



PERMANENT FIRST MAXILLARY MOLARS

BY: DR. RANA S. ALHAMDAN

Molar

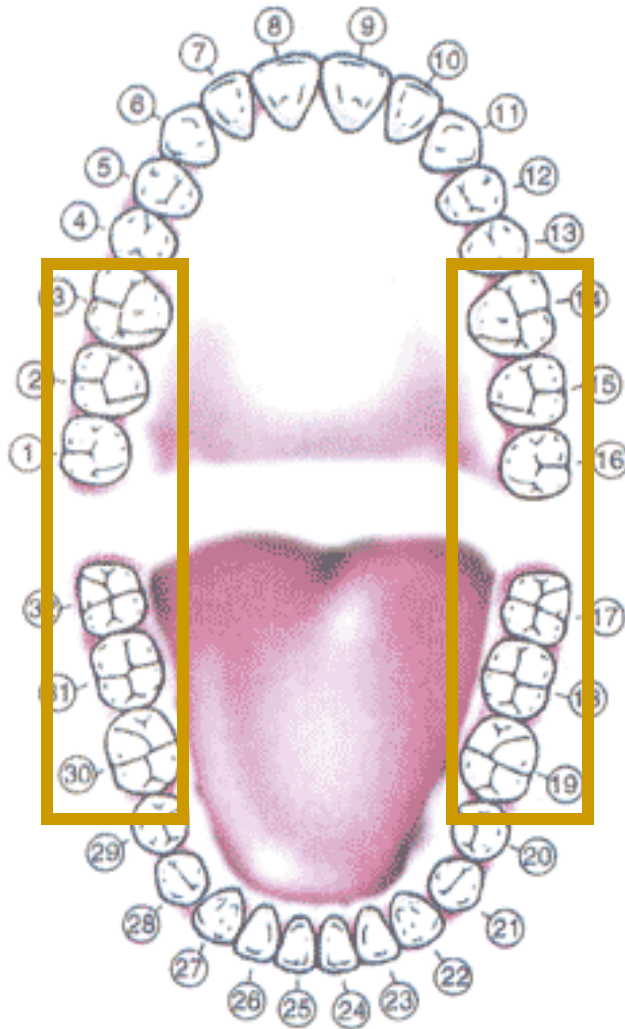
Molar

Second premolar
First premolar
Canine (cuspid)
Lateral incisor
Central incisor
Central incisor
Lateral incisor
Canine (cuspid)
First premolar
Second premolar



Main Function of maxillary & mandibular molars:

Mastication





They help to maintain:
proper **vertical dimension** and
the **continuity within the dental arch.**



Molars generally have **wide occlusal surface**



Upper teeth

Central incisors	7 - 8 yrs.
Lateral incisors	8 - 9 yrs.
Cuspids	11 - 12 yrs.
First bicuspid	10 - 11 yrs.
Second bicuspid	10 - 12 yrs.
First molars	6 - 7 yrs.

Second molars	12 - 13 yrs.
Third molars	17 - 21 yrs.

Lower teeth

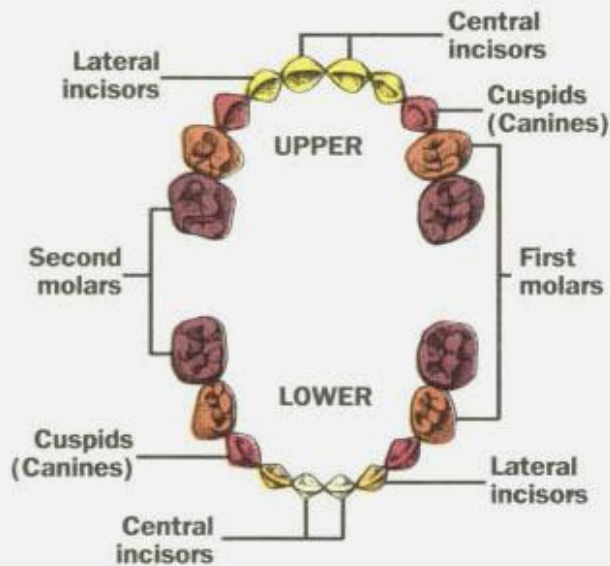
Third molars	17 - 21 yrs.
Second molars	11 - 13 yrs.
First molars	6 - 7 yrs.

Second Bicuspid	11 - 12 yrs.
First Bicuspid	10 - 12 yrs.
Cuspids	9 - 10 yrs.
Lateral incisors	7 - 8 yrs.
Central incisors	6 - 7 yrs.

First molars appears in the oral cavity at the age of **6 years** old.

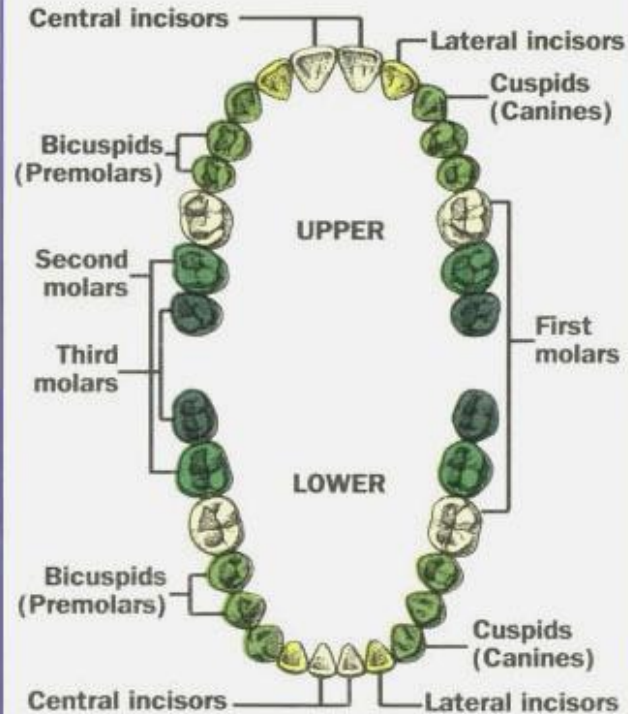
TOOTH DEVELOPMENT

When do primary (baby) teeth usually appear?

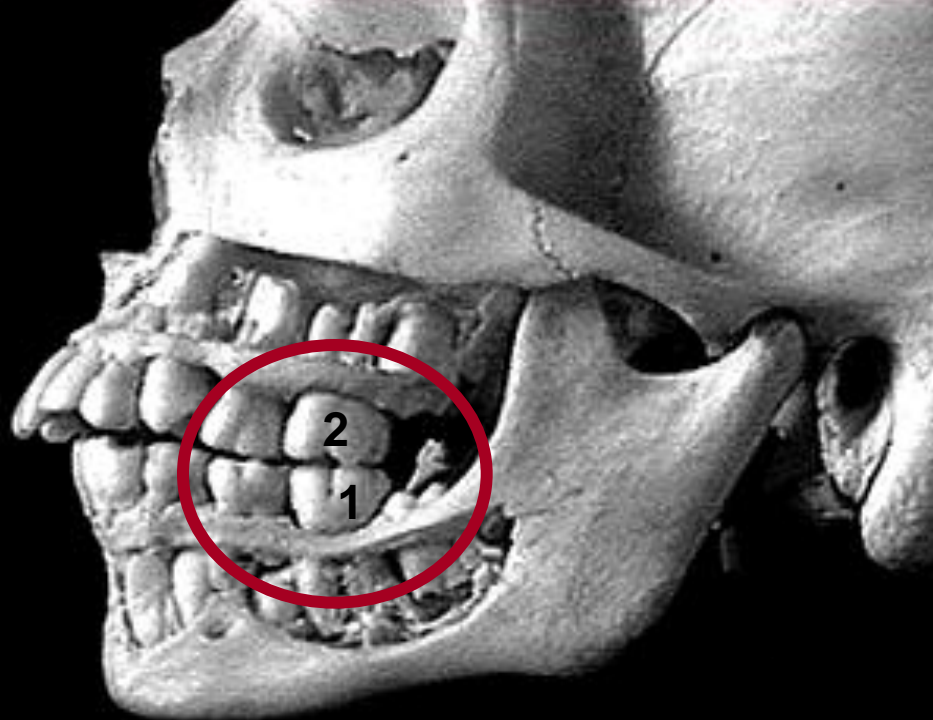


- | | |
|--------------|--------------|
| 6-10 months | 13-19 months |
| 8-13 months | 16-23 months |
| 10-16 months | 23-33 months |

When do permanent teeth usually appear?

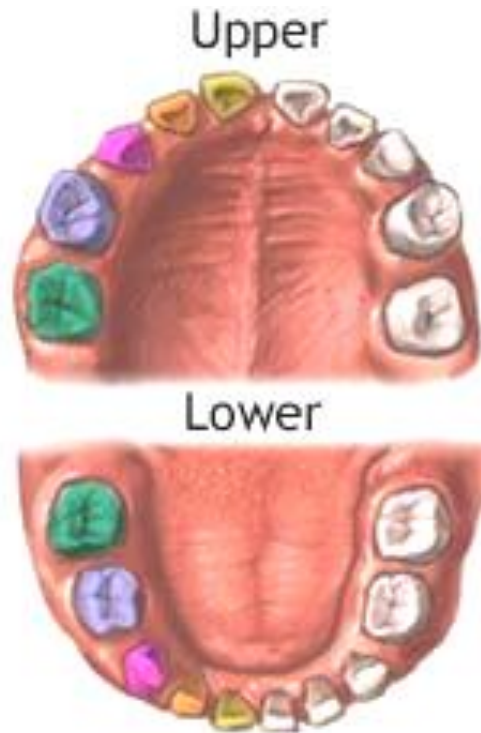


- | | |
|------------|-------------|
| 6-8 years | 11-13 years |
| 7-9 years | 17-21 years |
| 9-12 years | |



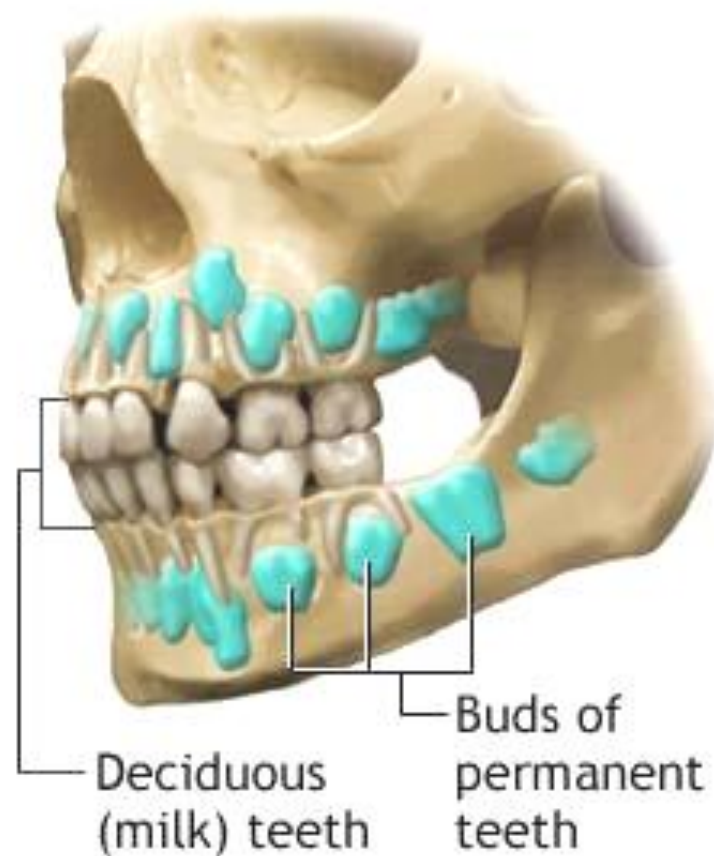
**MANDIBULAR MOLARS PRECEDE THE
MAXILLARY MOLARS**

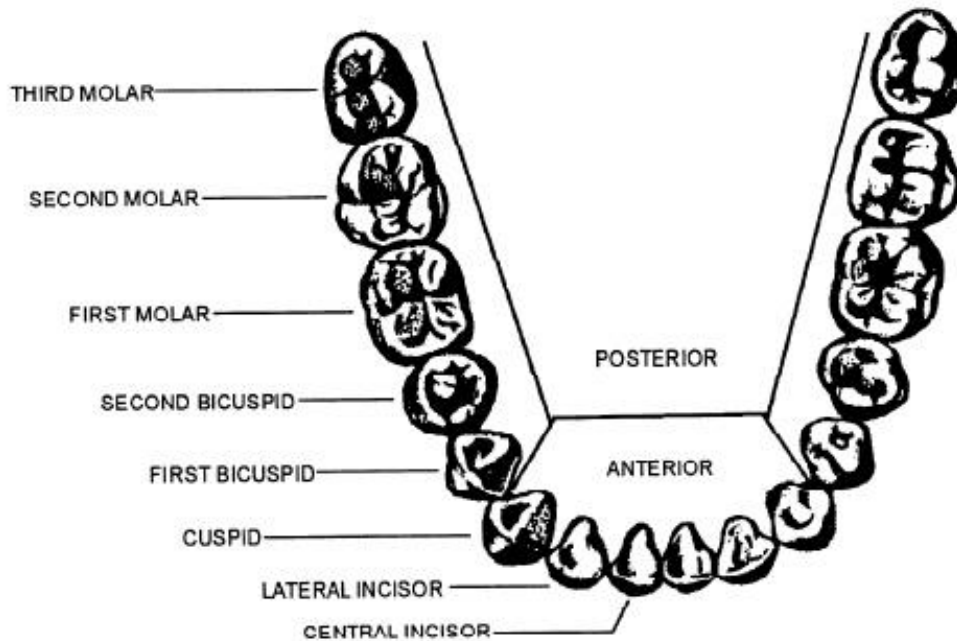
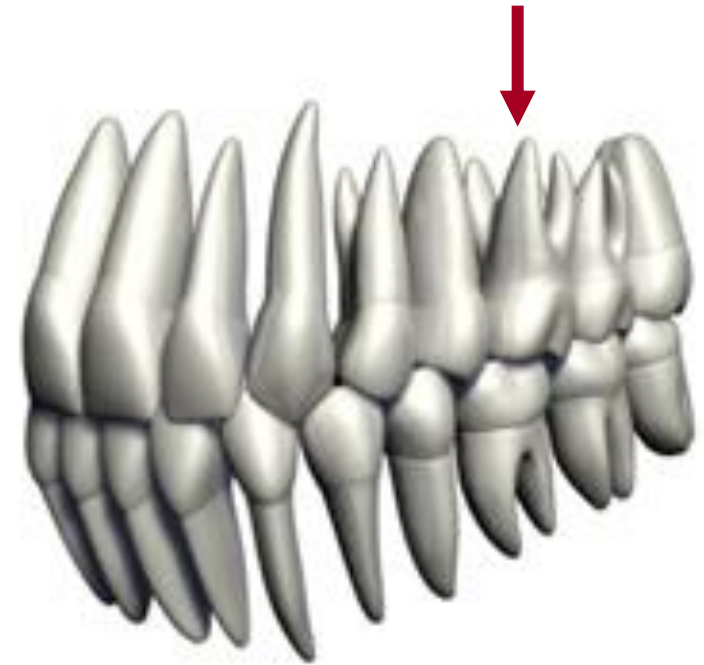
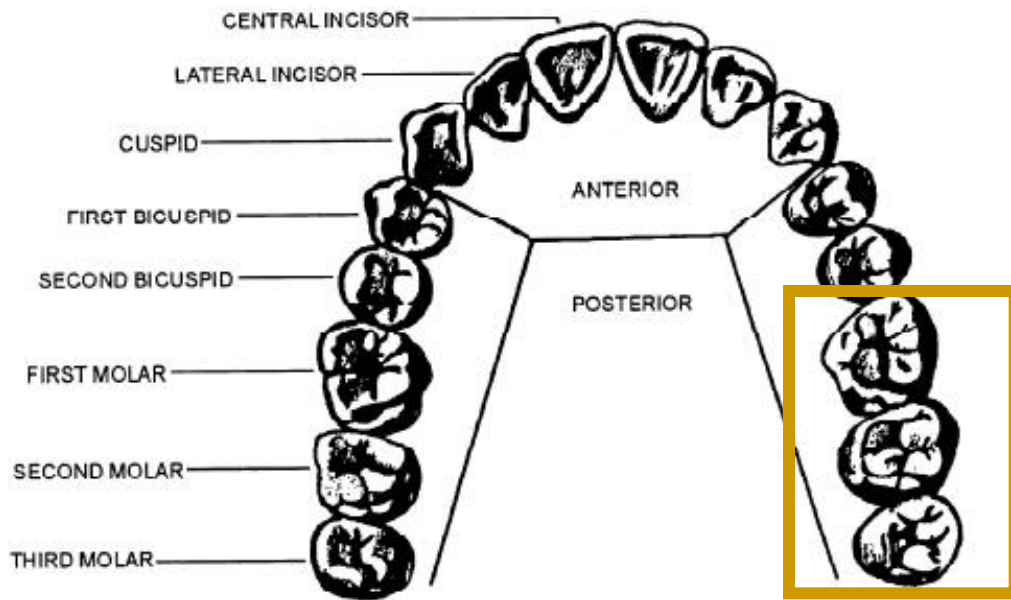
So first molar is **not a succedaneous** tooth because it has **no predecessor**



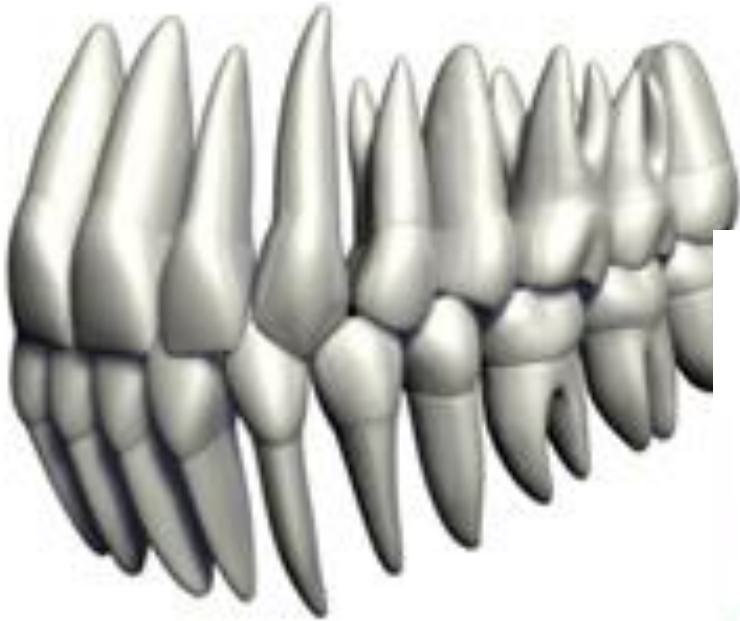
- Central incisor
- Lateral incisor
- Cuspid (canine)
- First molar
- Second molar

Child 2-5 years old

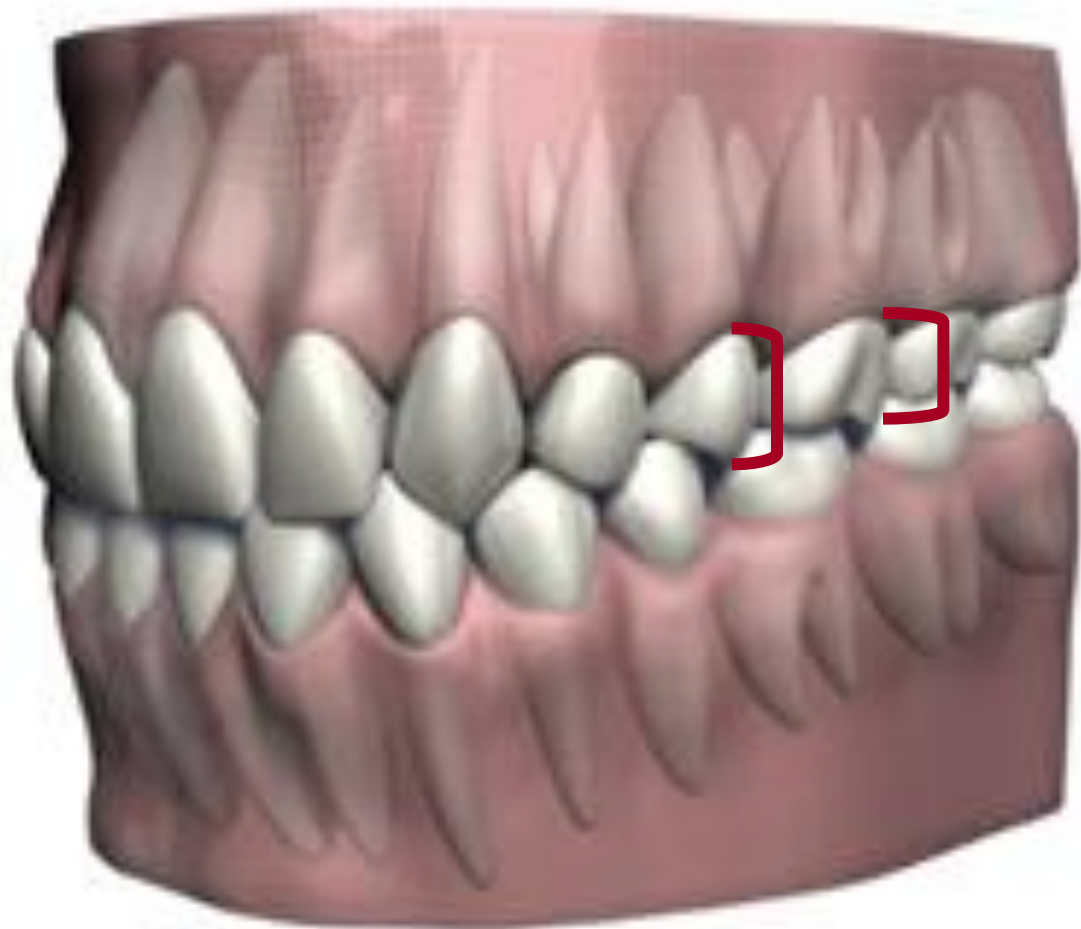




Maxillary molars are the largest and strongest tooth, by their bulk and their anchorage in the jaw.

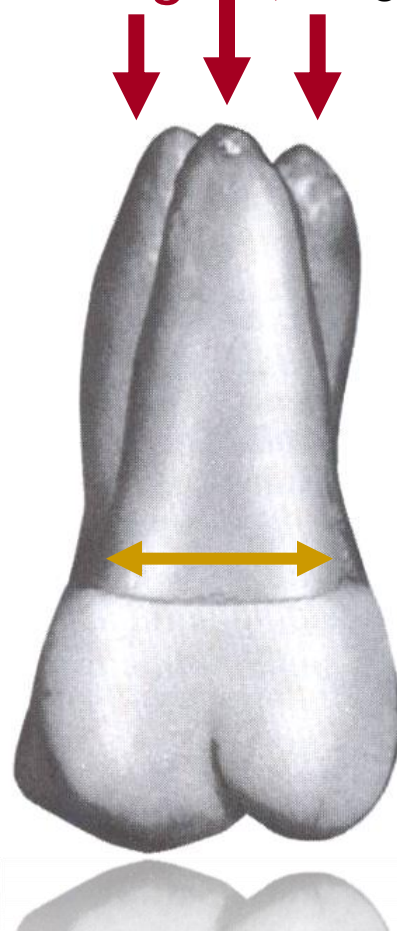


Although crowns on molars may be somewhat **shorter than the premolars**, but..their dimensions are greater in every respect.



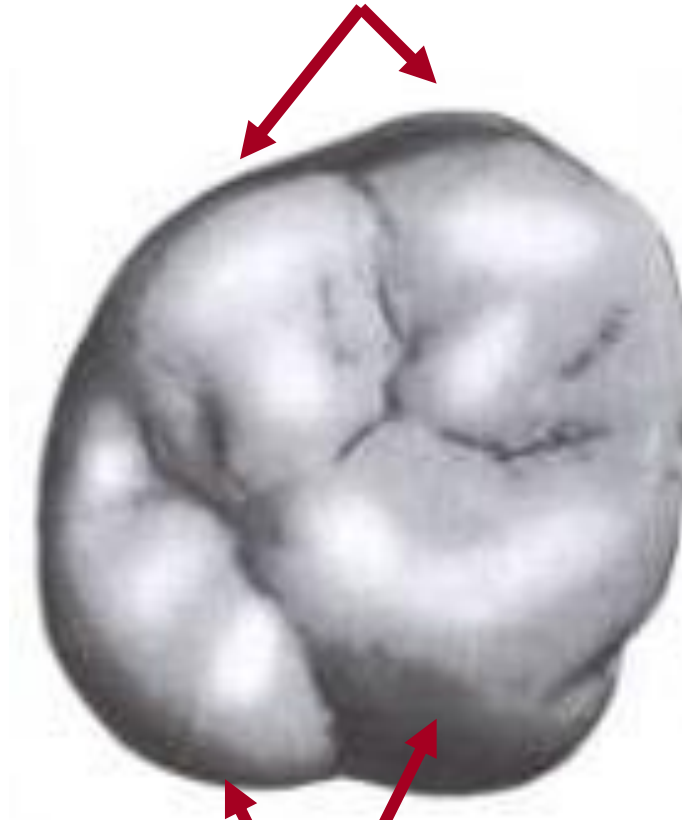
Molars roots are **broader at the base** and is trifurcated into **three roots**

(2 buccal and one lingual, Lingual root is the longest)



Have four cusps

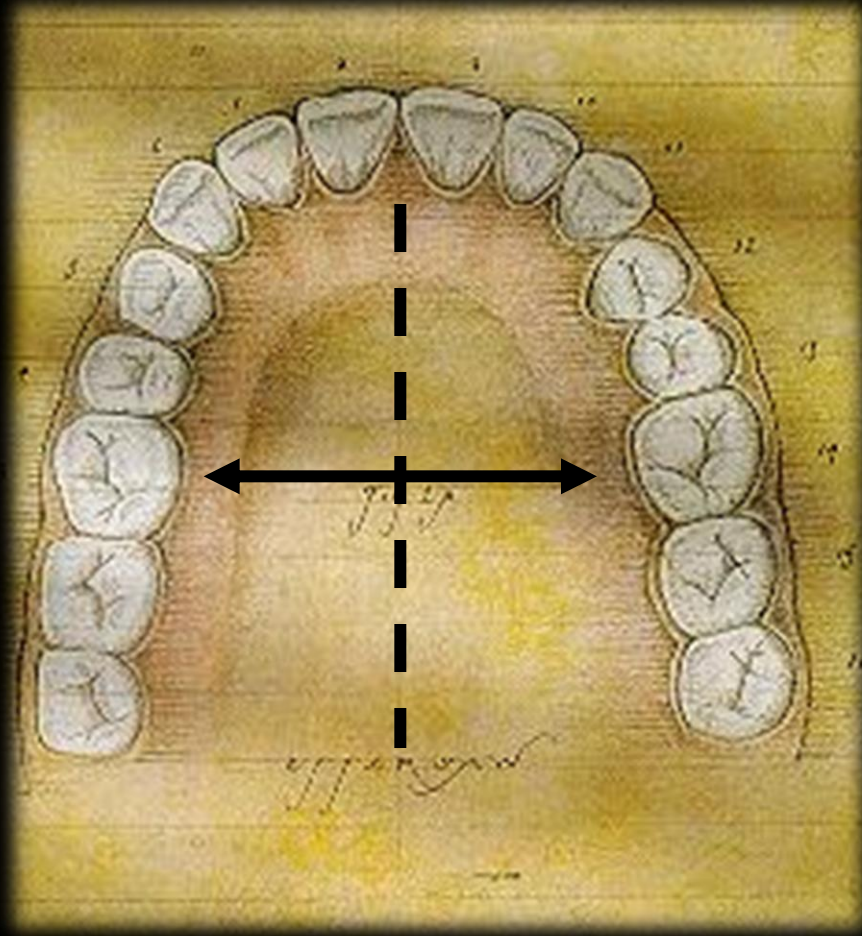
2 buccal



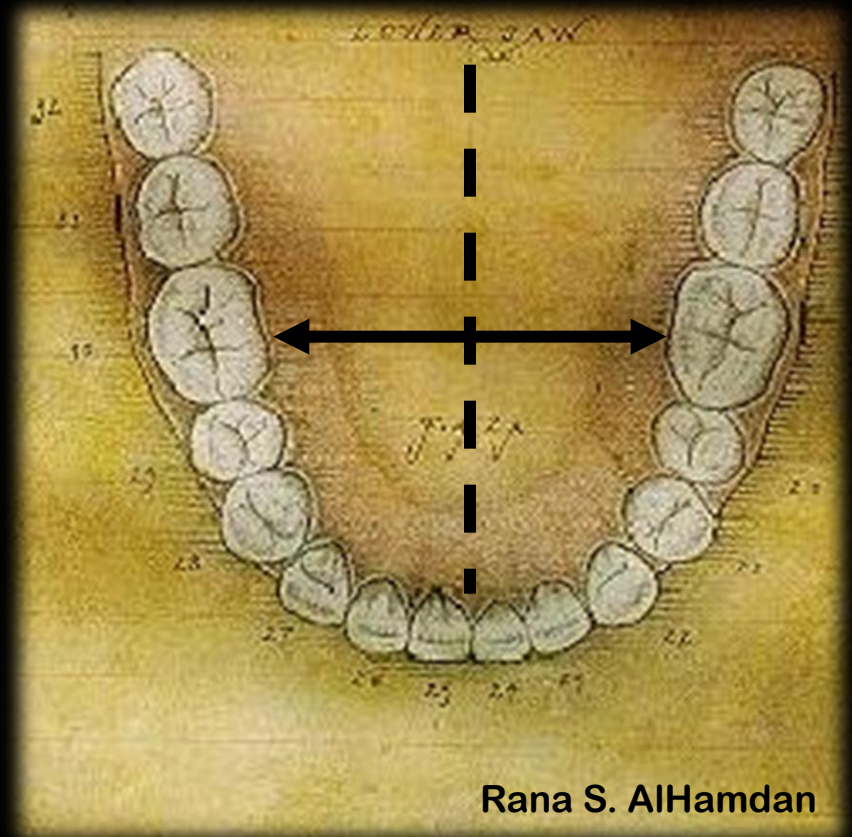
2 lingual

Normal location of the first permanent molar is at the **center** of fully developed adult jaw anteroposteriorly...

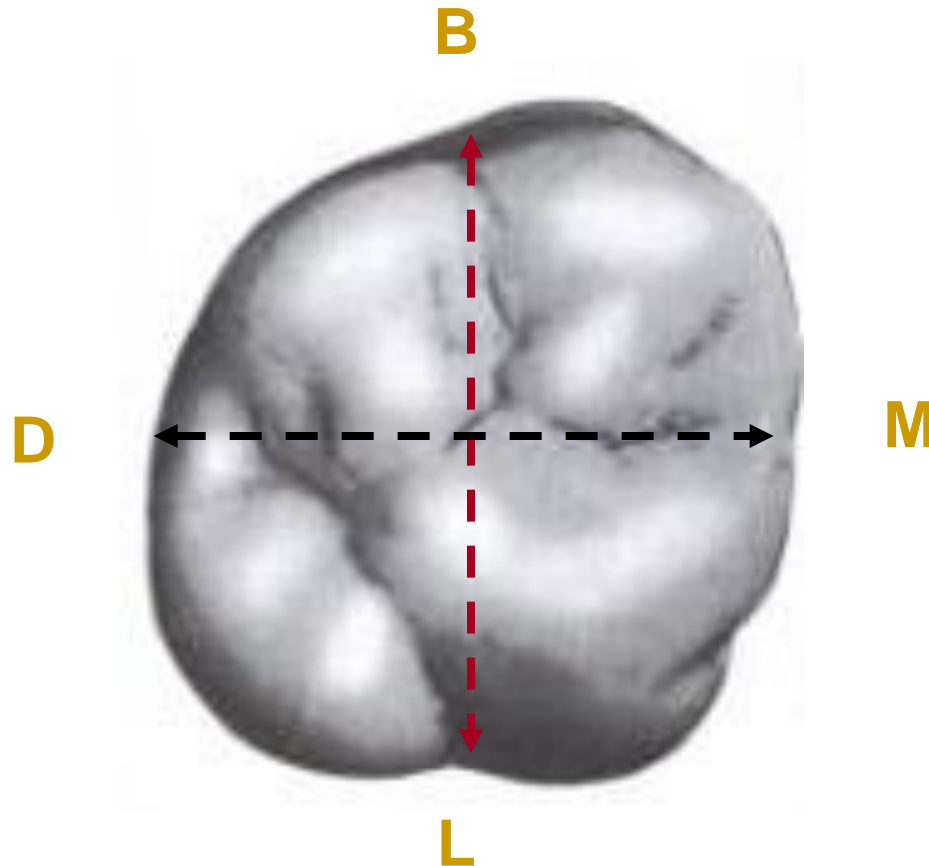




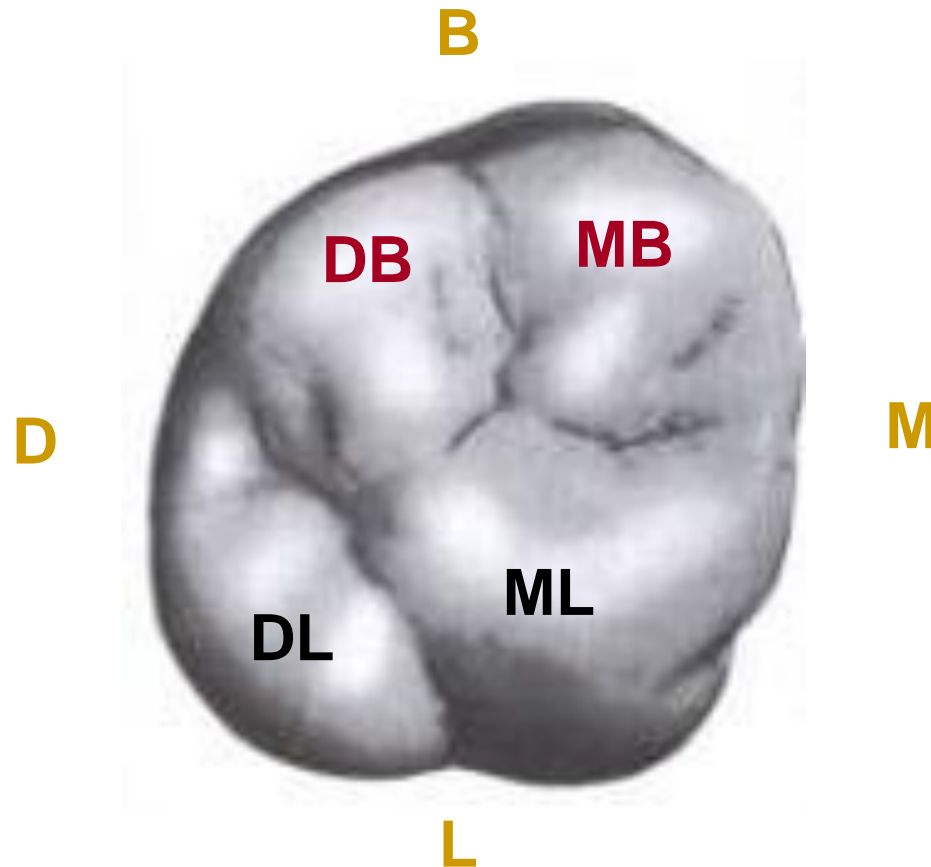
This significance position, first molar is considered the “cornerstones” of the dental arch..



The crown is **wider B-L** than M-D, usually extra dimension B-L is about 1 mm

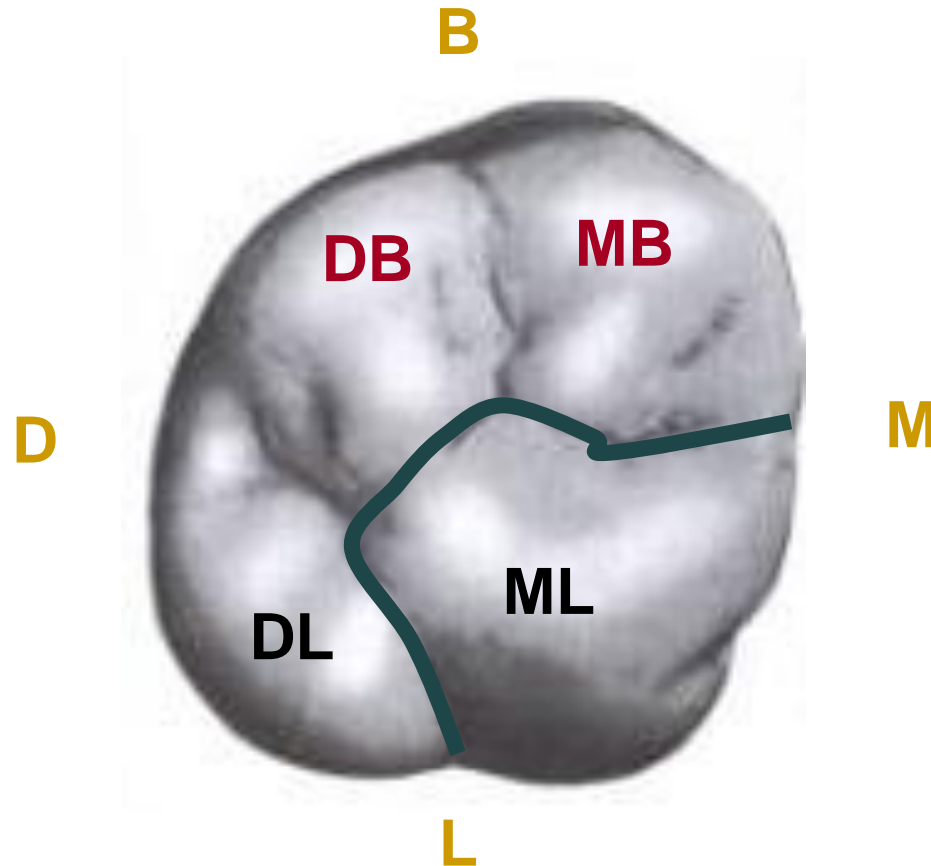


Has four well-developed cusps (**MB**, **DB**, **ML**, **DL**)

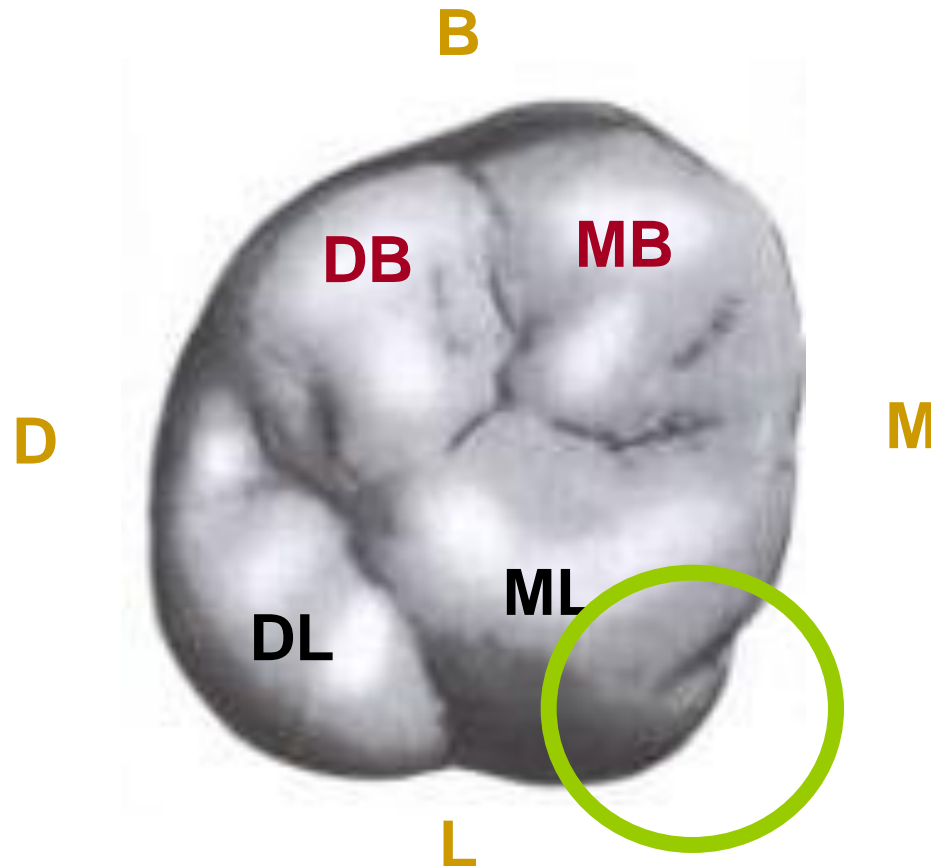


Has four well-developed cusps (MB, DB, ML, DL)

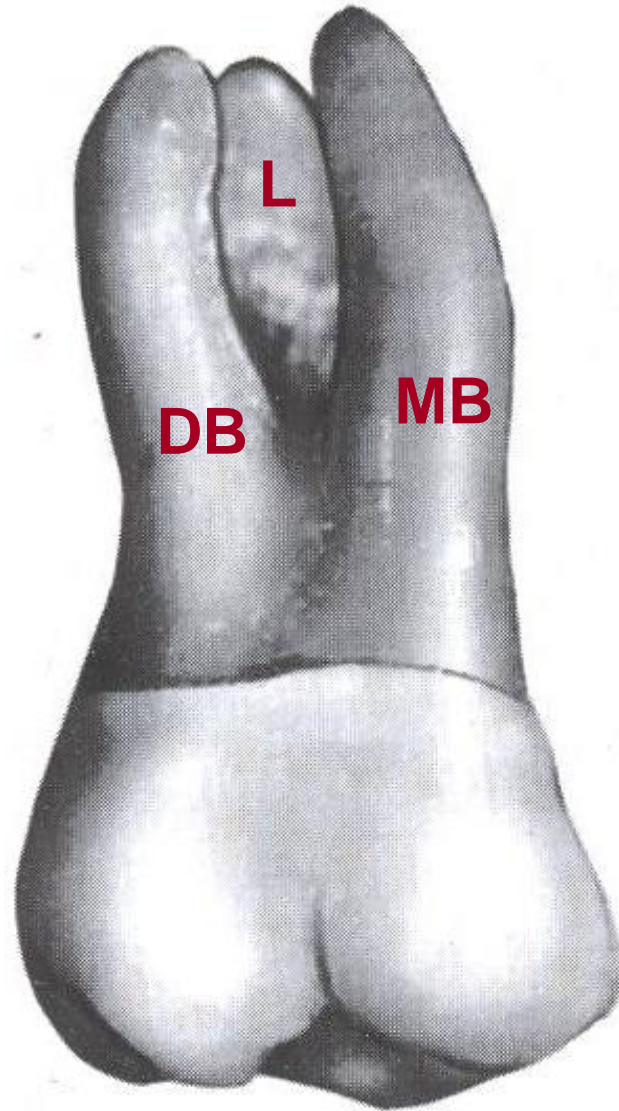
The
largest



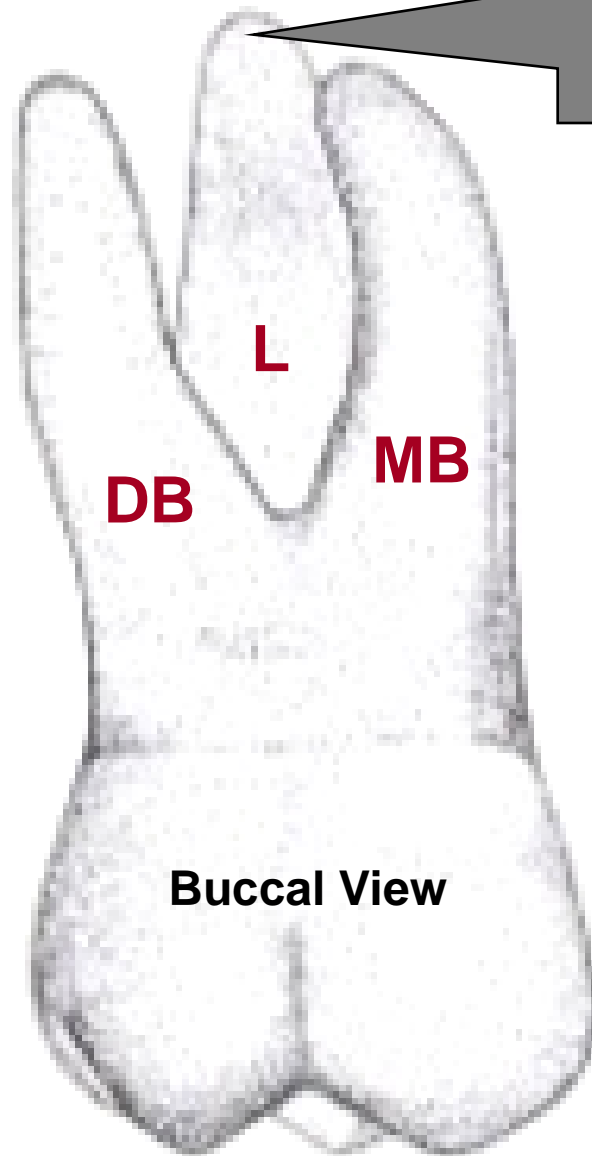
and one supplemental fifth cusp (**cusp or tubercle of Carabelli**) lingual to the ML cusp, it can grade down to series of grooves, depression or pits...



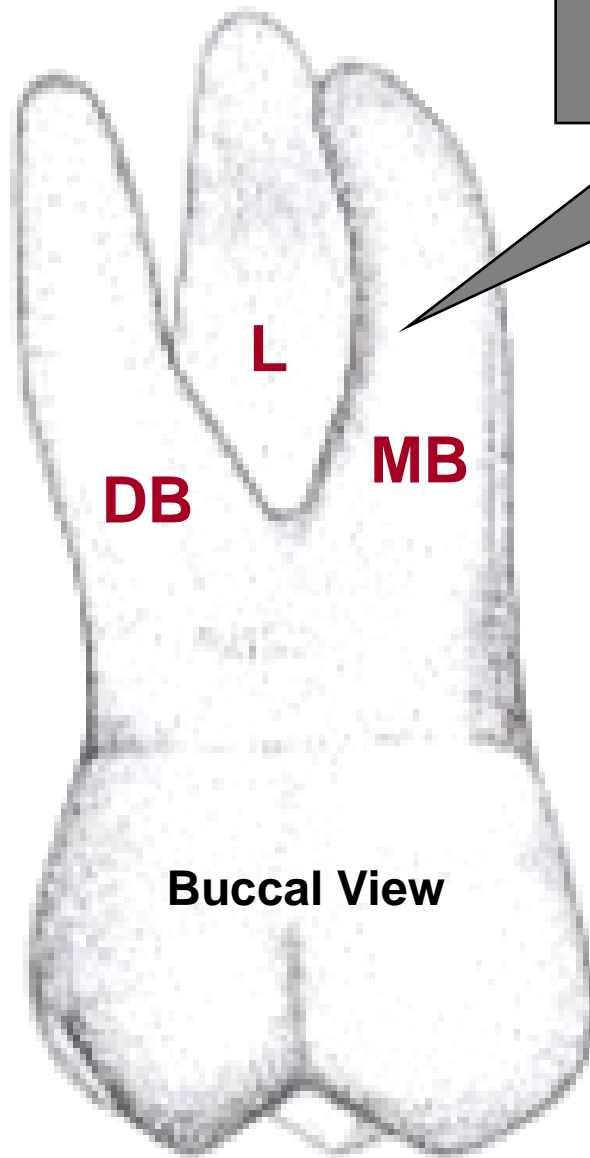
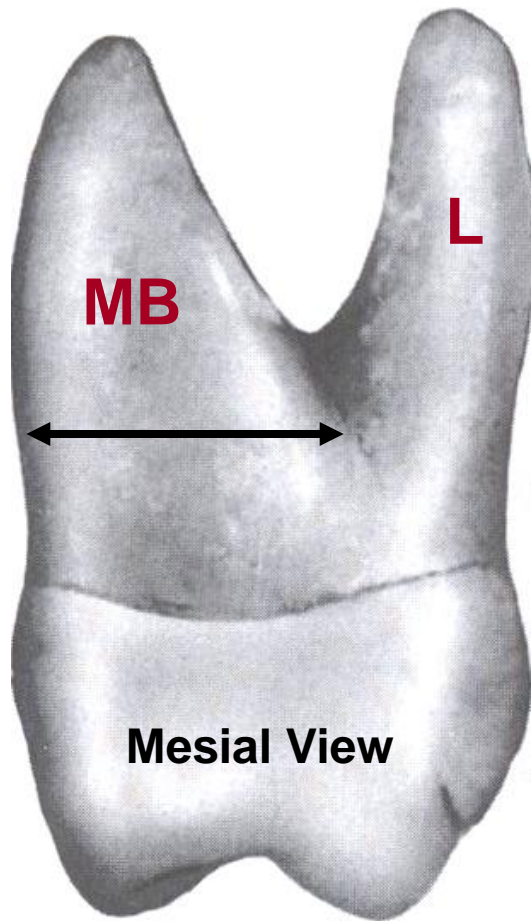
three roots are **MB** and **DB** and **L**, gives this tooth maximum anchorage.



Lingual root is the longest root,
it is tapered and smoothly rounded

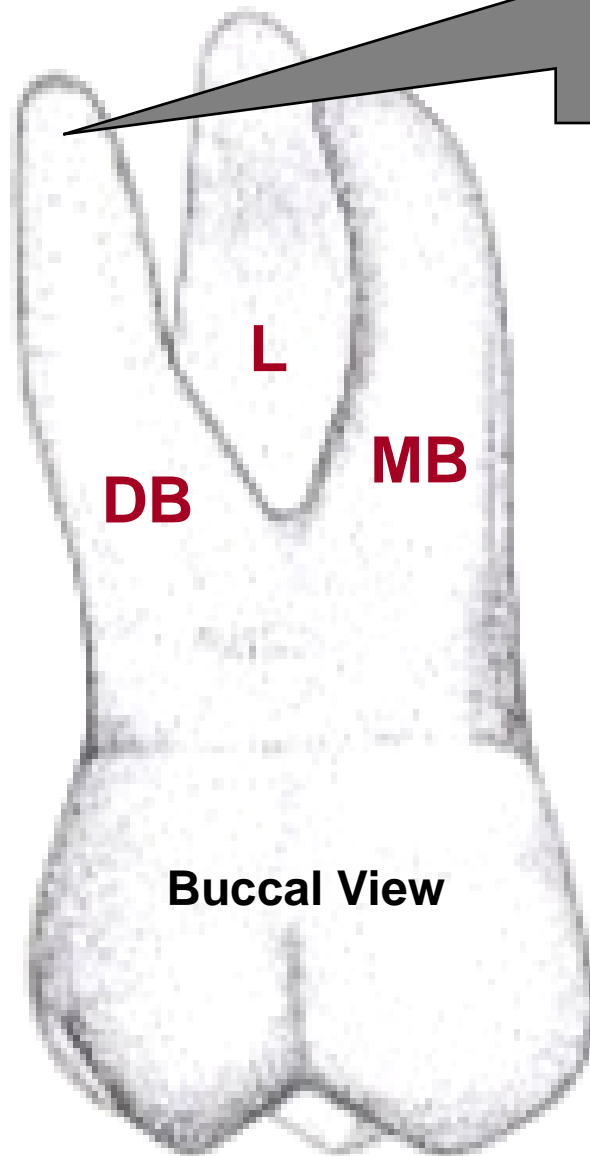


Buccal View



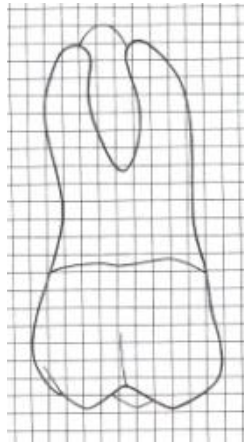
MB root is not as long, but broader BL & shaped so that its resistance to torsion is greater than that of the lingual root

DB root is the smallest, it is smoothly rounded

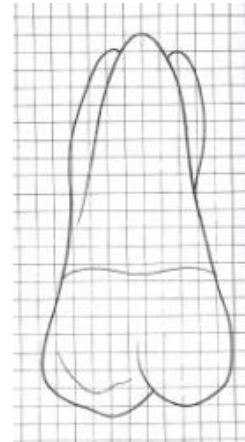


Buccal View

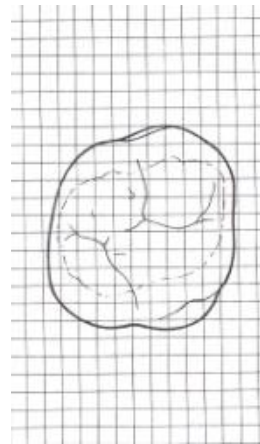
Detailed description of Maxillary 1st molar from all the aspects



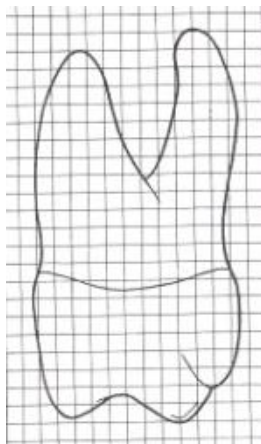
Buccal



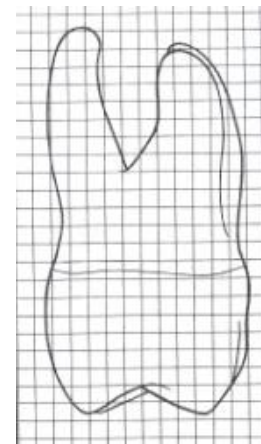
Lingual



occlusal

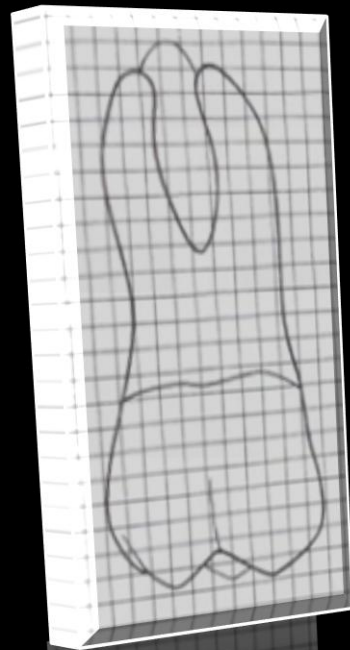


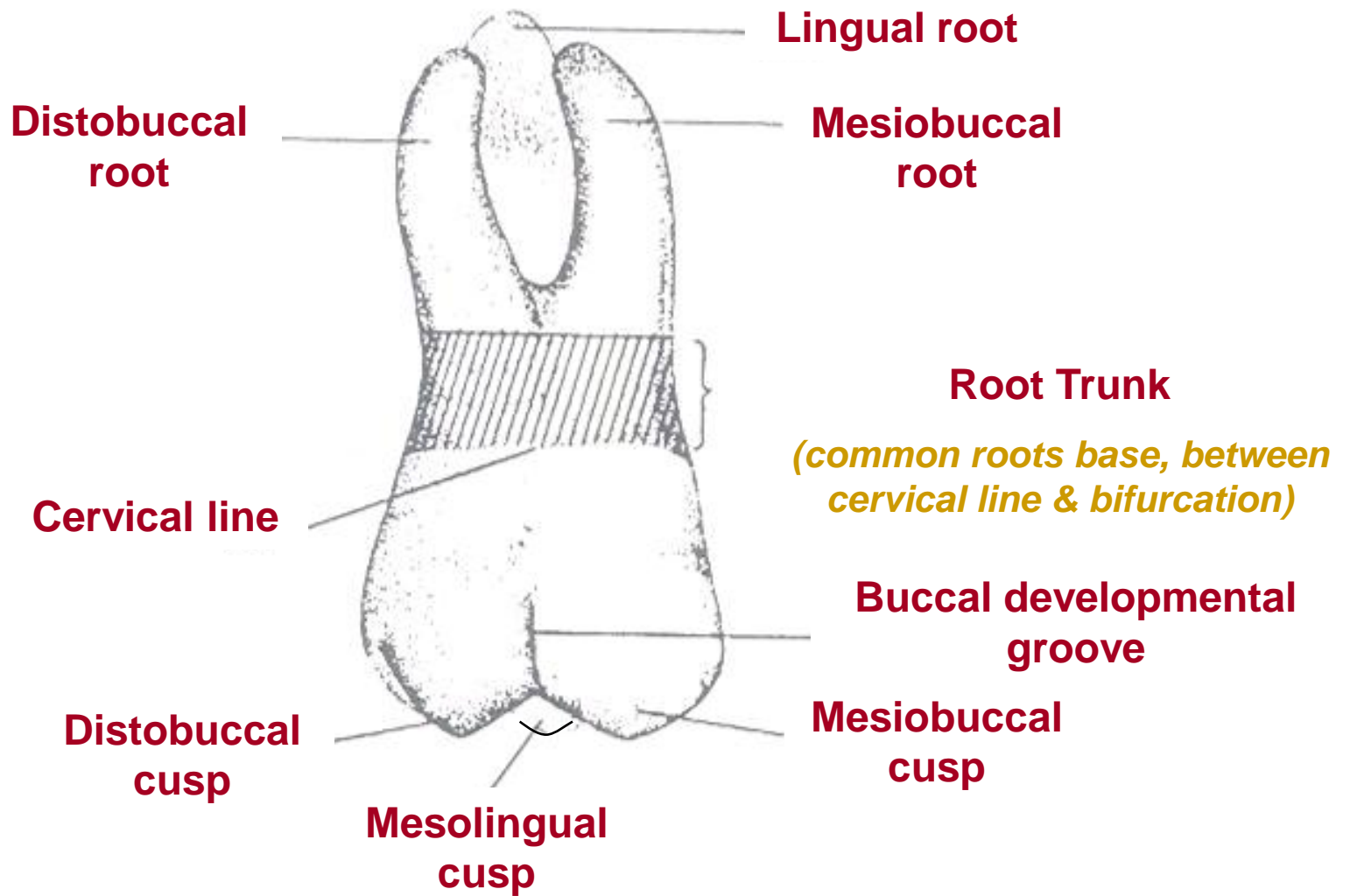
Mesial



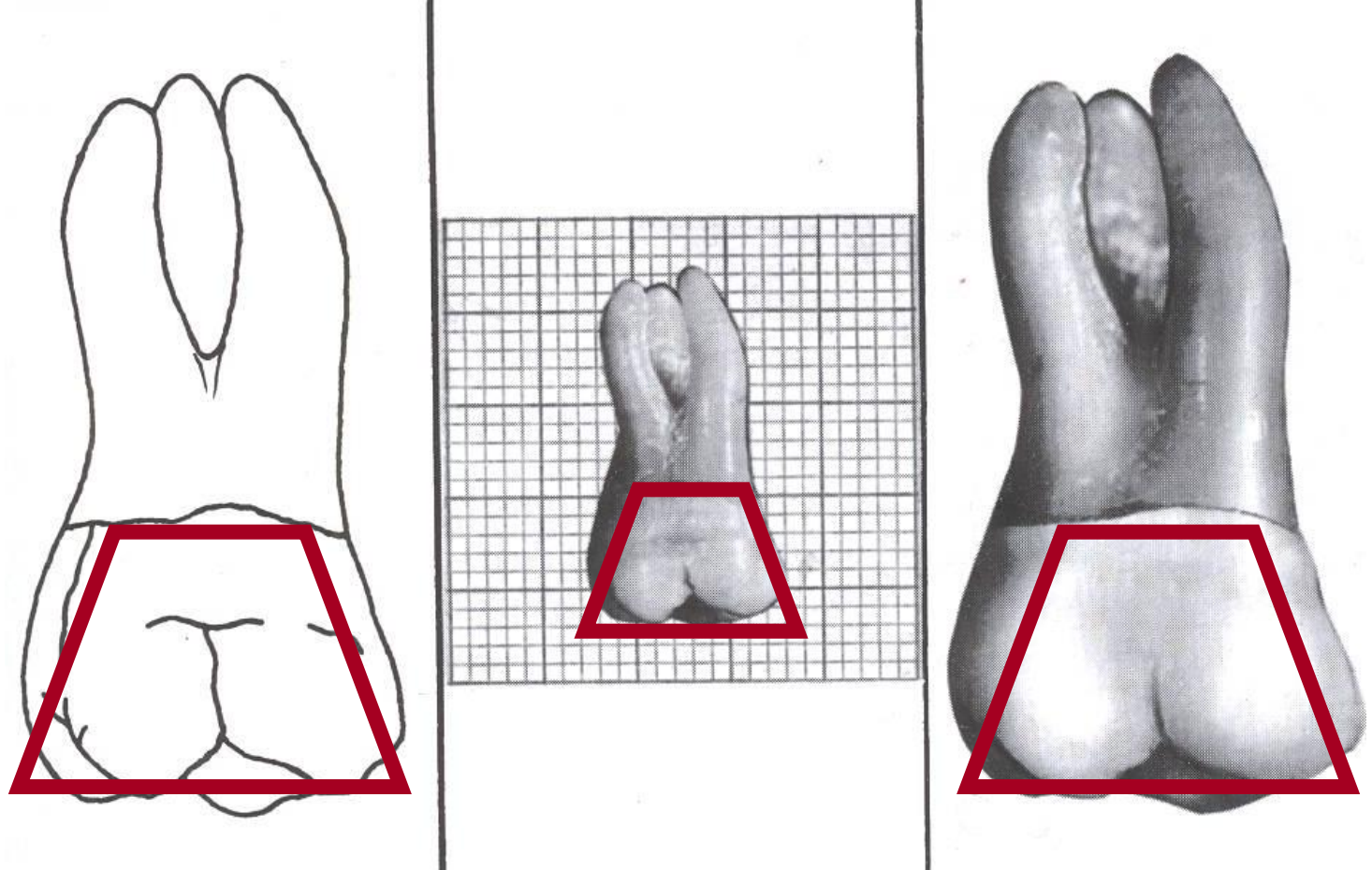
Distal

BUCCAL ASPECT

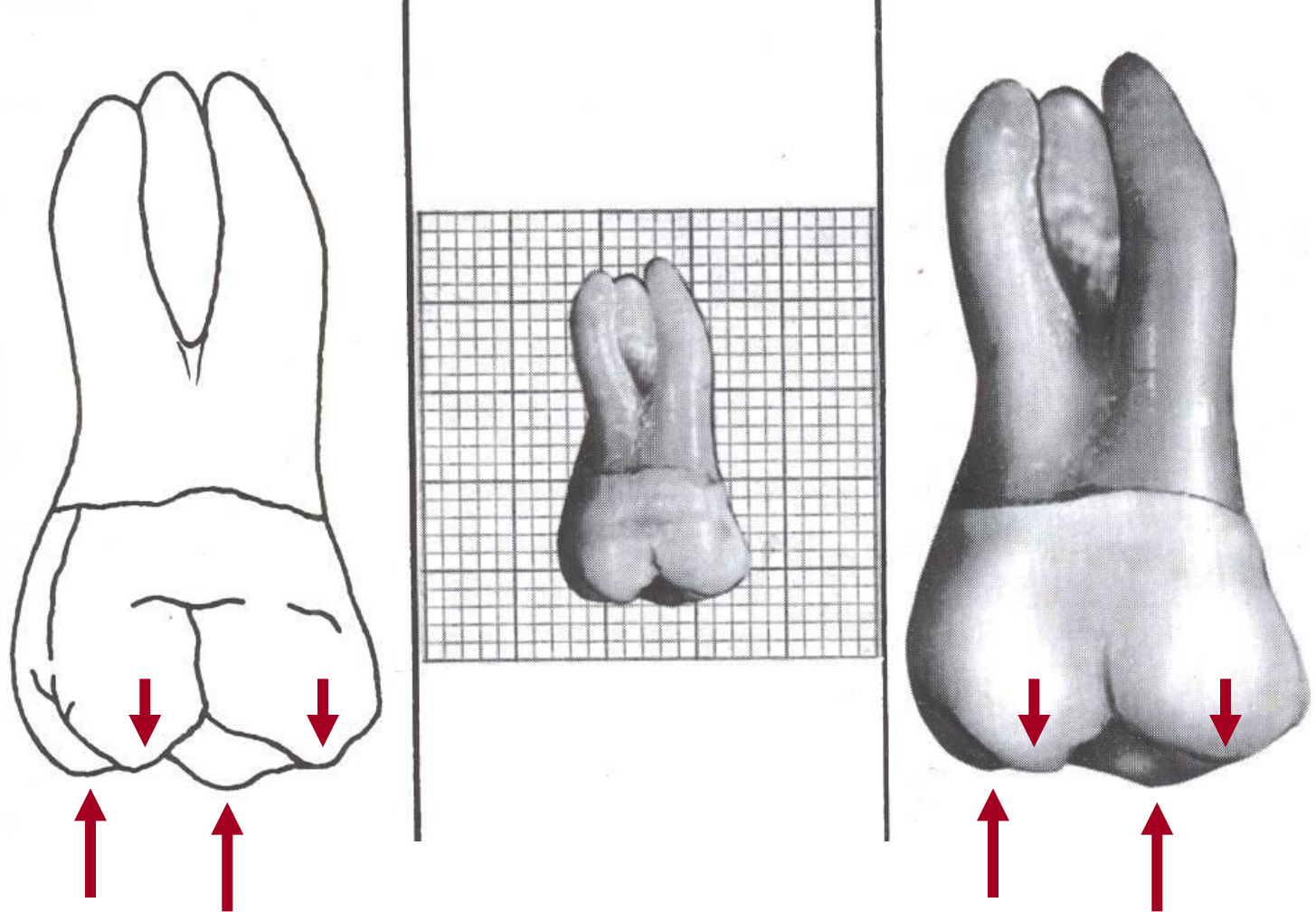




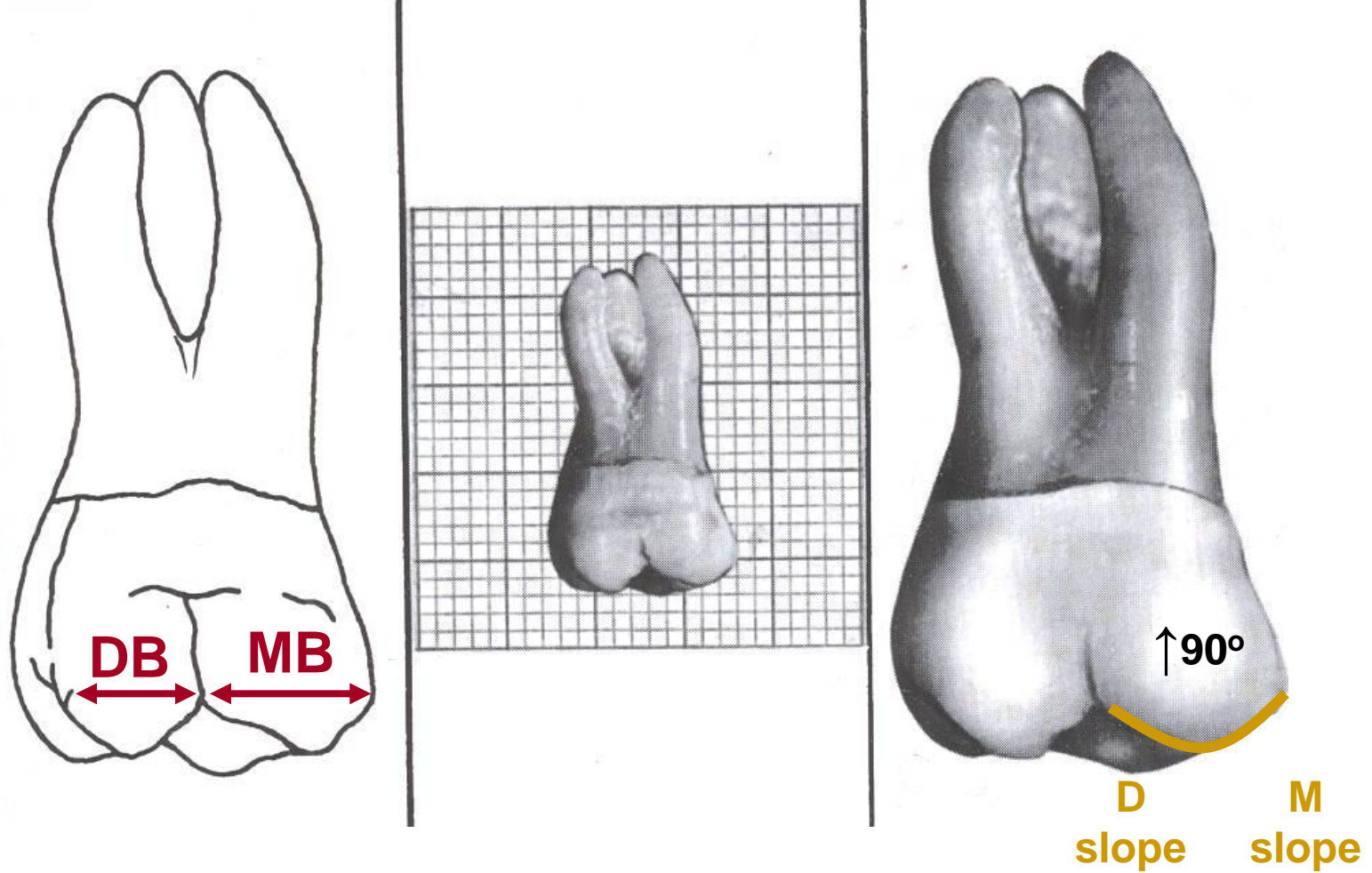
Buccal aspect of Max. right first molar.



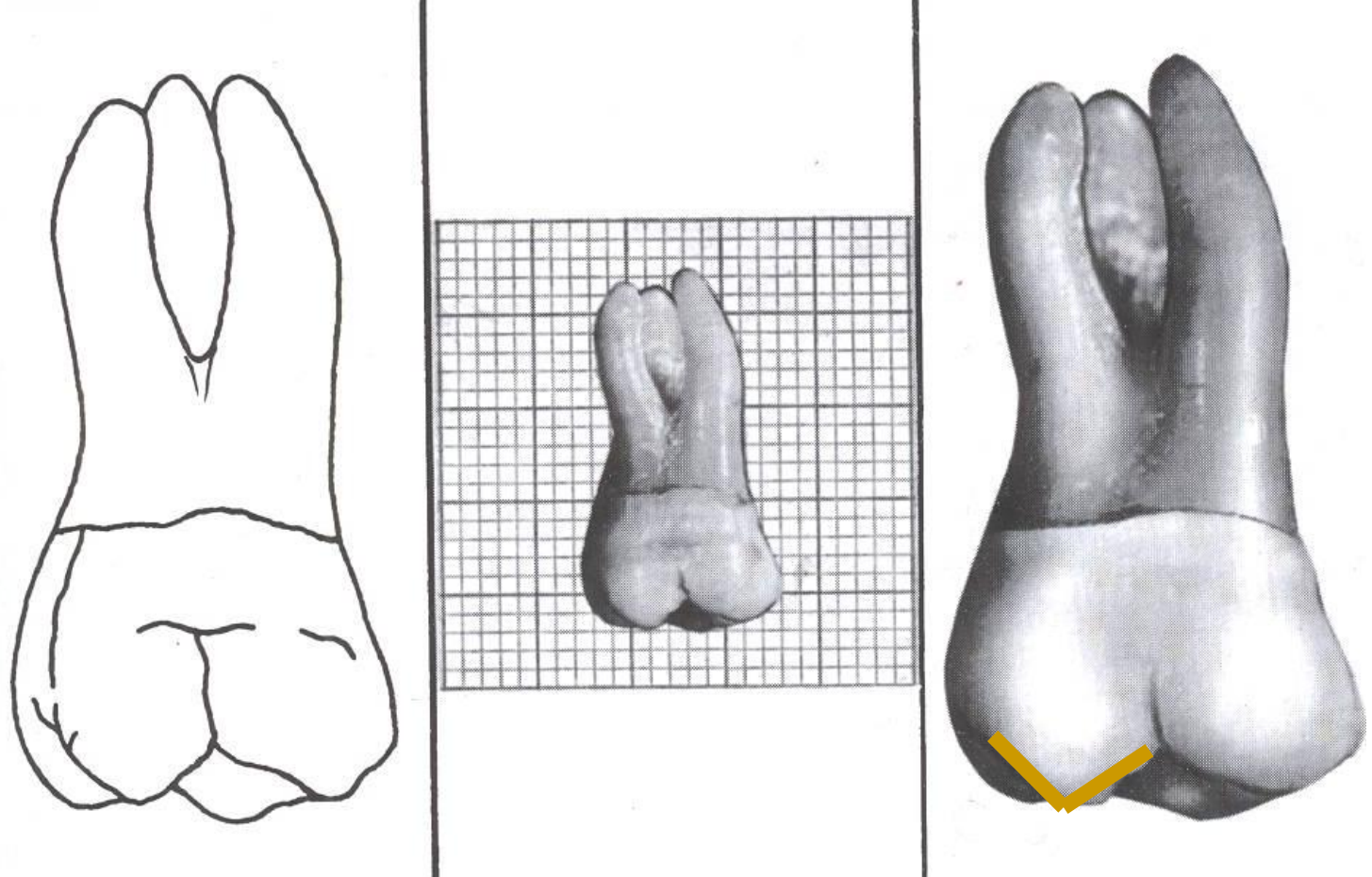
The crown is roughly **trapezoidal**..



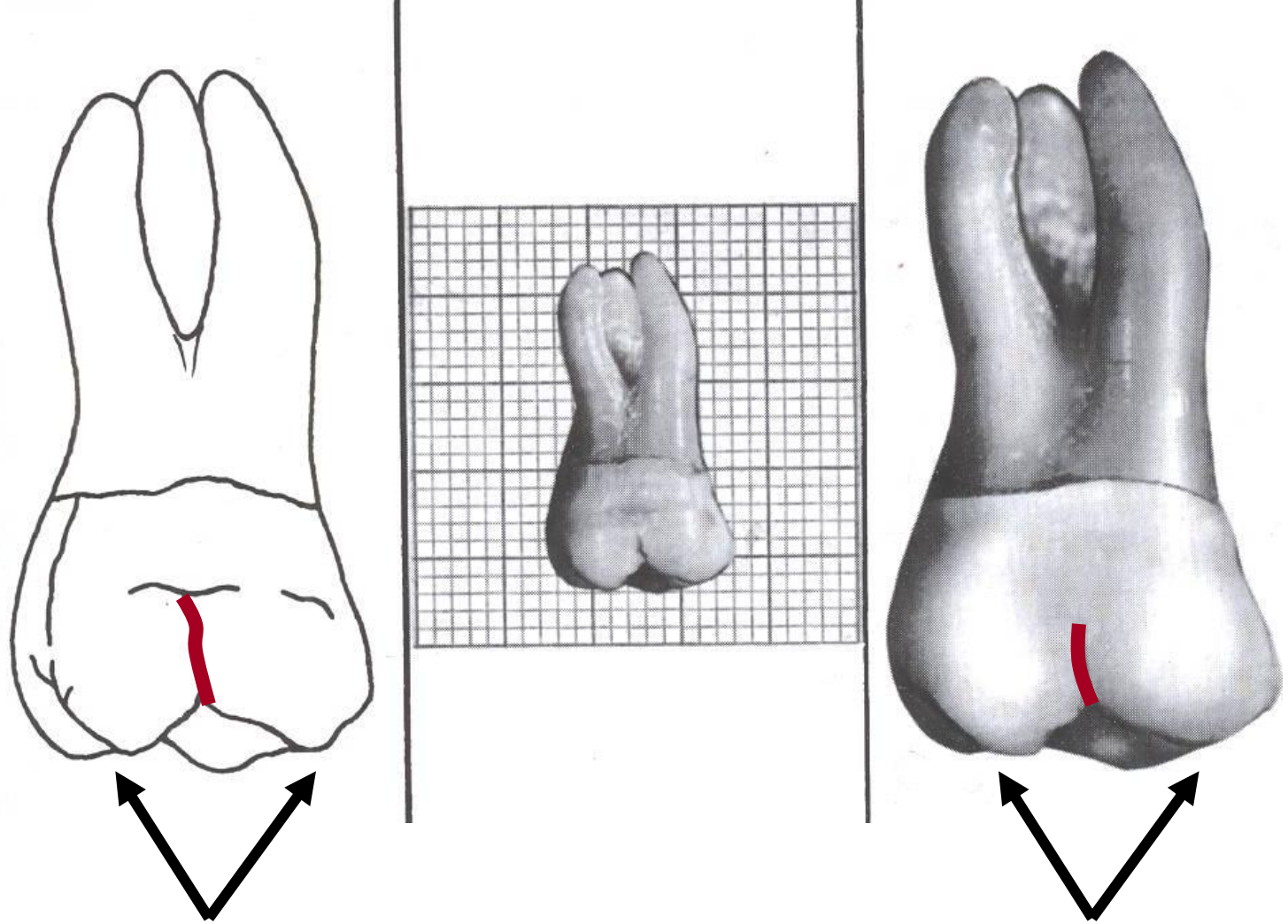
Parts of the **4 cusps** can be seen, the MB, DB, ML and DL



- MB is **broader** than the DB,
- and the M slope meets its D slope at an **obtuse angle**..

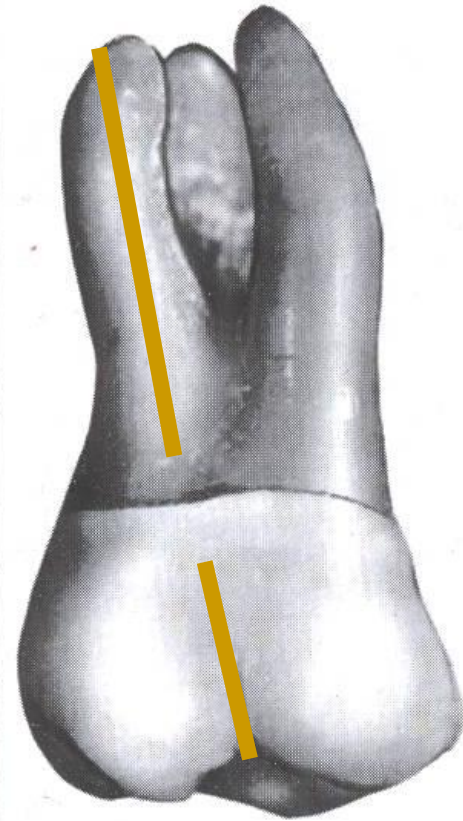
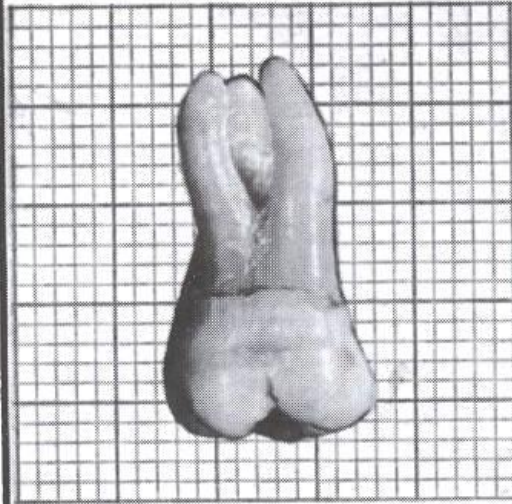
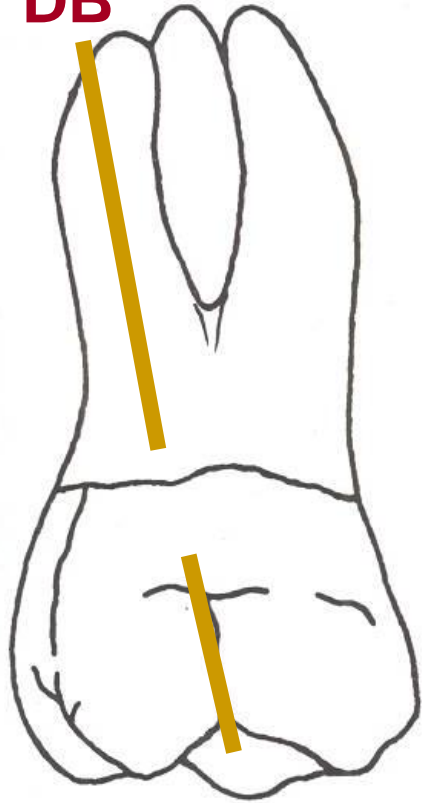


The mesial slope of the DB cusp meets its distal slope at **approximately a right angle**, therefore the **DB cusp is sharper** than the MB cusp..

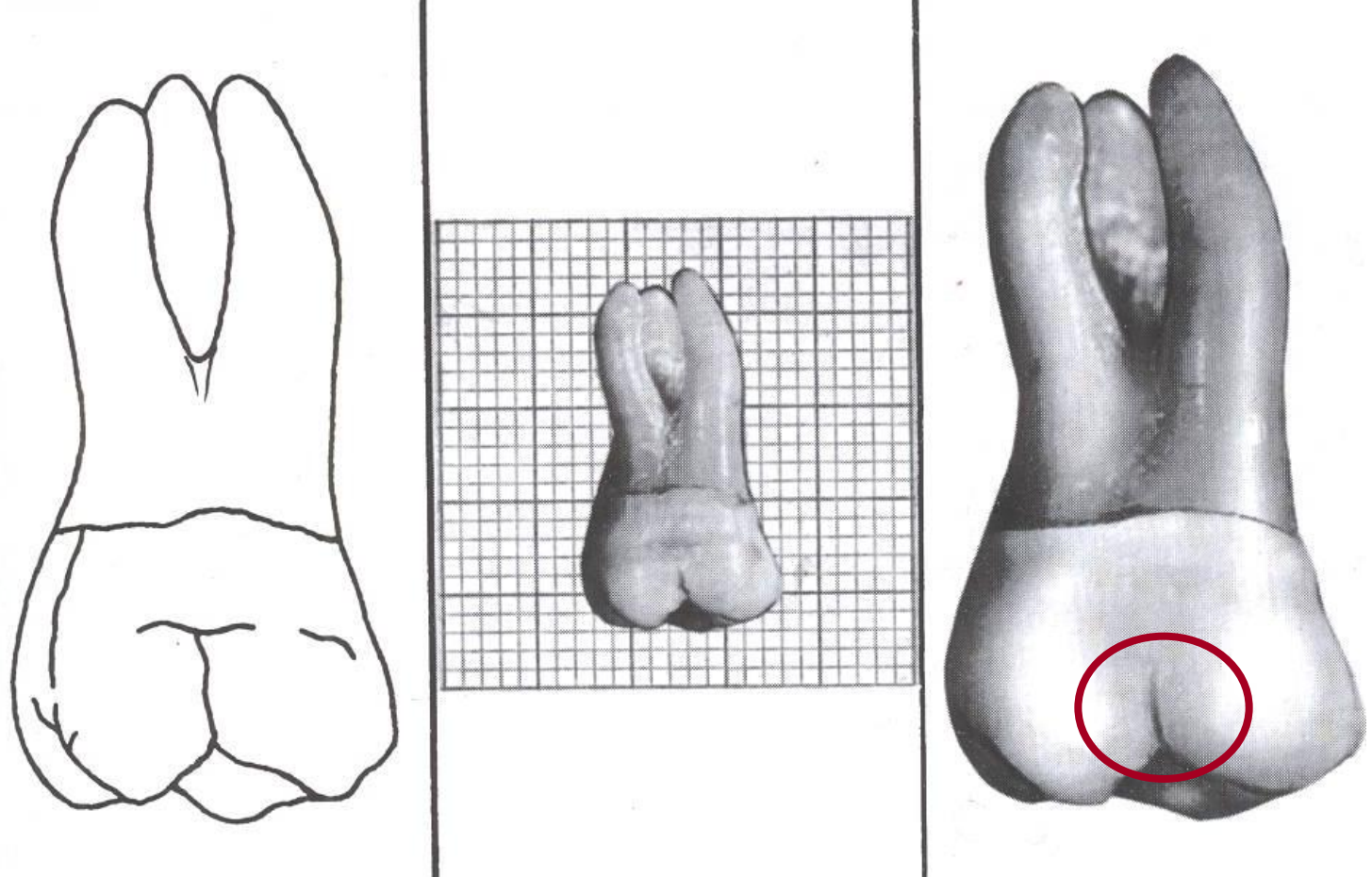


Buccal developmental **groove** that divides the 2 buccal cusps..

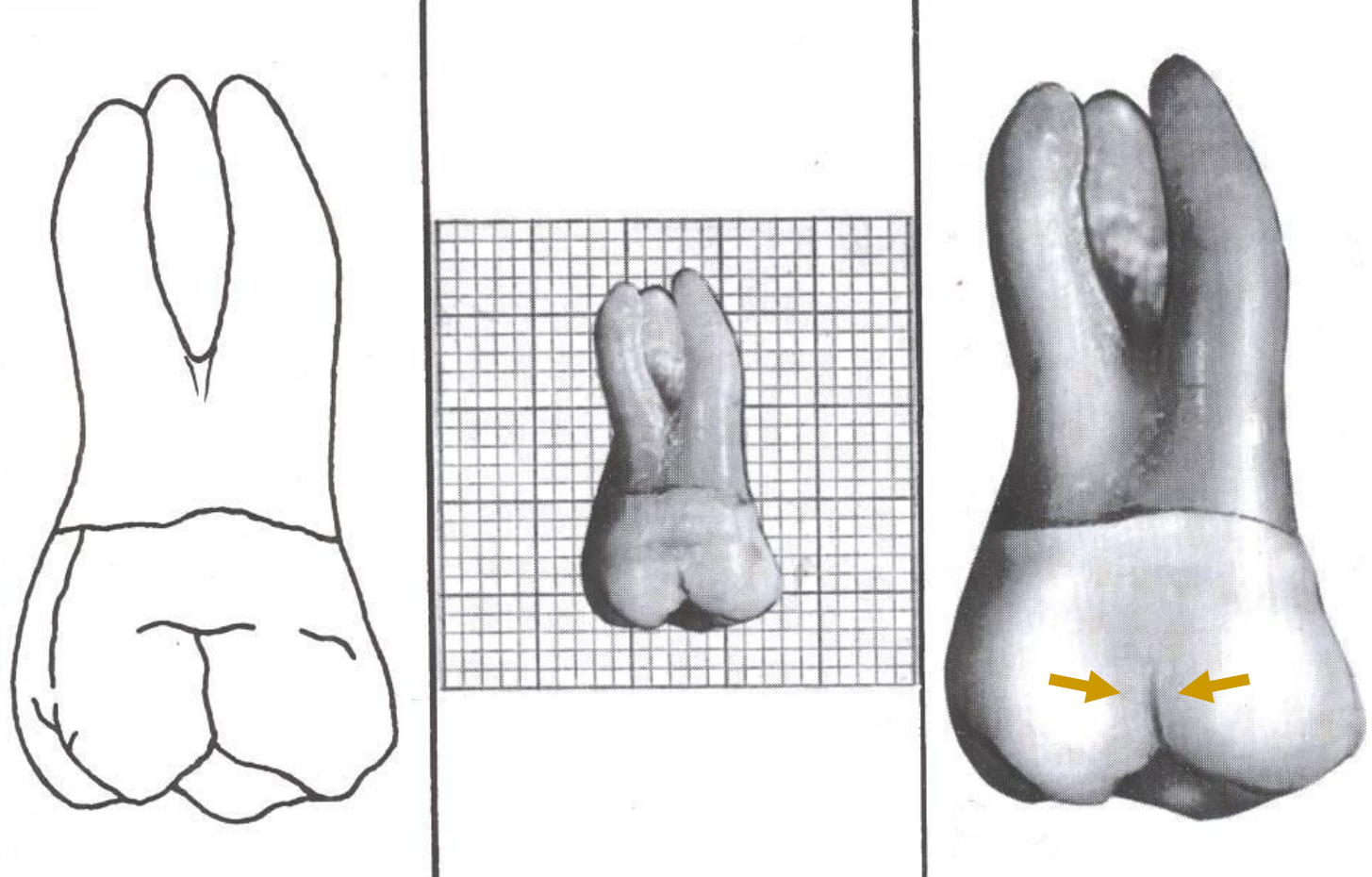
DB



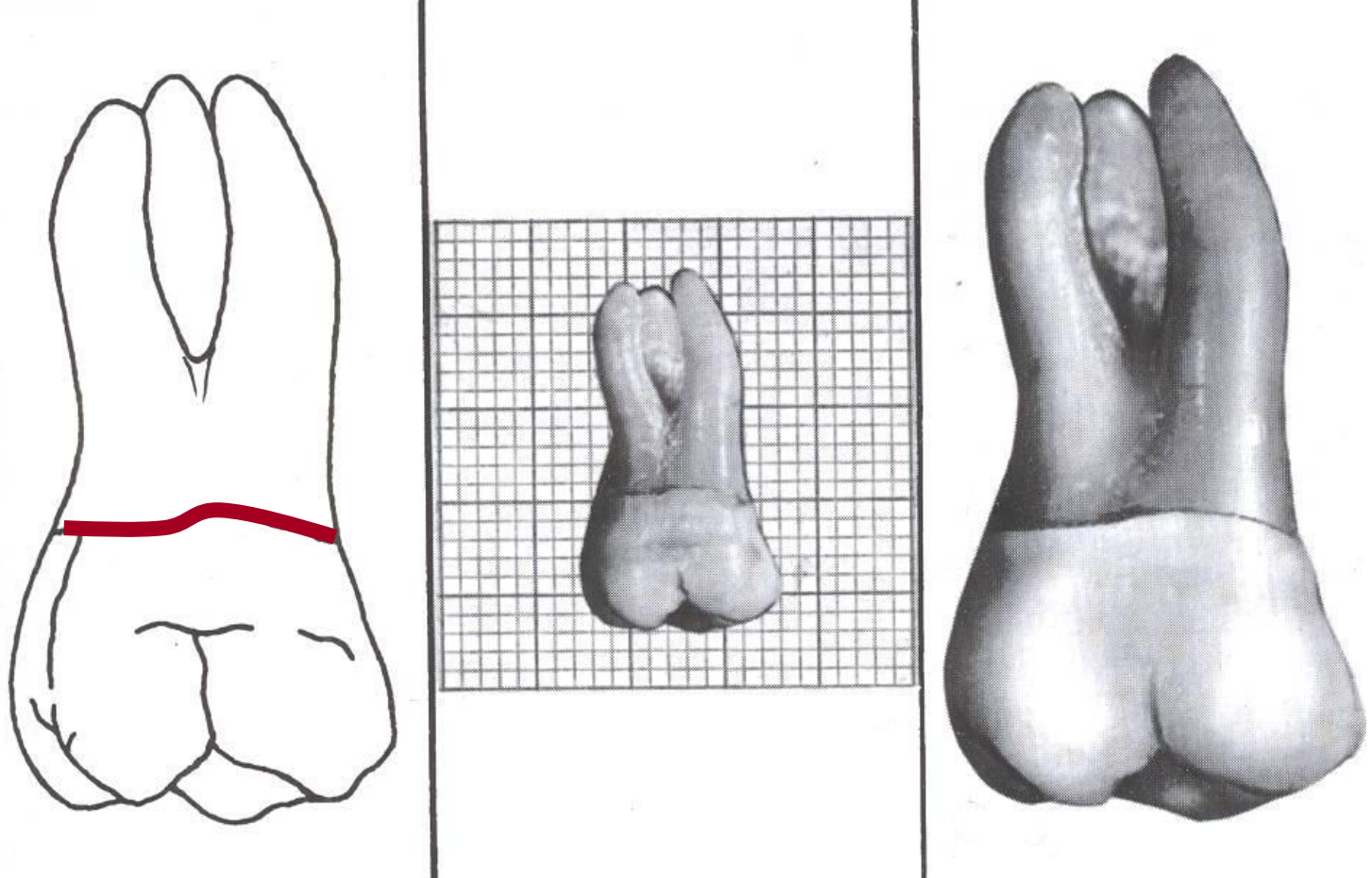
The buccal groove slants occlusoapically in a **line of direction parallel to the long axis of the DB root..**



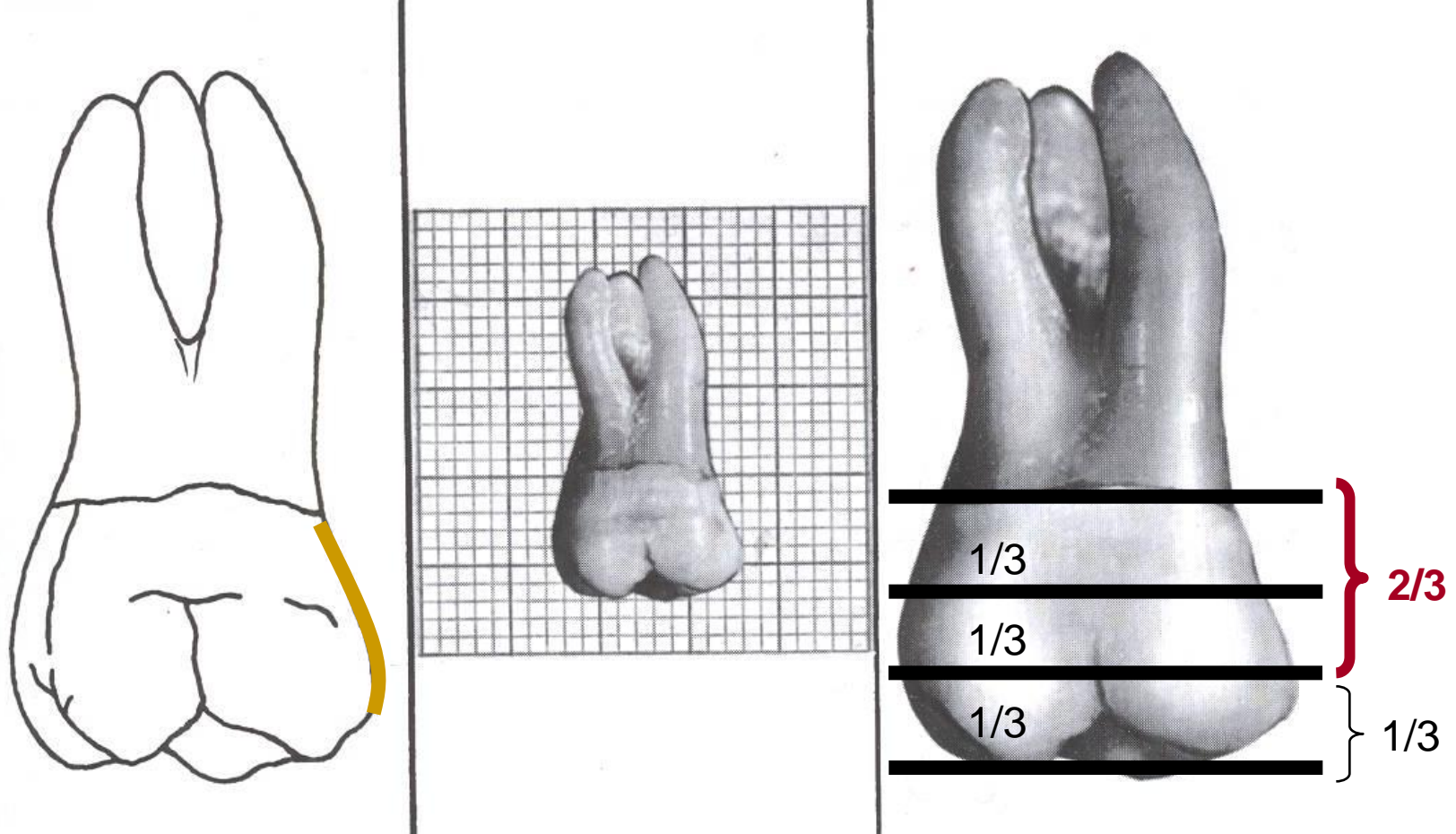
Buccal groove becomes more shallow toward its termination,
gradually fading out..



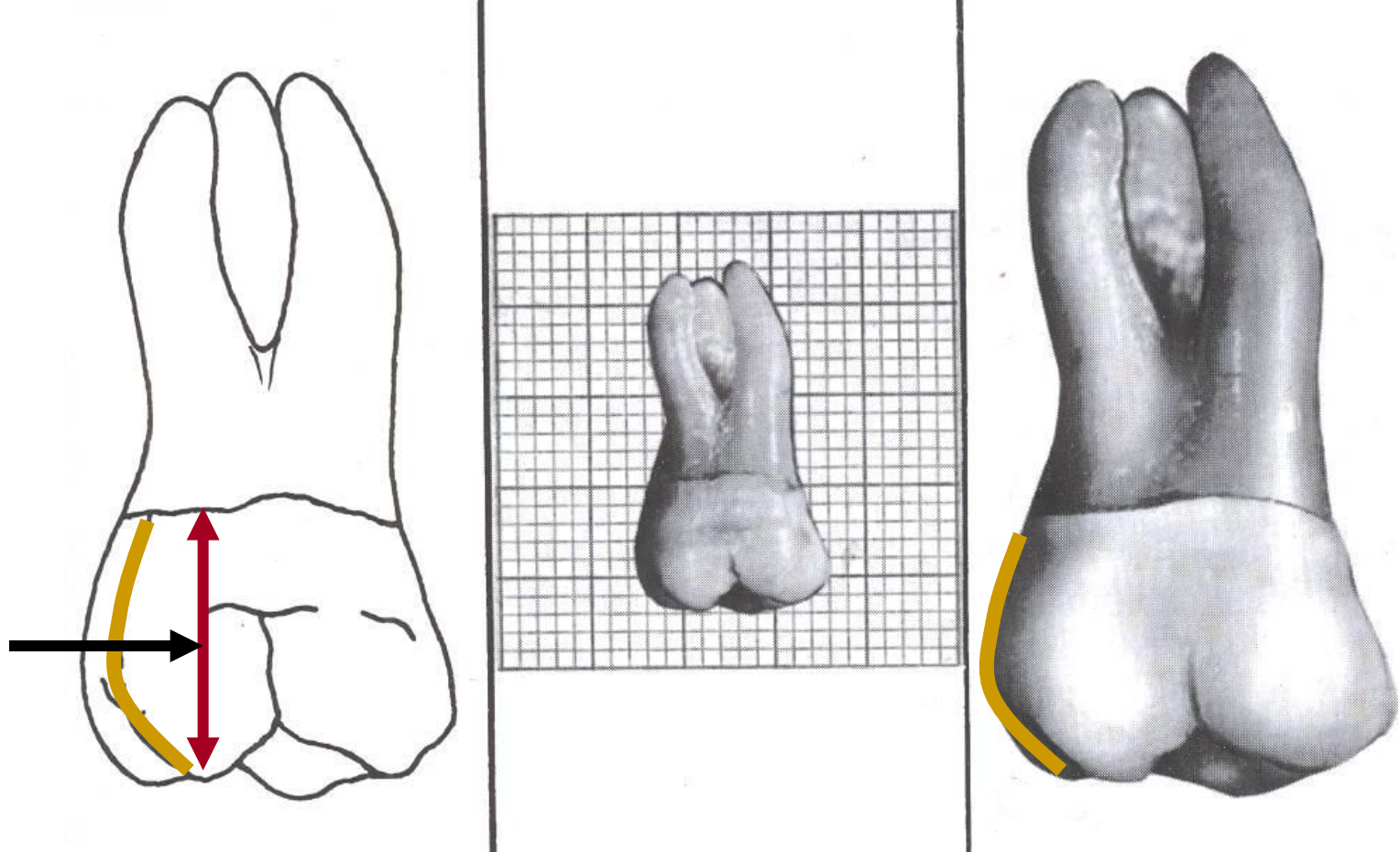
Lateral to the end of the buccal groove, a developmental dip in the enamel



Cervical line not so straight.. This line generally convex and the convexity toward the roots..

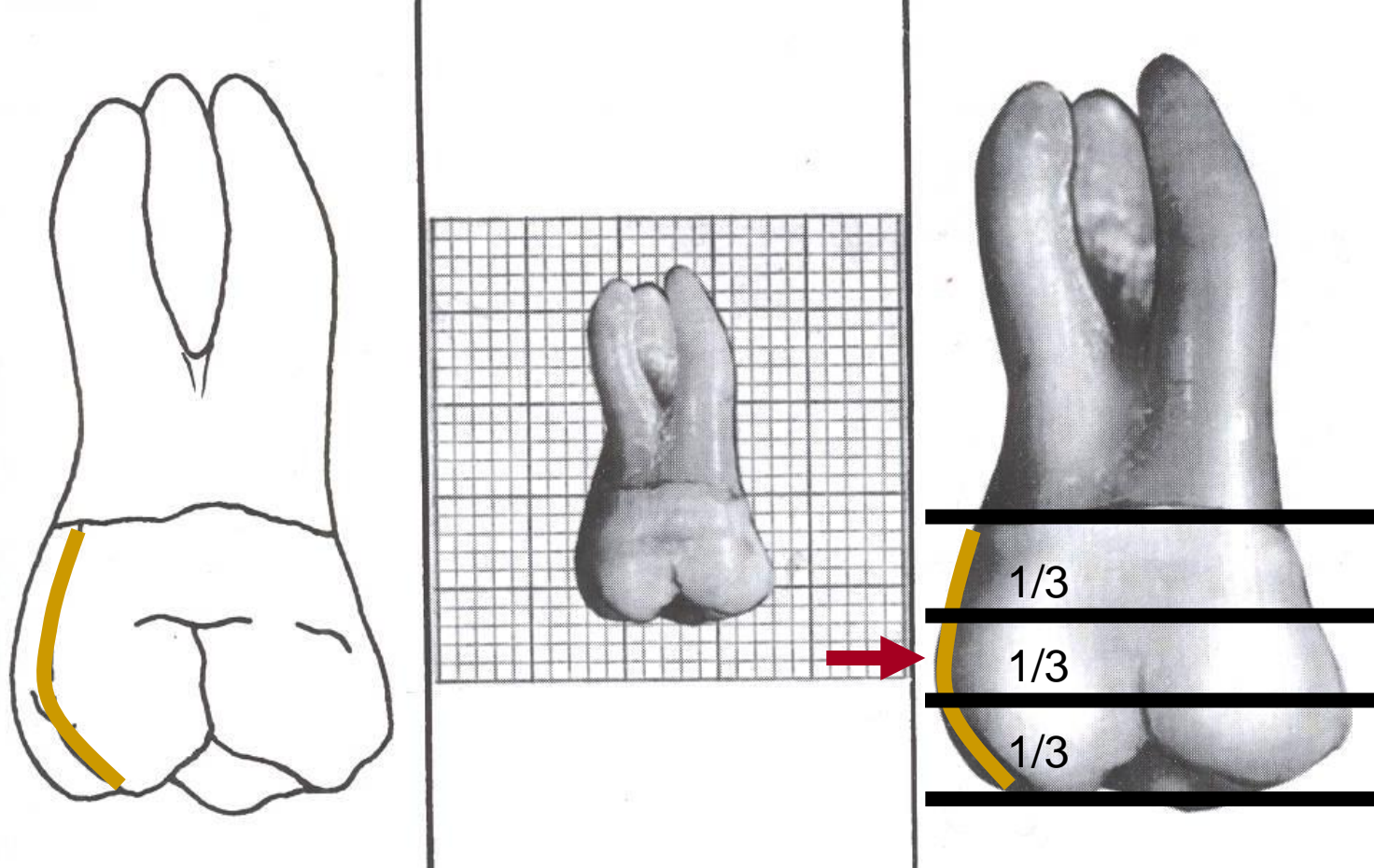


Mesial outline of the crown follows a **nearly straight path**, to the contact area..this crest is approximately **2/3** the distance from cervical line to tip of MB cusp..

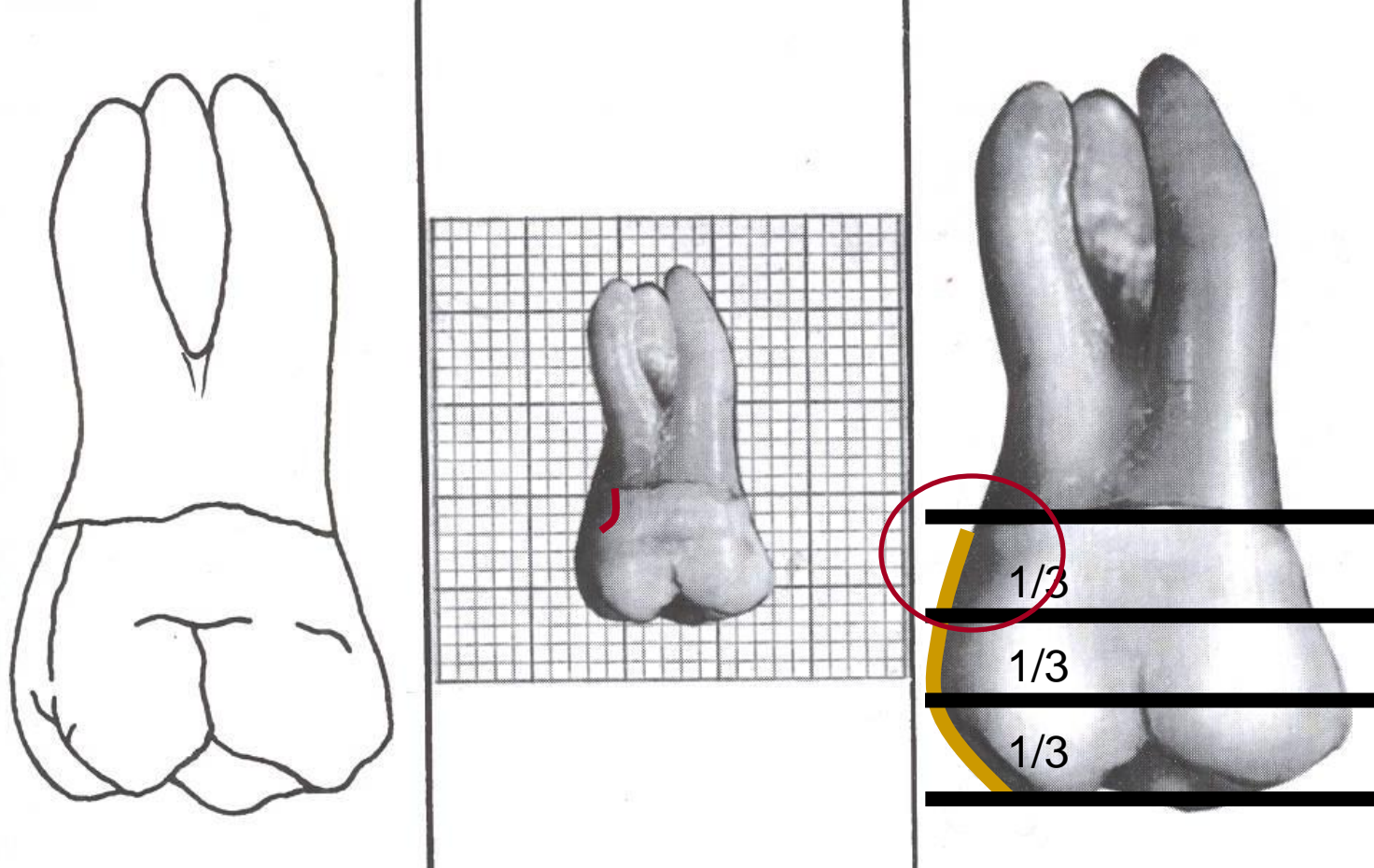


Distal outline of the crown is **convex**, distal surface is **spheroidal**.

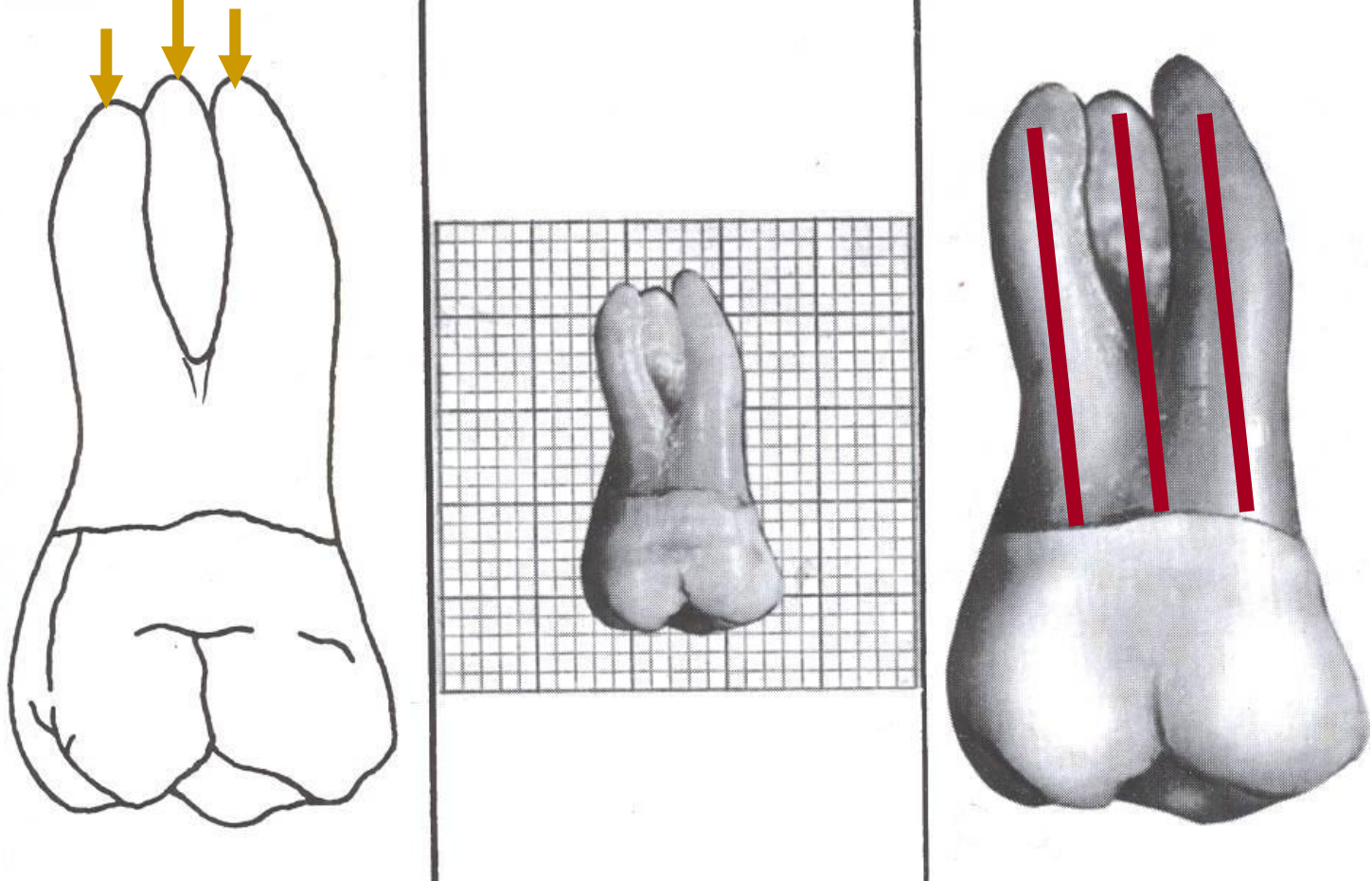
Crest of curvature on the distal side of the crown is located at a level approximately **half the distance from cervical line to tip of the cusp**.



The distal contact area is in the **middle of the middle third**.

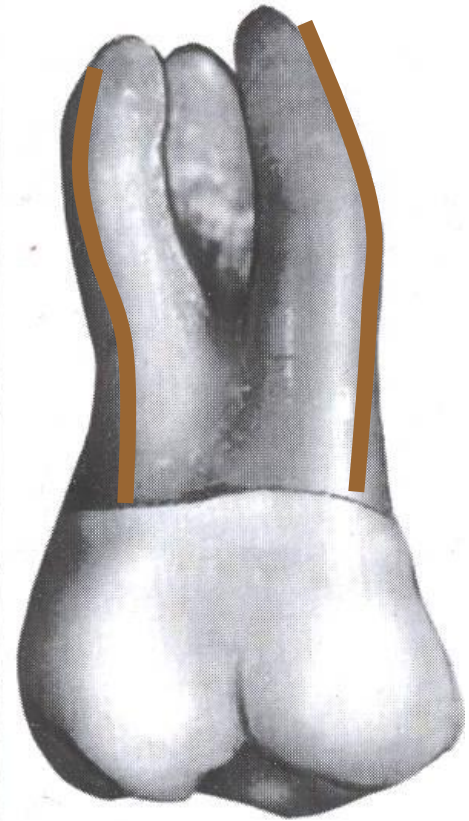
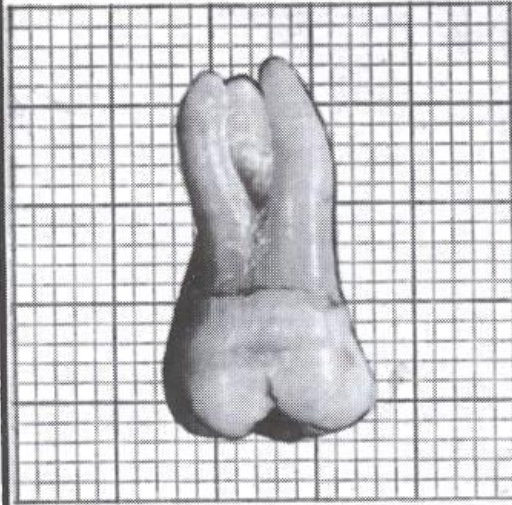
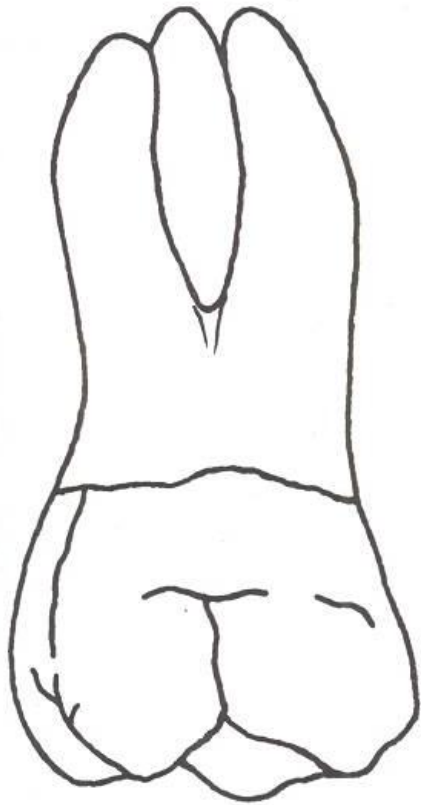


Flattened area or a concave area is seen on the distal surface at the cervical third of the crown

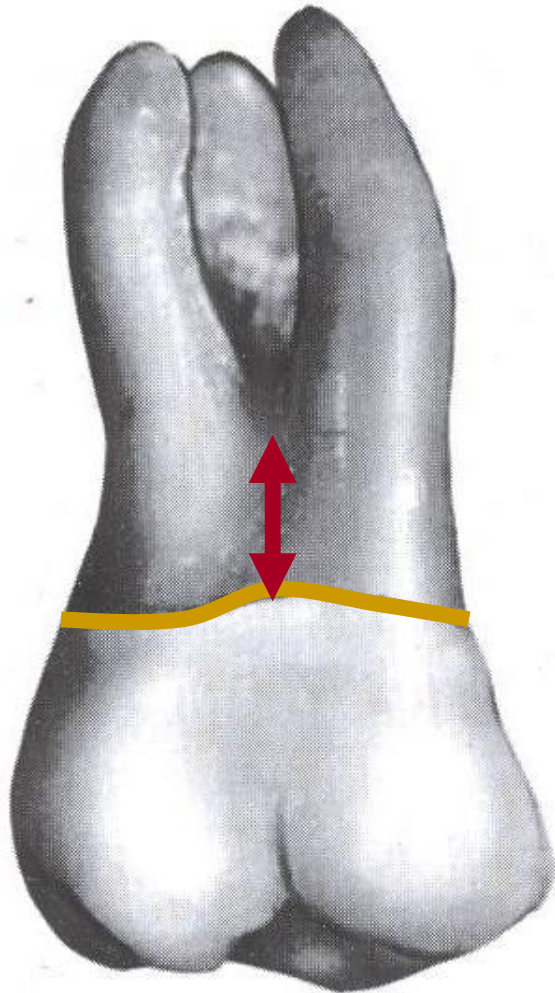


The **three roots may be seen** from the buccal aspect

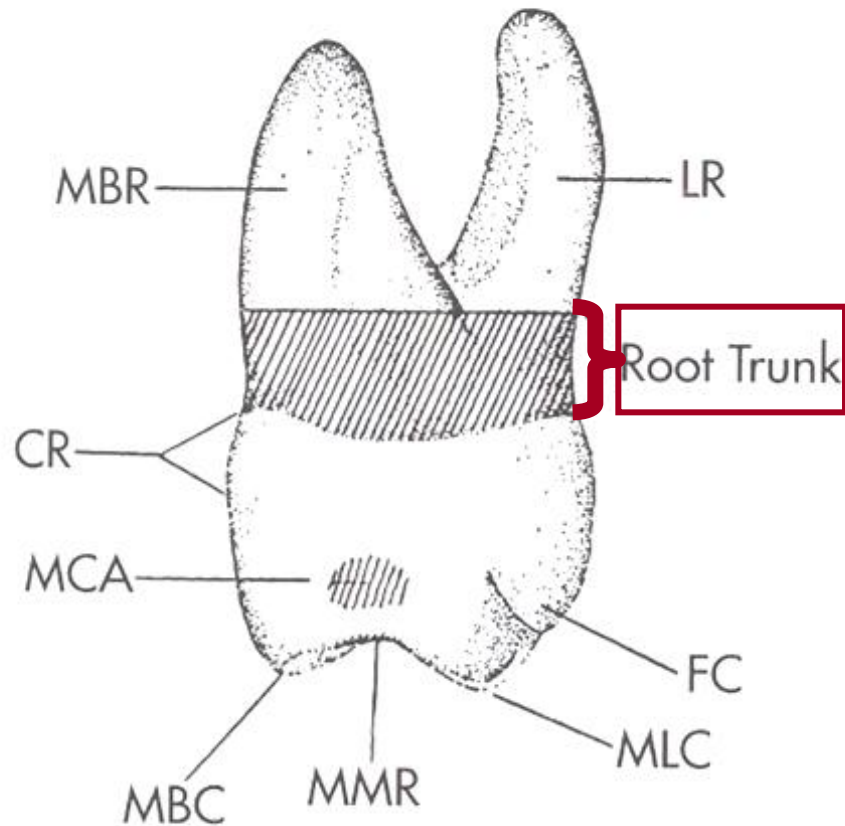
Axes of the roots are **inclined distally**



Roots are **not straight**.

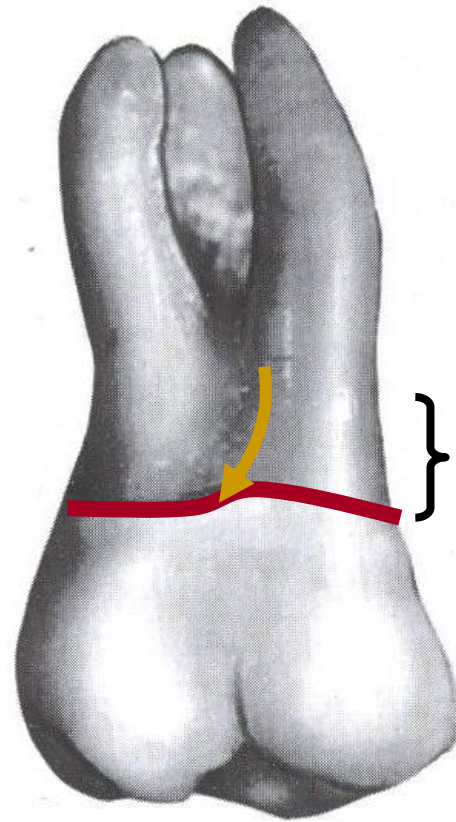


The point of bifurcation of the 2 buccal roots is located **around 4 mm** above the **cervical line**.



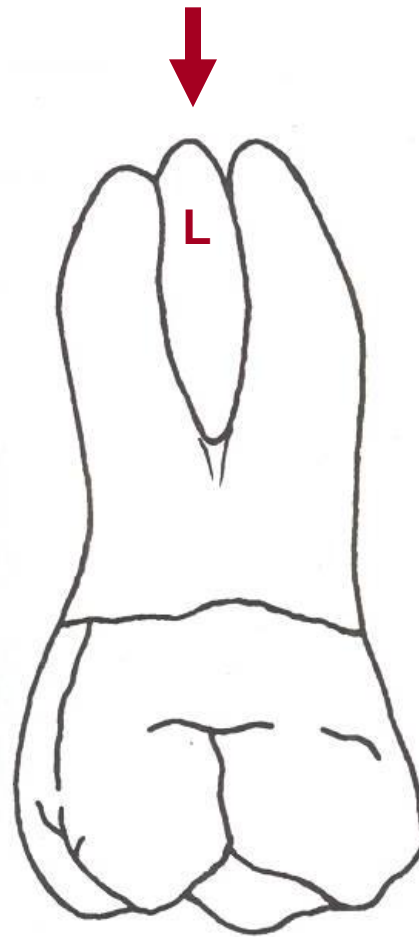
The common root base is called the **root trunk**..

Cervical line



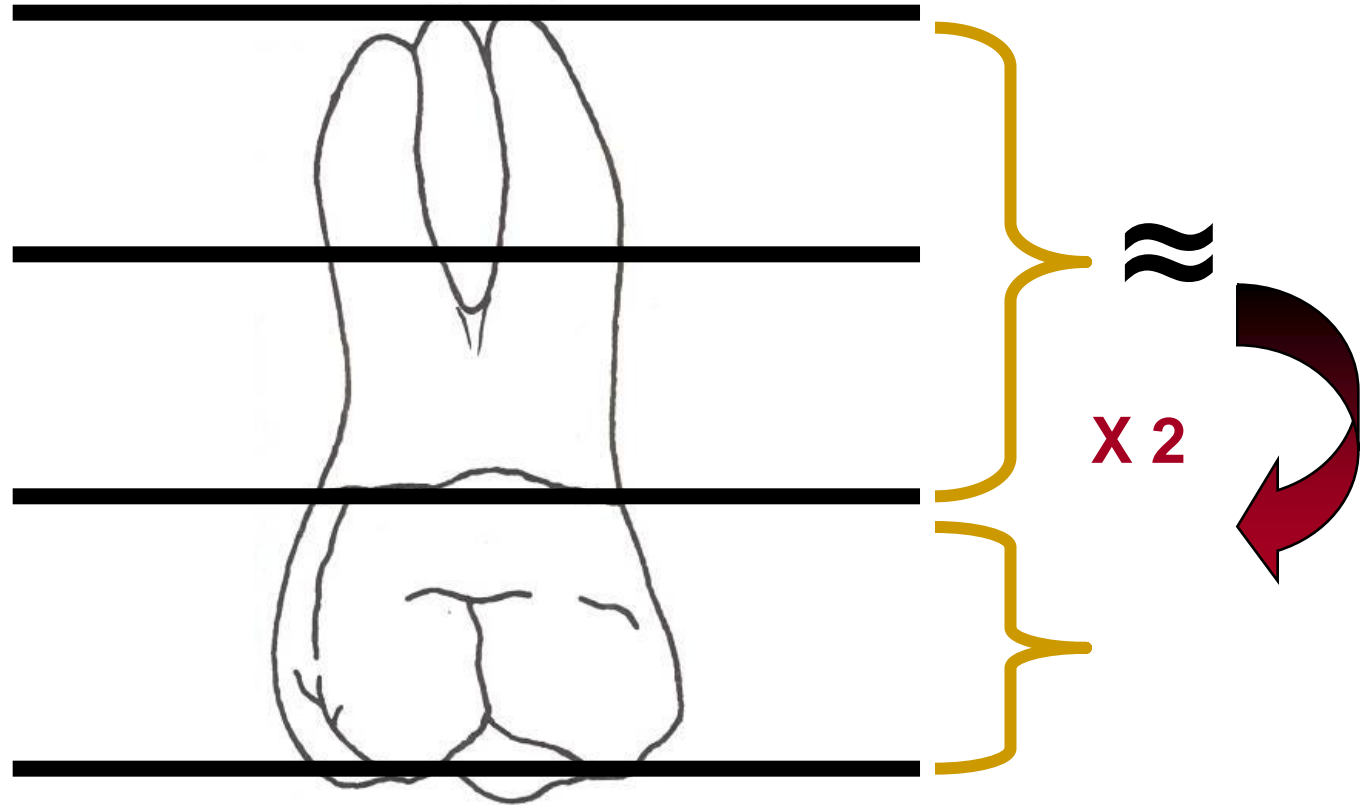
Root Trunk

Deep developmental **groove** buccally on the root trunk starts at the bifurcation and progresses downward, becoming shallower until it terminates in a shallow depression at the **cervical line**..

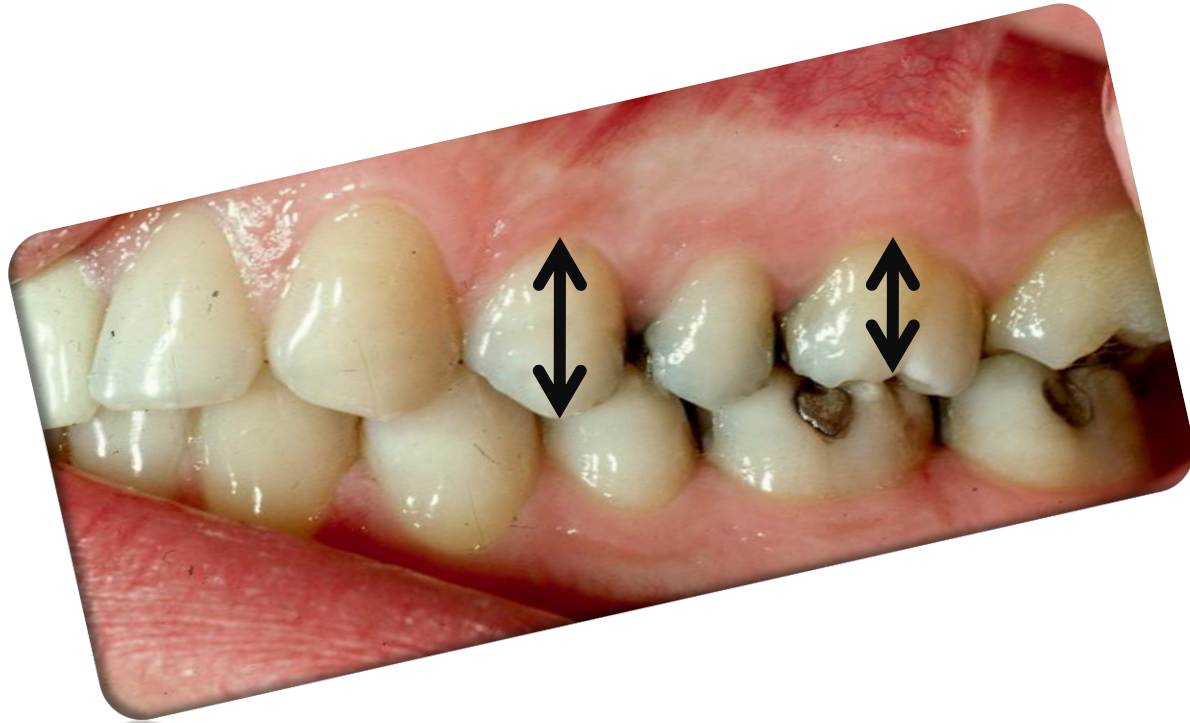


Lingual root is the longest..

The 2 buccal roots closer in length to each other.

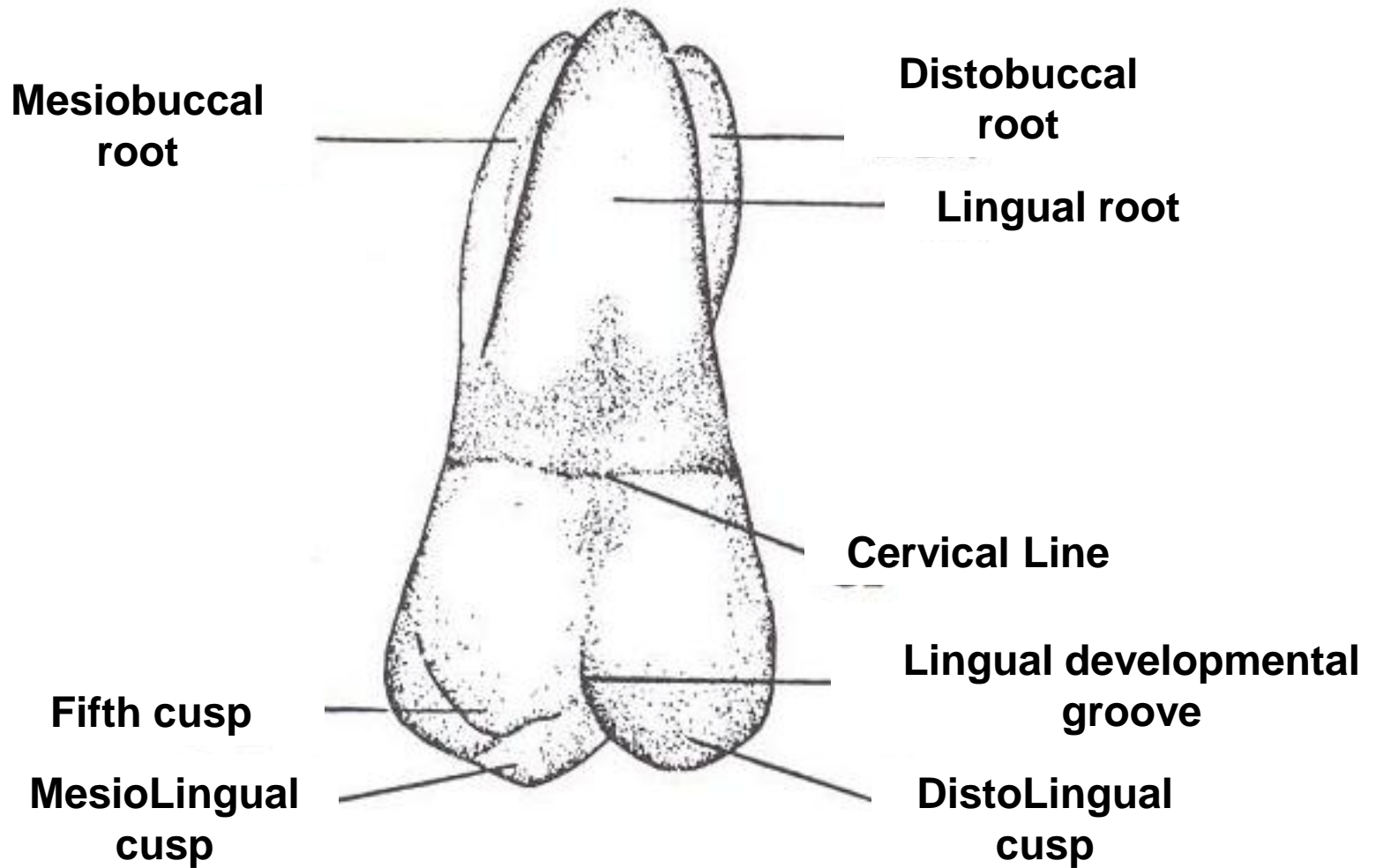


On the average, the roots are about twice as long as the crown..

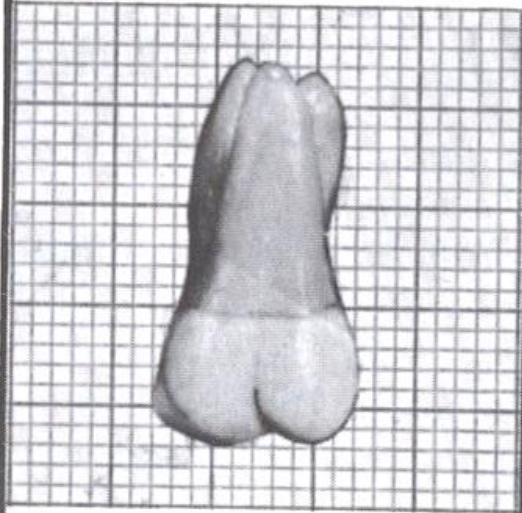
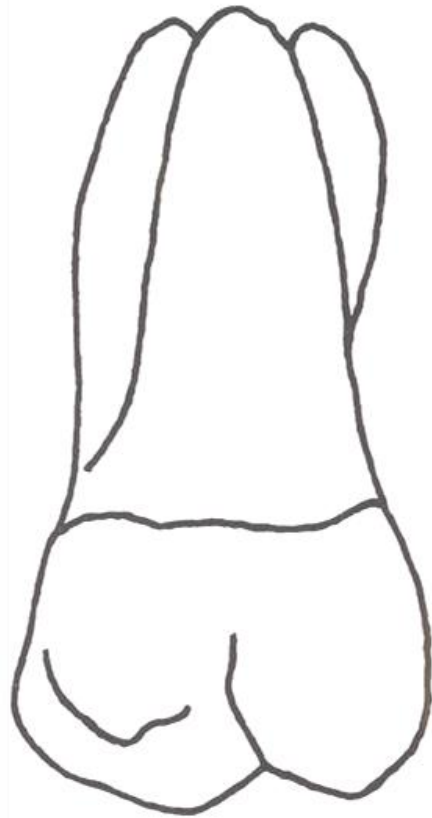


They have large crowns but shorter than the premolars.

LINGUAL ASPECT



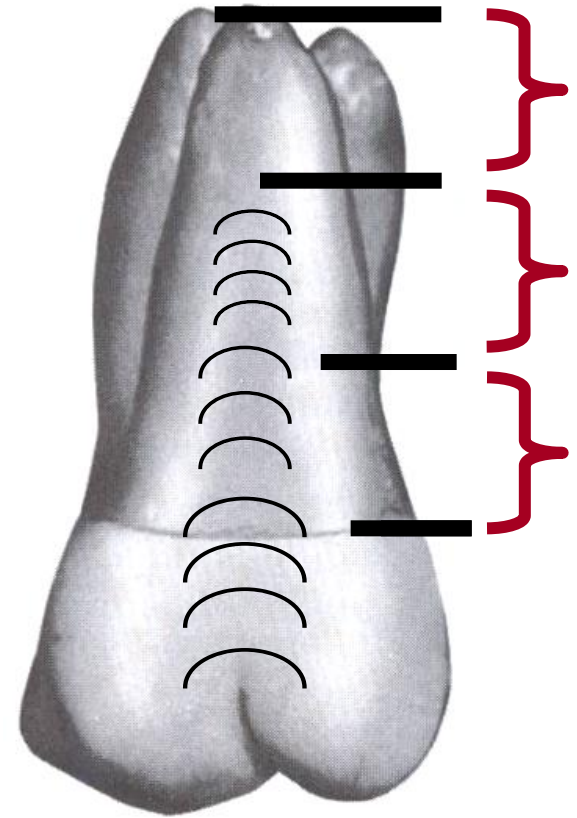
Lingual aspect of Max. right first molar..



Smooth curvature of D outline of the crown creates an arc that is almost a **semicircle**..

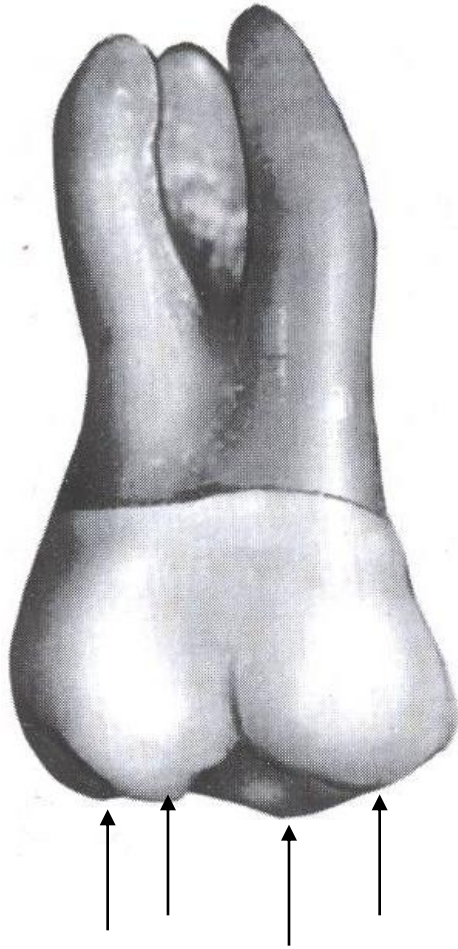


Lingual view



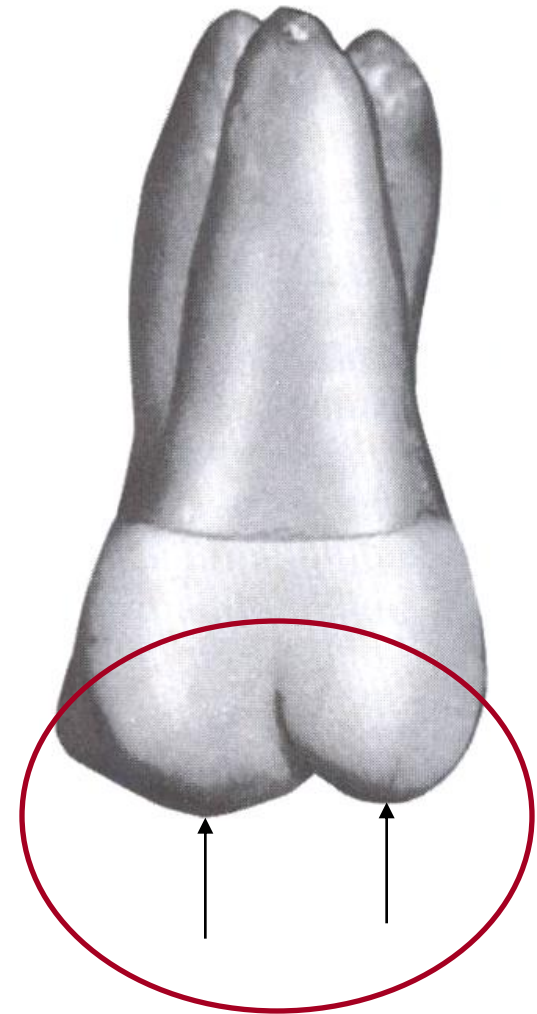
Shallow depression in the surface extends from the end of lingual groove to the center of lingual surface of lingual root at cervical line and then continues in an apical direction on the lingual root, fading out at the middle 1/3 of the root

Buccal view

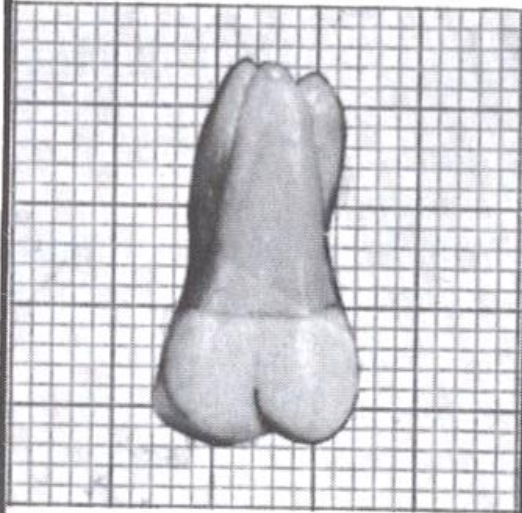
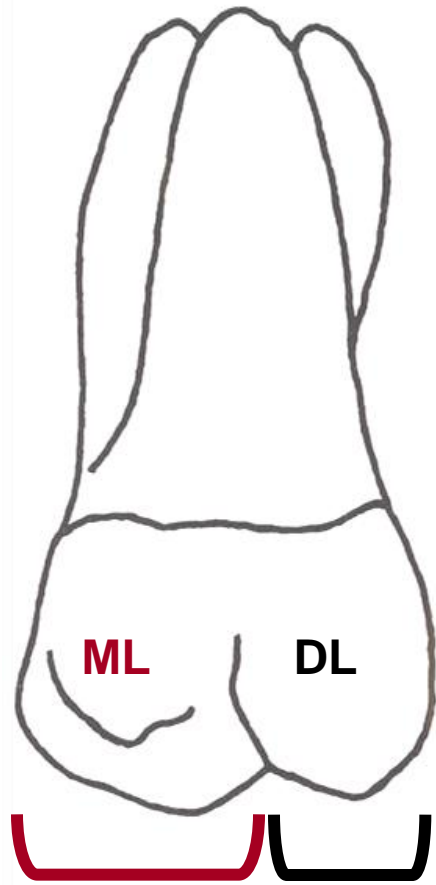


Vs.

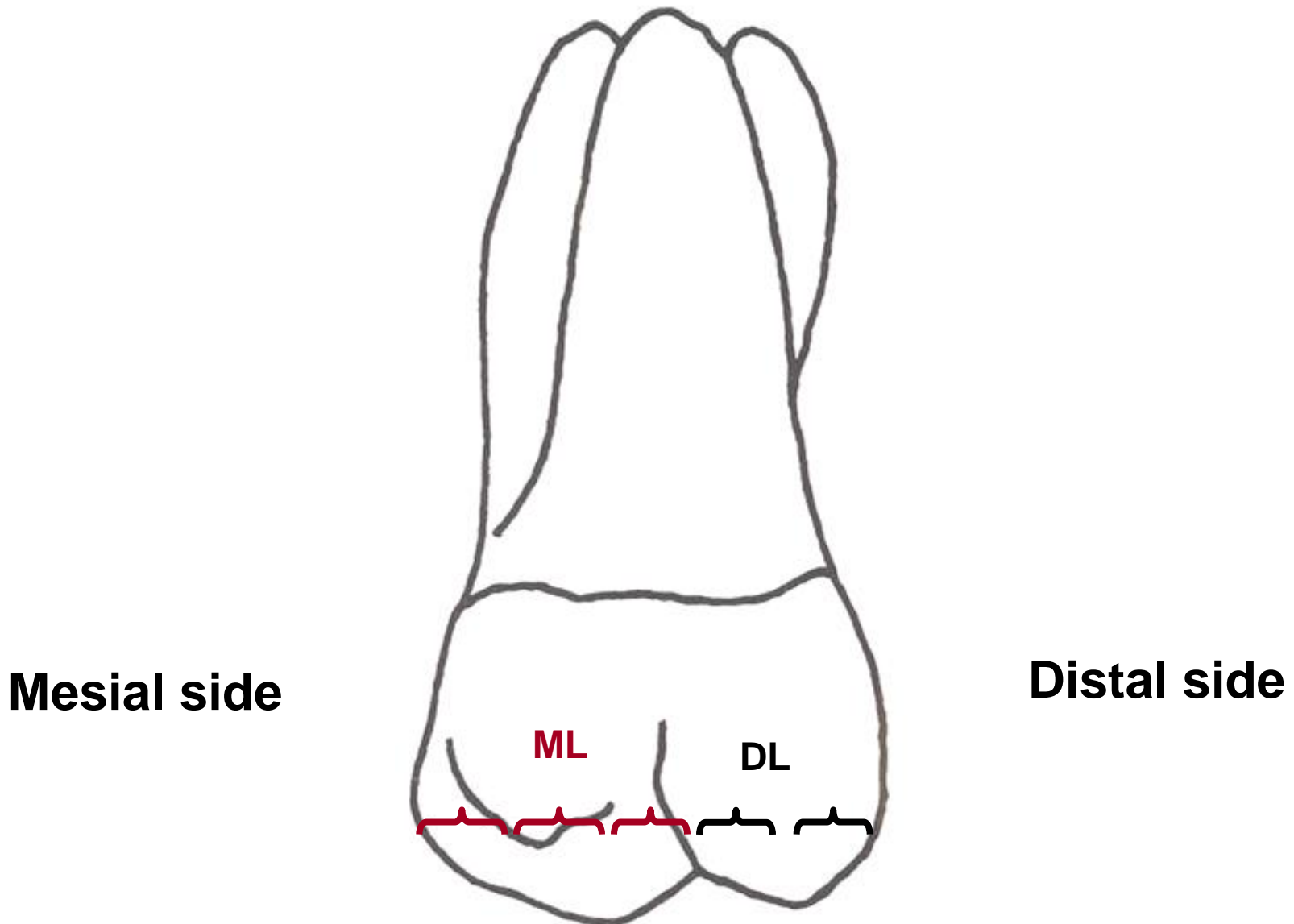
Lingual view



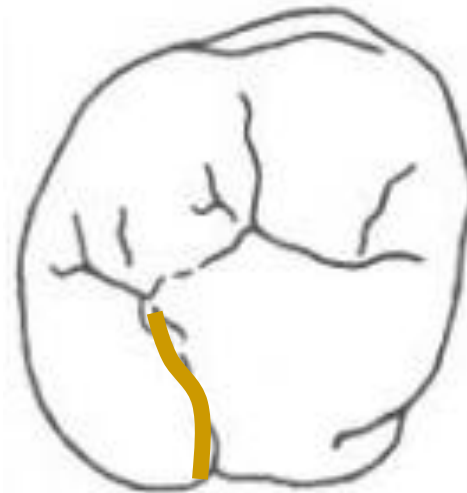
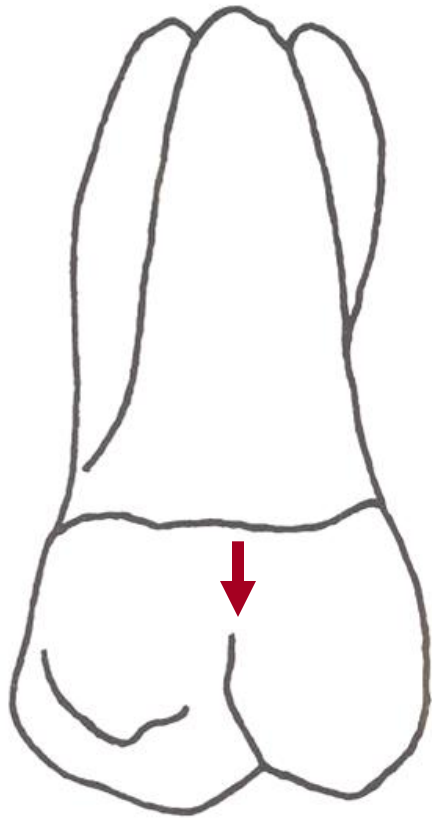
Lingual cusps are the only cusps seen from lingual aspect



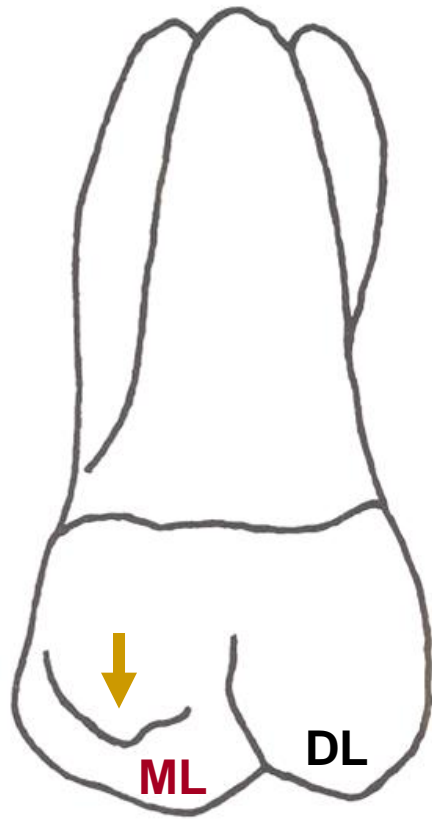
ML cusp is larger than DL cusp



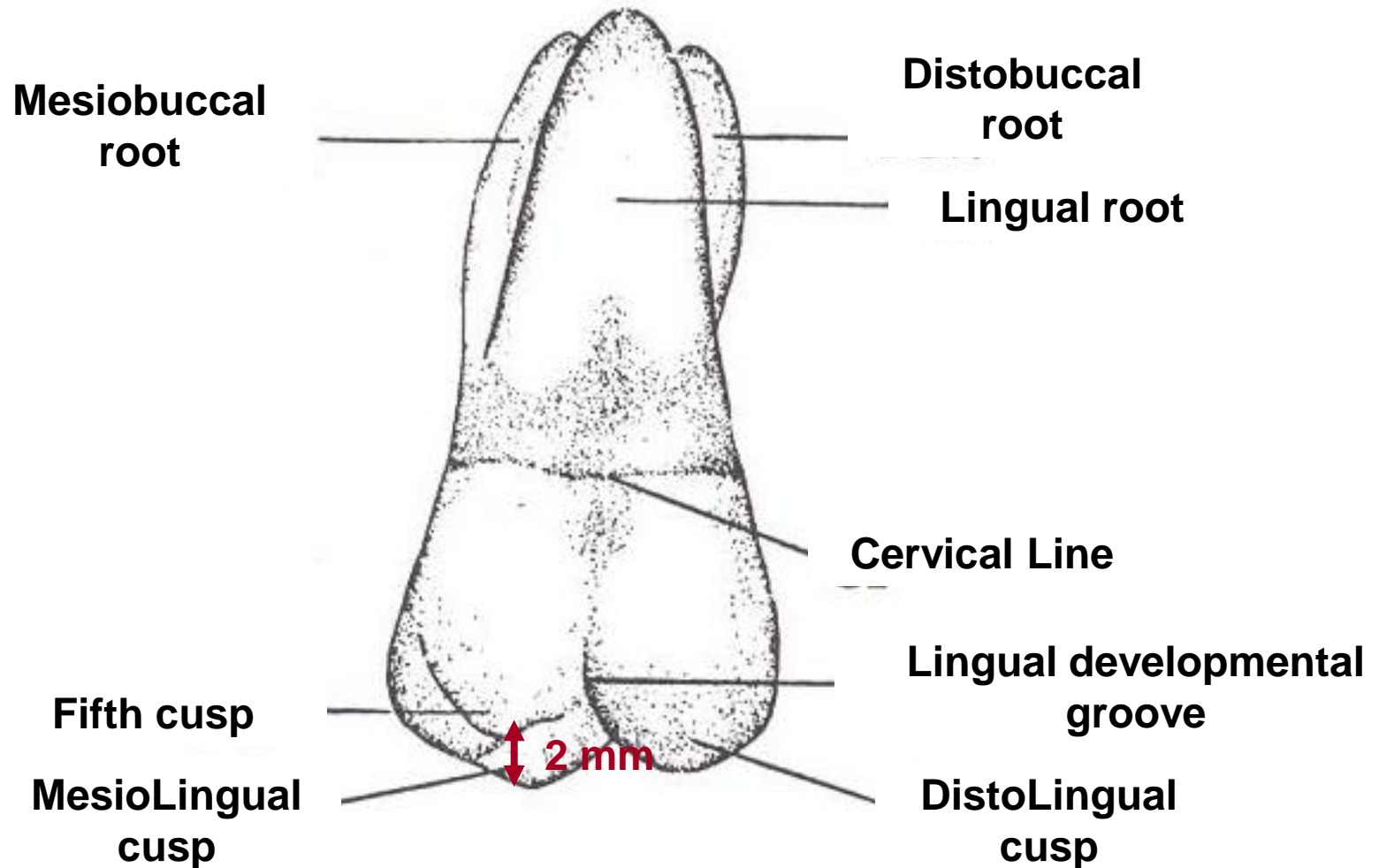
**ML cusp width is about $\frac{3}{5}$ of M-D crown diameter,
DL cusp width making up the remaining $\frac{2}{5}$**



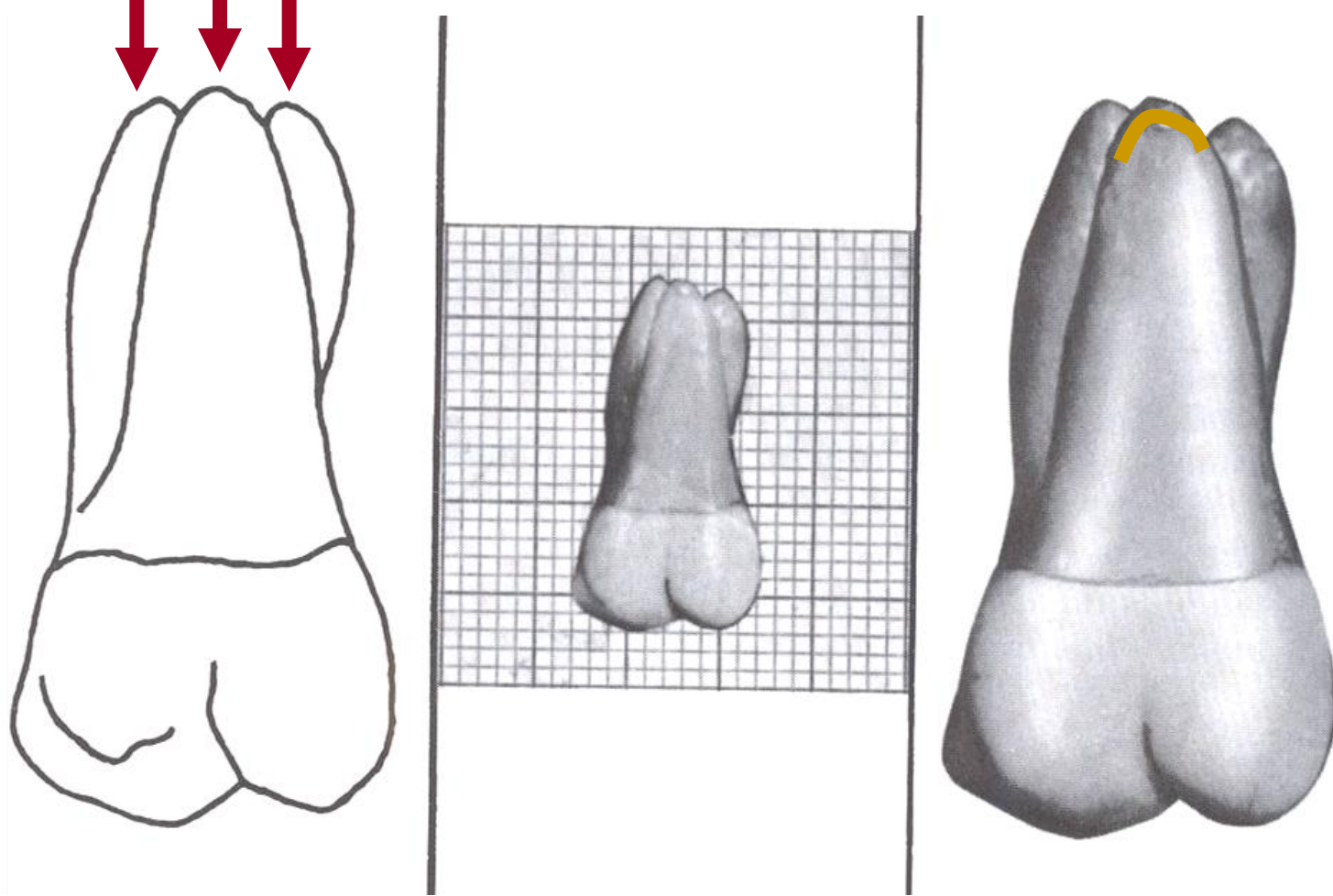
Lingual groove starts approximately at the center of lingual surface mesiodistally, curves sharply to the distal as it crosses between the cusps, and continues on to the occlusal surface



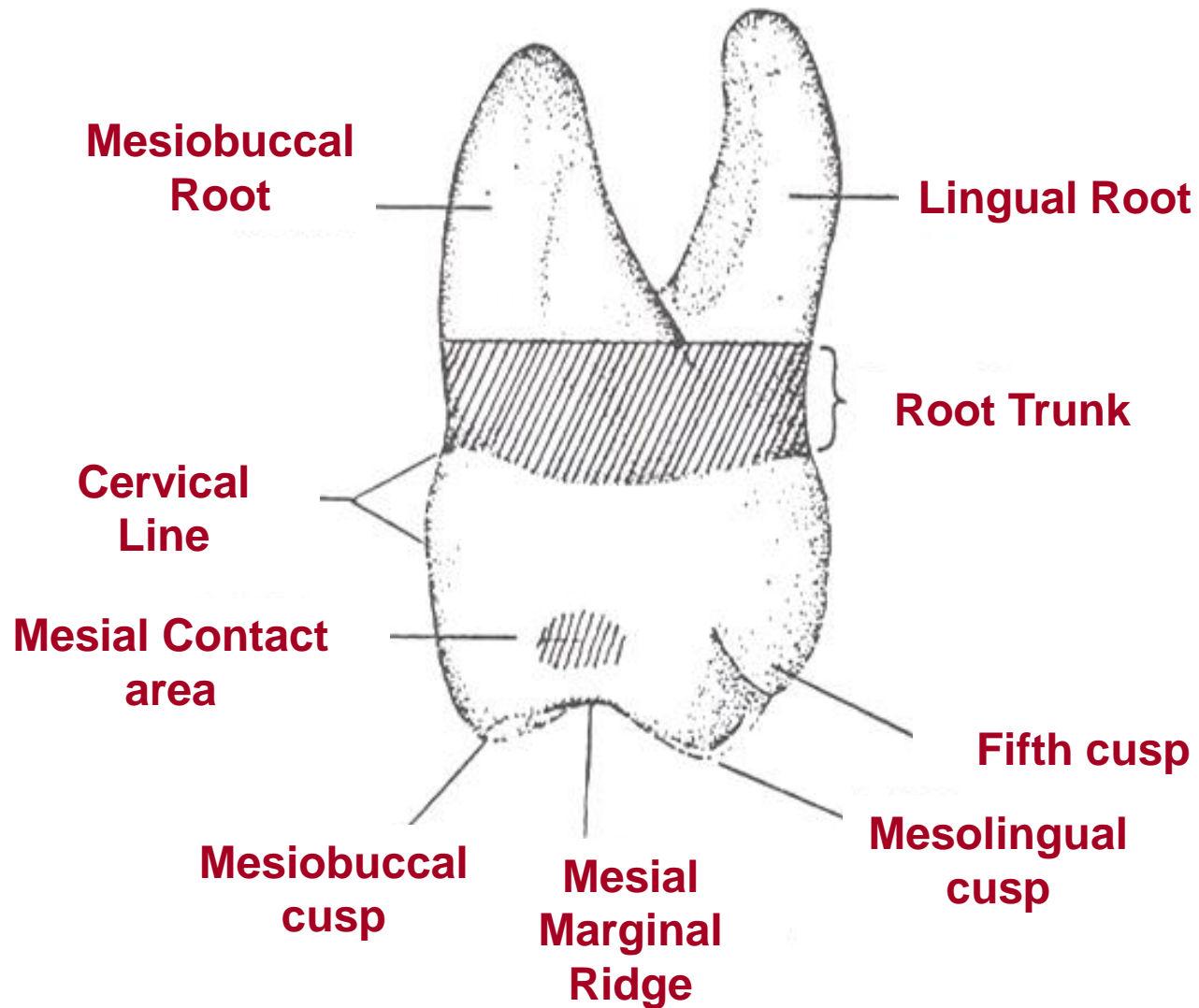
Fifth cusp appears attached to the ML surface of the **ML cusp**.
Outlined occlusally by an irregular groove



Cusp ridge of the fifth cusp is approximately 2 mm cervical to the cusps ridge of the ML cusp



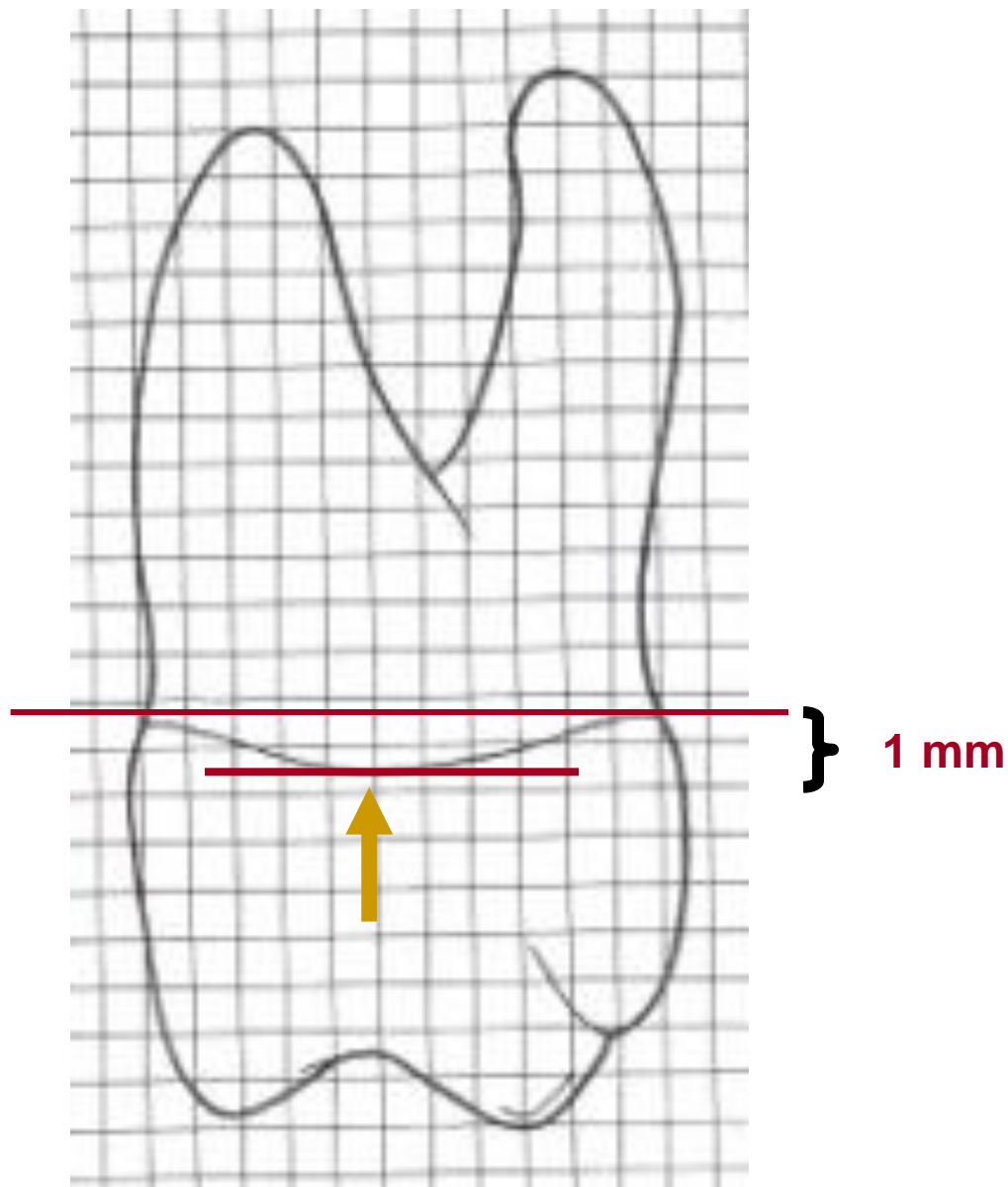
All the 3 roots are visible from the lingual aspect.
Lingual root is conical, with bluntly rounded apex



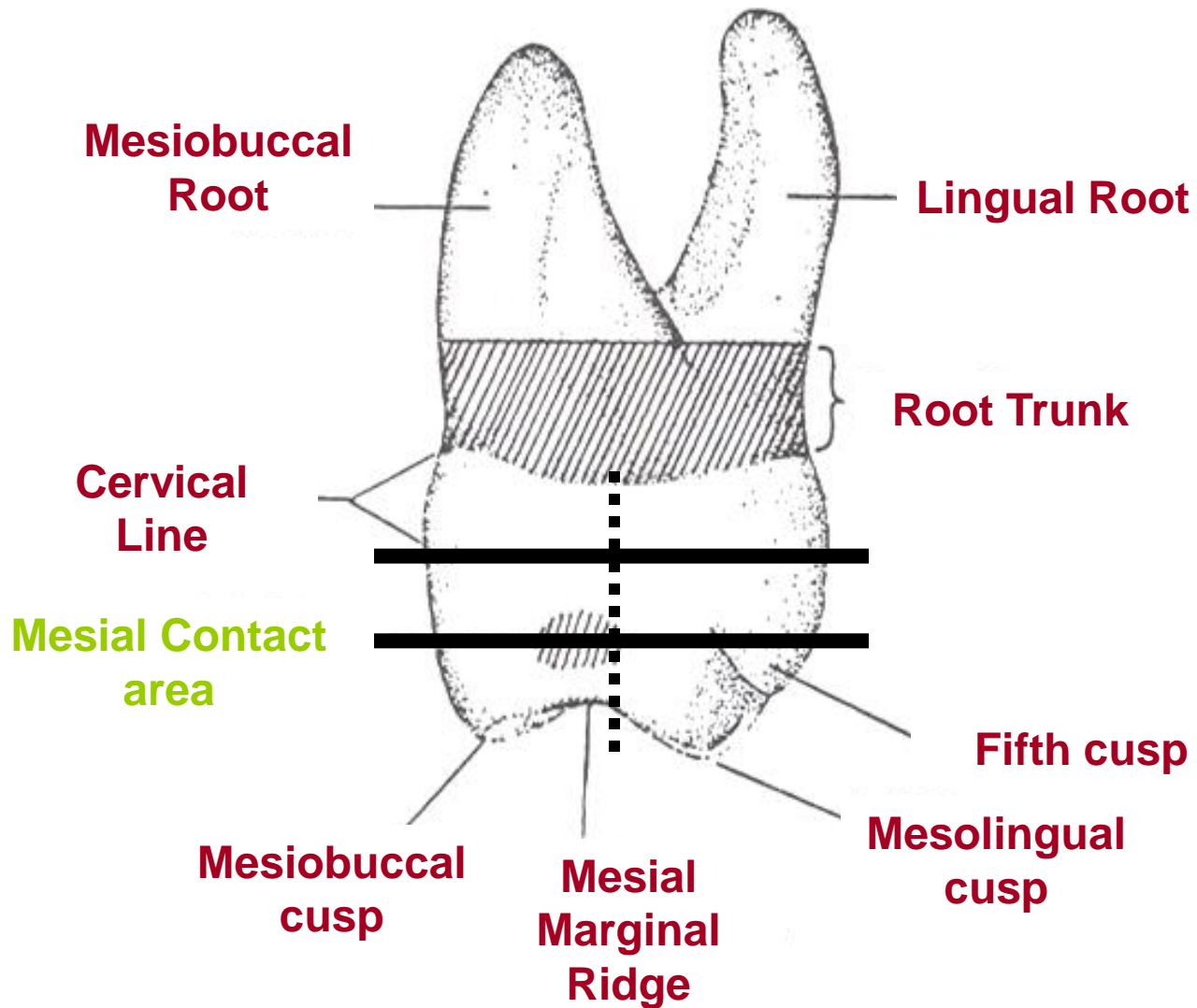
Maxillary Right First Molar, Mesial Aspect



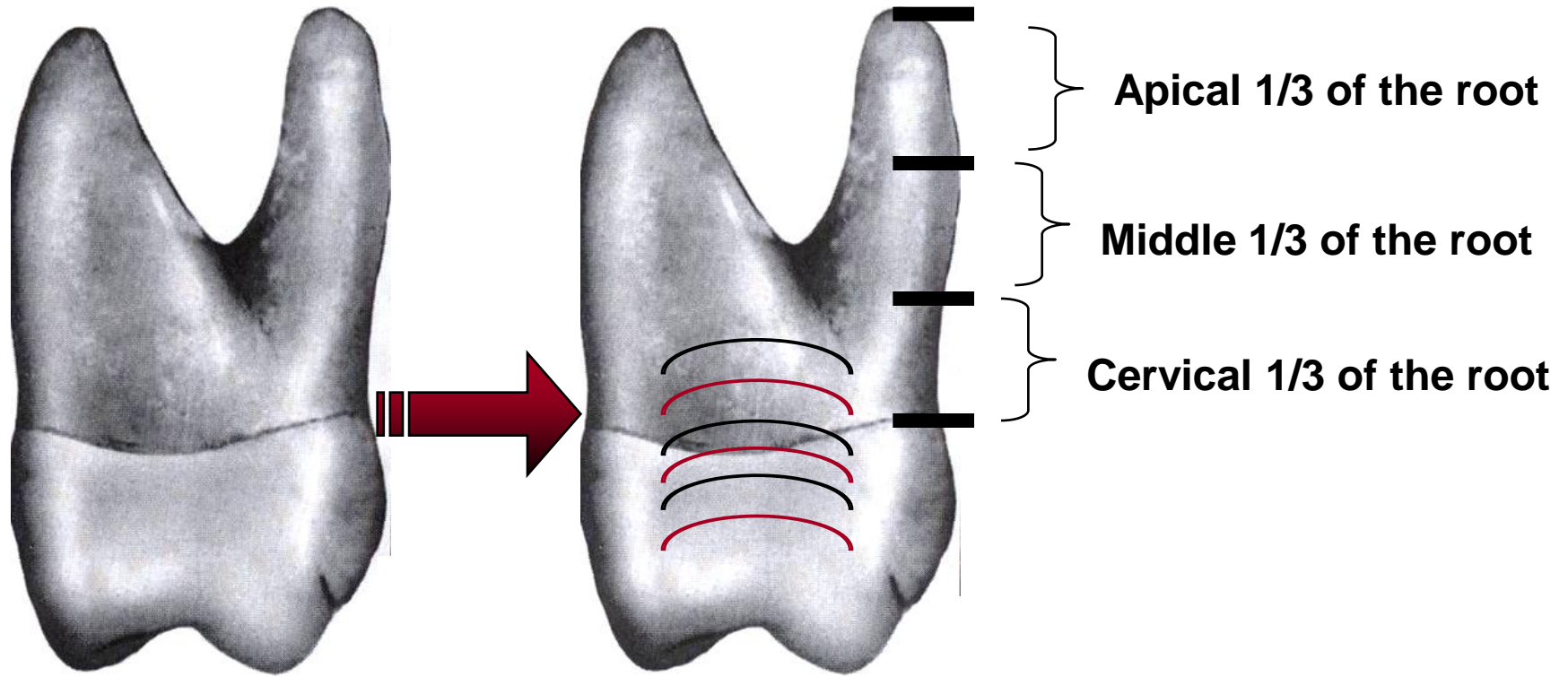
Increased B-L dimensions can be seen



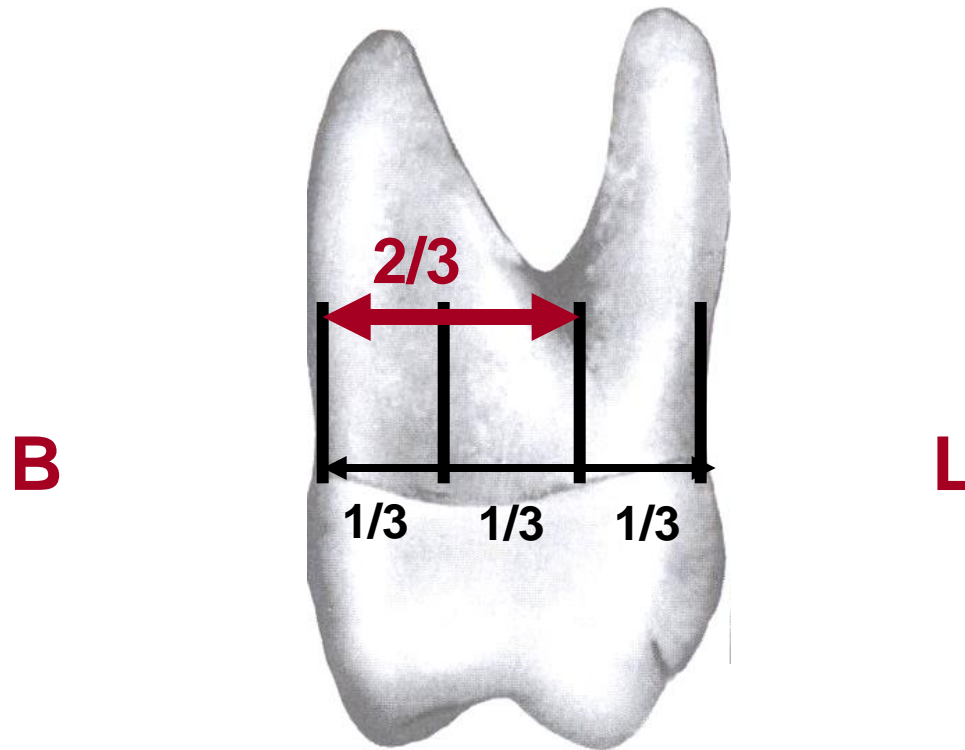
Cervical line is irregular, **curving occlusally** (not more than 1 mm).
Maximum curvature of the cervical line is **above the contact area**



Mesial contact area approximately at the junction of the middle and occlusal thirds of crown, Somewhat buccaly rather than in the center of B-L dimension

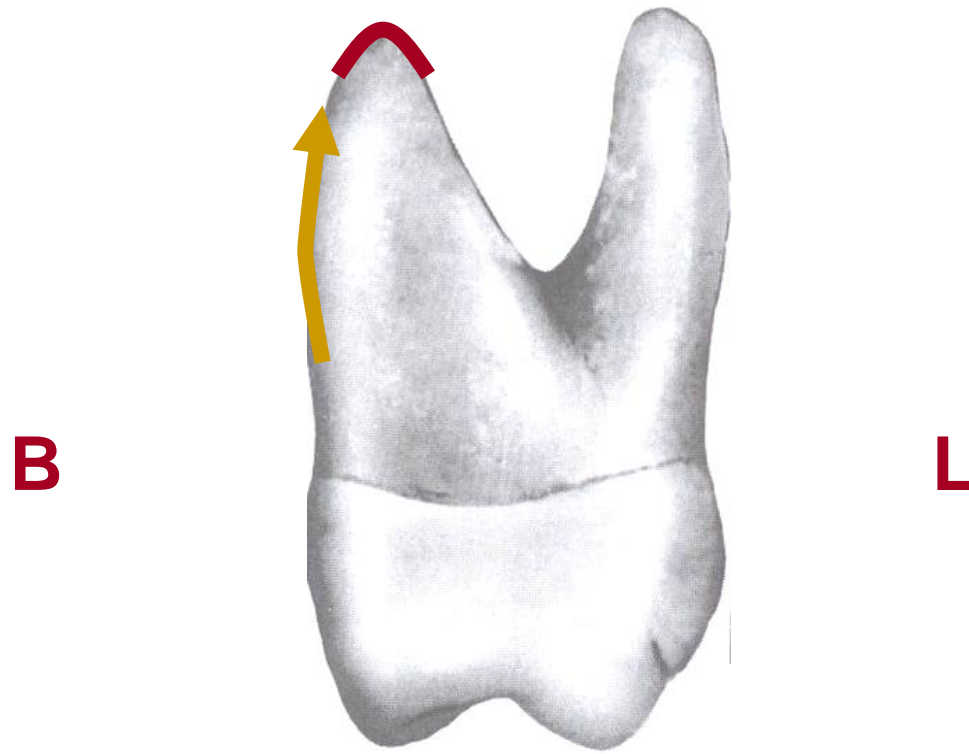


Mesial Shallow concavity is usually found above contact area, this concavity may be continued to the mesial surface of the root trunk at its cervical 1/3

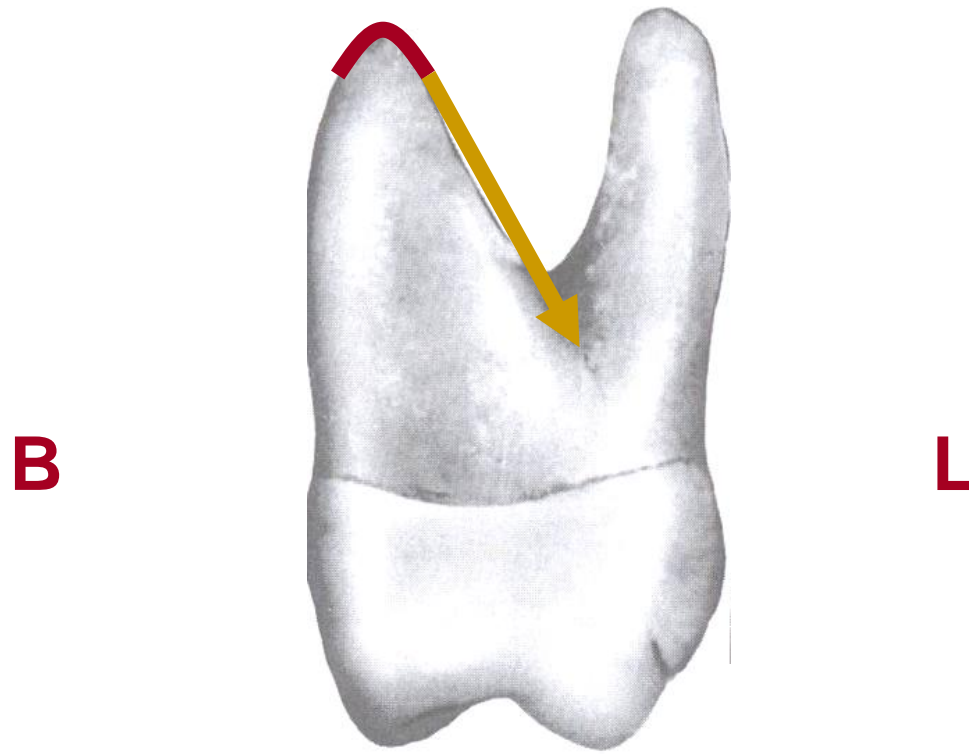


MB root is broad and flattened.

Width of MB root is $\frac{2}{3}$ of the crown B-L measurement at cervical line..

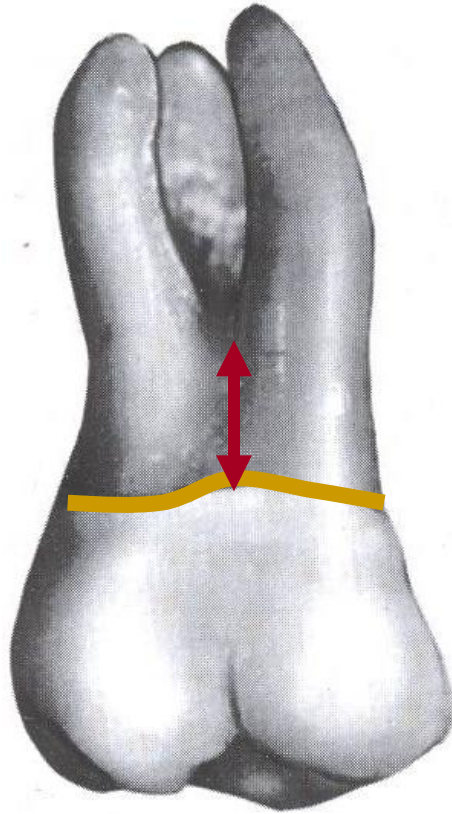


Buccal outline of MB root **extends upward** and **outward** from the crown, with **blunt apex**

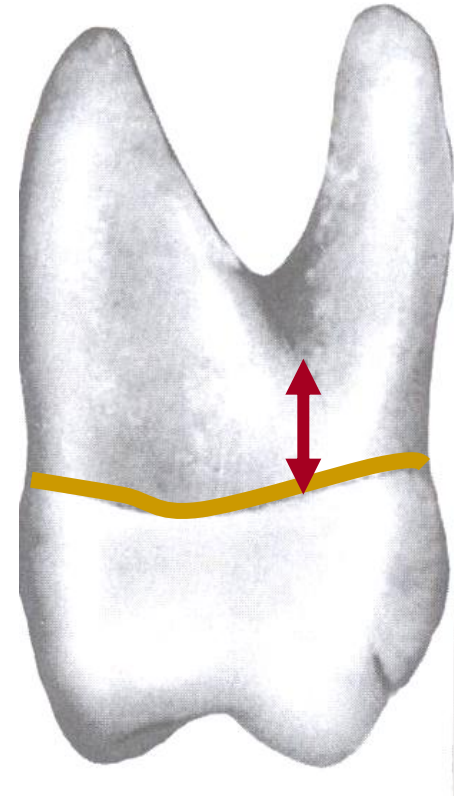


Lingual outline of the MB root is relatively **straight** from the blunt round apex to the bifurcation with the lingual root..

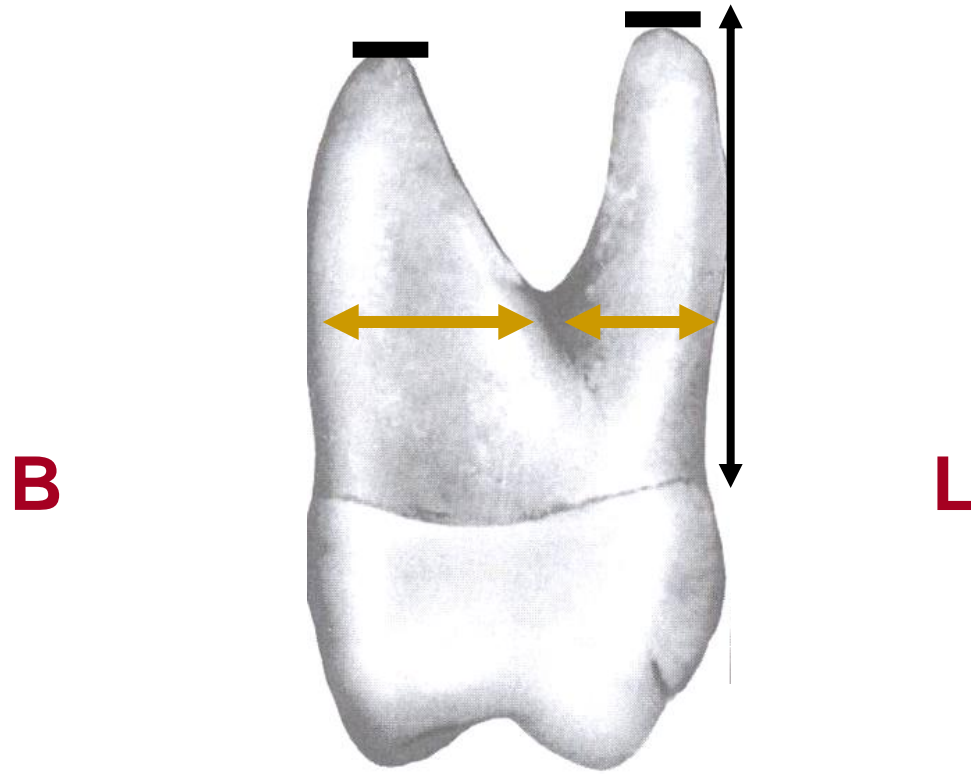
Buccal view



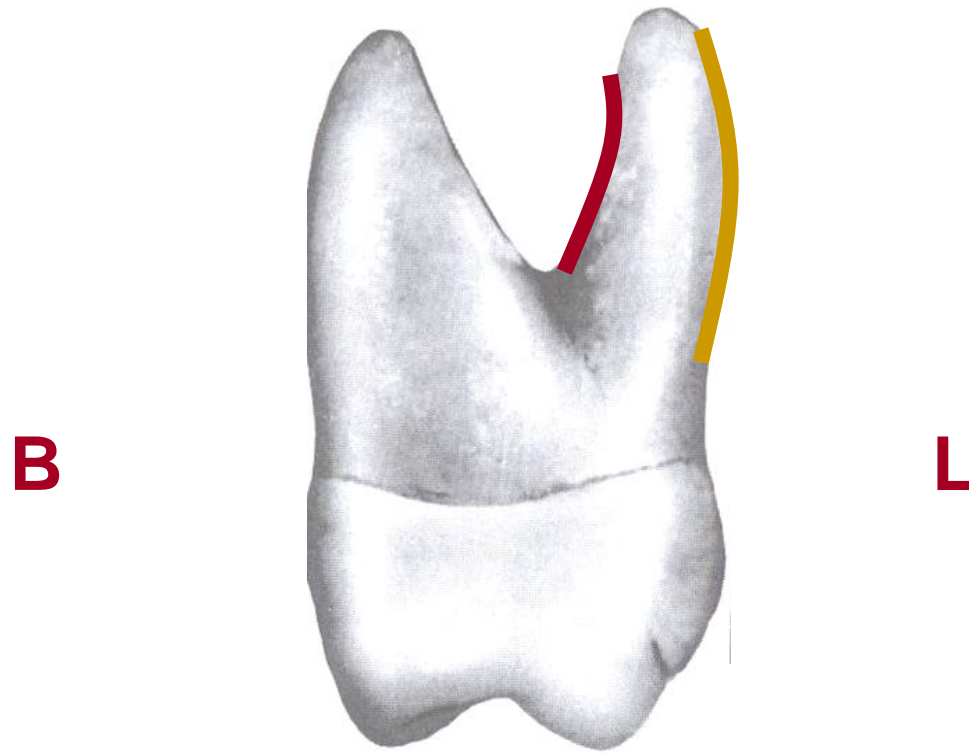
Mesial view



Level of root bifurcation **mesially more**
closer to cervical line than buccaly

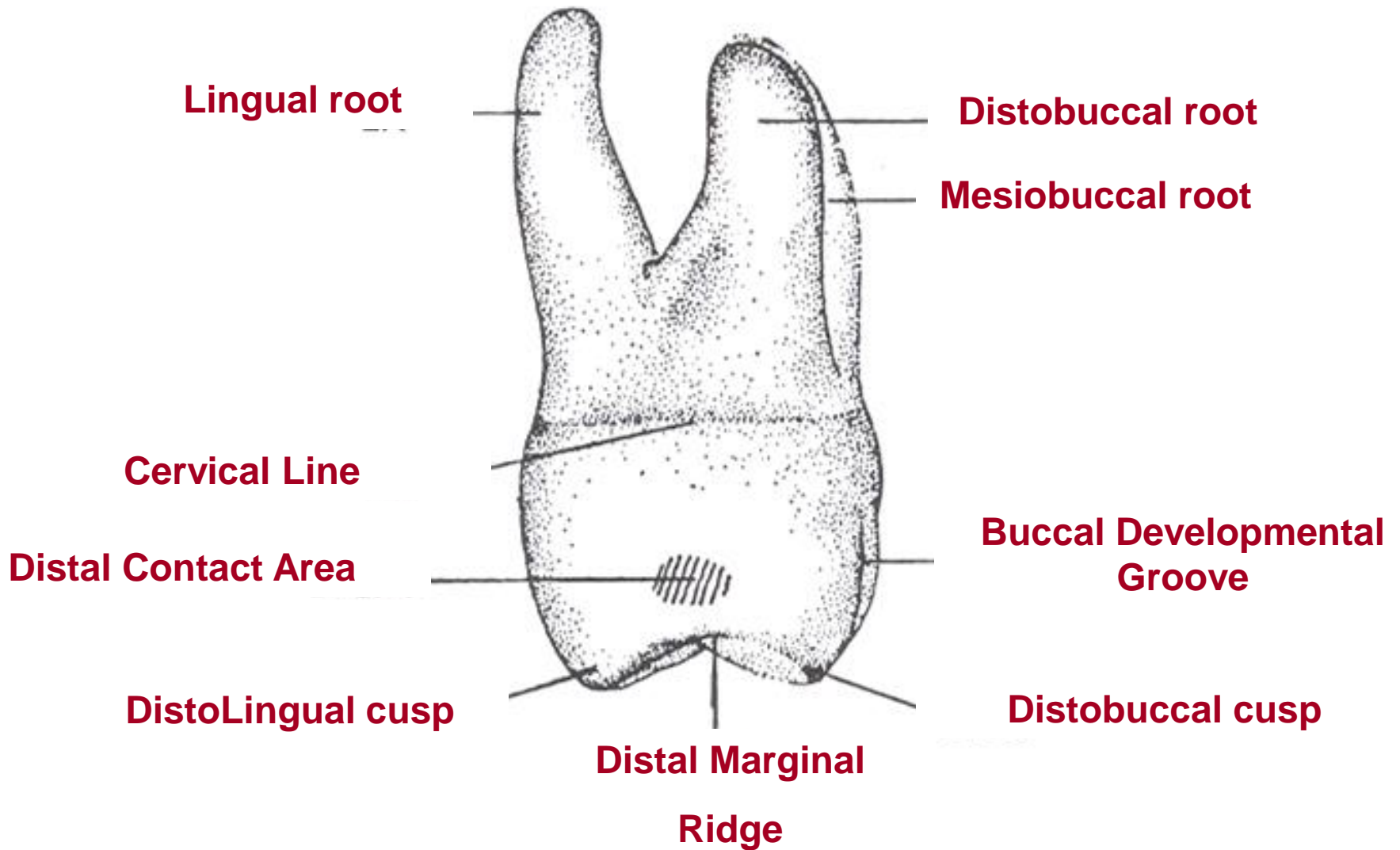


Lingual root is longer than mesial root
but is narrower from mesial aspect.

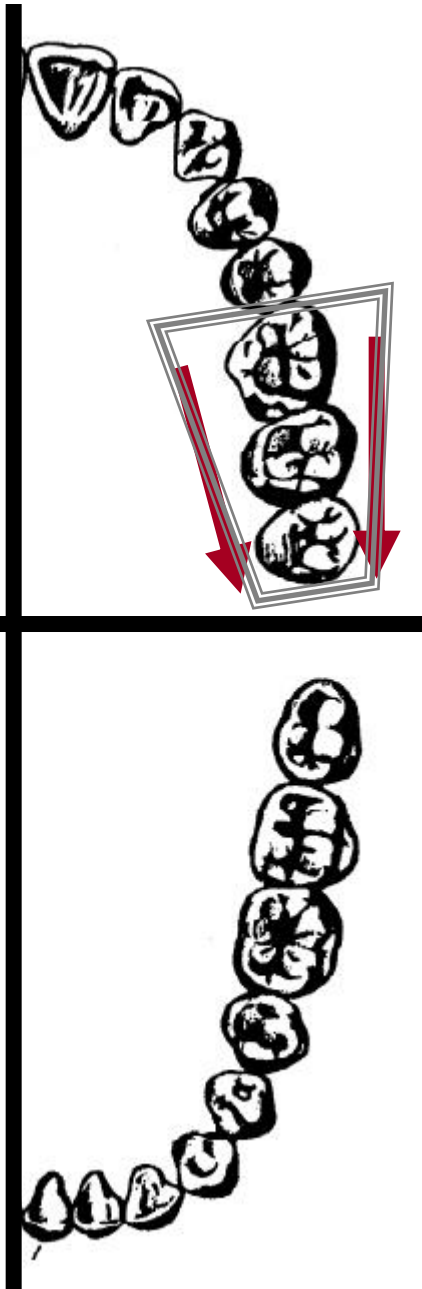


Lingual root is banana-shaped, extending
lingually

DISTAL ASPECT



Maxillary Right First Molar, Distal Aspect.



There is tendency
of the crown to
taper distally..

Mesial view

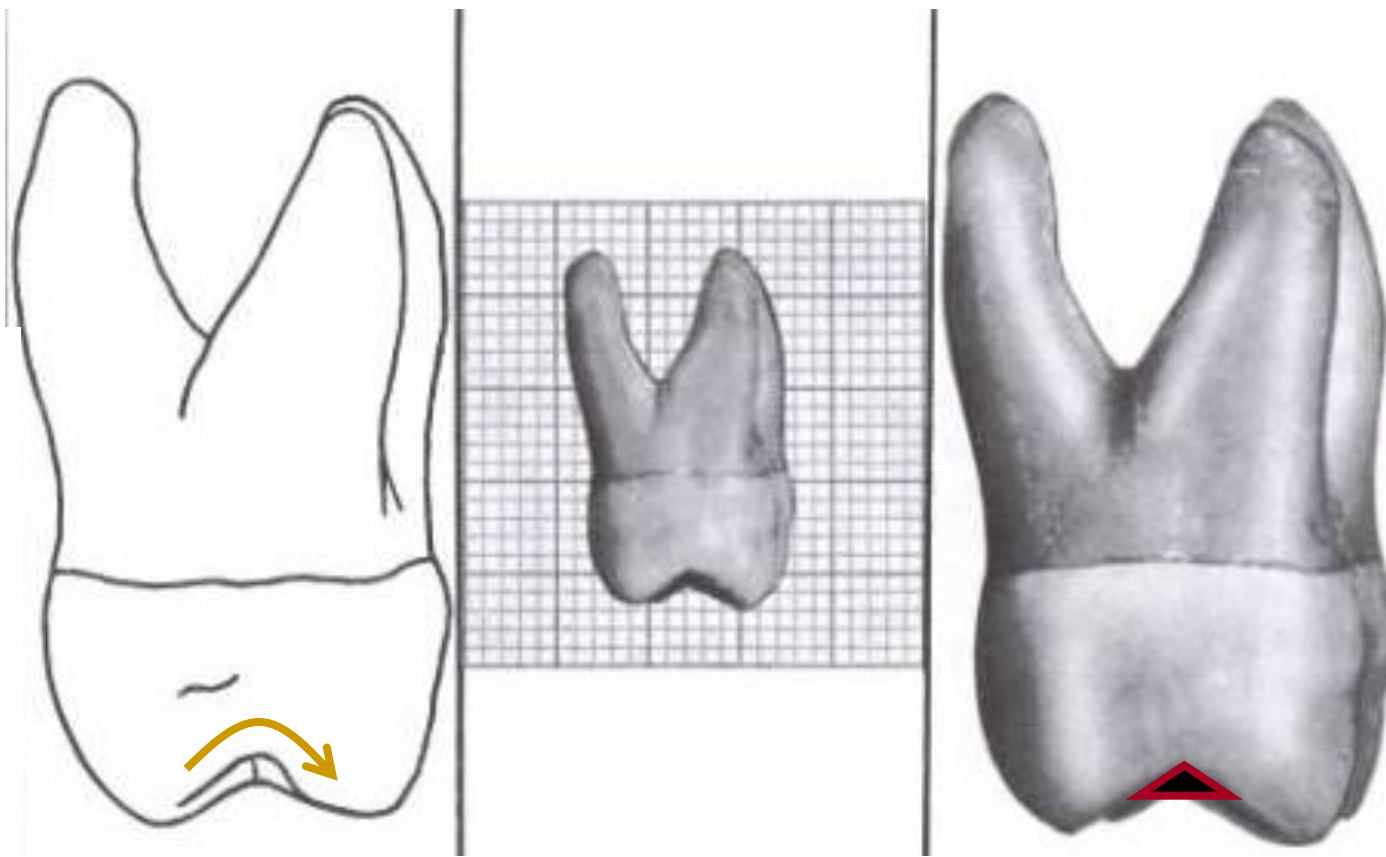


Vs.

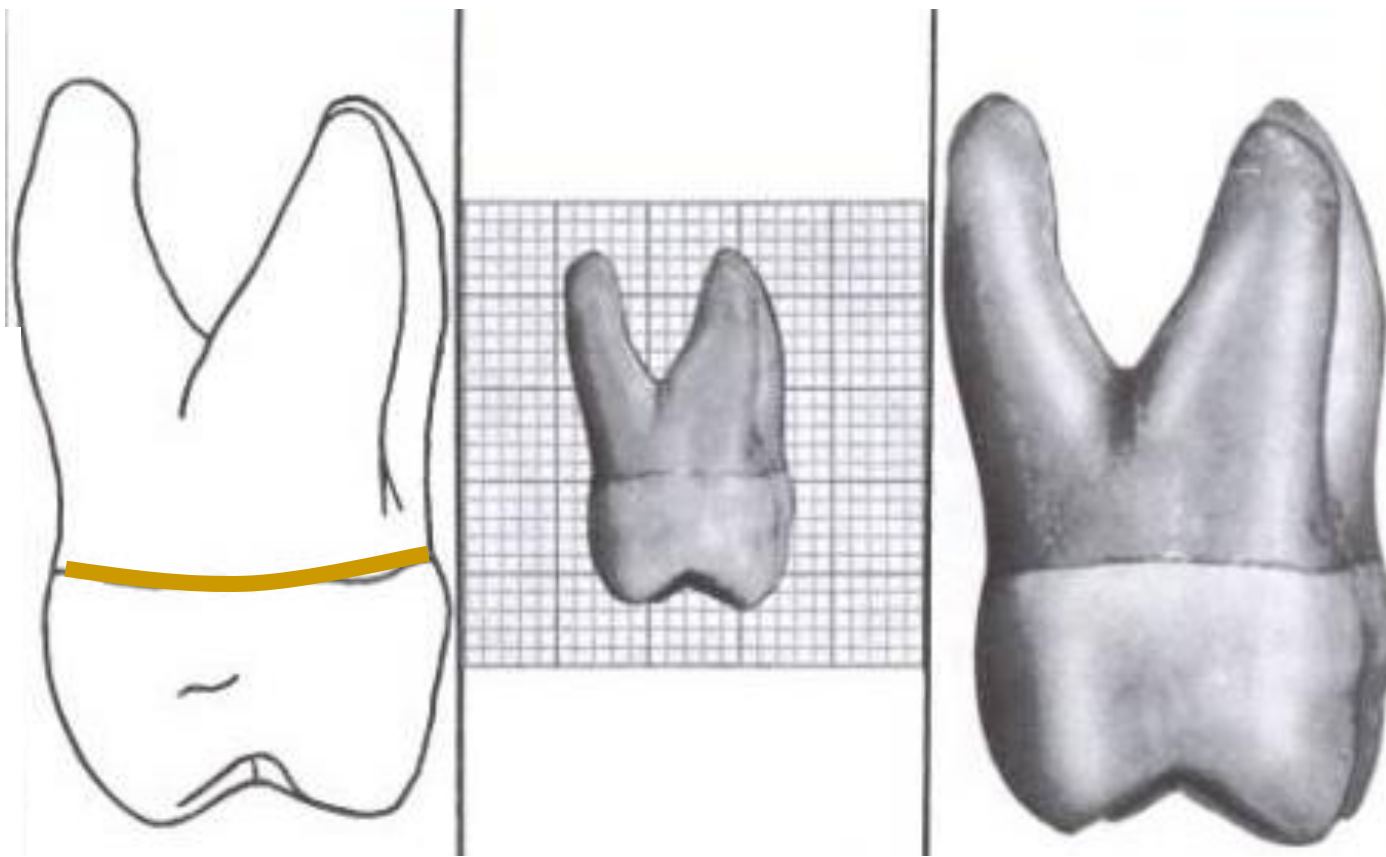
Distal view



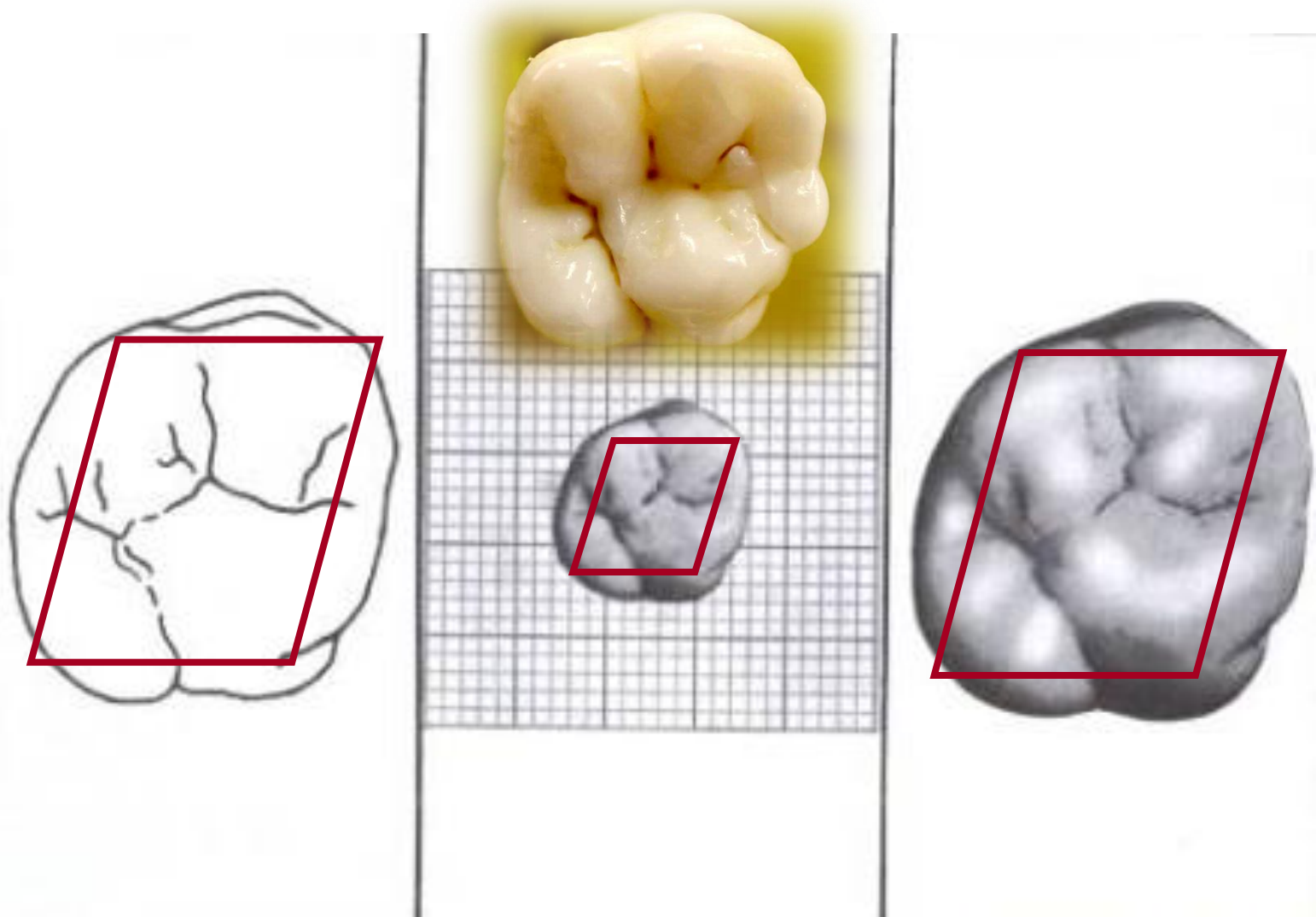
That's why..most of the buccal surface of the crown may be seen from the distal aspect..
= the B-L measurement of the crown mesially is greater than the D.



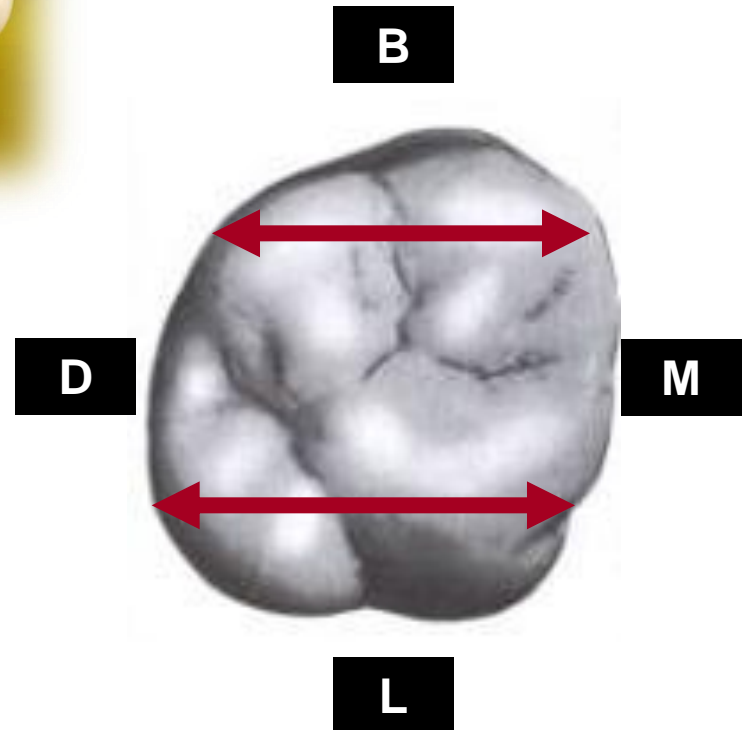
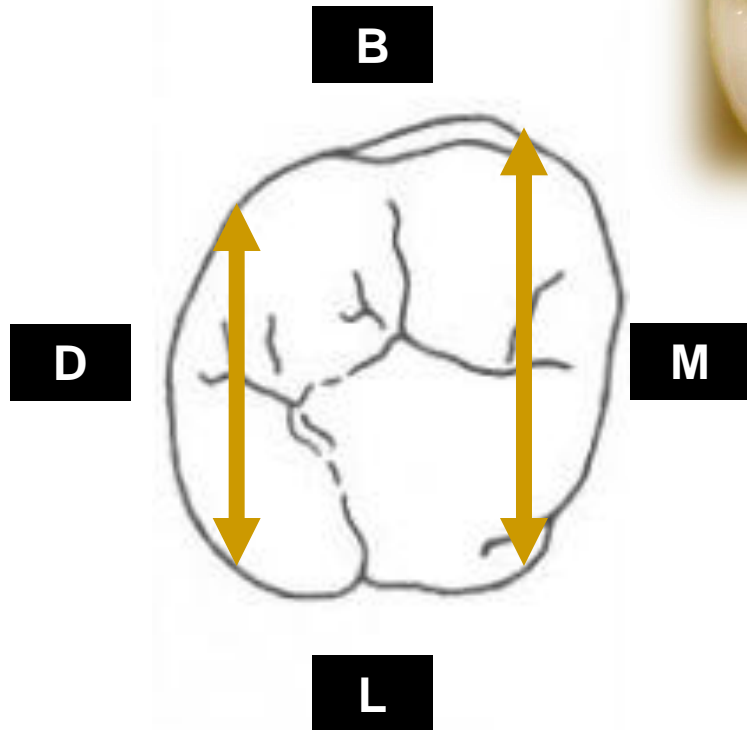
Distal marginal ridge **curve** sharply in cervical direction, **exposing triangular ridges on occlusal surface** distally.



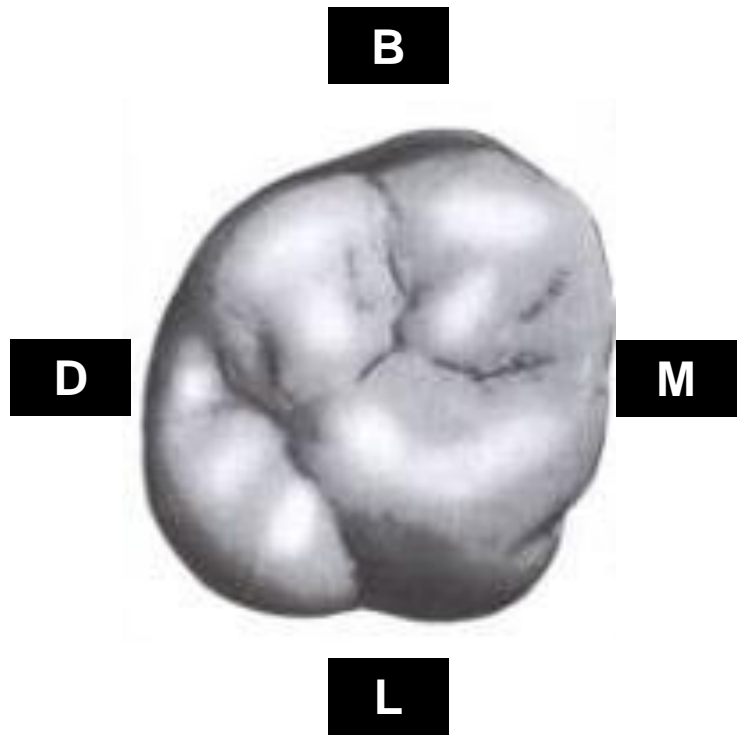
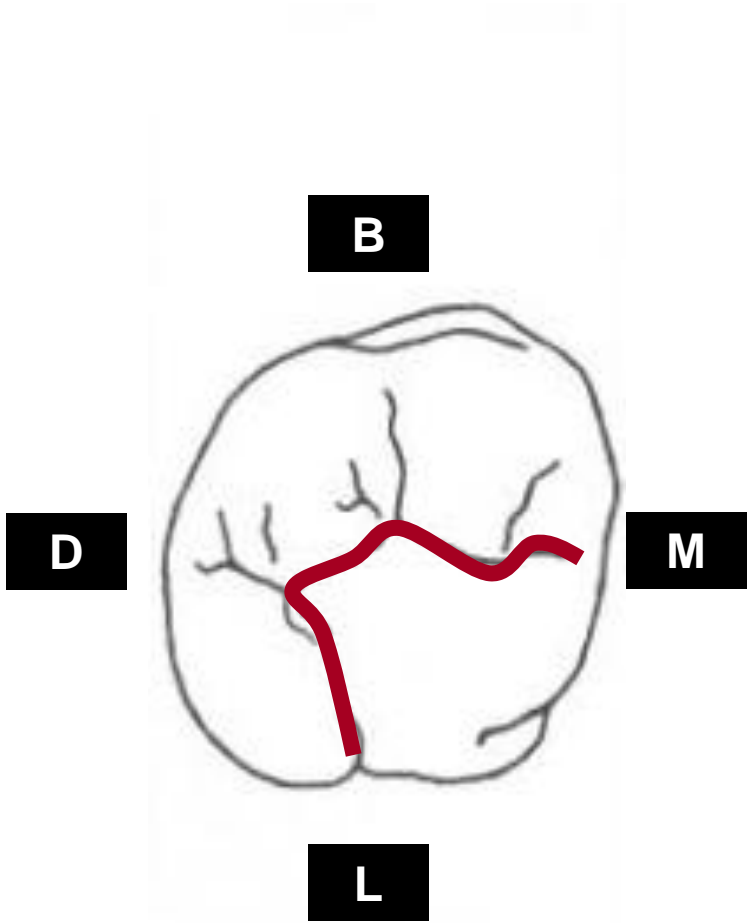
Cervical line almost straight B-L, occasionally it curves apically around 0.5 mm



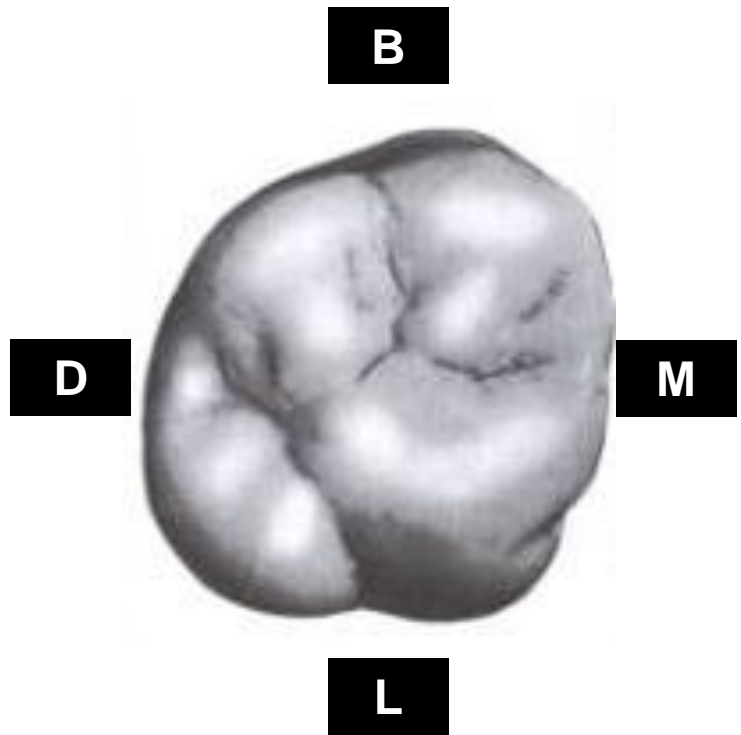
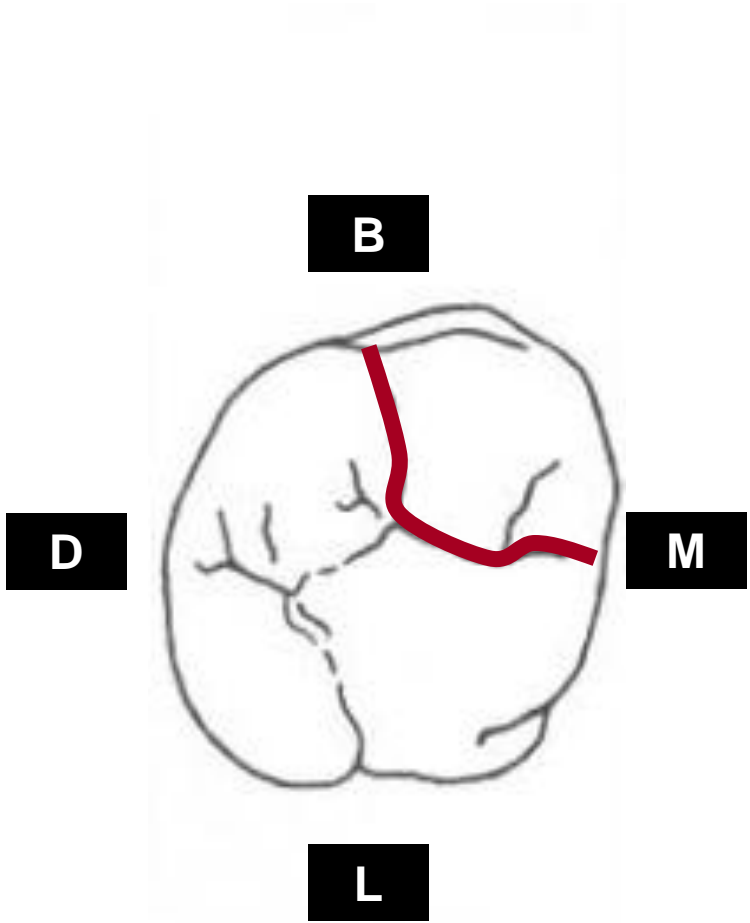
Occlusal outline is somewhat **rhomboidal**



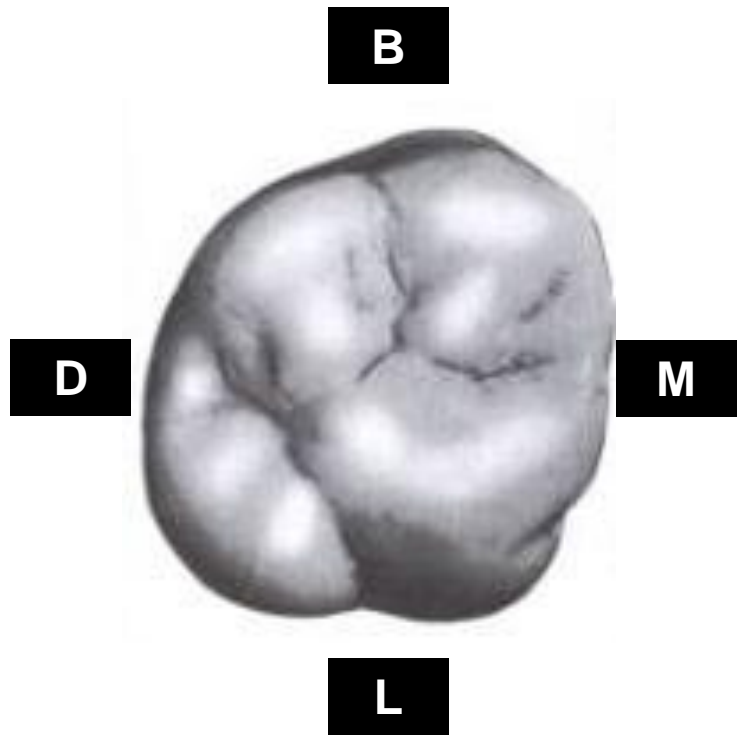
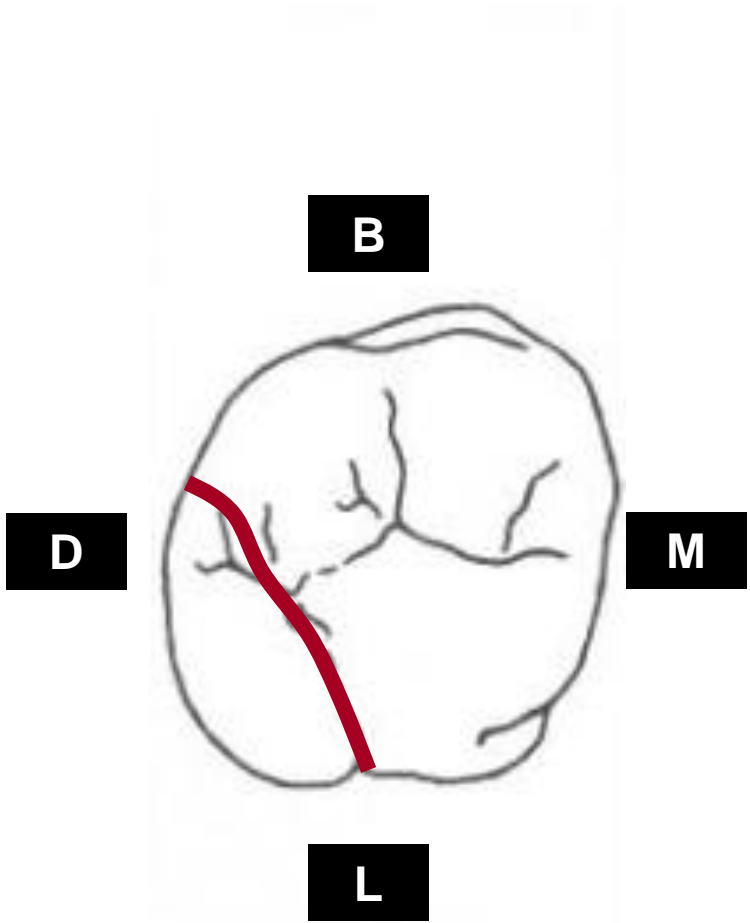
Wider mesially than distally &
wider lingually than buccally



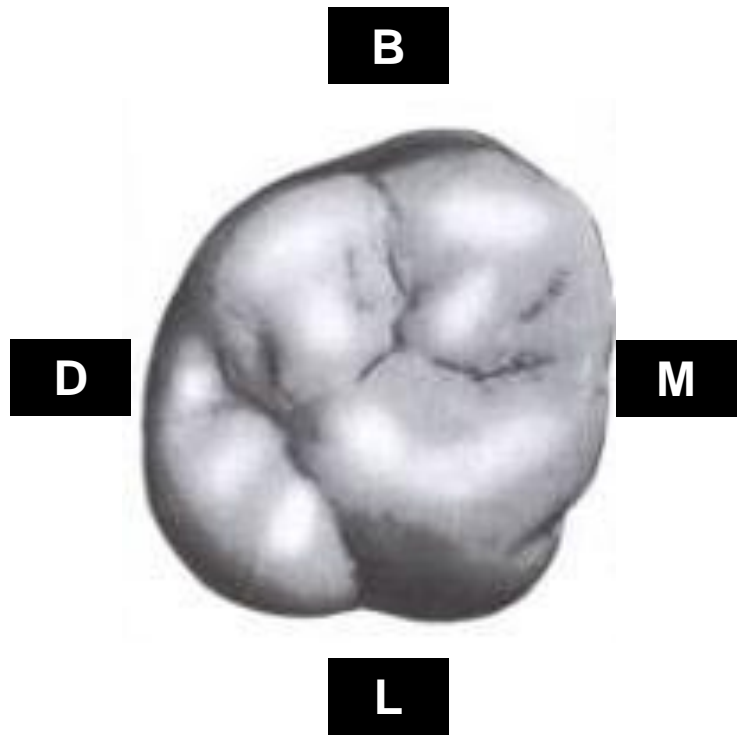
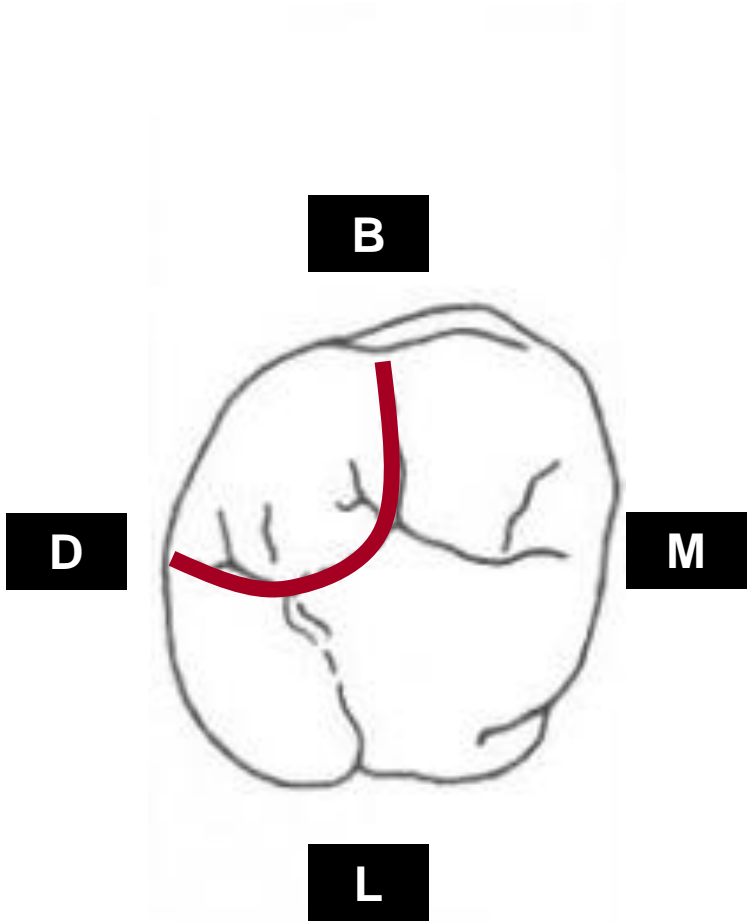
ML cusp is the largest → MB → DL → DB → fifth cusp.



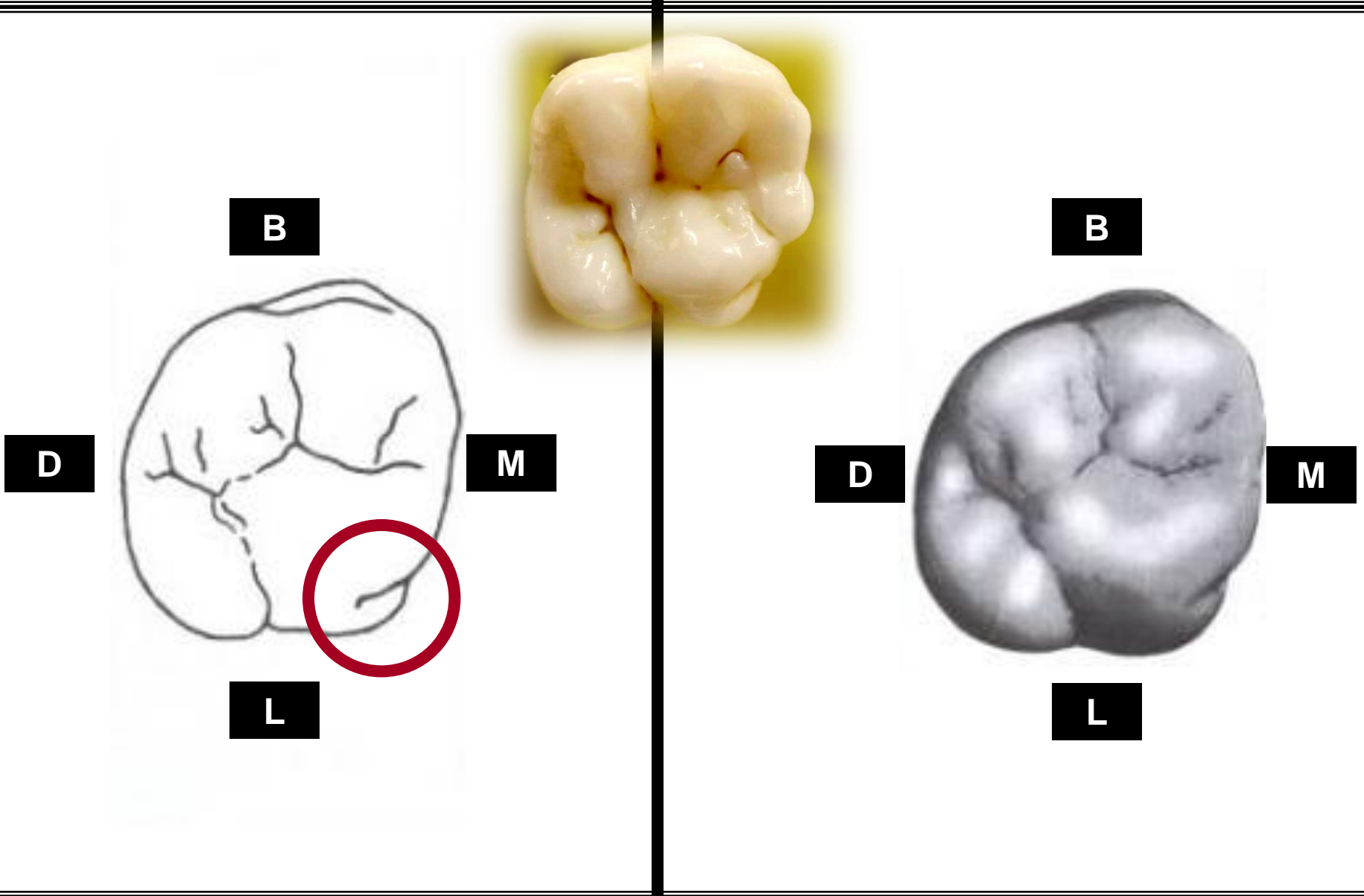
ML cusp is the largest → MB → DL → DB → fifth cusp.



ML cusp is the largest → MB → DL → DB → fifth cusp.



ML cusp is the largest → MB → DL → **DB** → fifth cusp.



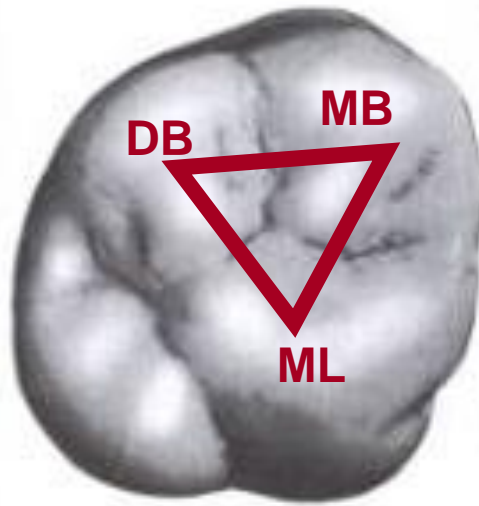
ML cusp is the largest → MB→DL→ DB → fifth cusp.

Primary cusps 3 :
ML, MB, DB cusps

Secondary cusp:
Tubercle of Carabelli..

“DL common to all max. molars !”

B



M

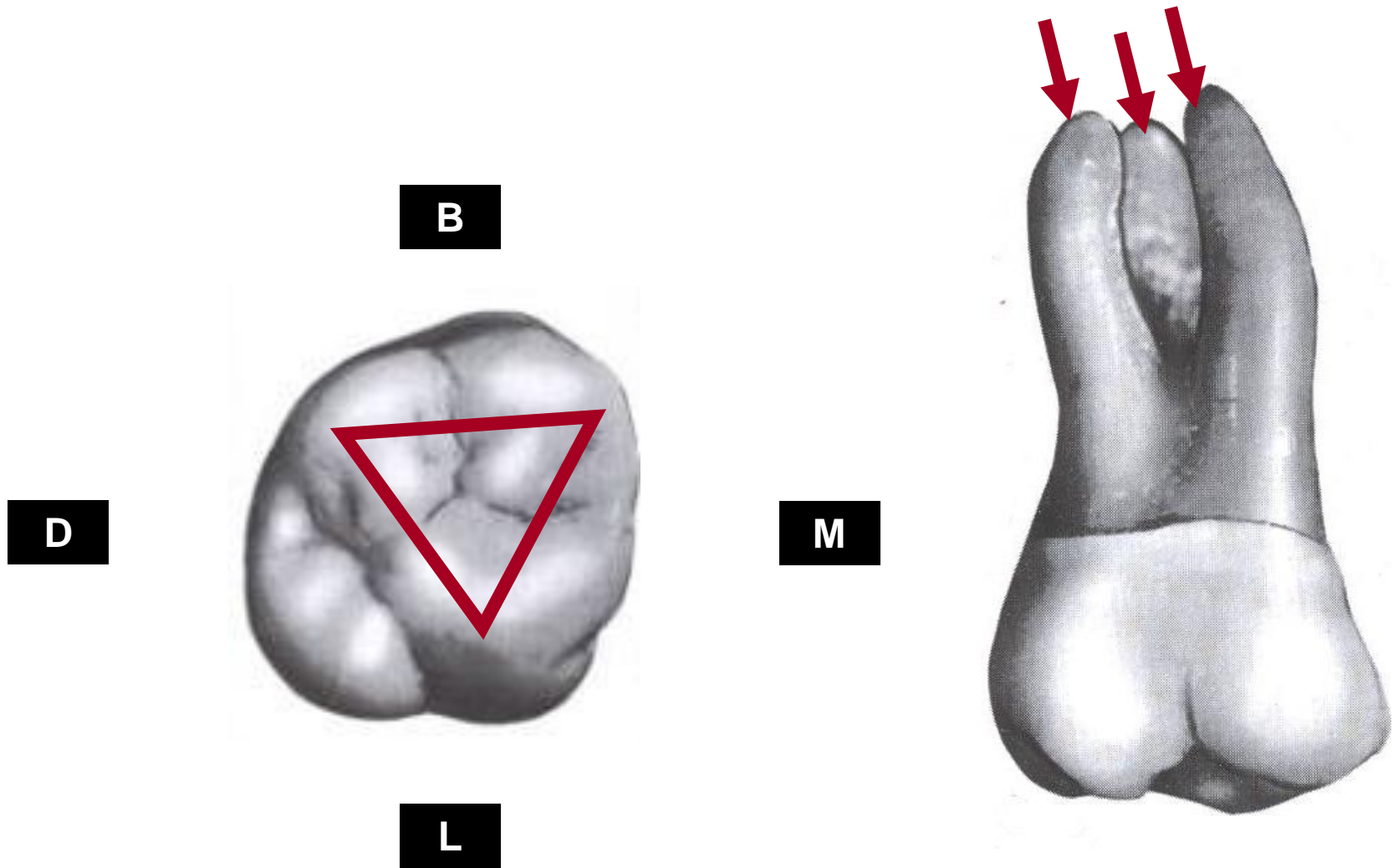


**DL cusp becomes progressively smaller
on 2nd and 3rd molars..often
disappearing**

D

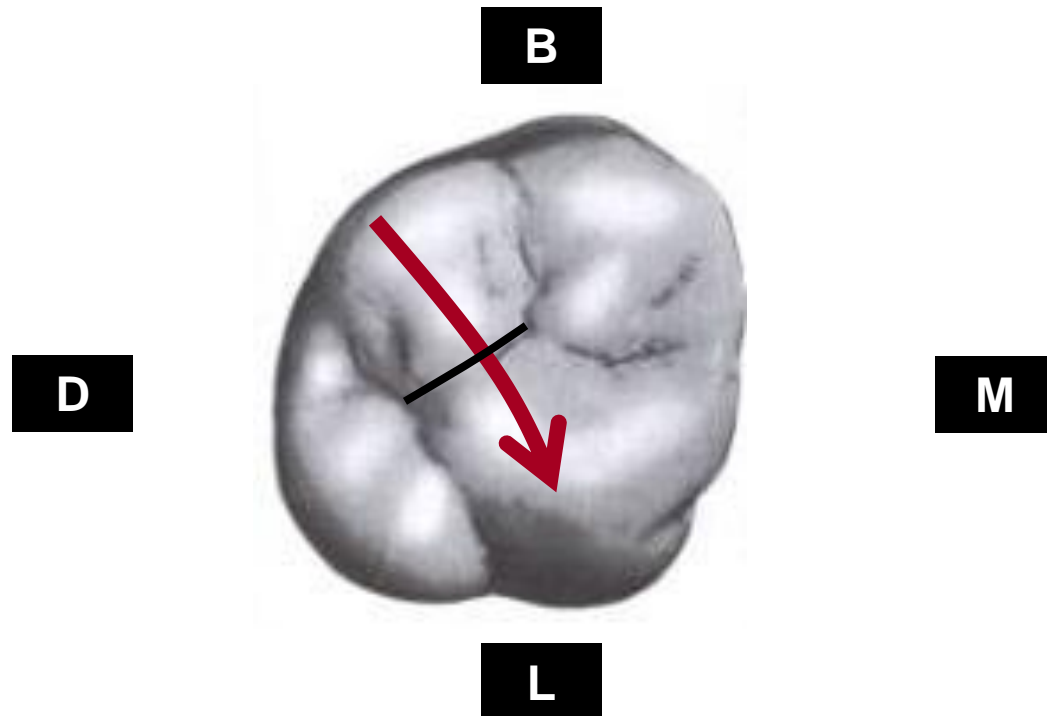
L



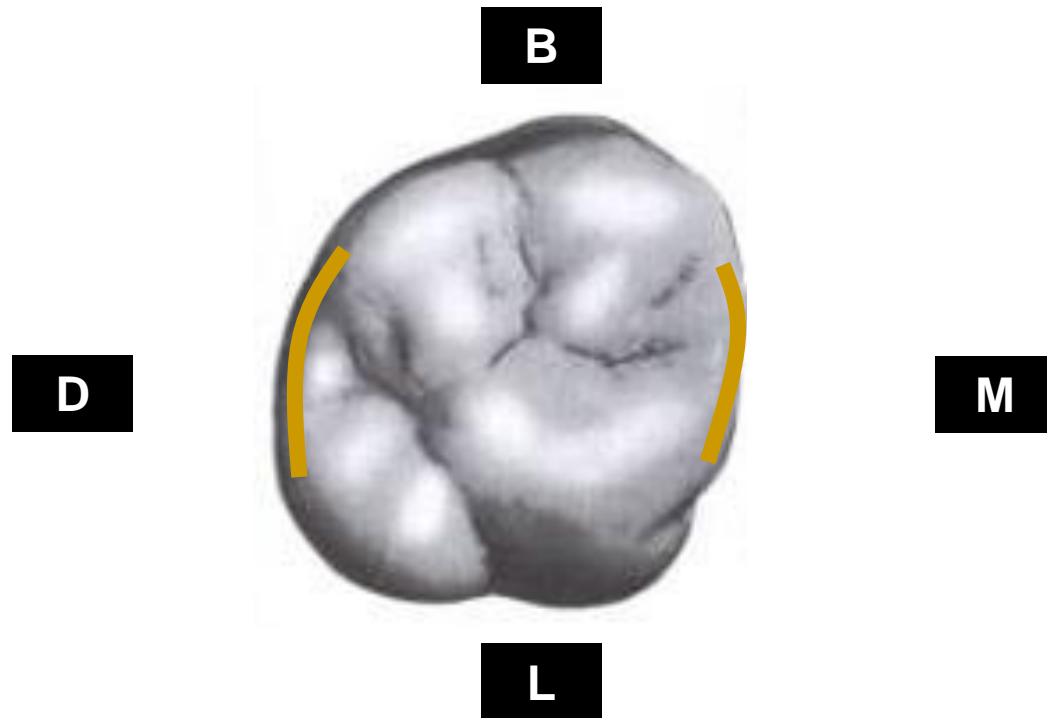


Triangular arrangement of cusps is reflected
in the outline of the root trunks of maxillary
molars

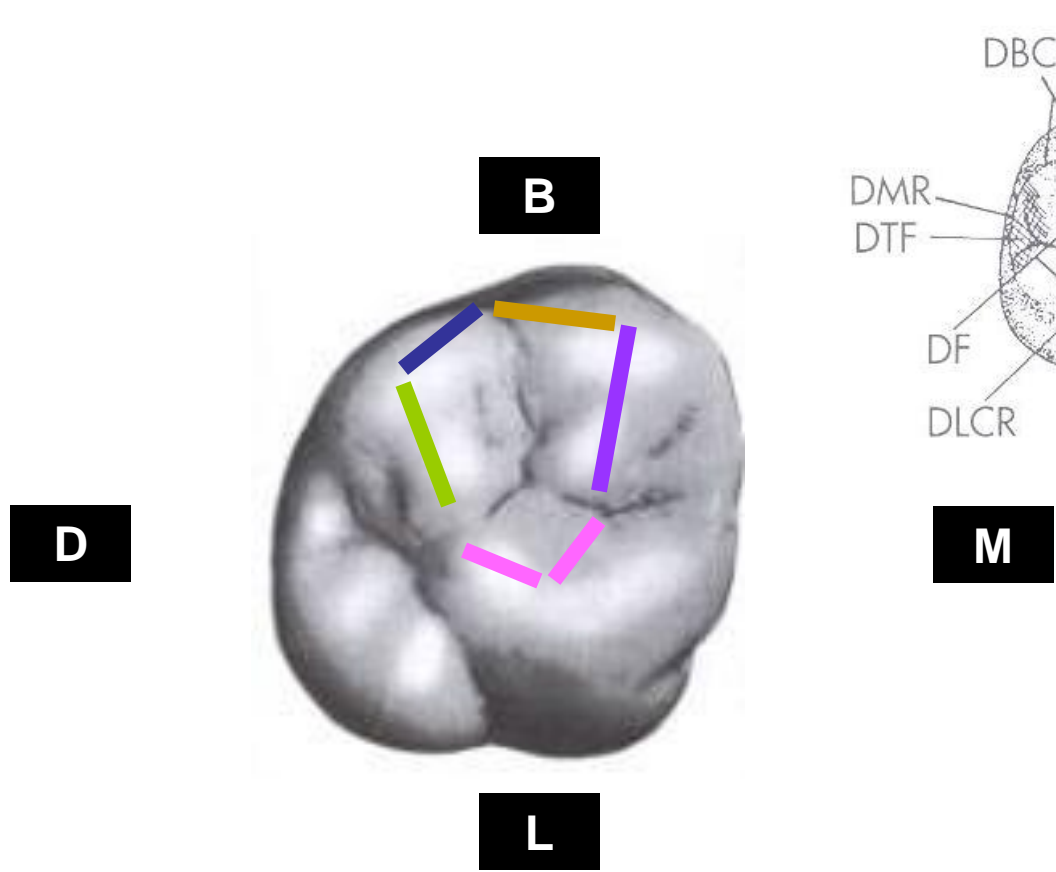
Oblique ridge is a ridge that crosses the occlusal surface obliquely



Oblique ridge reduced in height in the center of occlusal surface, being at the level of marginal ridge

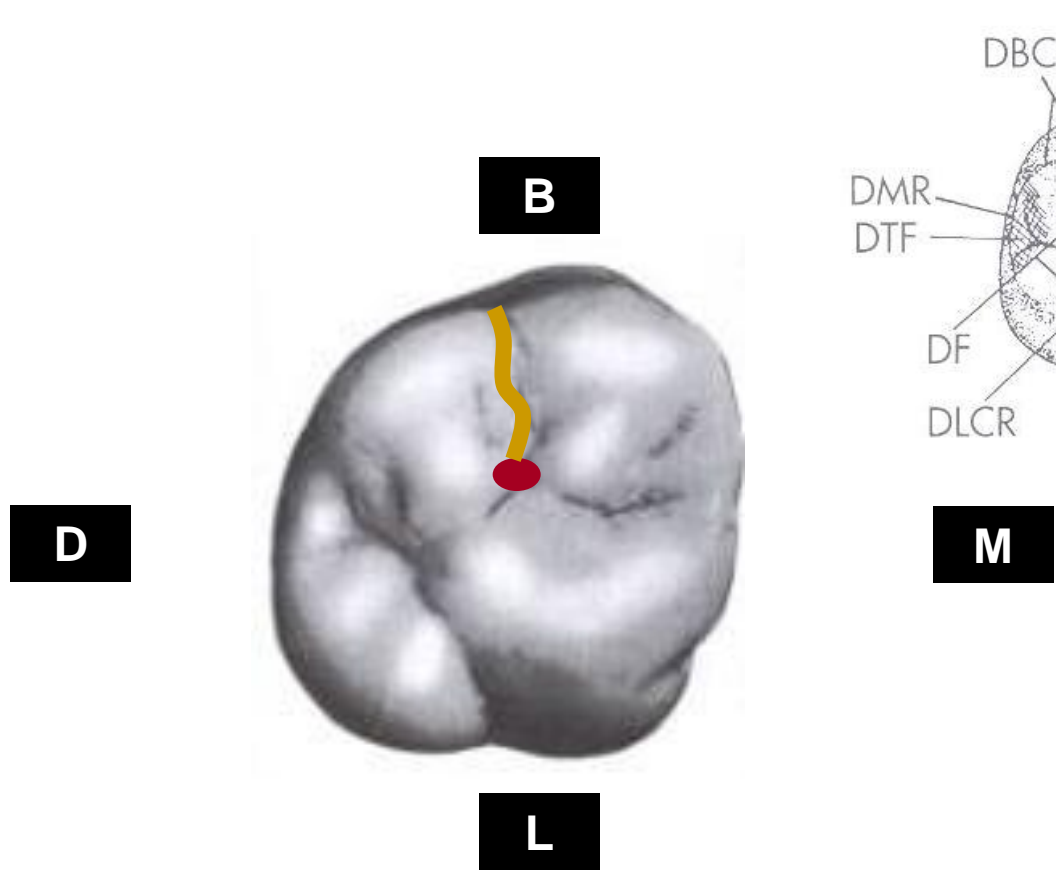


Mesial marginal ridge & distal marginal ridge

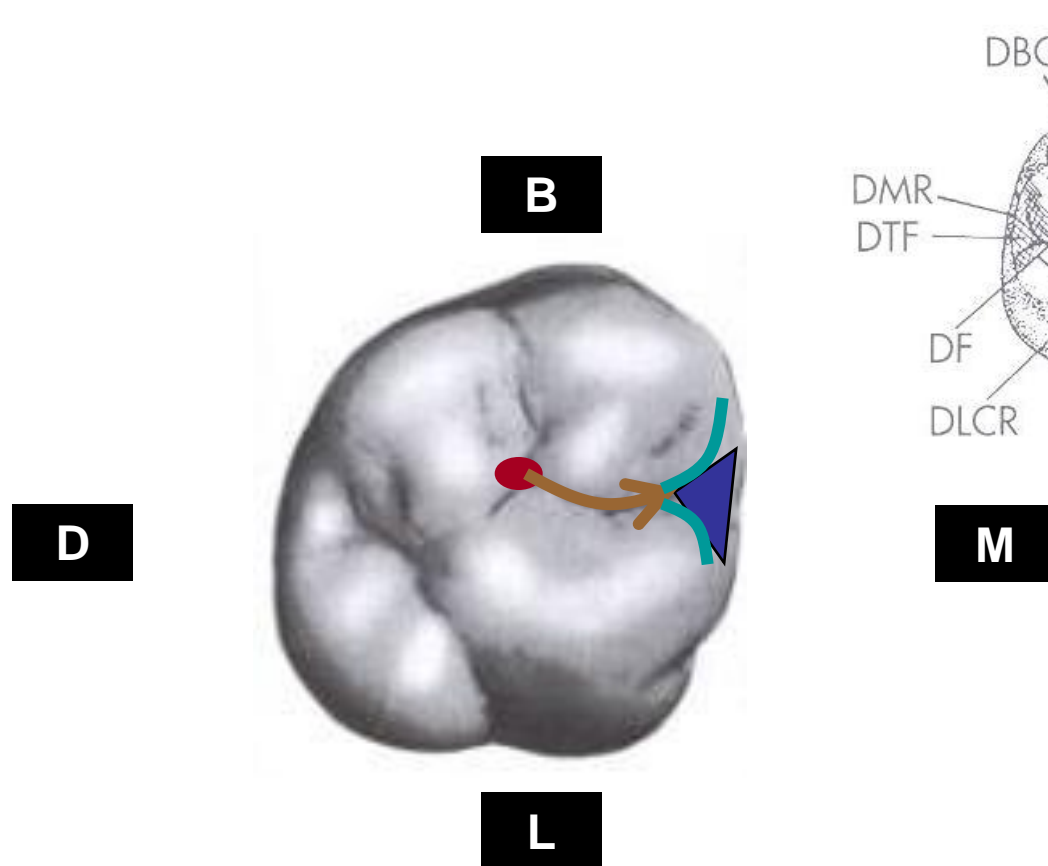


Central fossa : is a concave area bound by the distal slope of the MB cusp, mesial slope of DB cusp, the crest of the oblique ridge, and the crests of the 2 triangular ridges of the MB and ML cusps..

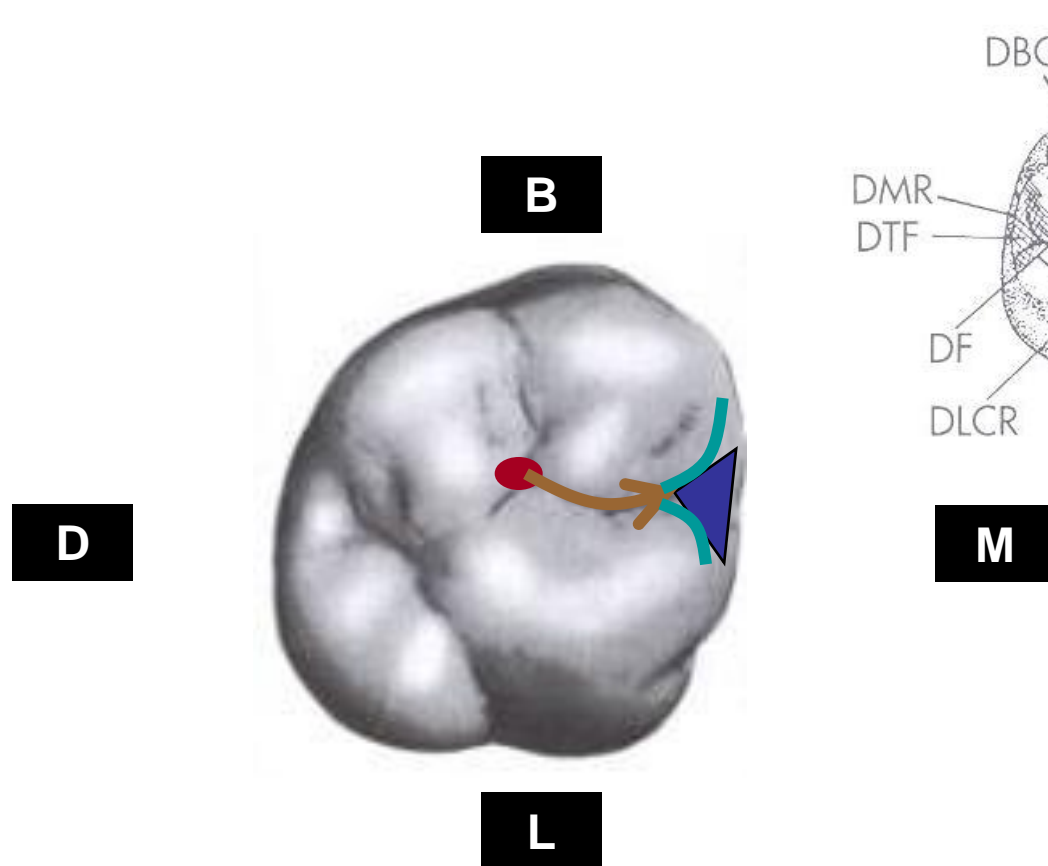
Central fossa contains developmental and supplemental grooves



From **central pit**, **buccal** developmental **groove** radiates buccally between the buccal cusps.



Central developmental groove progress and terminates at apex of the mesial triangular fossa, here it is joined by short supplemental grooves that radiates into the triangular fossa..occasionally one or more supplemental groove cross the mesial marginal ridge of the crown...

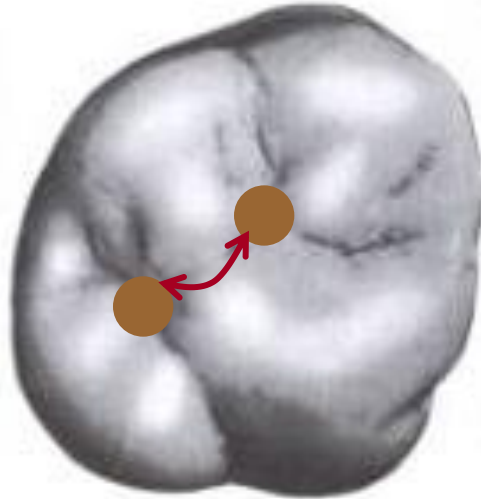


Mesial triangular ridge : it is triangular in shape, with the base at mesial marginal ridge and its apex at the point where the **supplemental grooves** join the central groove.



D

B

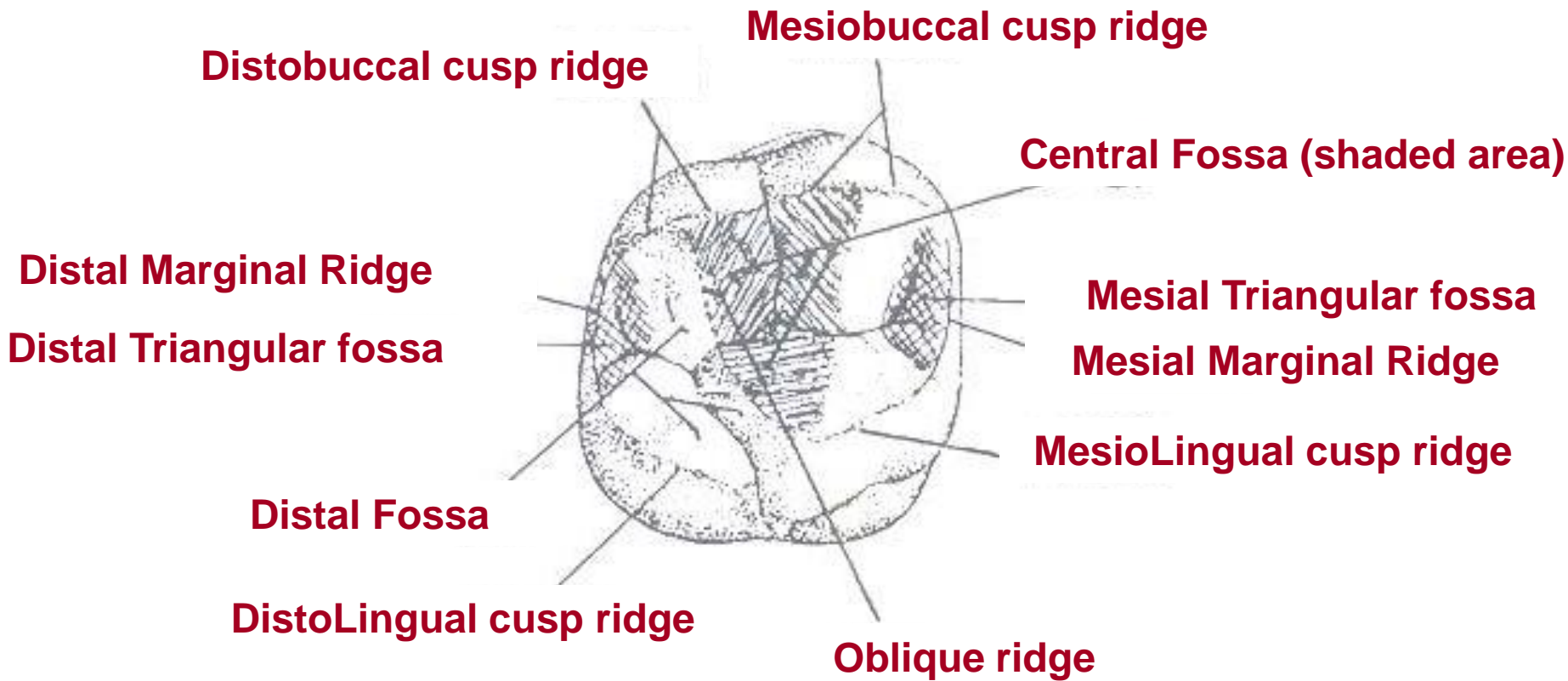


M

L

Transverse groove of the oblique ridge:

groove that cross the oblique ridge transversely joining the central and distal fossae



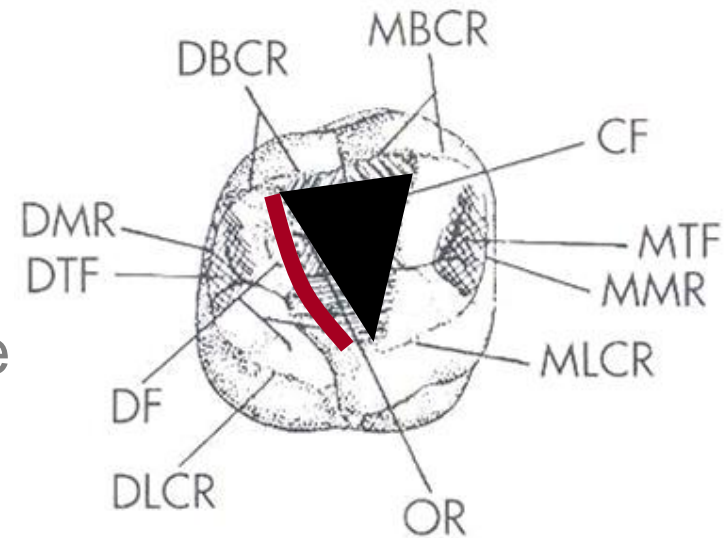
Occlusal aspect maxillary right first molar

- **2 major fossae :**

- Central fossa (roughly triangular and mesial to the oblique ridge)
- Distal fossa (roughly linear and distal to the oblique ridge)

- **2 minor fossae:**

- Mesial triangular fossa (distal to the mesial marginal ridge)
- Distal triangular fossa (mesial to the distal marginal ridge)

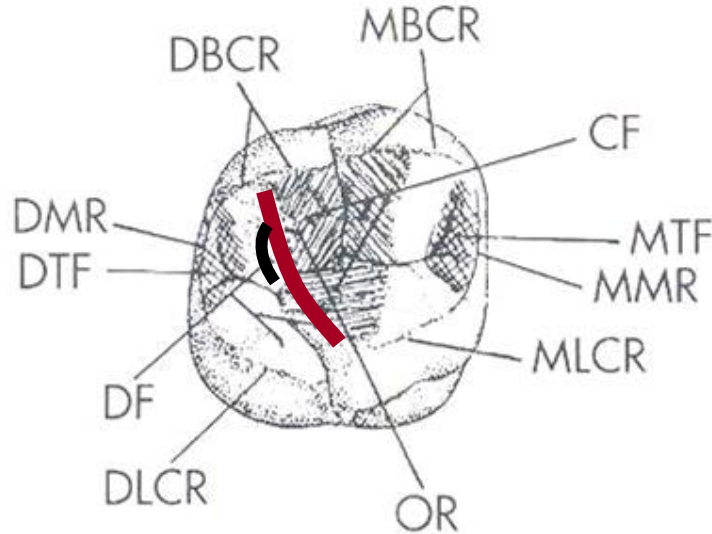


- **2 major fossae :**

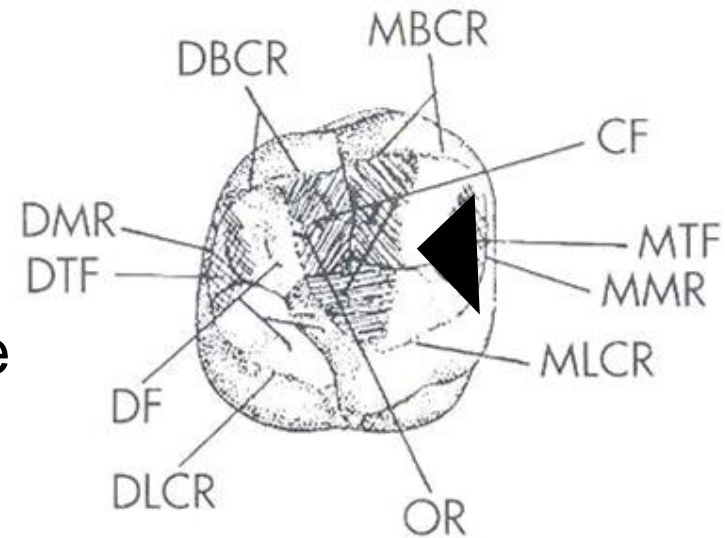
- Central fossa (roughly triangular and mesial to the oblique ridge)
- Distal fossa (roughly linear and distal to the oblique ridge)

- **2 minor fossae:**

- Mesial triangular fossa (distal to the mesial marginal ridge)
- Distal triangular fossa (mesial to the distal marginal ridge)



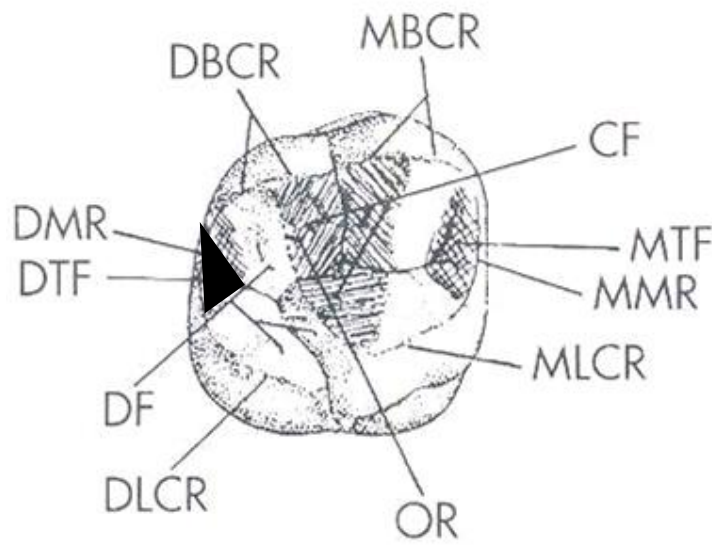
- 2 major fossae :
 - Central fossa (roughly triangular and mesial to the oblique ridge)
 - Distal fossa (roughly linear and distal to the oblique ridge)
- **2 minor fossae:**
 - Mesial triangular fossa (distal to the mesial marginal ridge)
 - Distal triangular fossa (mesial to the distal marginal ridge)



- 2 major fossae :
 - Central fossa (roughly triangular and mesial to the oblique ridge)
 - Distal fossa (roughly linear and distal to the oblique ridge)

- **2 minor fossae:**

- Mesial triangular fossa (distal to the mesial marginal ridge)
- Distal triangular fossa (mesial to the distal marginal ridge)

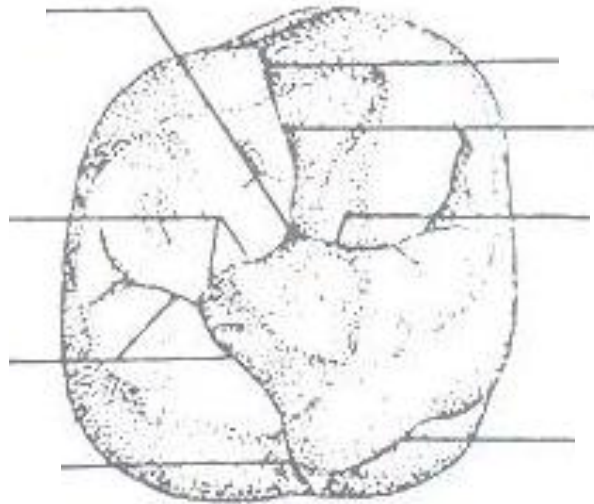


Central pit

Transverse groove of oblique ridge

Distal Oblique groove

Lingual groove



Buccal Groove

Buccal Groove of Central Fossa

Central Groove of Central Fossa

Fifth cusp groove :
Developmental groove that outlines a fifth cusp

Developmental grooves of Occlusal aspect of Maxillary right first molar

EXTREME VARIATIONS !!!



Abnormal long roots with extreme curvature



M-D measurement of root trunk smaller than usual



Lingual & DB roots fused



Fifth cusp with maximum development



Well developed crown while roots poorly developed



Extreme B-L measurement



v. Long DB cusp, buccal cusp narrow M-D



Extreme development of lingual portion when compared to buccal development



Note:

**Name of the Fifth
cusp?**





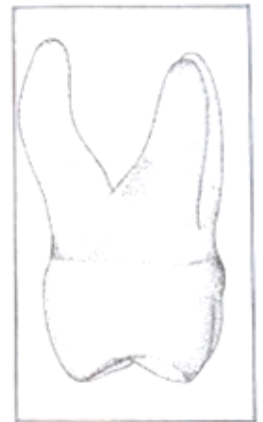
Note:

Largest cusp
?





Note:
Longest root ?



Distal





Any Q..??





Have a nice day
😊