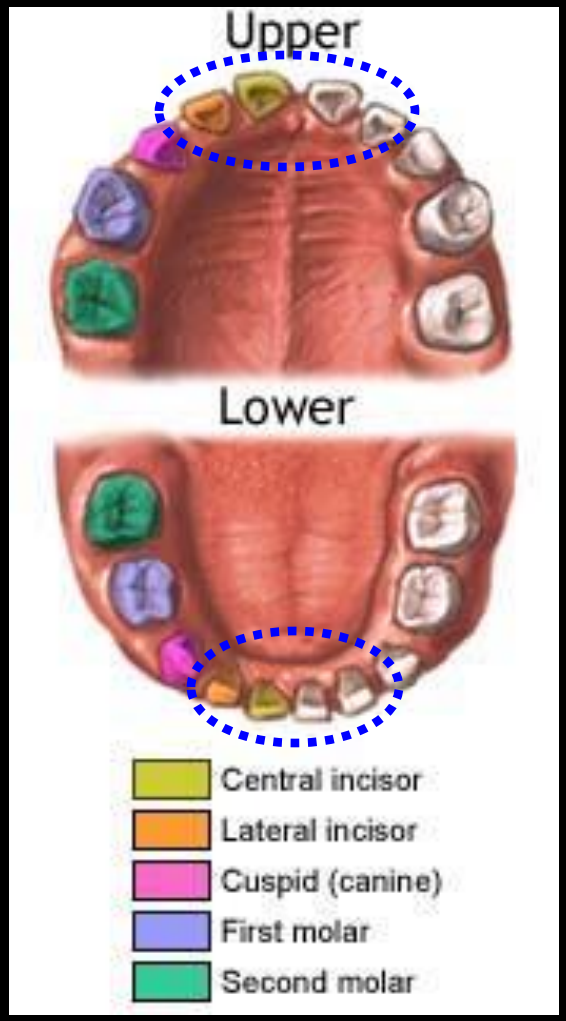
6. *Primary anterior teeth :* labial and lingual cervical ridges are more prominent
7. *Primary molars :* crowns and roots at their cervical portions are more slender mesiodistally
8. *Primary molars :* buccocervical ridges are much more pronounced, especially on the 1st molars
9. *Primary molars :* buccal & lingual surfaces are flatter above cervical curvatures, occlusal tables are much narrower buccolingually

Essential differences between primary and secondary teeth :

10. *Primary molars :* roots are longer and more slender and flare more, extending out beyond projected outlines of the crowns
11. Little or no root trunk in primary molars
12. Thinner enamel and dentine
13. Pulp chamber is relatively large
14. Pulp horns extend rather high occlusally



Primary incisors



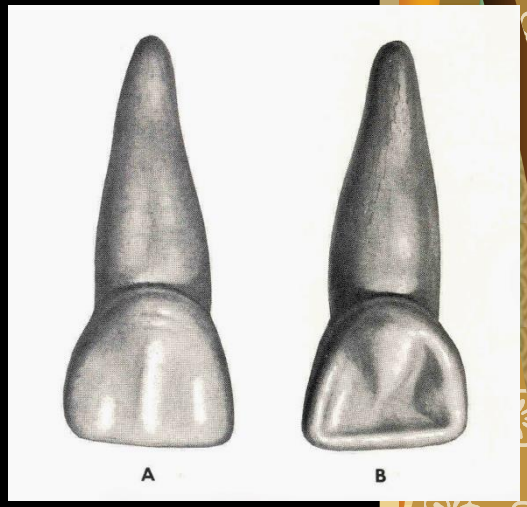
Primary incisors

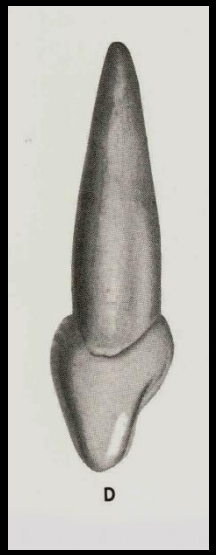
- Similar shape to permanent incisors
- Much more smaller
- No mamelon
- Prominent cervical ridge
- Crowns are wide mesiodistally, short incisocervically

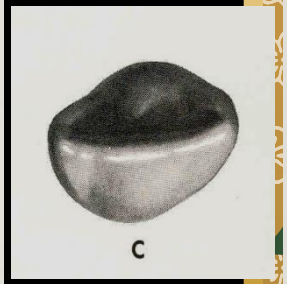


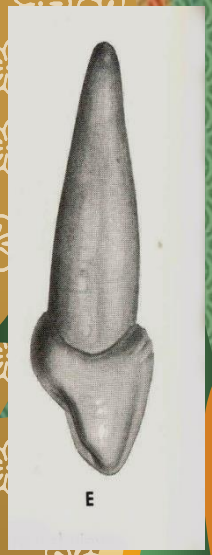
Maxillary central incisor

- Mesiodistal diameter (crown width) is greater than incisocervical diameter (crown length)
- Labial surface is very smooth
- Incisal edge is nearly straight
- Mesio-incisal angle is right angle and sharp
- Disto-incisal angle is rounded and obtuse
- Distal outline is more curved



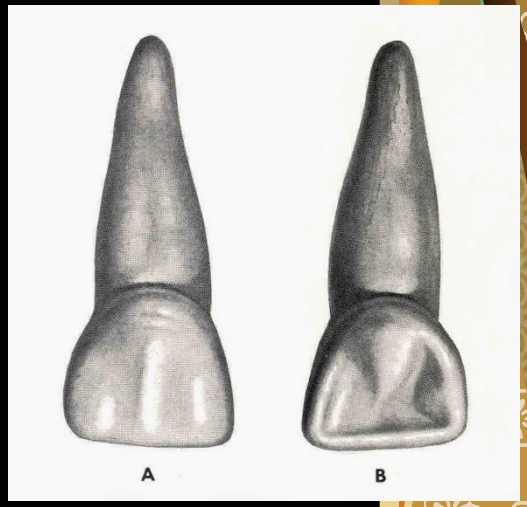


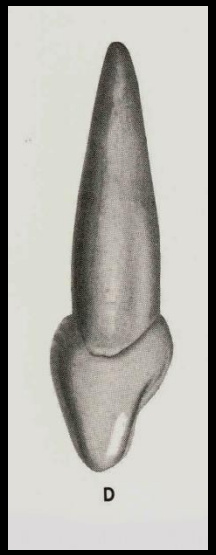


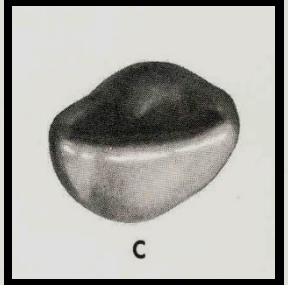


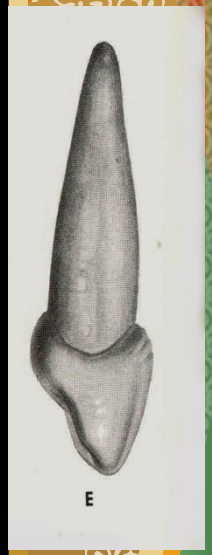
Maxillary central incisor

- Well-developed marginal ridges
- Highly developed cingulum
- Cingulum extends up toward incisal ridge, dividing into a mesial and distal fossa
- Development of cervical ridges both labial and lingual surfaces
- Mesial and distal aspects are similar, crown width is nearly the same as crown length



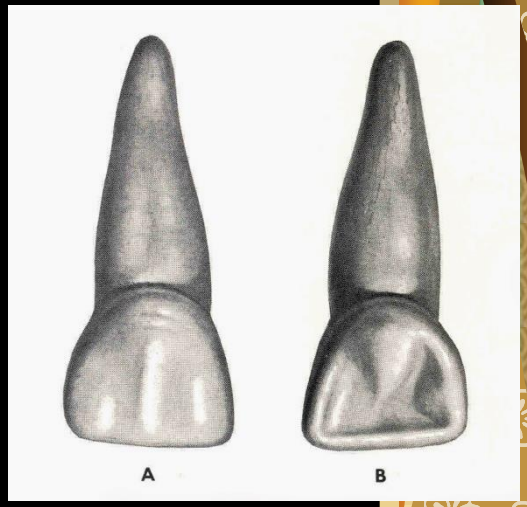


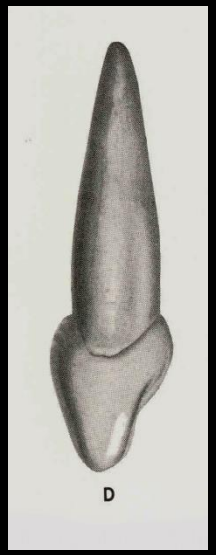


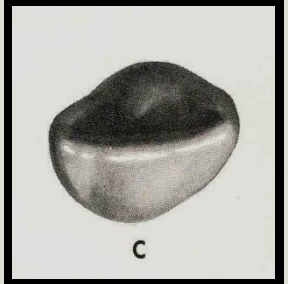


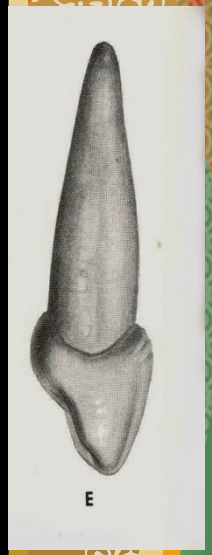
Maxillary central incisor

- Cervical line (CEJ) is distinct, curving toward incisal ridge
- The cervical curvature distally is less than the curvature mesially
- Root length is greater in comparison with crown length than permanent central incisor
- Root narrows lingually
- Conical and tapered single root, blunt apex







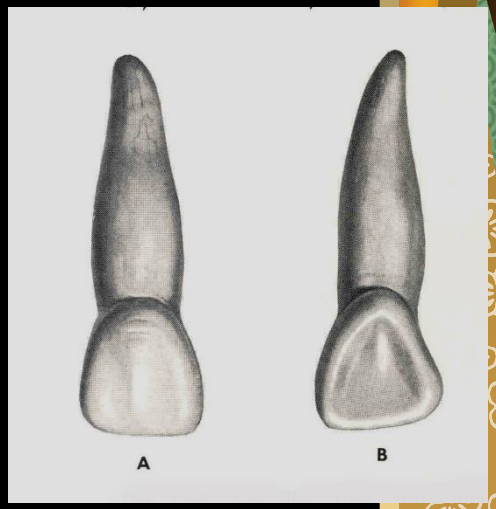


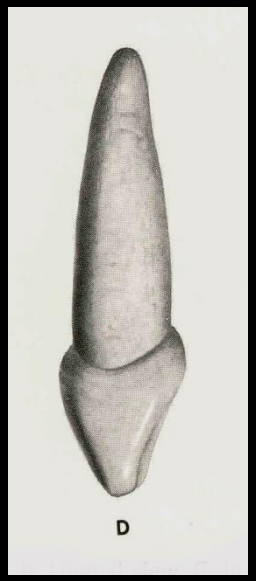
Maxillary lateral incisor

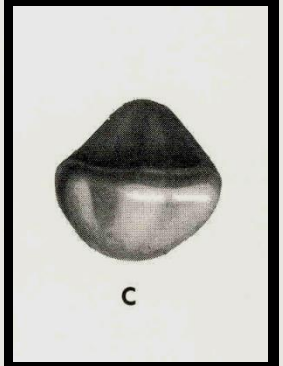
- Much smaller than maxillary central incisor
- Crown length is greater than crown width
- Disto-incisal angles are more rounded
- Labial surface is more convex M-D
- Longer root in proportion to its crown

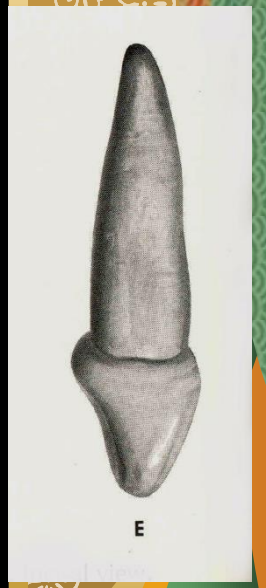
  than maxillary central incisor ratio

  (twice of crown height)



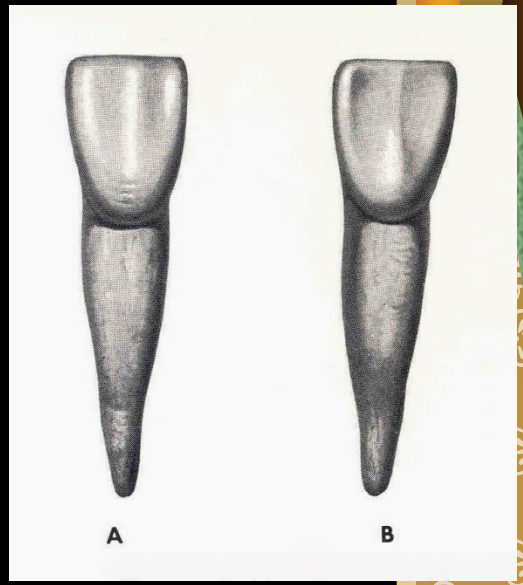


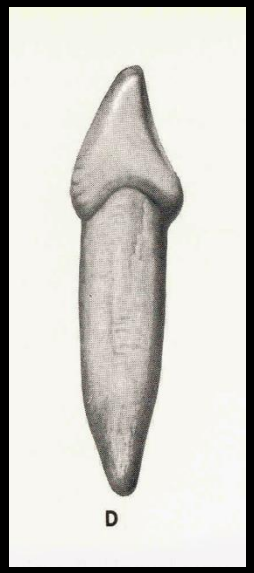


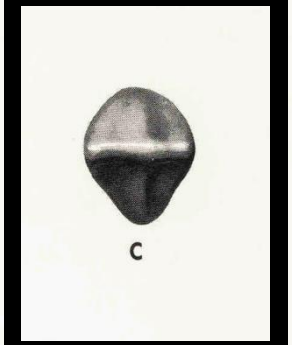


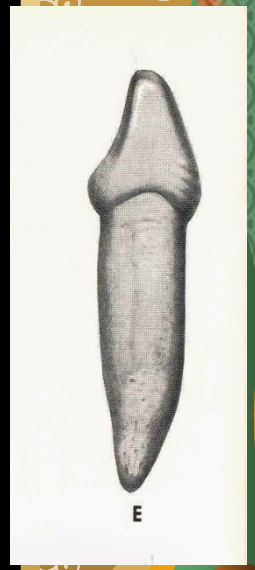
Mandibular central incisor

- Bilateral symmetry
- M-I and D-I angle are sharp, almost 90°
- Labial surface is flat M-D
- Marginal ridges are not as marked as maxillary incisors
- More shallow lingual fossa
- Root is narrow but conical and tapered with relatively pointed apex
- Root is almost twice the crown length



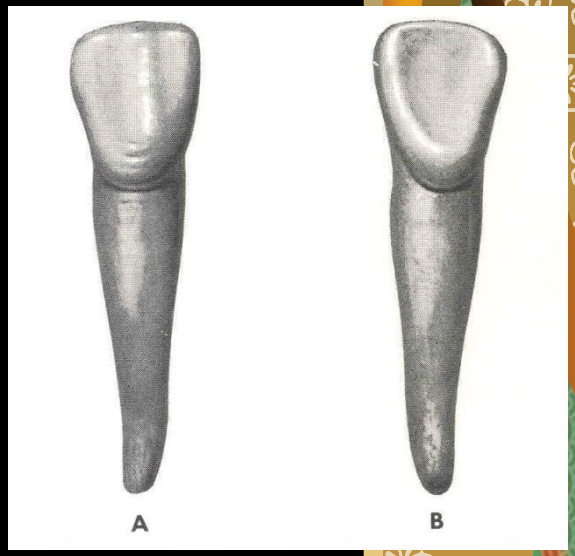


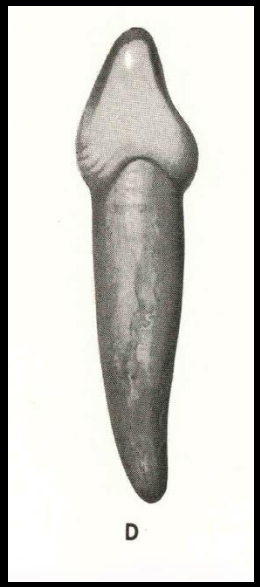


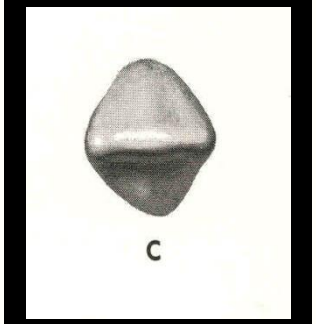


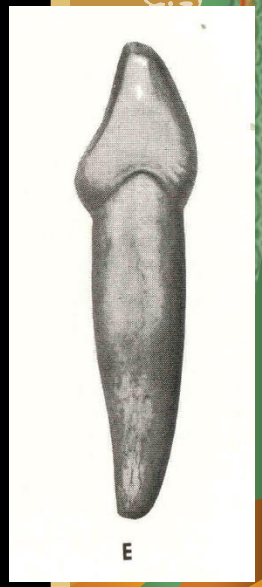
Mandibular lateral incisor

- Incisal ridge slopes downward distally
- D-Inc angle is rounded
- Distal margin of the crown is more rounded
- Crown is wider and longer than the mandibular central incisor
- Marginal ridges and cingulum are more prominent, deeper fossa
- Root is narrow and conical with distal inclination near its apex

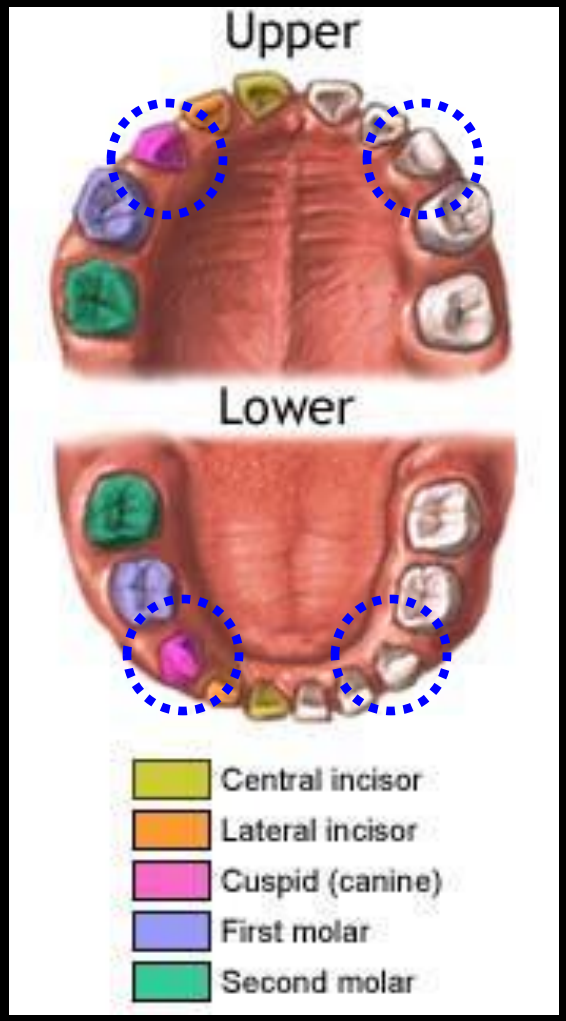








Primary Canines



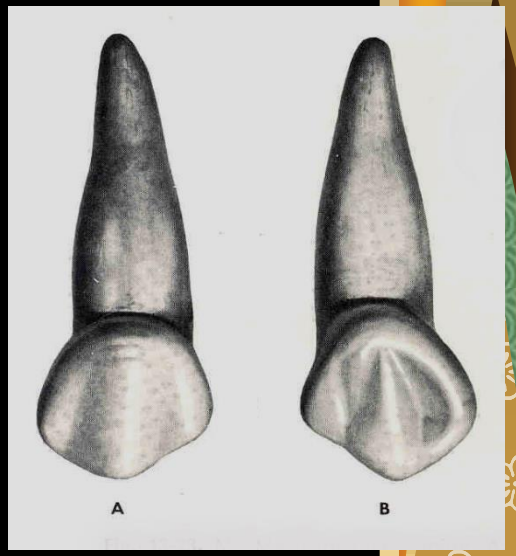
Primary Canines

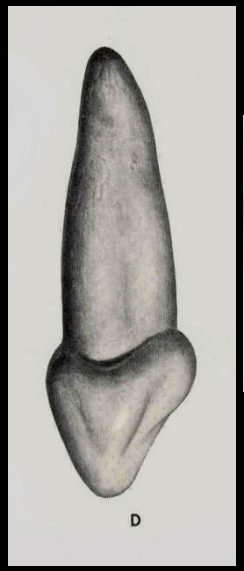
- Bulkier than the primary incisors
- Crown is more constricted at the cervix
- More convex M and D surfaces
- Sharp cusp with well developed facial lobe
- Root is about twice as long as the crown

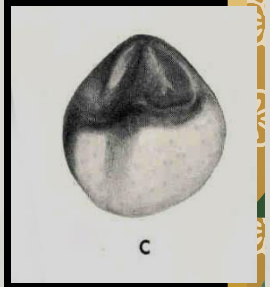


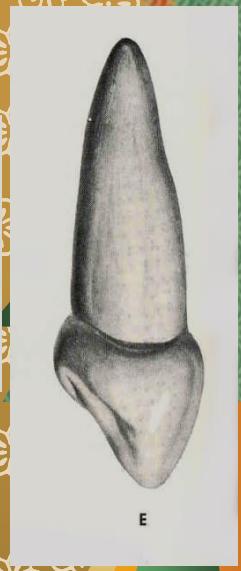
Maxillary canine

- Crown is diamond or rhomboidal shaped
- Crown may be as wide as they are long
- Cusp is much longer and sharper, compared with permanent maxillary canine
- M cusp ridge is longer than D cusp ridge
- Distal margin of the crown is more rounded
- Prominent labio-cervical ridge and labial ridge



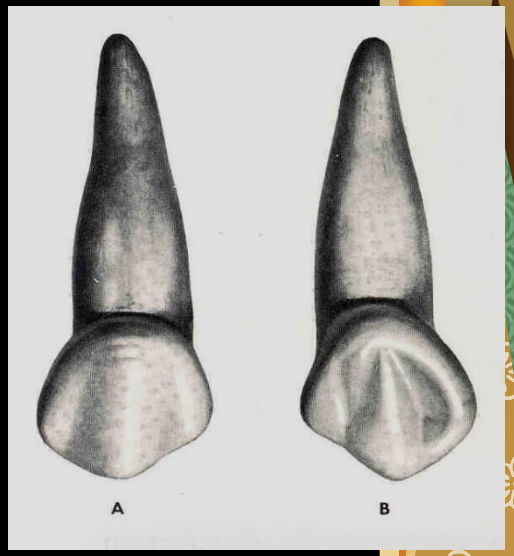


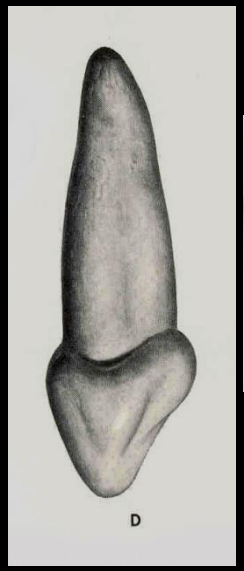


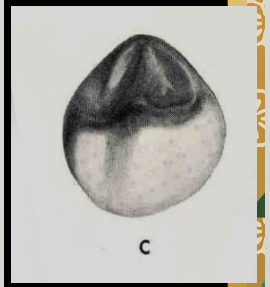


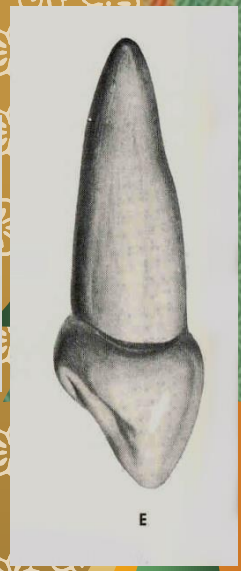
Maxillary canine

- Large cingulum, well-developed marginal ridges
- Prominent lingual ridge, connecting cingulum and cusp tip
- Lingual ridge divides into shallow ML and DL fossae
- Root is long, slender, and tapering lingually
- Root is more than twice the crown length



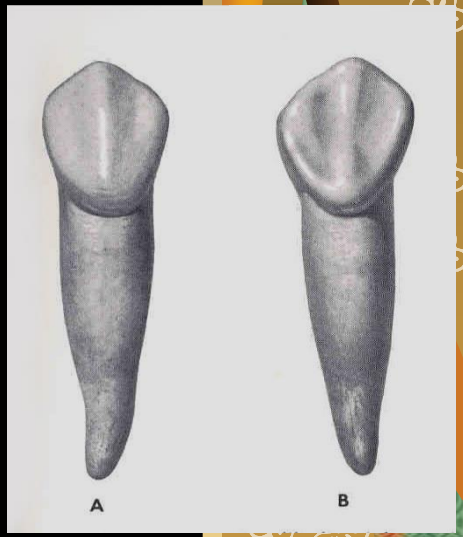


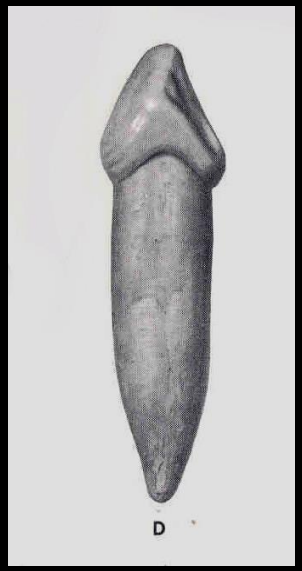


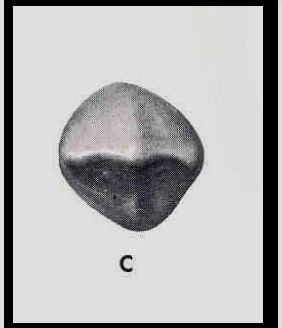


Mandibular canine

- Crown height is greater than M-D width
- Crown and root are shorter than maxillary canine
- La-Li crown width is much smaller than maxillary canine
- D cusp ridge is longer than M cusp ridge
- Cingulum and marginal ridges are less prominent
- Root is shorter and more tapered, pointed apex than maxillary canine









Anterior teeth

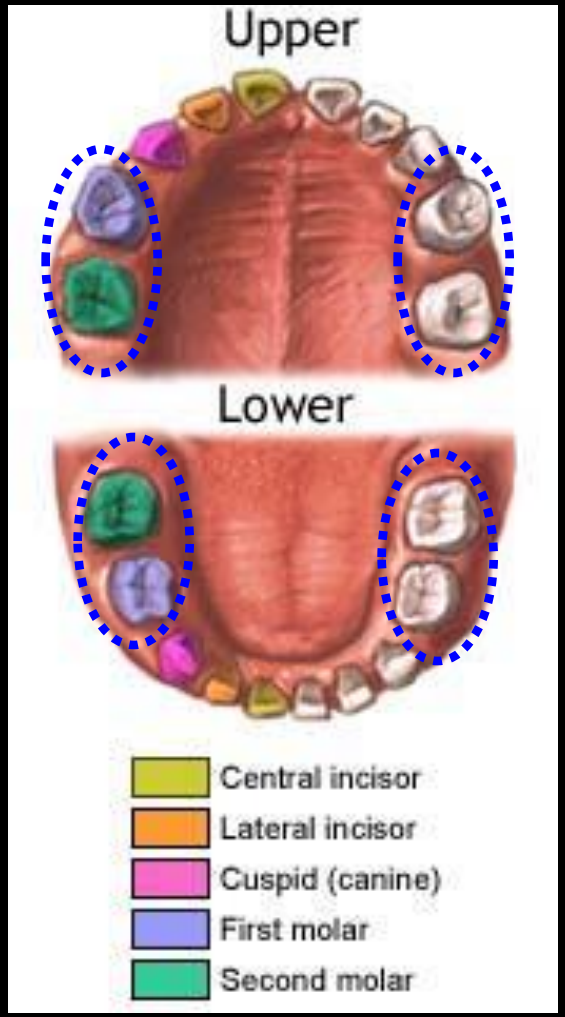




Anterior teeth



Primary Molars

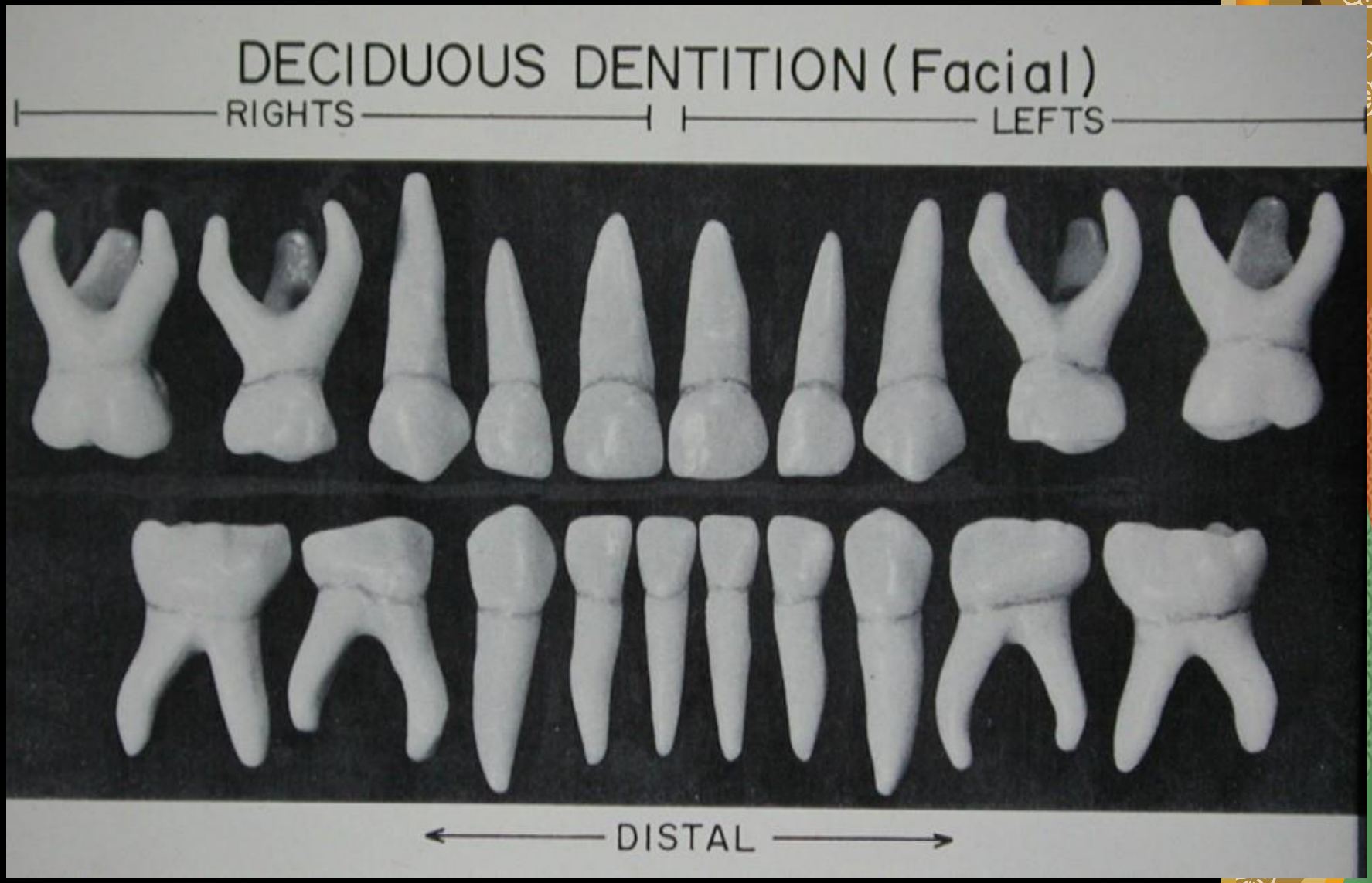




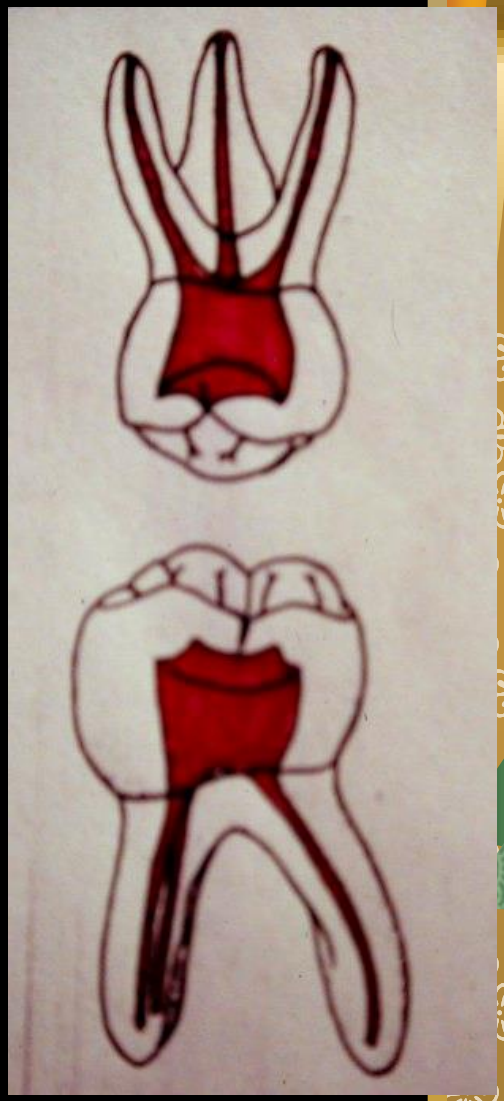
Deciduous molars

- Crown:
  - M-D width is more than B-Li width, except Max. 1st molar
  - Occlusocervical height is short
- Prominent buccocervical ridge
- Little or no root trunk
- Long and slender; bowed and flared out roots
- Maxillary molar has 3 roots: MB, DB and Pa
- Mandibular molar has 2 roots: M and D




DECIDUOUS DENTITION (Facial)
RIGHTS
LEFTS
DISTAL

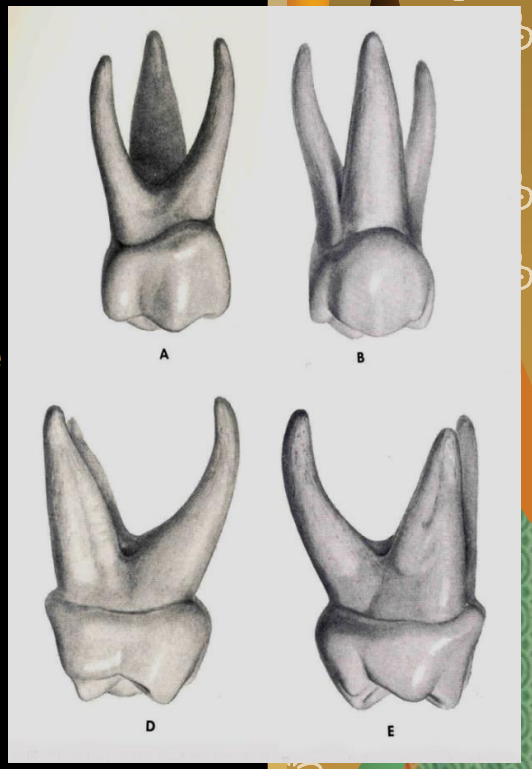


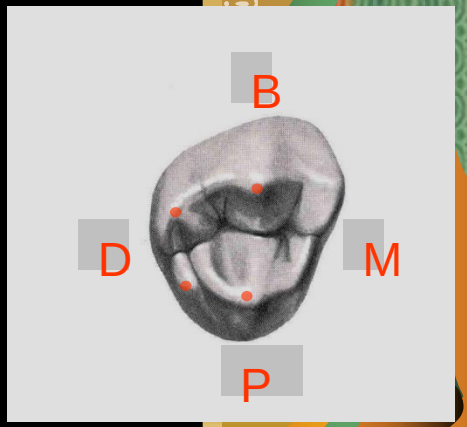


Maxillary 1st molar

- Crown is wider buccolingually, short crown height
- *Buccal aspect :*
  - Buccal surface is smooth, may have no buccal groove
  - Cervical line is curved down mesially,

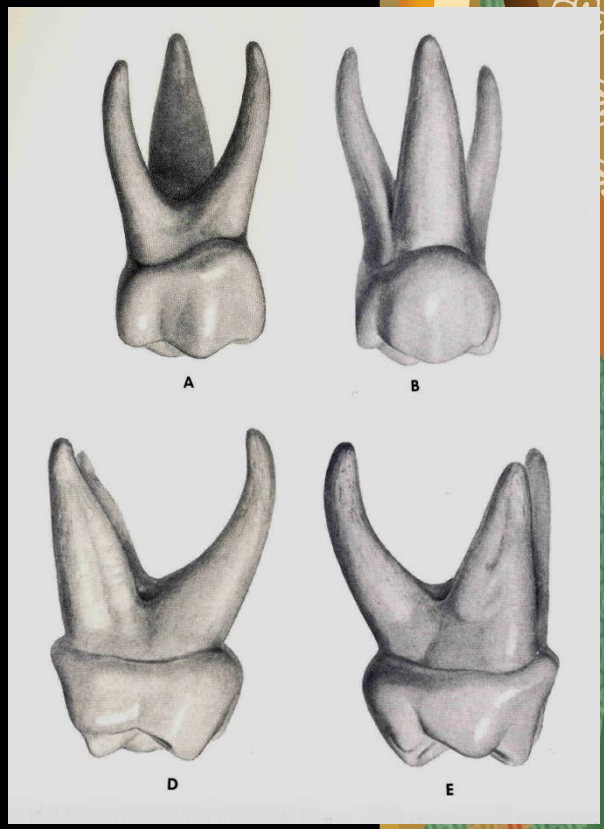
    large cervical bulge mesially
- *Palatal aspect :*
  - ML cusp is the most prominent cusp on this tooth
  - Short lingual groove
  - Relatively straight cervical line





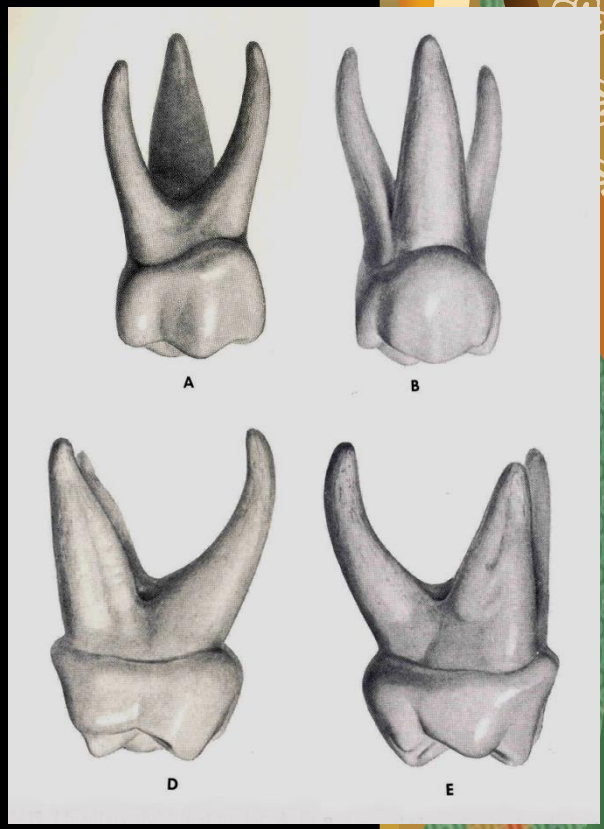
Maxillary 1st molar

- *Mesial aspect :*
  - Cervical third is wider than occlusal third
  - ML cusp is longer and sharper than MB cusp
  - Prominent bulge (buccocervical ridge)
  - Cervical line shows some curvature in the direction of occlusal surface



Maxillary 1st molar

- *Distal aspect :*
  - Crown is narrower distally than mesially
  - DB cusp is long and sharp
  - DL cusp is poorly developed
  - No prominent buccocervical ridge
  - Cervical line may curve occlusally, or may extend straight across from B to Li



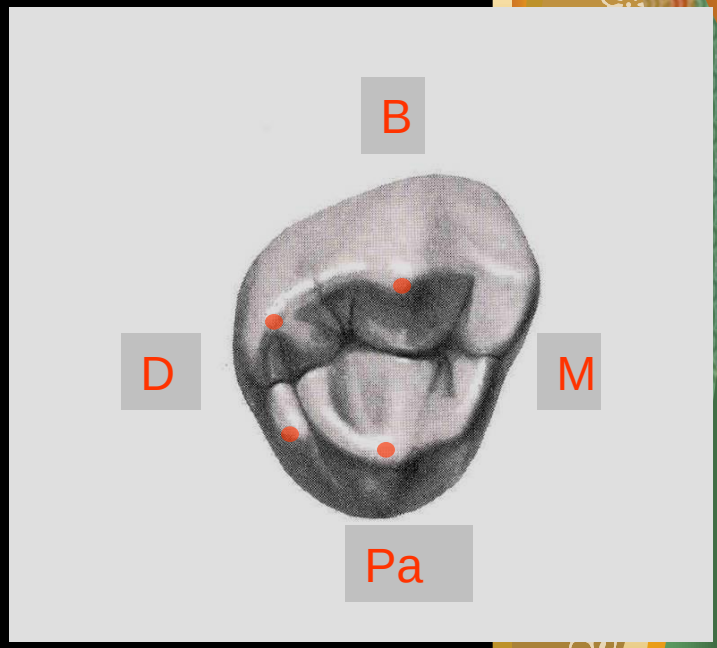
Maxillary 1st molar

- *Occlusal aspect :*
  - Crown resembles a maxillary permanent premolar

    (DB and DLi cusps are much less prominent)
  - Crown converges lingually and distally
  - 4 cusps: MB, DB, MLi and DLi

    MLi cusp is the largest cusp,

    DLi cusp is the smallest cusp
  - May have 3 cusps (no DLi cusp)

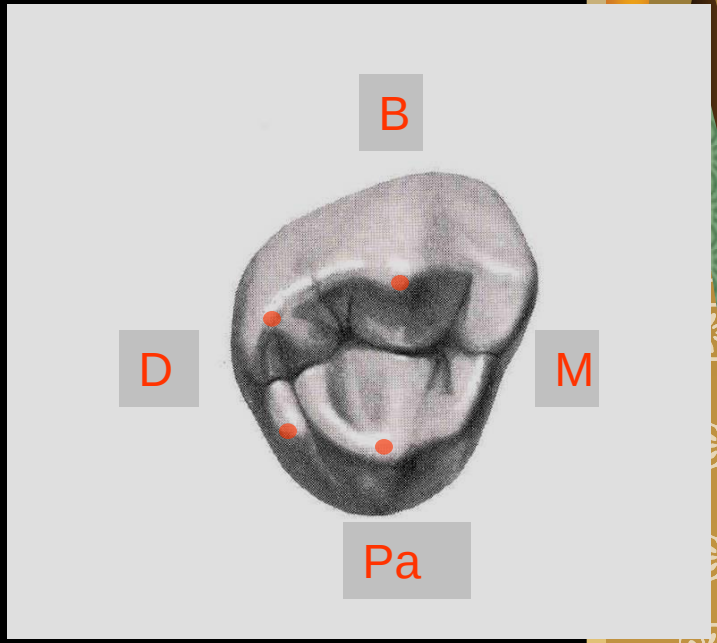


Maxillary 1st molar

- *Occlusal aspect :*
  - Central fossa
  - Mesial triangular fossa
  - Buccal developmental groove
  - Distal marginal ridge is thin and poorly developed compared with mesial marginal ridge
  - 4-cusp type : 3 pits, oblique ridge (MLi and DB cusps),

    Occlusal grooves : “ H ” pattern

    3-cusp type (no DL cusp) : 2 pits



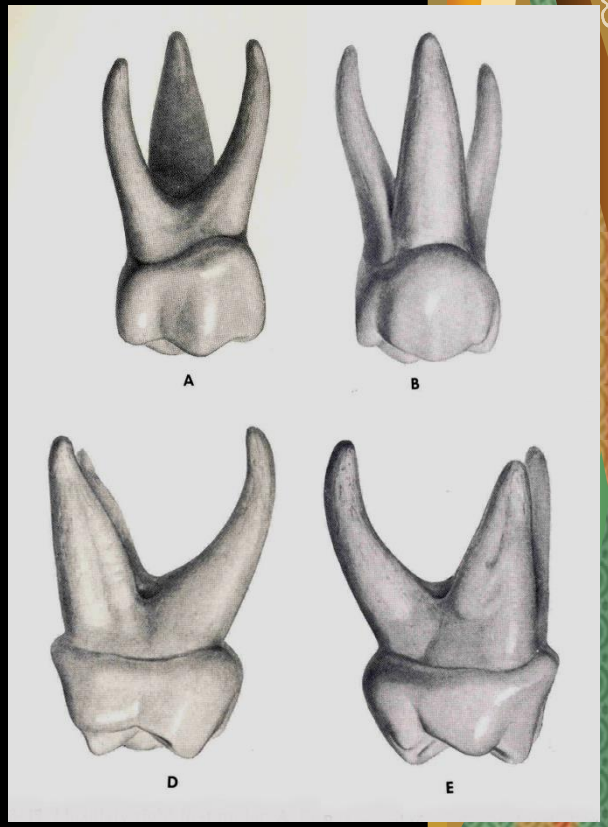
Maxillary 1st molar

- Roots are slender and long, spread widely
- 3 roots (MB, DB and Pa); 3 root canals

  Pa root is the largest and longest

  DB root is the shortest
- 4 pulp horns, MB pulp horn is the largest

  MB > ML > DB > DL

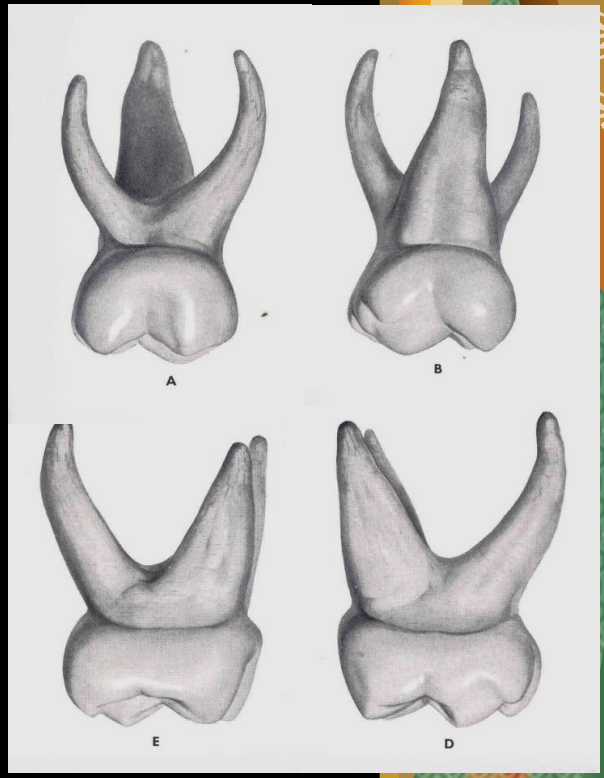


Maxillary 1st molar



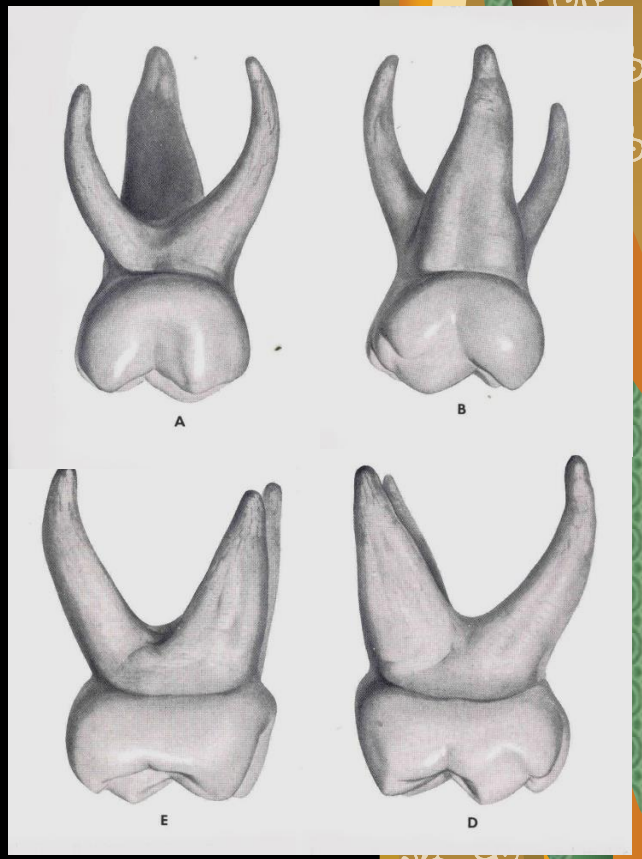
Maxillary 2nd molar

- Crown outline is similar to maxillary permanent 1st molar
- Smaller size, short crown height
- *Buccal aspect :*
  - 2 well-defined buccal cusps, nearly equal
  - A buccal developmental groove
- *Palatal aspect :*
  - ML cusp, DL cusp, and the fifth cusp (tubercle of Carabelli)
  - Lingual developmental groove



Maxillary 2nd molar

- *Mesial aspect :*
  - ML cusp is larger than MB cusp
  - MB cusp is relatively short and sharp
  - Cervical line is little curvature or almost straight



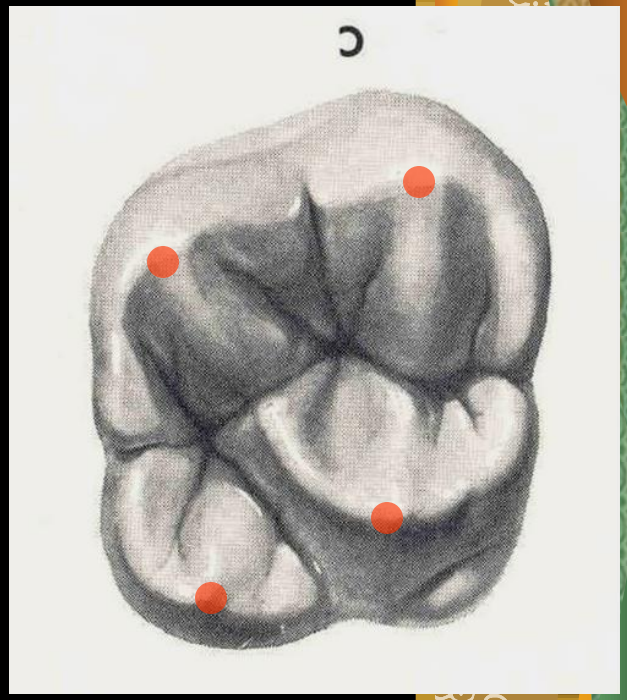
- *Distal aspect :*
  - Distal surface is narrower than mesial surface
  - DB and DL cusps are about the same in length
  - Cervical line is approximately straight

Maxillary 2nd molar

- *Occlusal aspect :*
  - Resembles maxillary permanent 1st molar, rhomboidal
  - M-D width is slightly greater than B-L width
  - 4 cusps: MB, DB, MLi and DLi
  - MLi cusp is the largest cusp,

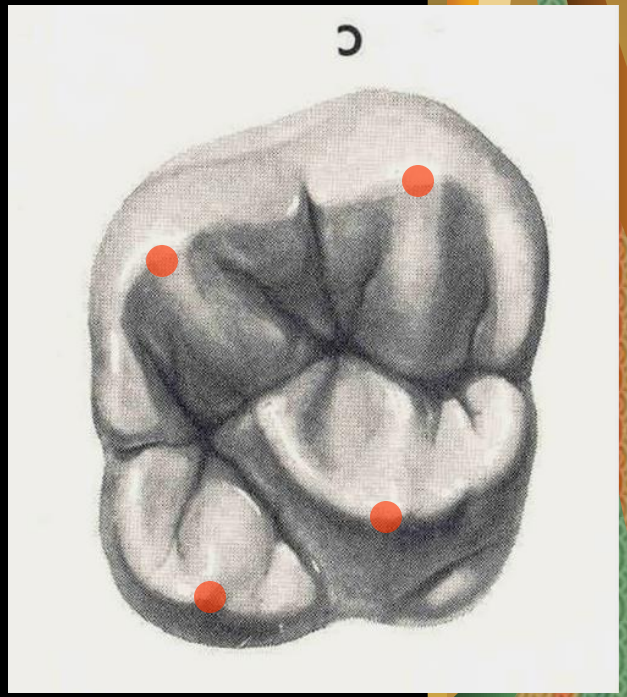
    DLi cusp is the smallest cusp
  - Fifth cusp or tubercle of Carabelli on

    palatal surface



Maxillary 2nd molar

- *Occlusal aspect :*
  - Central fossa, central pit
  - Mesial triangular fossa, mesial pit
  - Distal triangular fossa, distal pit
  - Buccal and lingual developmental grooves
  - Oblique ridge (ML and DB cusps)
  - Well-developed mesial and distal marginal ridges



Maxillary 2nd molar

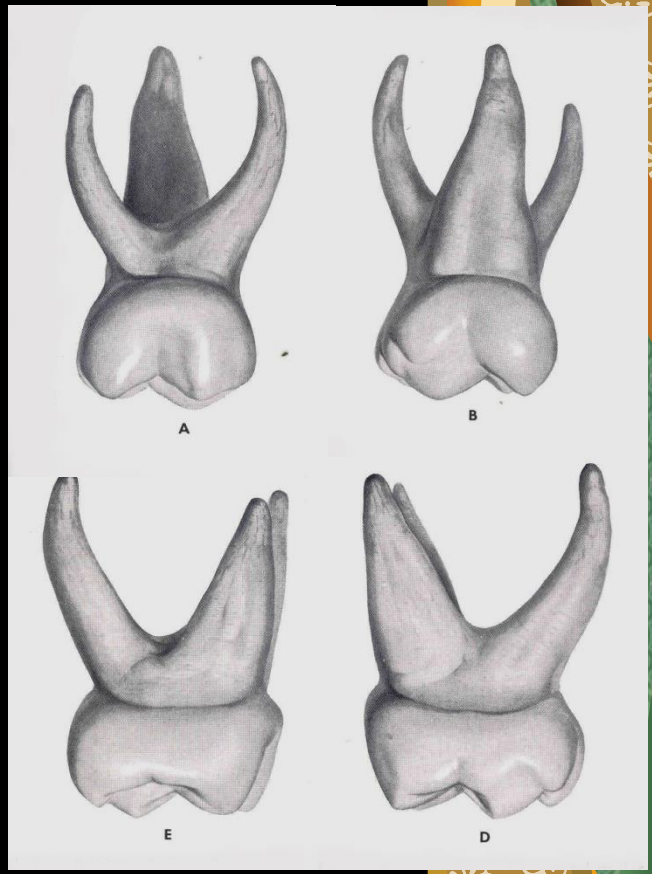
- 3 roots (MB, DB and Pa); 3 root canals

  Pa root is the largest

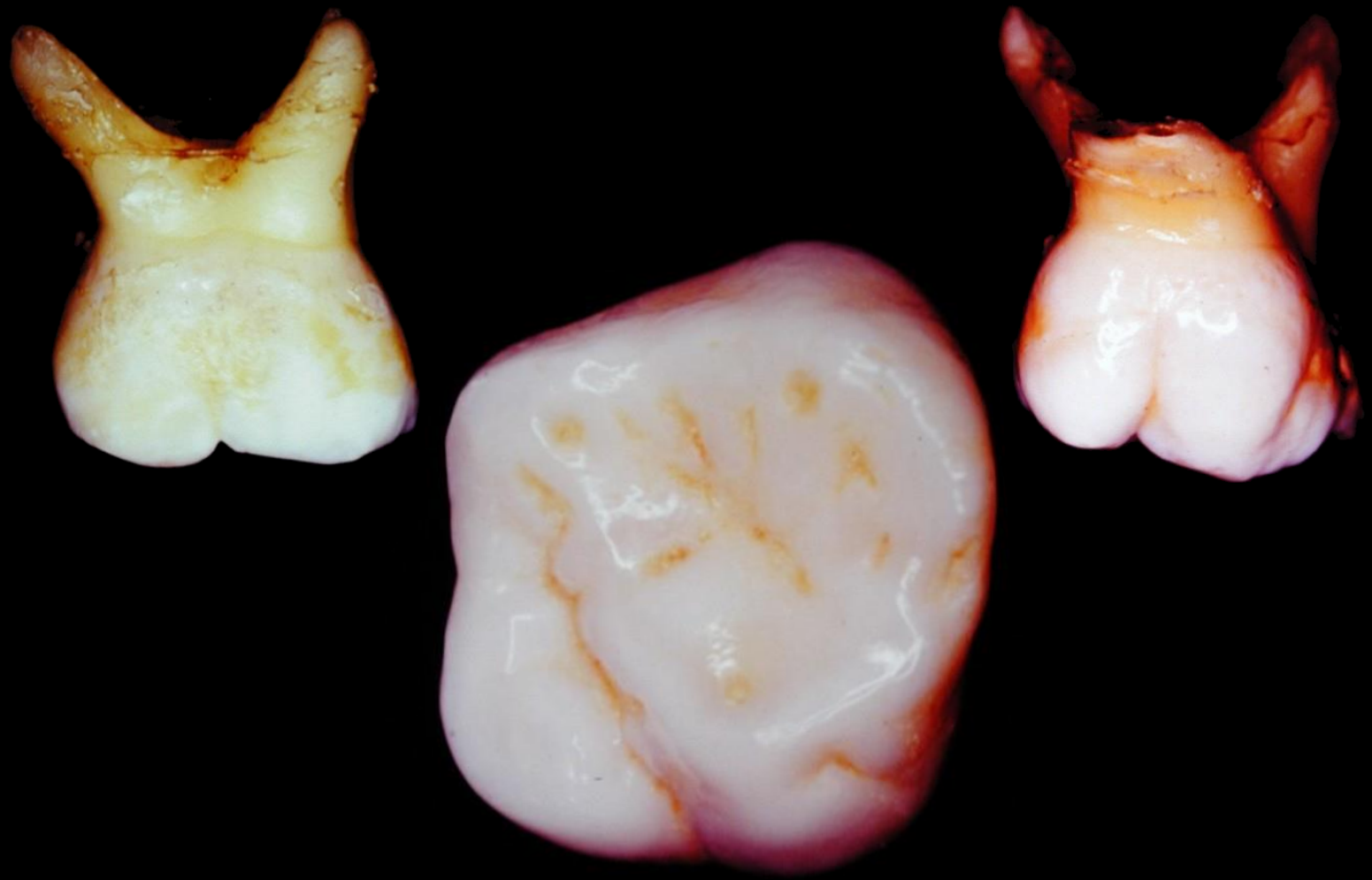
  DB root is the shortest

- 4 or 5 pulp horns, MB pulp horn is the largest

  MB > ML > DB > DL



Maxillary 2nd molar

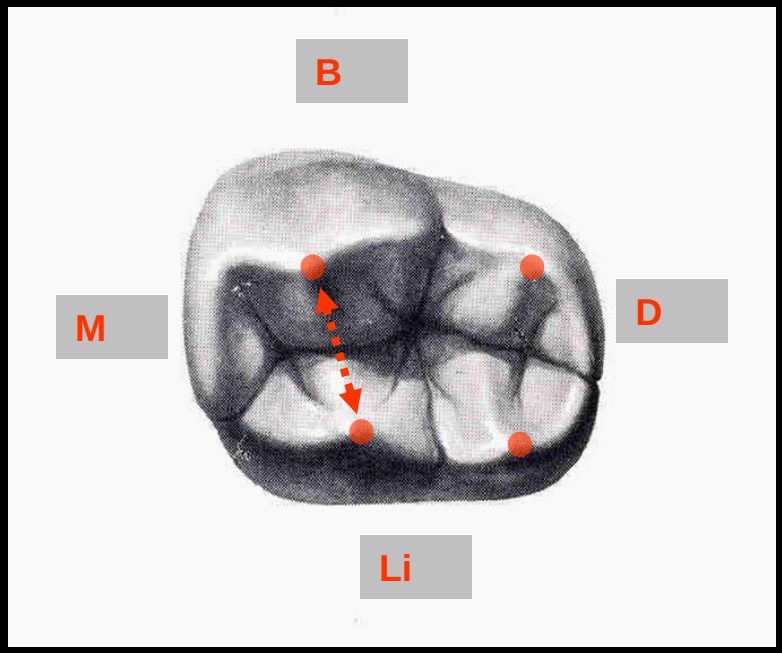


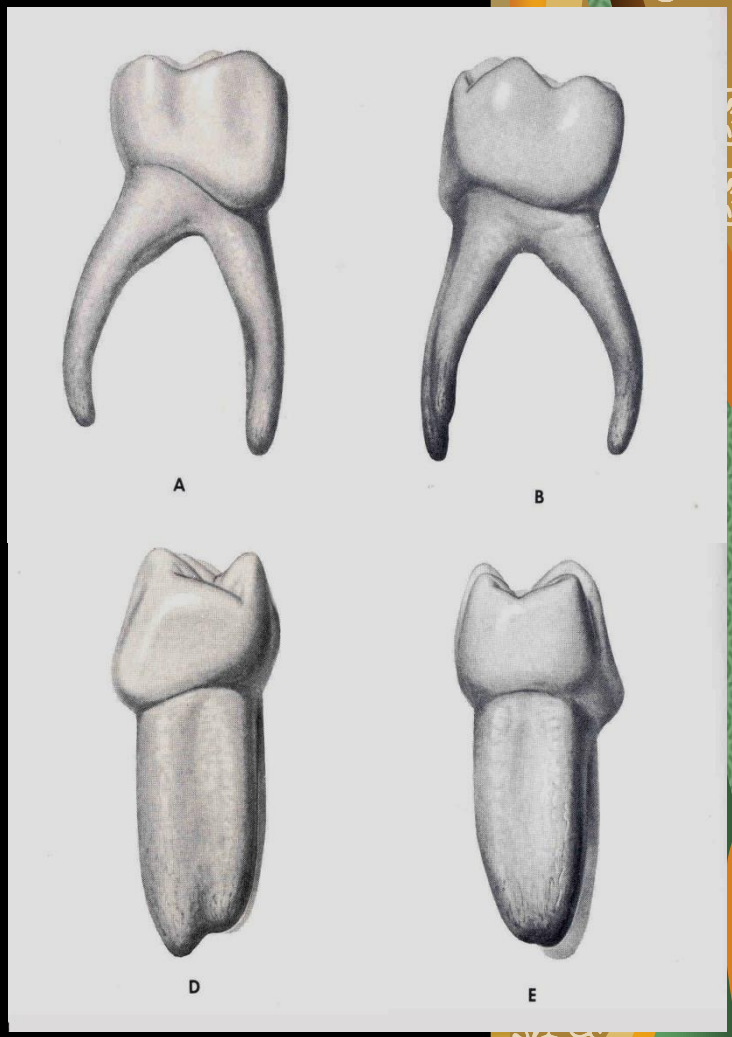
Mandibular 1st molar

- Unique features compared with other deciduous and permanent teeth :

  long and narrow occlusal table

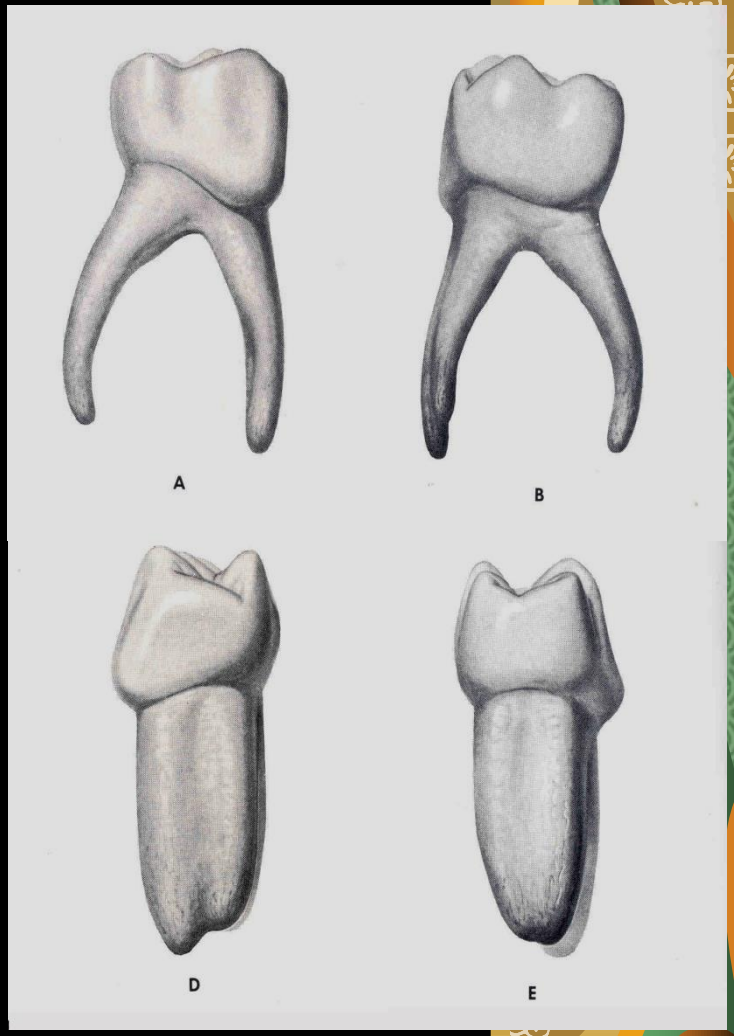
- Crown : M-D width is greater than B-L width and short O-C height





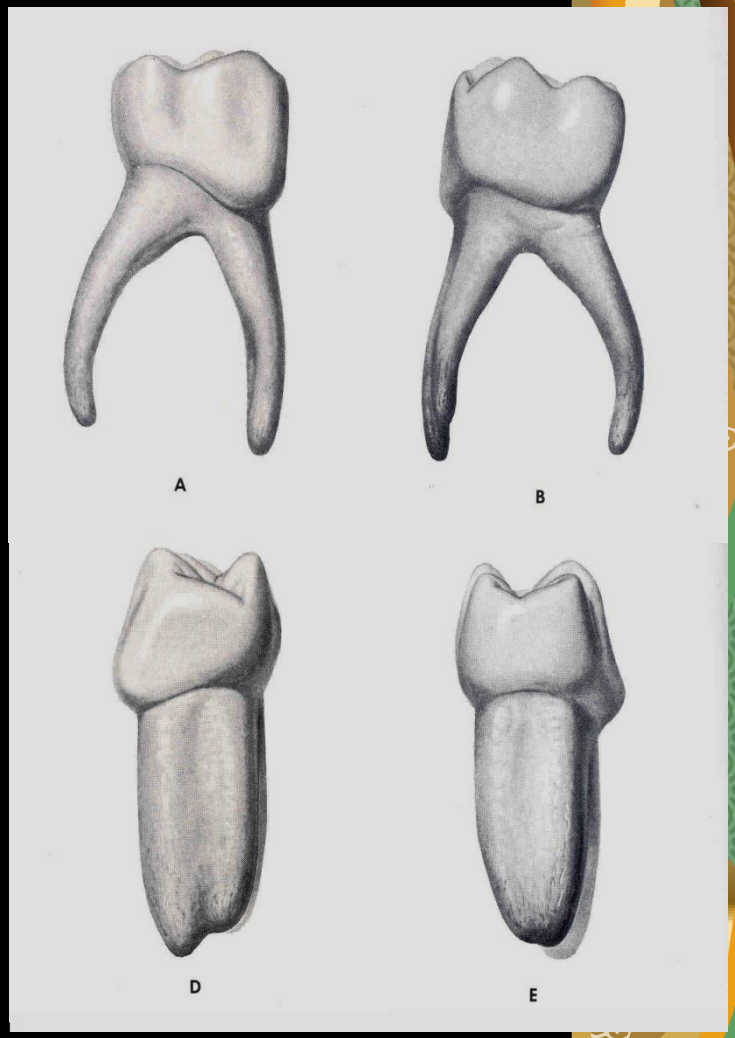
Mandibular 1st molar

- *Buccal aspect :*
  - MB cusp is larger than DB cusp
  - A developmental depression (no B groove)
  - Cervical line is curved down mesially, due to large mesio-cervical bulge
  - Distal portion of crown is shorter than mesial portion
  - Mesial outline of crown is almost straight
  - Distal portion converges toward cervix



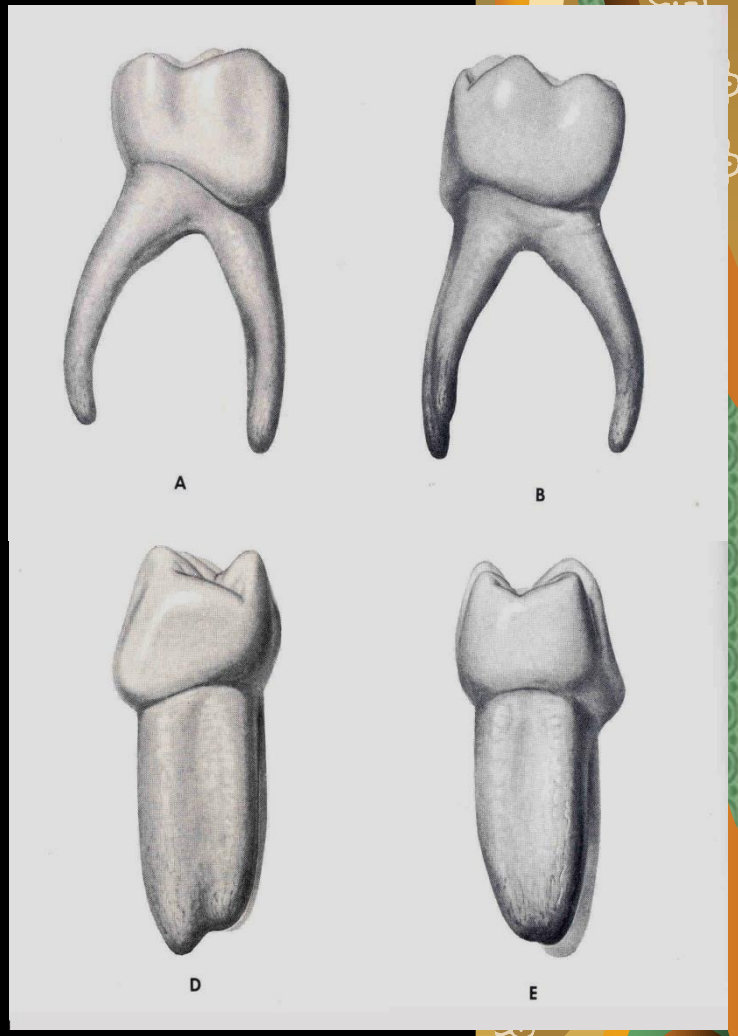
Mandibular 1st molar

- *Lingual aspect :*
  - ML cusp is long and sharp
  - DL cusp is rounded
  - Short lingual groove
  - Cervical line is straighter
  - Crown length mesially and distally is more uniform than buccal aspect



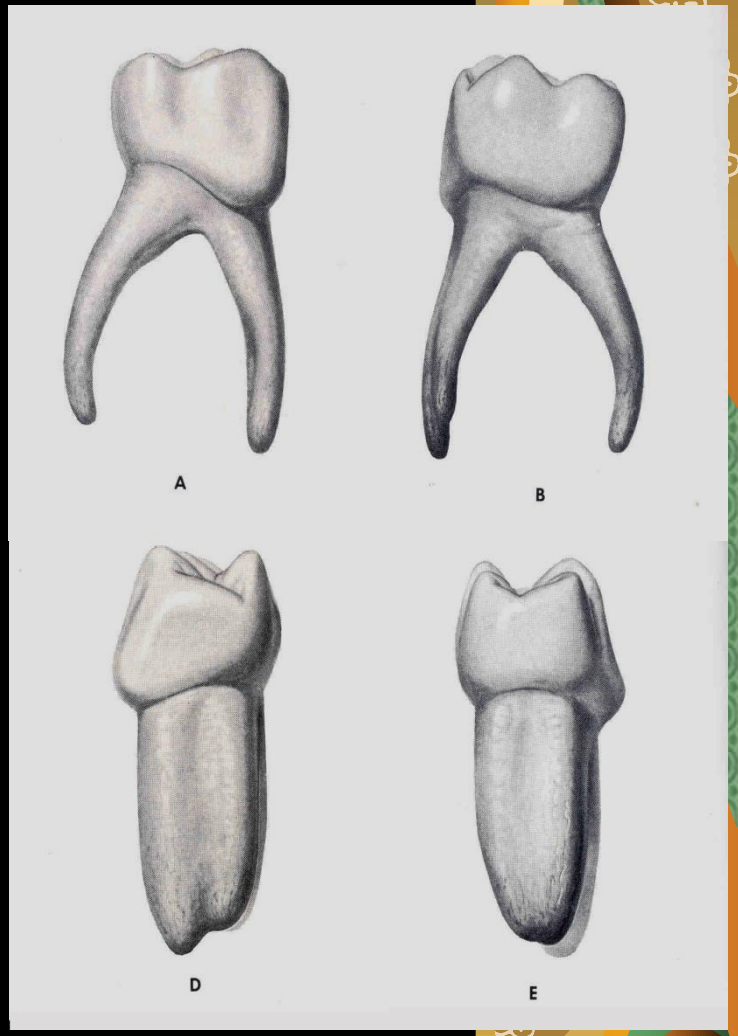
Mandibular 1st molar

- *Mesial aspect :*
  - Extreme curvature buccally at cervical third
  - MB and ML cusps
  - MB crown length is greater than ML
  - Cervical line slants upward buccolingually
  - Well-developed mesial marginal ridge



Mandibular 1st molar

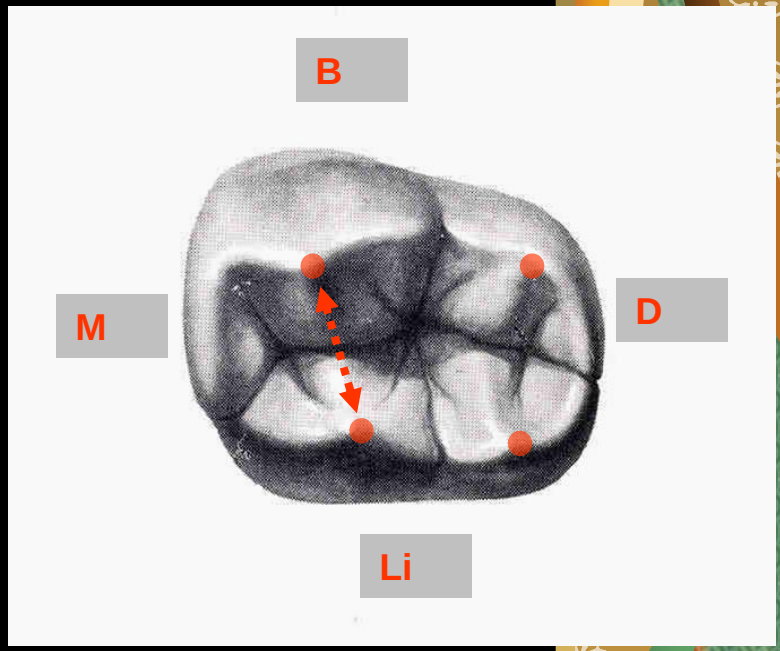
- *Distal aspect :*
  - DB and DL cusps are not long, not sharp
  - Cervical line does not drop buccally, cervical line extends almost straight
  - Crown length buccally and lingually is more uniform
  - Distal marginal ridge is not as straight or well defined as mesial marginal ridge



Mandibular 1st molar

- *Occlusal aspect :*
  - Rhomboidal occlusal crown outline

    (large cervical bulge mesiobuccally)
  - 4 cusps: MB, MLi, DB and DLi
  - Transverse ridge (MB and MLi cusps)
  - 2 fossae :
    - smaller mesial triangular fossa – M pit
    - larger distal triangular fossa – C and D pits
  - Buccal and lingual developmental grooves

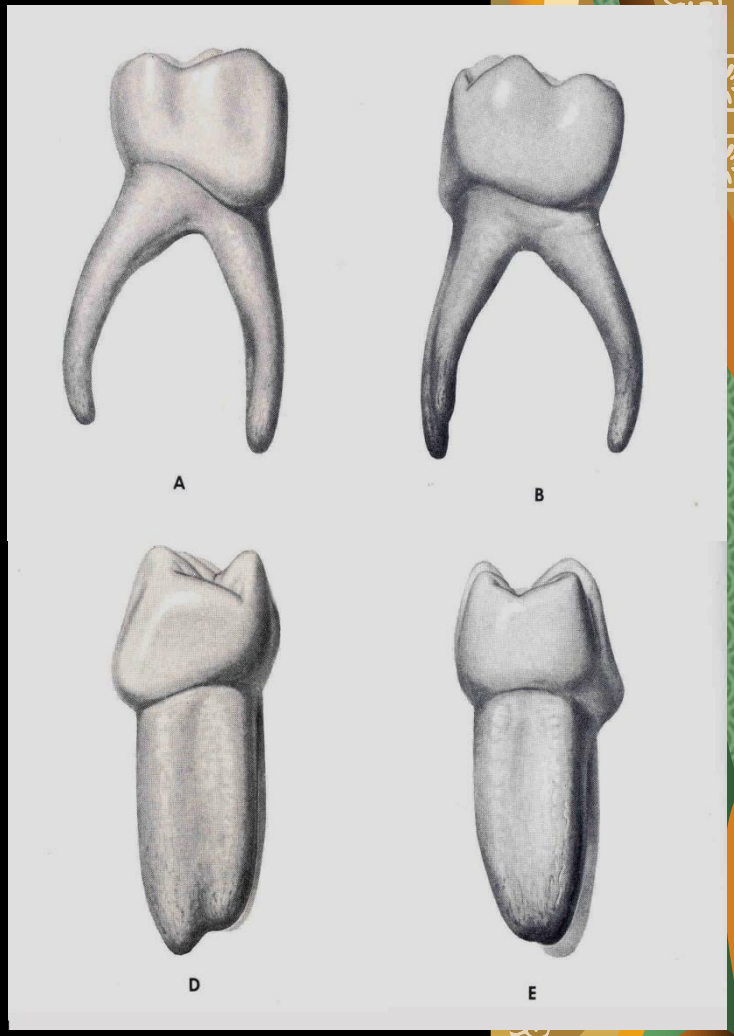


Mandibular 1st molar

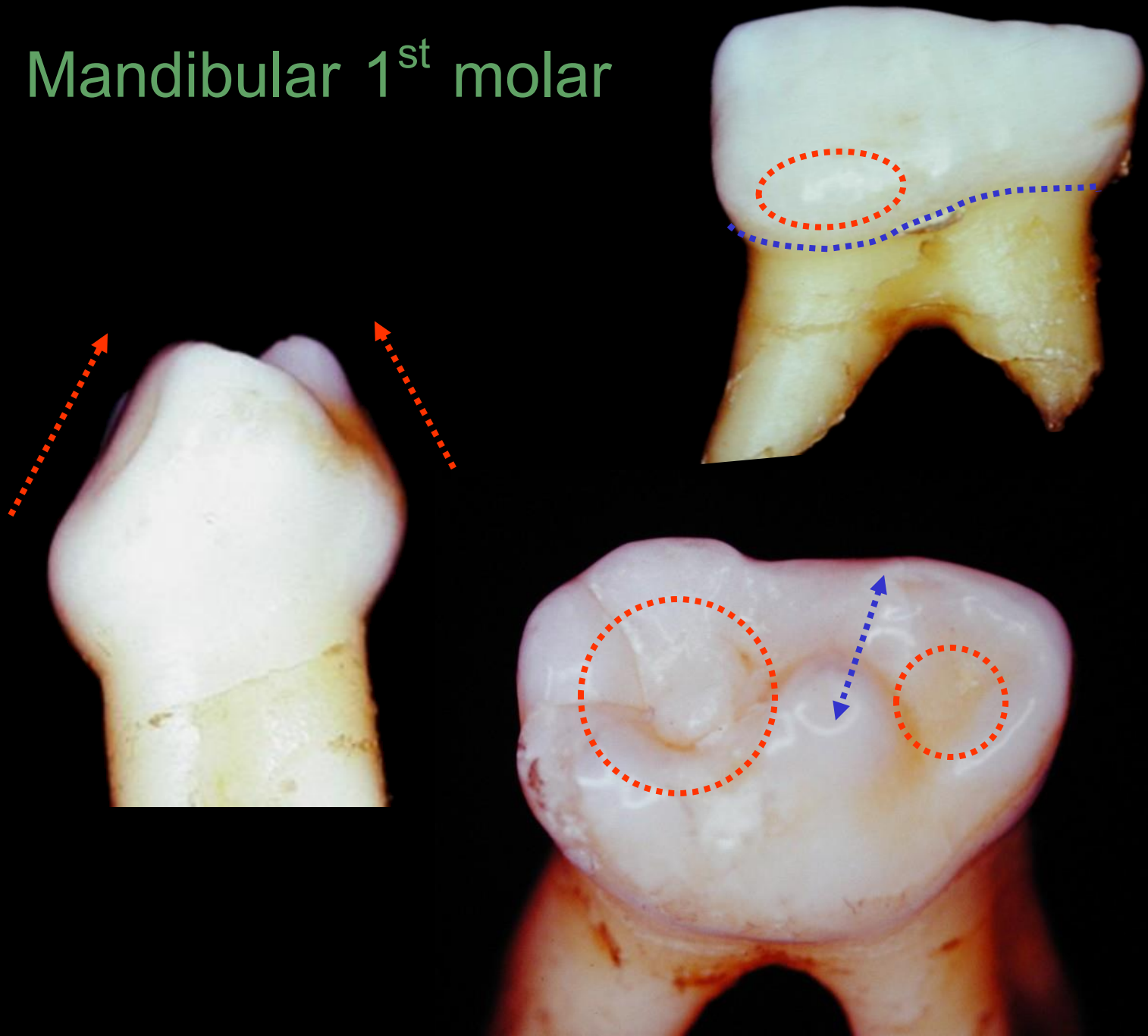
- Mesial root end is flat and almost square
- A developmental depression extends almost full length of root on mesial side
- Distal root is rounder and shorter and tapers more apically
- 2 roots (M and D);

  3 root canals (MB, MLi, and D)
- 4 pulp horns, MB pulp horn is the largest

  DL pulp horn is the smallest

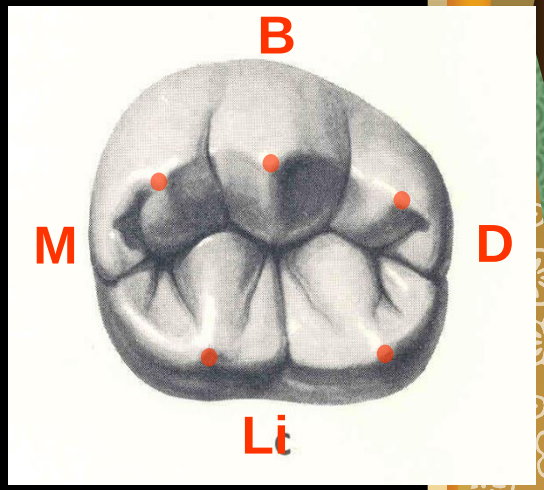


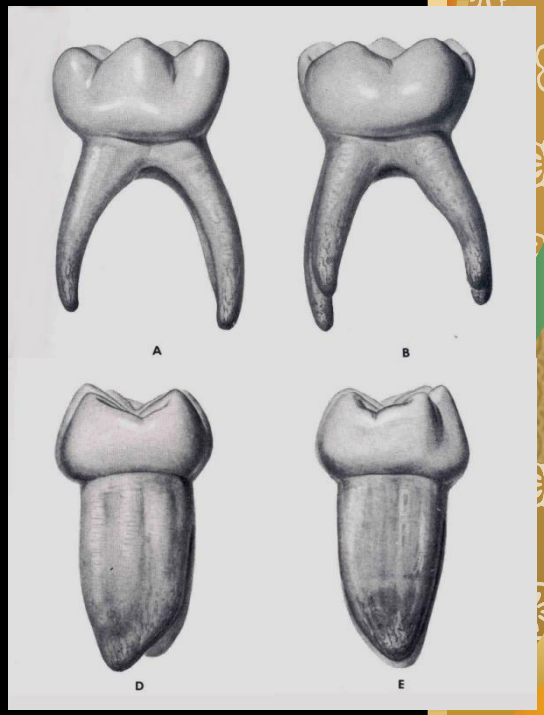
Mandibular 1st molar



Mandibular 2nd molar

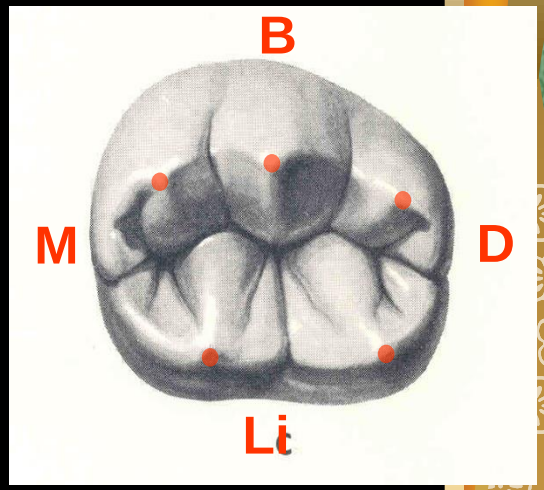
- Crown outline is similar to mandibular permanent 1st molar
- Smaller size, short crown height
- M-D width is greater than B-L width
- *Buccal aspect :*
  - 3 cusps, almost equal
    - MB, DB, and Distal cusps
  - MB and DB developmental grooves

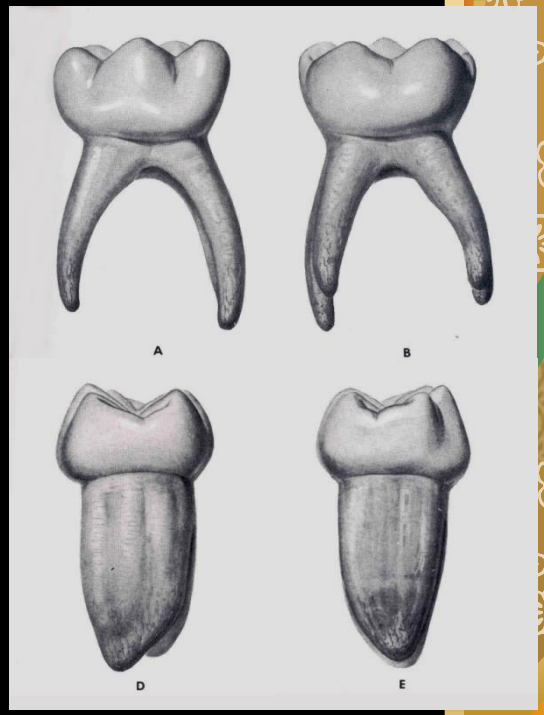




Mandibular 2nd molar

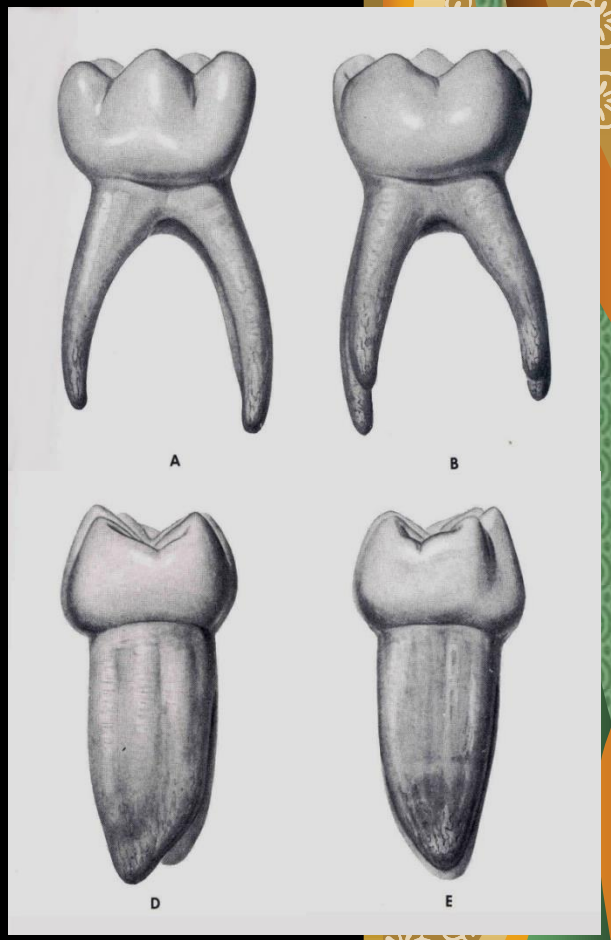
- *Lingual aspect :*
  - 2 cusps, almost equal
    - ML and DL cusps
  - A short lingual groove
  - Crown narrows lingually
  - Cervical line is relatively straight





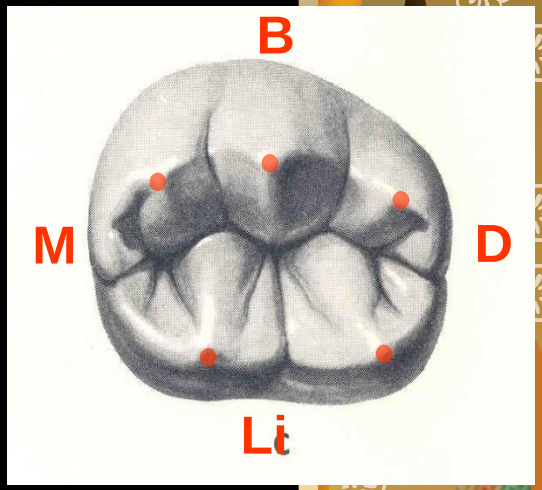
Mandibular 2nd molar

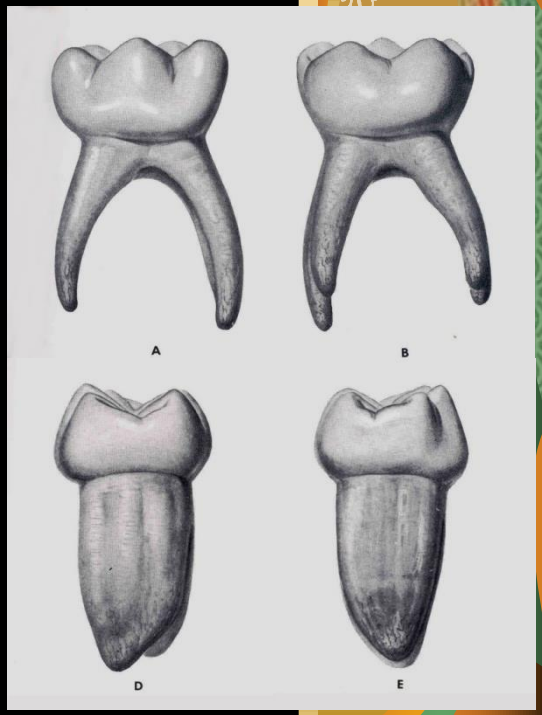
- *Mesial aspect :*
  - Outline of crown resembles mandibular permanent 1st molar
  - Marginal ridge is high, makes MB and ML cusps appear rather short
    - ML cusp is longer, or higher than MB cusp
  - Cervical line extends upward buccolingually



Mandibular 2nd molar

- *Distal aspect :*
  - Crown is not as wide distally as it is mesially
  - Distal marginal ridge dips down more sharply and is shorter buccolingually than mesial marginal ridge
  - Cervical line extends upward buccolingually



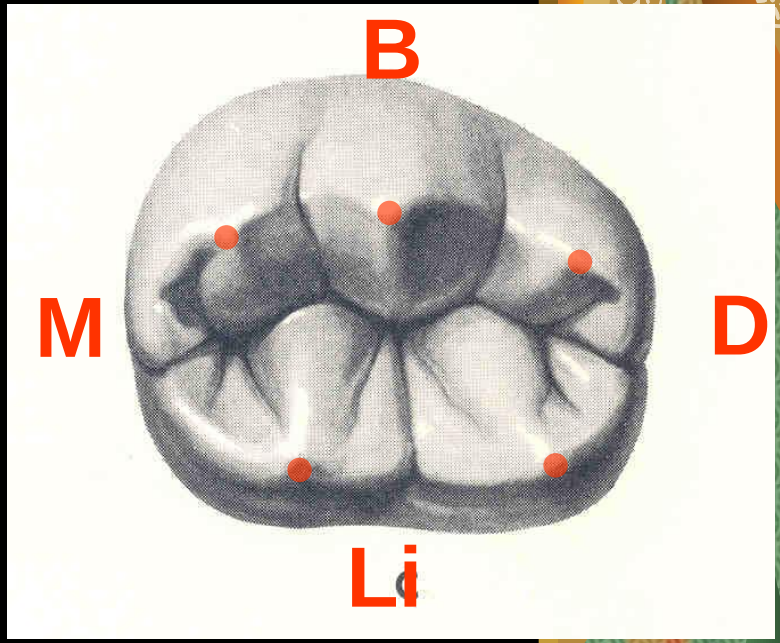


Mandibular 2nd molar

- *Occlusal aspect :*
  - Occlusal outline is rectangular
  - 5 cusps : MB, DB, ML, DL and D cusps
  - 3 buccal cusps are similar in size;

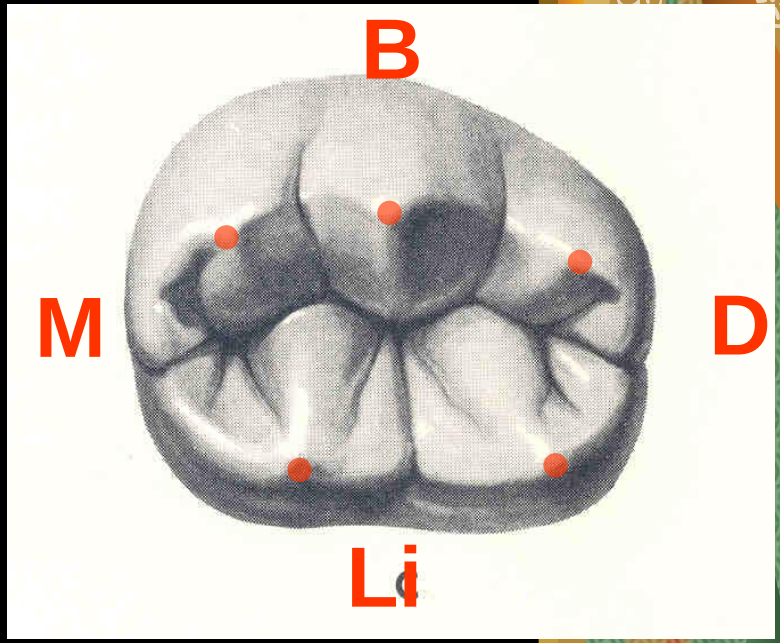
    DB cusp is slightly larger

    (D cusp of permanent molar is smaller than the other two)
  - 2 lingual cusps are also equal



Mandibular 2nd molar

- *Occlusal aspect :*
  - M marginal ridge is better developed, more pronounced than D marginal ridge
  - Outline of crown converges distally
  - D triangular fossa is not as well defined as M triangular fossa
  - 3 pits : M, C and D pit
  - Occlusal grooves : “ Y ” pattern



Mandibular 2nd molar

- 2 roots (M and D) :

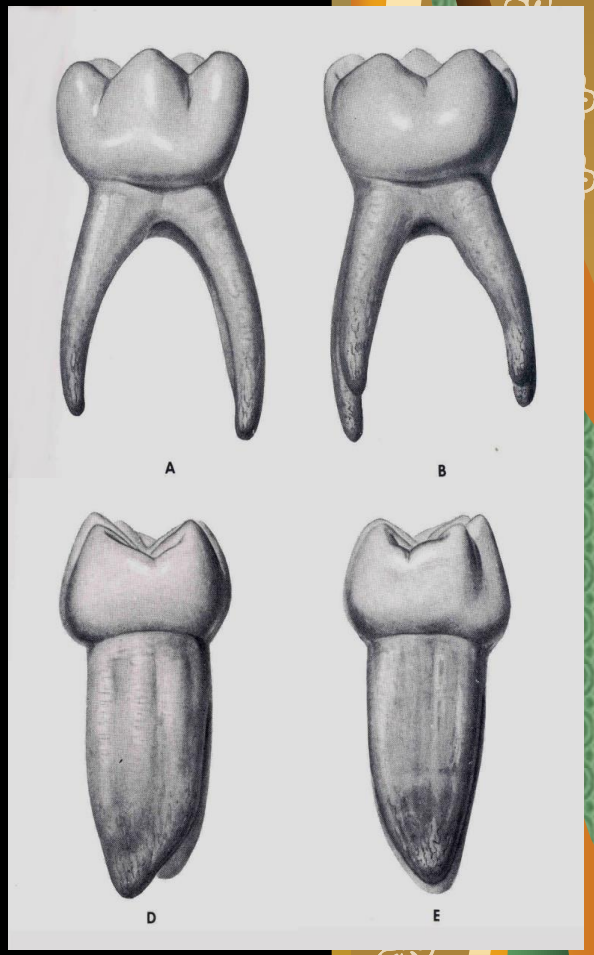
  M root is broad and flat with blunt apex, depression

  D root is broad and flat but is narrower and less

  blunt at apex;

  3 root canals (MB, ML and D)

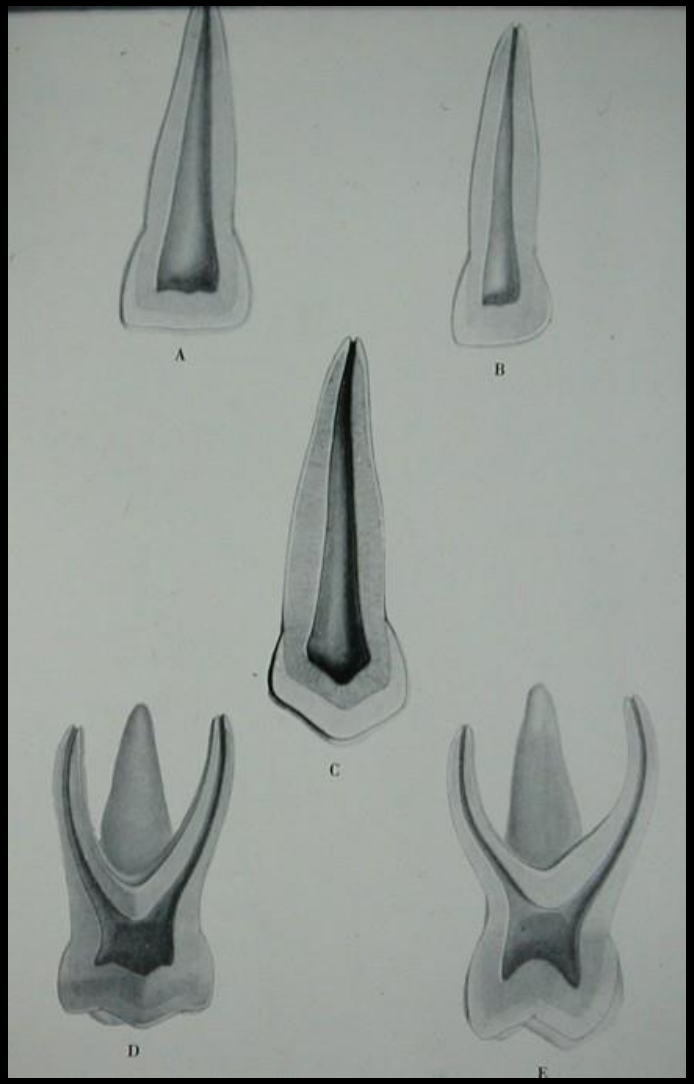
- 5 pulp horns;
  - MB and ML pulp horns are the largest
  - Distal pulp horn is the smallest



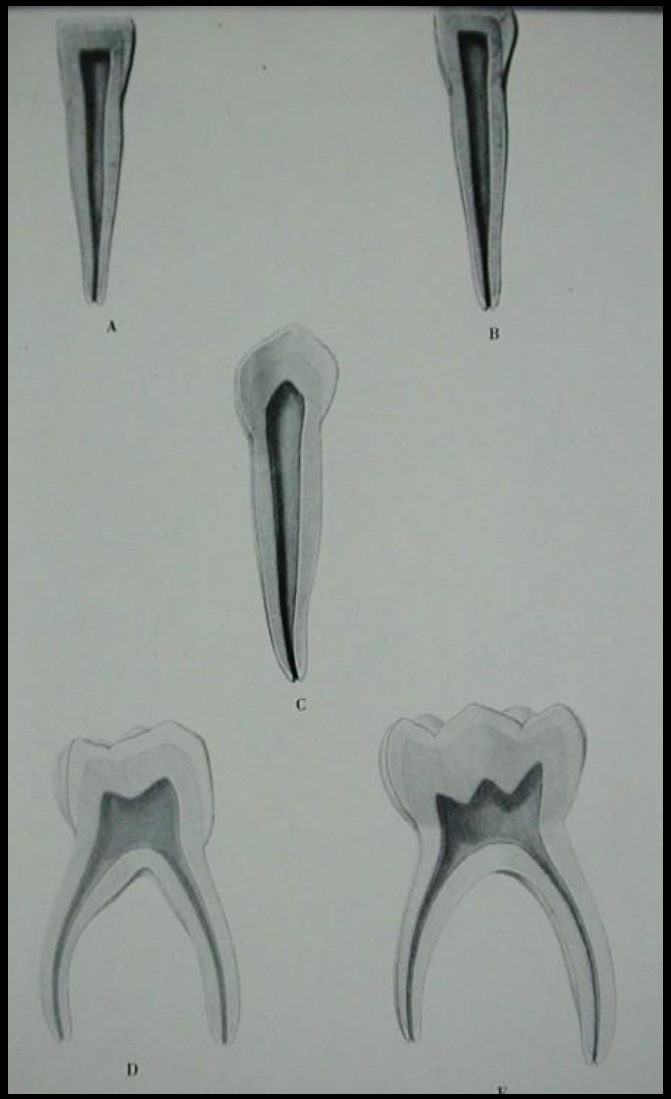
Mandibular 2nd molar



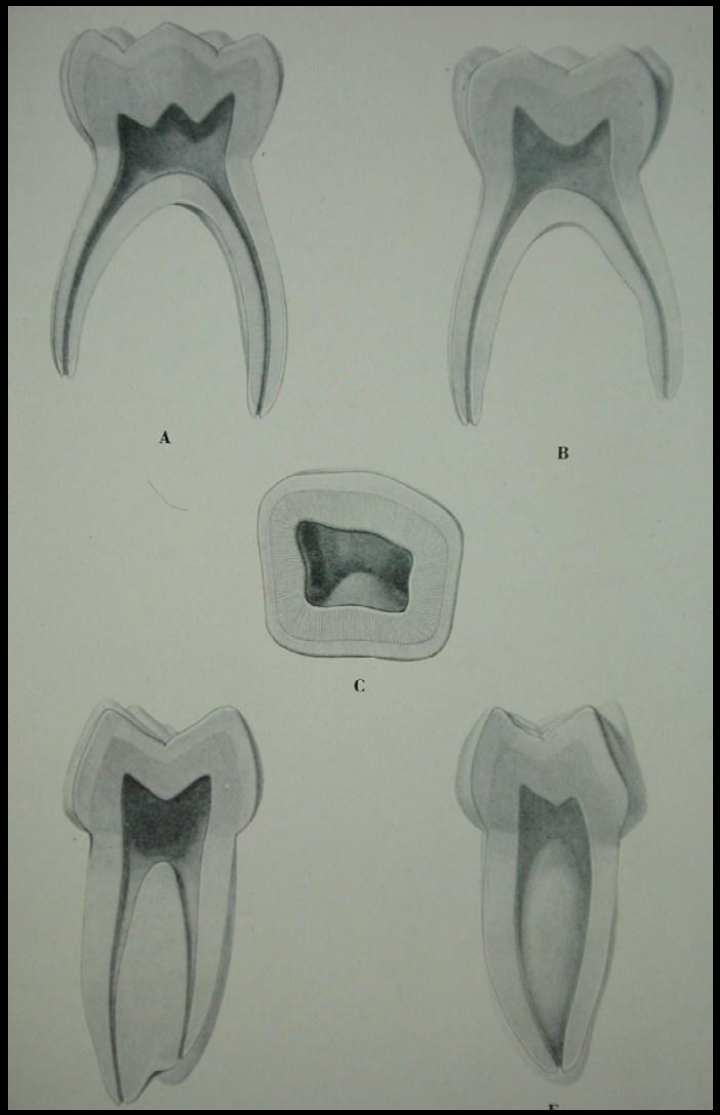
Maxillary teeth



Mandibular teeth



Mandibular 2nd molar





References

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Scheid RC, Weiss G : Woelfel's Dental Anatomy, 8th ed, Philadelphia, PA, 2012, Lippincott Williams & Wilkins.

