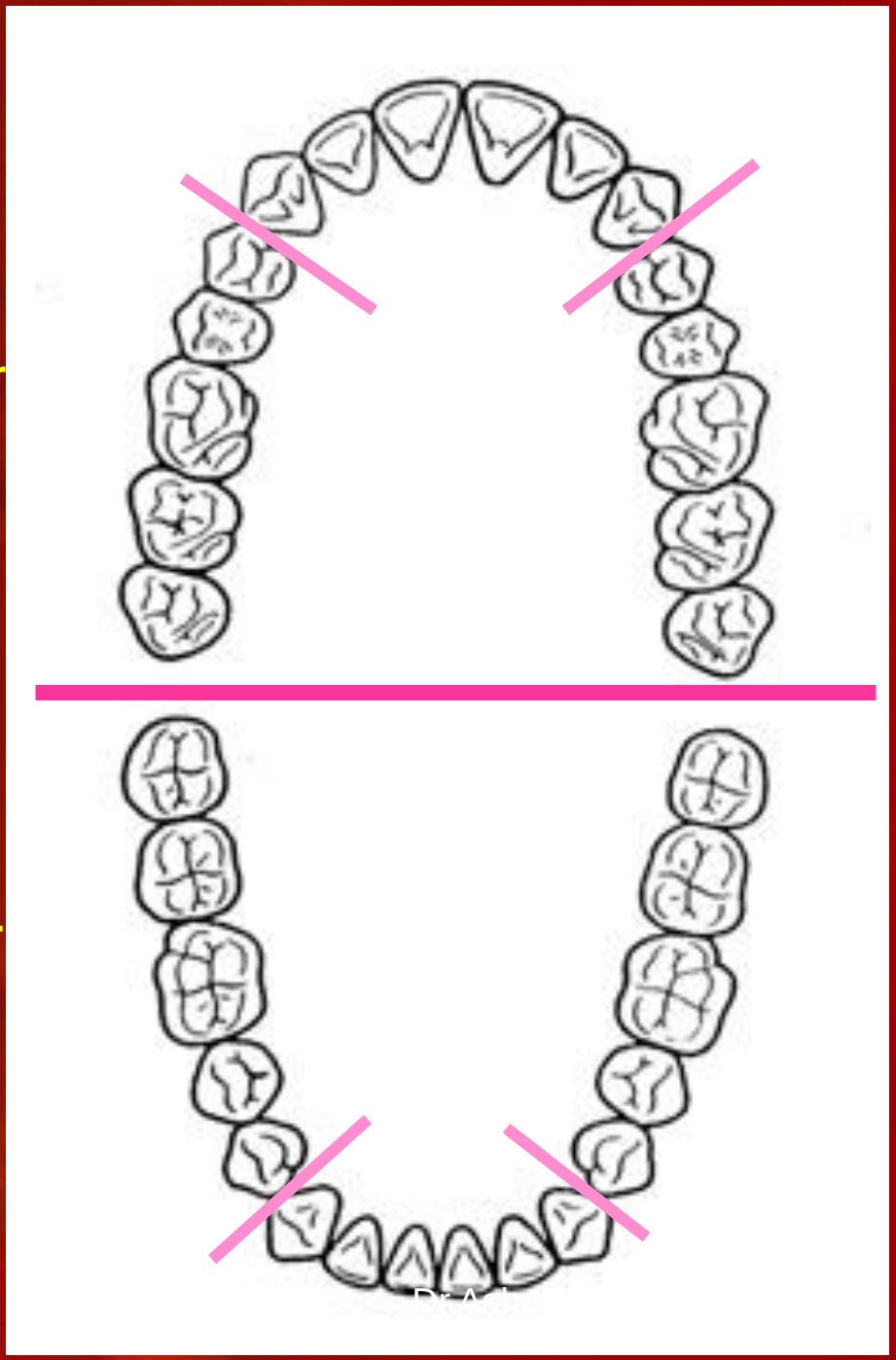
PREMOLARS

Your merits are judged by the result you produce, not by the efforts you put!!!
So try to produce good result...

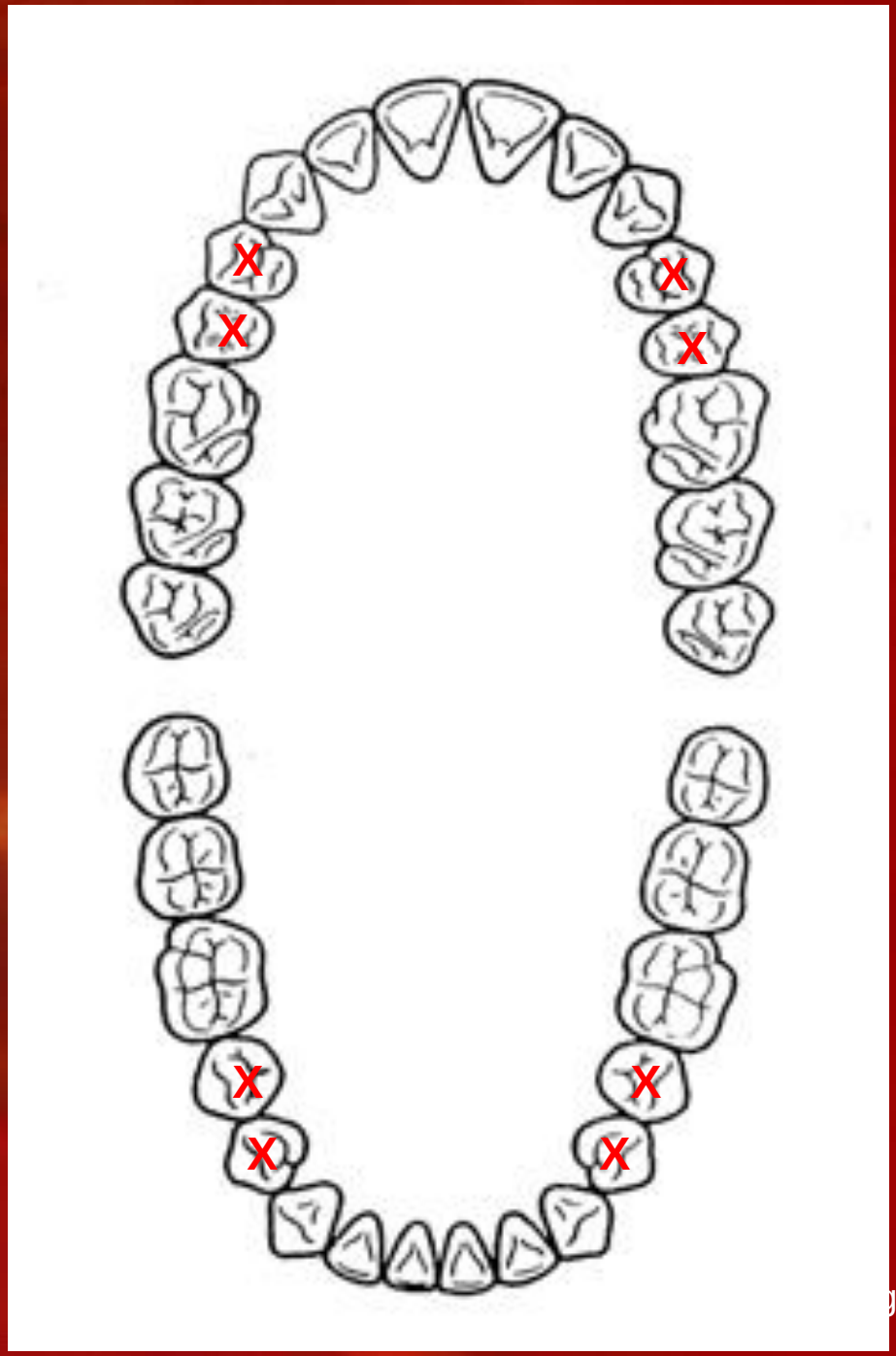
Maxillary
Right Posterior
Segment



Maxillary
Left Posterior
Segment

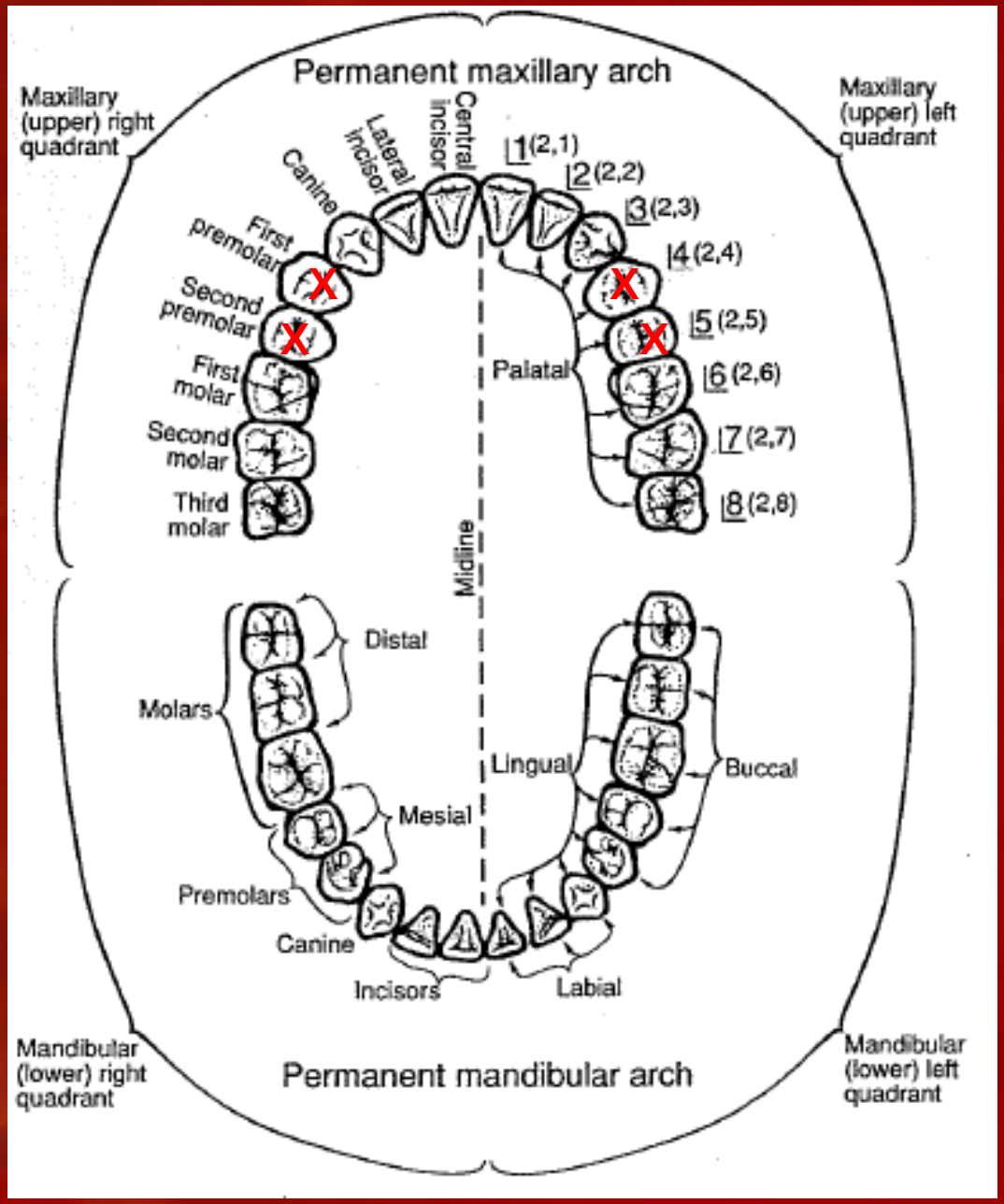
Mandibular
Right Posterior
Segment

Mandibular
Left Posterior
Segment



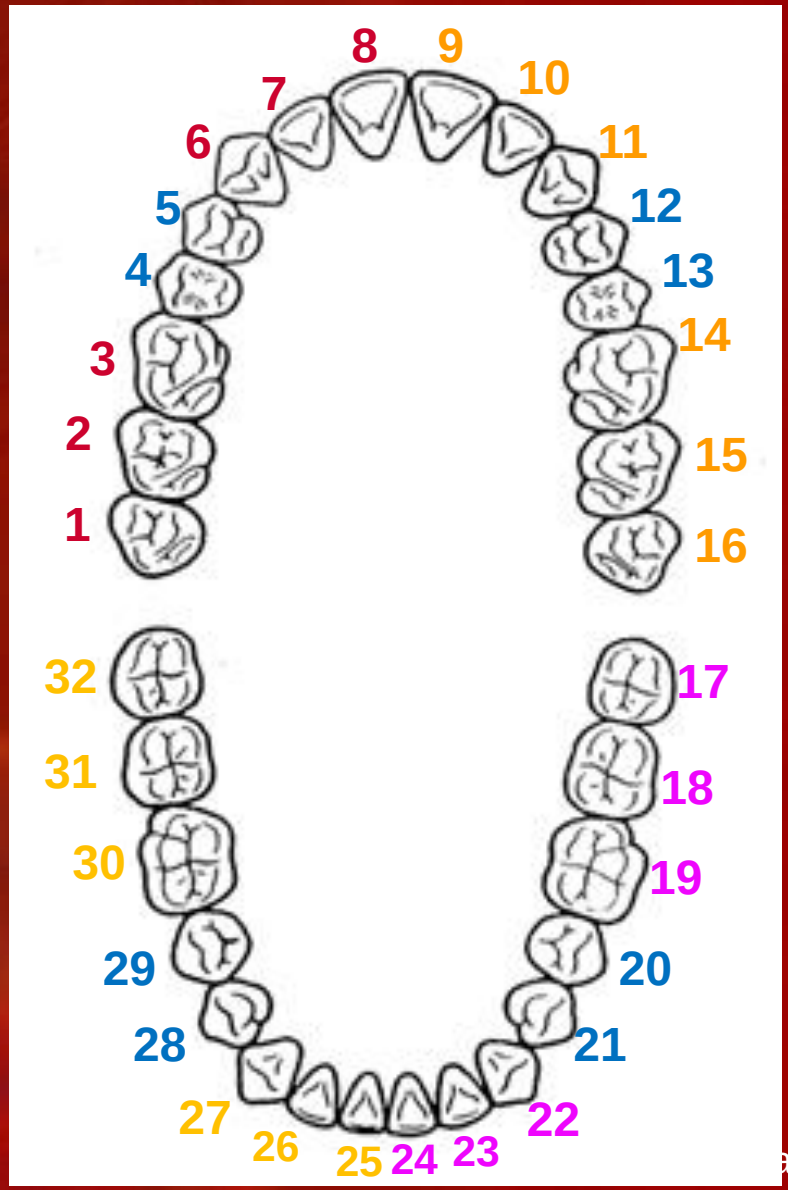
Maxillary BICUSPIDS (Premolars)

Mandibular BICUSPIDS (Premolars)



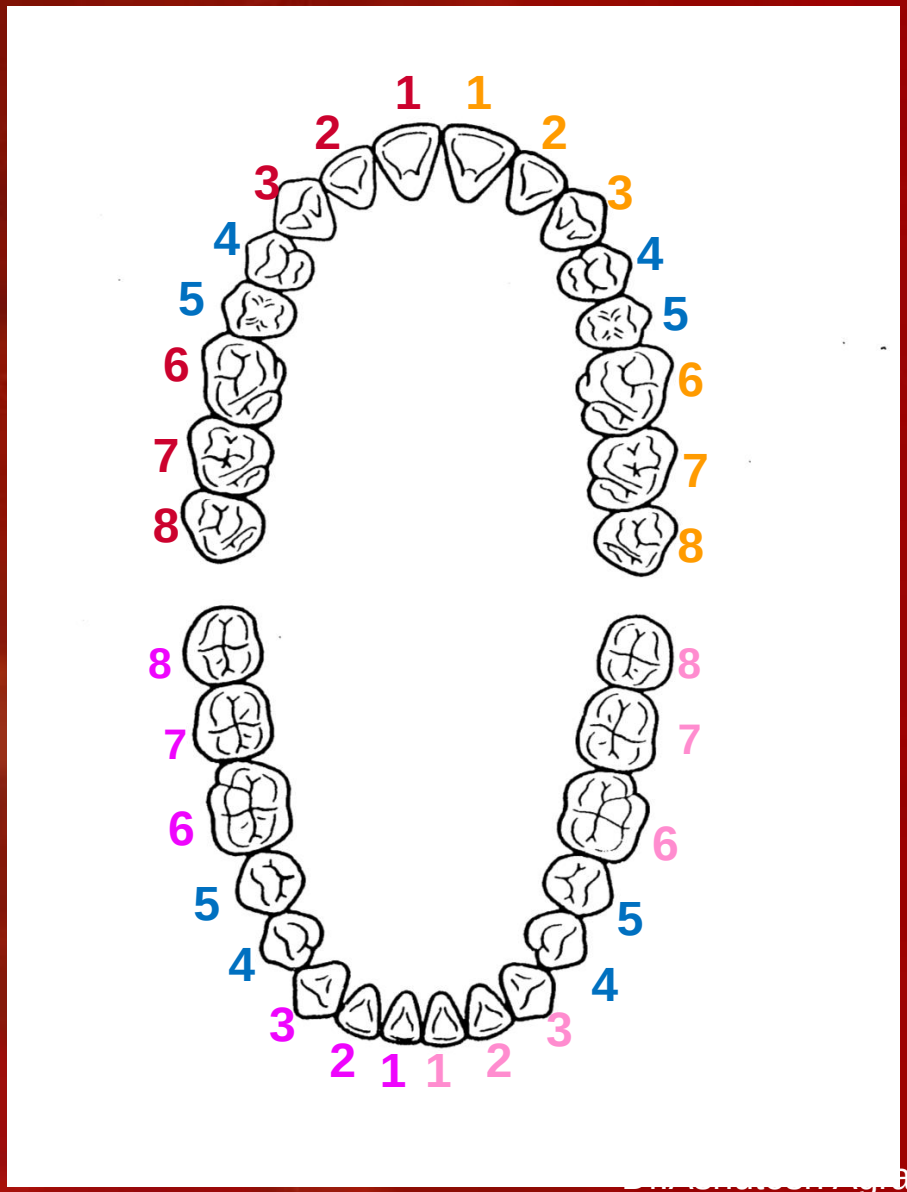
Dr.Ashutosh Agrawal

Universal Method of Tooth Numbering



 # 21- permanent mandibular left 1st premolar

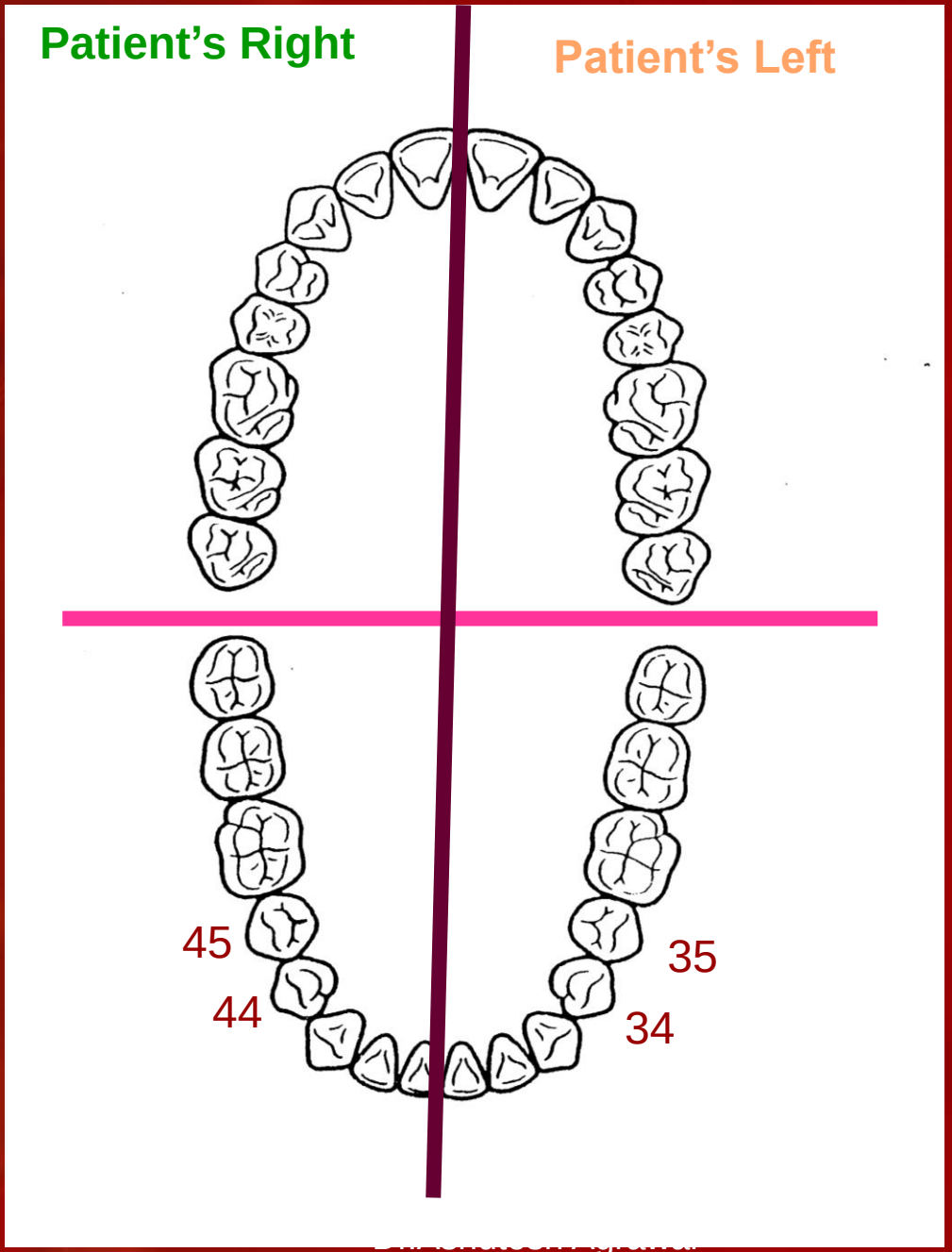
"***PALMER***" Method of Tooth Numbering



5 ***permanent mandibular right 2nd premolar***

Maxillary Right Quadrant (1)

Maxillary Left Quadrant (2)

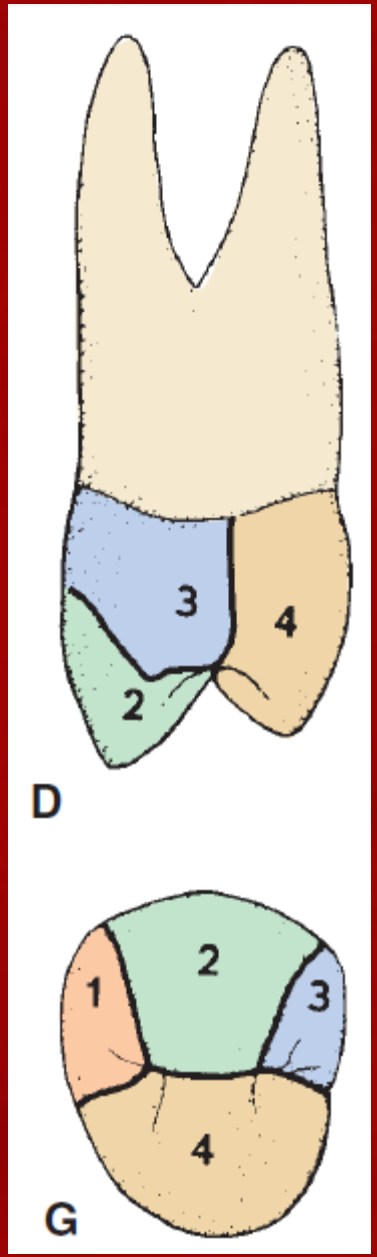


Mandibular Right Quadrant (4)

Mandibular Left Quadrant (3)

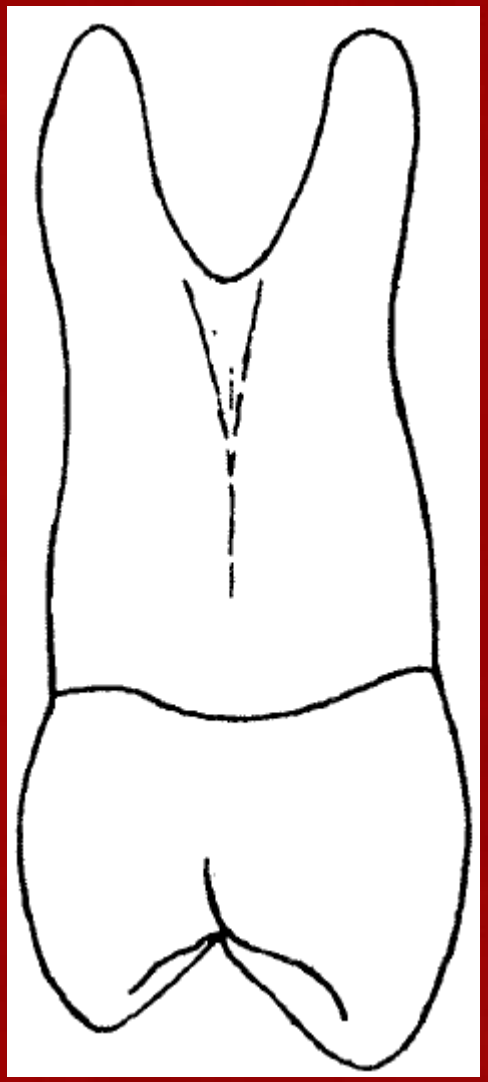
MAXILLARY PREMOLAR

- The maxillary premolars number four: two in the right maxilla and two in the left maxilla.
- The term *bicuspid- misnomer!!!*
- The maxillary premolars are developed from the same number of lobes as anterior teeth-four.
- Lingual lobe- lingual cusp.



- The buccal cusp of the maxillary first premolar especially is long and sharp, assisting the canine as a prehensile or tearing tooth.
- The second premolars~ molars (they function much like the molars, but to a lesser degree).
- The maxillary premolar crowns & roots are shorter than those of the maxillary canines.
- The maxillary premolar crowns longer than those of the molars. & The root lengths equal those of the molars.

- When premolars have two roots, one is placed buccally and one lingually.



1st PREMOLAR


Midline
towards midline = Mesial
away from midline = distal

Patient's Right **Patient's Left**

8,7,6,5,4,3,2,1 | 1,2,3,4,5,6,7,8

8,7,6,5,4,3,2,1 | 1,2,3,4,5,6,7,8

4

Permanent maxillary left premolar

1,2,3,4,5,6,7,8 | 9,10,11,12,13,14,15,16

32,31,30,29,28,27,26,25 | 24,23,22,21,20,19,18,17

#12 Permanent maxillary left premolar

18,17,16,15,14,13,12,11 | 21,22,23,24,25,26,27,28

48,47,46,45,44,43,42,41 | 31,32,33,34,35,36,37,38

24 Permanent maxillary left premolar

Average Dimensions in millimeters

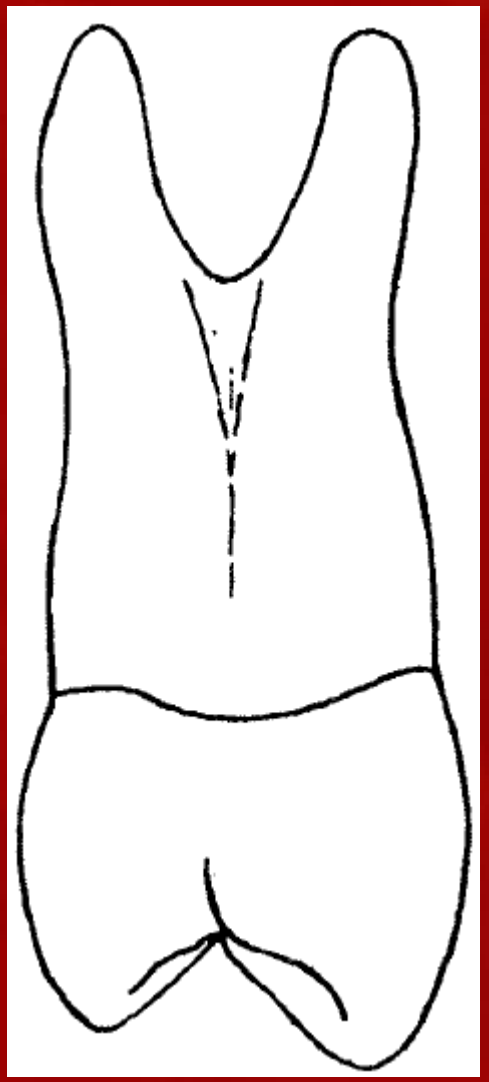
Crown Length	Root Length	Mesiodistal Diameter at Contact Area	Mesiodistal Diameter at Cervical Line	Labiolingual Diameter at Crest of Curvature	Labiolingual Diameter at Cervical Line	Curvature of Cervical Line M D
8.5	14.0	7.0	5.0	9.0	8.0	1.0 0

CHRONOLOGY

First evidence of calcification- 11/ 2 to 13/4 yr
Enamel completed- 5 to 6 yr
Eruption-10 to 11 yr
Root completed-12 to 13 yr

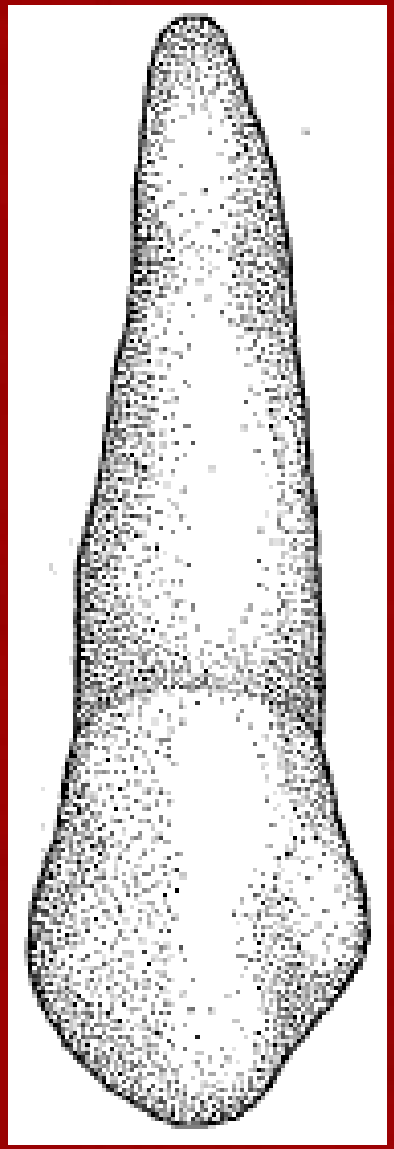
Maxillary First Premolar

- Two sharply defined cusps, a buccal and a lingual
- The buccal cusp is usually about 1 mm longer than the lingual cusp.
- The crown is angular, and the buccal line angles are prominent.



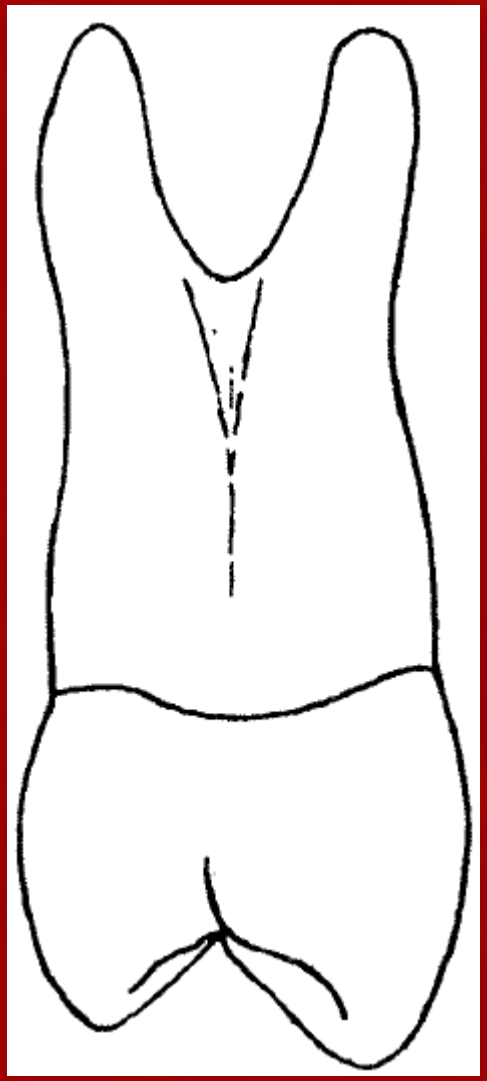
Maxillary First Premolar

- Resembles the canine from the buccal aspect.
- The mesial slope of the cusp is longer than the distal slope.
- Two roots and two pulp canals.



Maxillary First Premolar

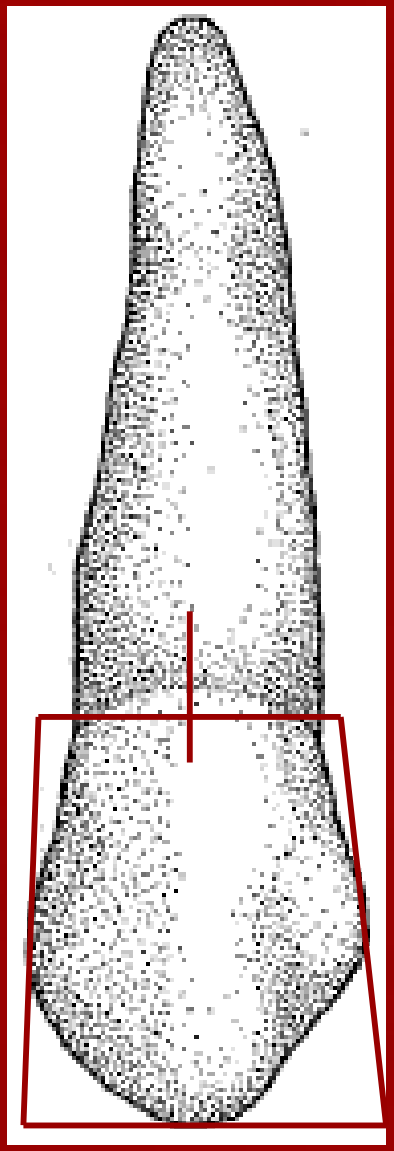
- The maxillary first premolar has some characteristics common to all posterior teeth.



1. Greater relative faciolingual measurement as compared with the mesiodistal measurement
2. Broader contact areas
3. Contact areas more nearly at the same level
4. Less curvature of the cervical line mesially and distally
5. Shorter crown, cervico-occlusally when compared with anterior teeth

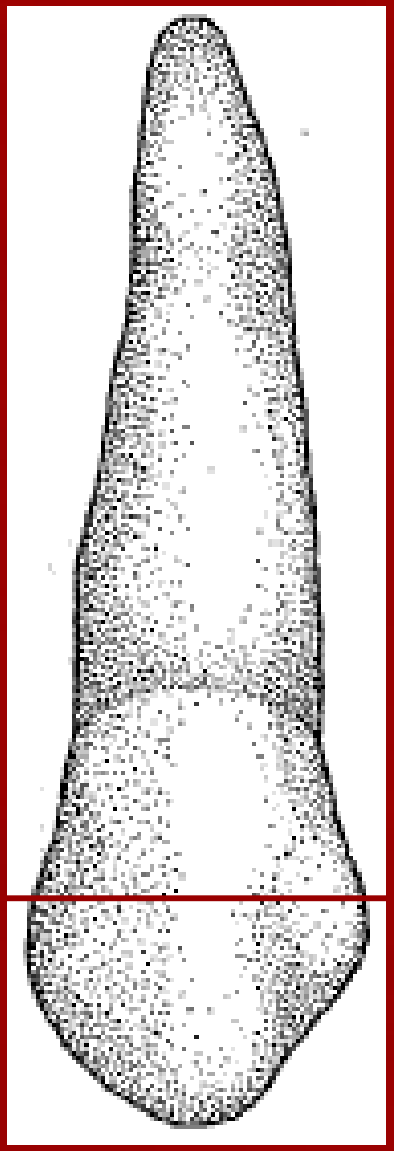
Buccal Aspect

- The crown is roughly trapezoidal.
- The crown exhibits little curvature at the cervical line.
- The crest of curvature of the cervical line buccally is near the center of the root buccally.



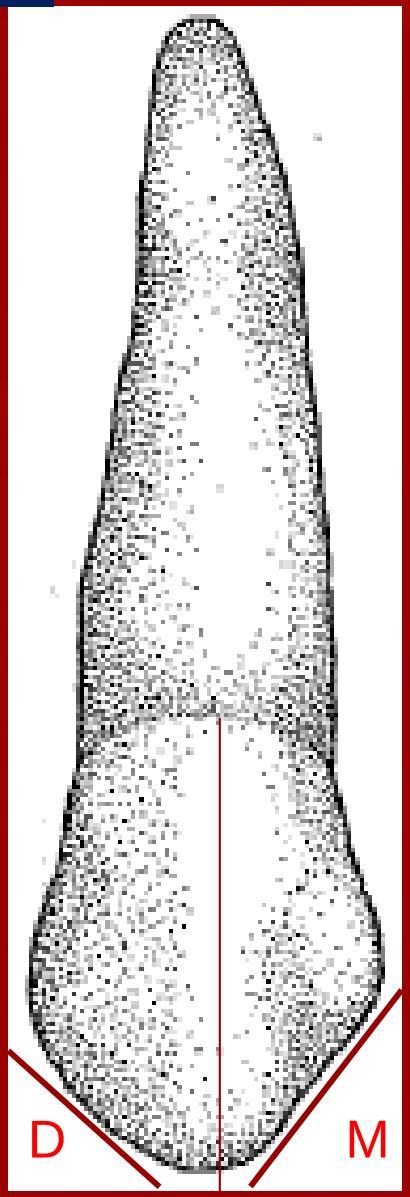
Buccal Aspect

- Mesial outline
- The contact area- broad
- The crest lies immediately occlusal to the halfway point from the cervical line to the tip of the buccal cusp.



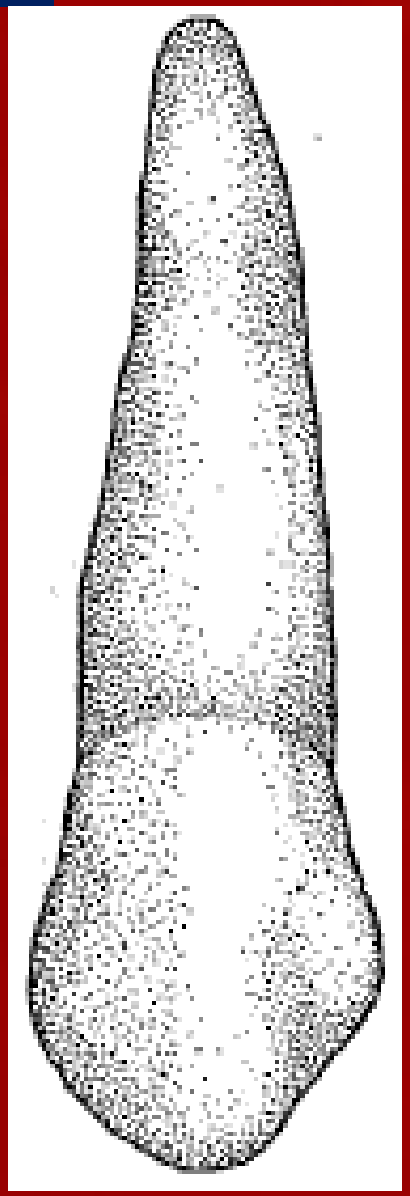
Buccal Aspect

- The mesial slope straight and longer than the distal slope, which is shorter and more curved.
- Tip of the buccal cusp is distal to a line bisecting the buccal surface of the crown.



Buccal Aspect

- The distal outline.
- The distal contact area broader curvature than is found mesially.
- The crest of curvature of the contact area tends to be a little more occlusal.

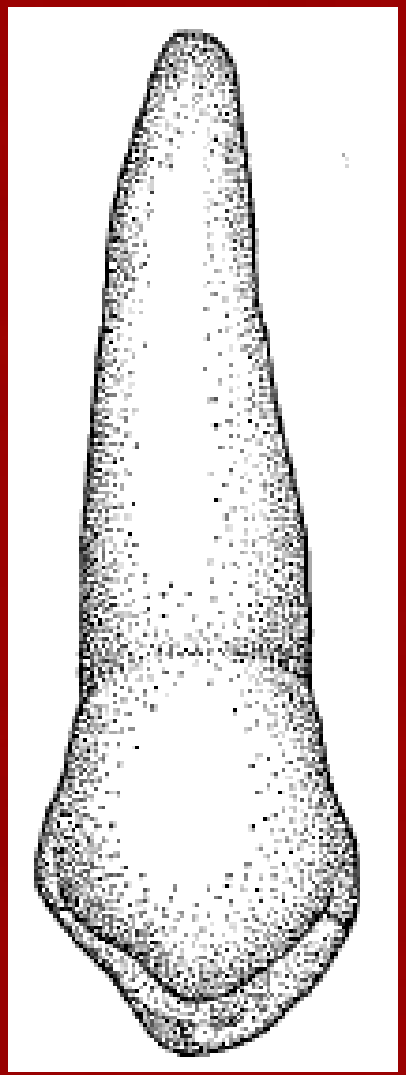


Buccal Aspect

- The buccal surface of the crown is convex.
- The continuous ridge from cusp tip to cervical margin on the buccal surface of the crown is called the *buccal ridge.*

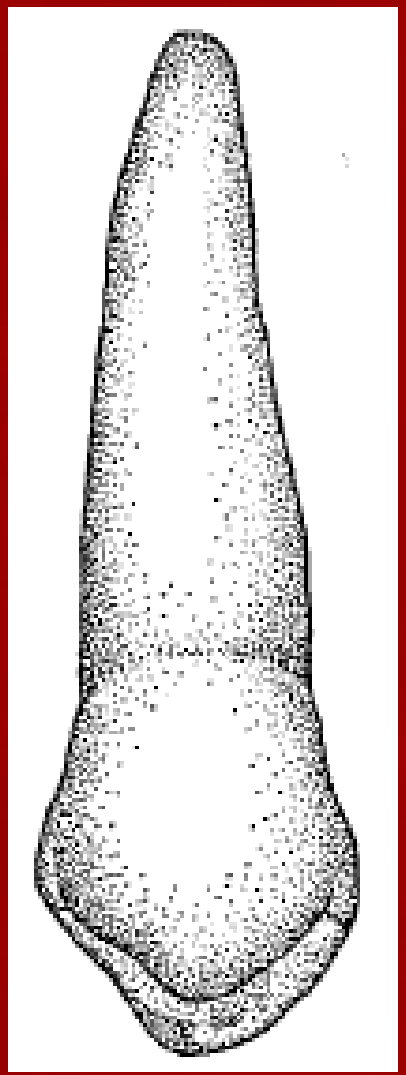
Lingual Aspect

- Reverse of the gross outline of the buccal aspect.
- The crown tapers toward the lingual because the lingual cusp is narrower mesiodistally than the buccal cusp.
- The lingual cusp is smooth and spheroidal from the cervical portion to the area near the cusp tip.
- The cusp tip is pointed, with mesial and distal slopes meeting at an angle of about 90 degrees.



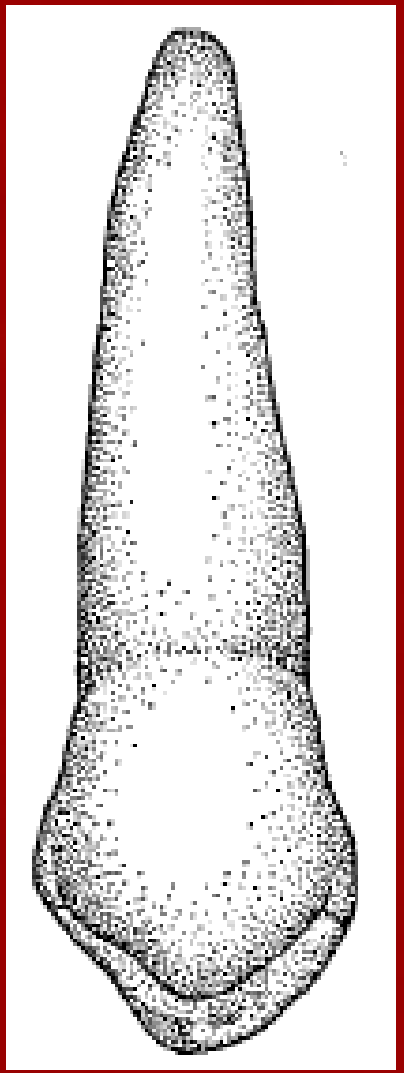
Lingual Aspect

- *Lingual ridge- sometimes*
- The mesial and distal outlines of the lingual portion of the crown are convex.
- The cervical line lingually is regular, with slight curvature toward the root and the crest of curvature centred on the root.



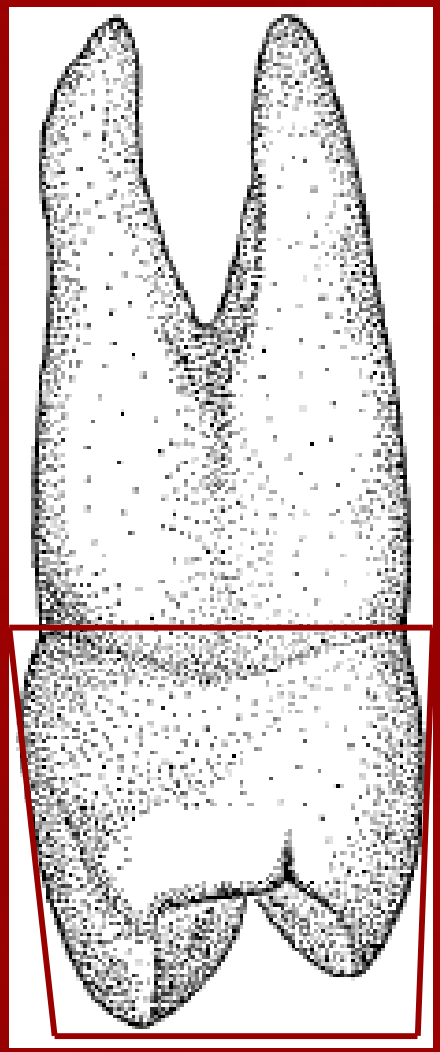
Lingual Aspect

- The lingual portion of the lingual root is smooth and convex at all points.
- The apex of the lingual root tends to be more blunt than the buccal root apex.



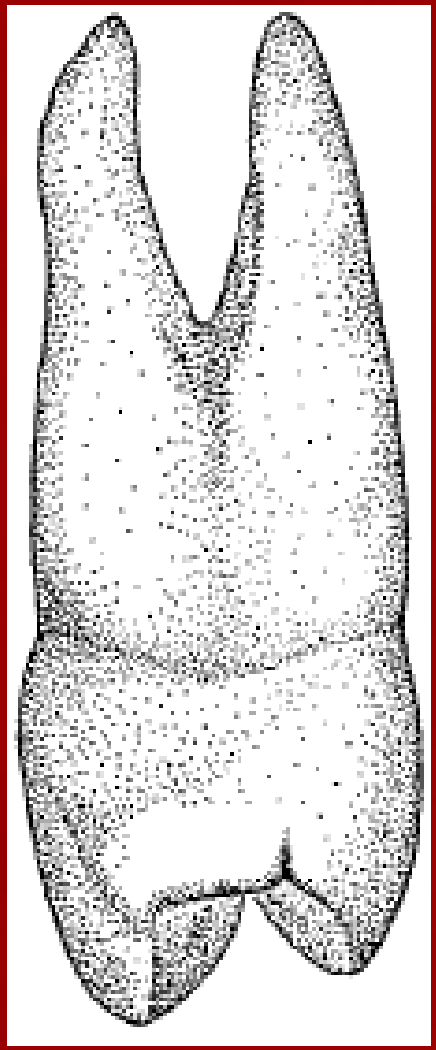
Mesial Aspect

- Roughly trapezoidal (opposite)
- Another characteristic that is representative of all posterior maxillary teeth is that the tips of the cusps are well within the confines of the root trunk.



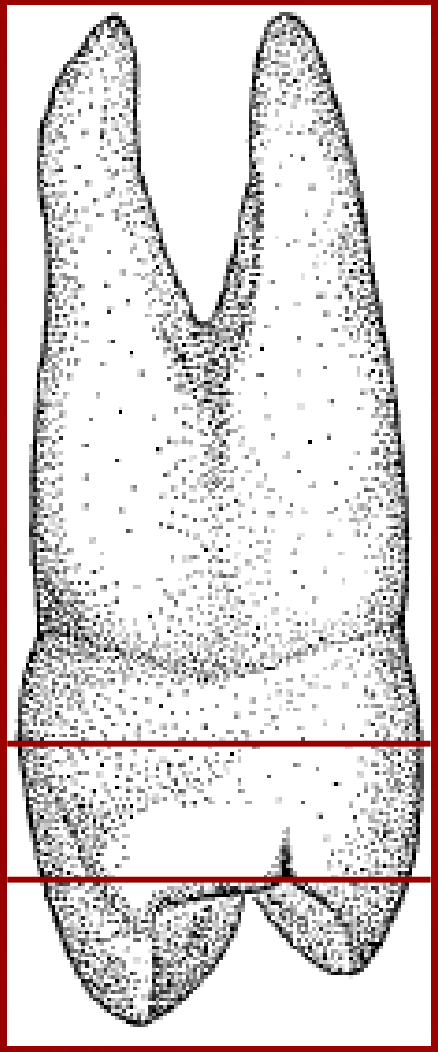
Mesial Aspect

- Maxillary first premolars have two roots, one buccal and one lingual these are clearly outlined from the mesial aspect.



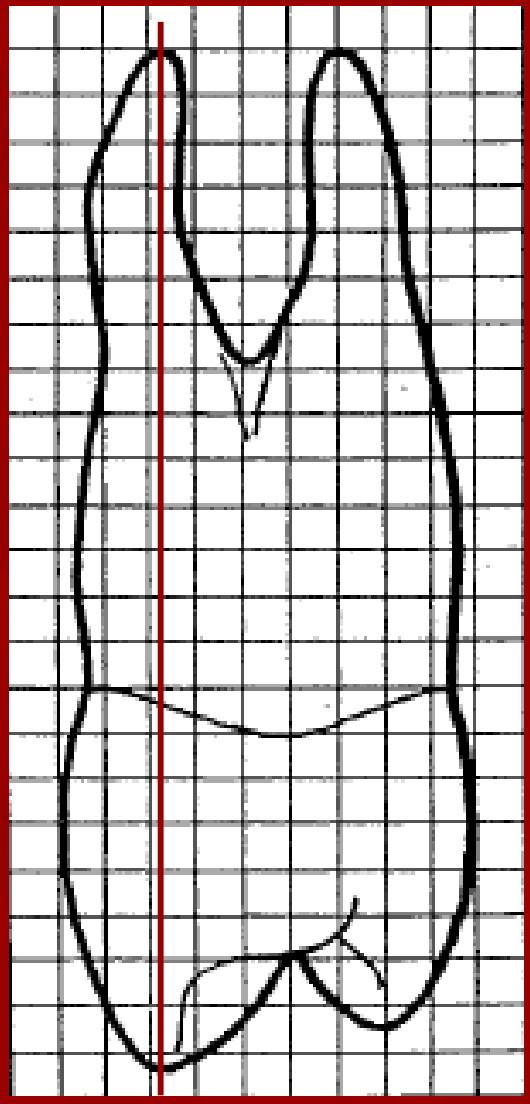
Mesial Aspect

- The curvature of CL- occlusally is less (approx 1 mm).
- The buccal outline of the crown curves outward below the cervical line.
- The crest of curvature is often located approximately at the junction of cervical and middle thirds.



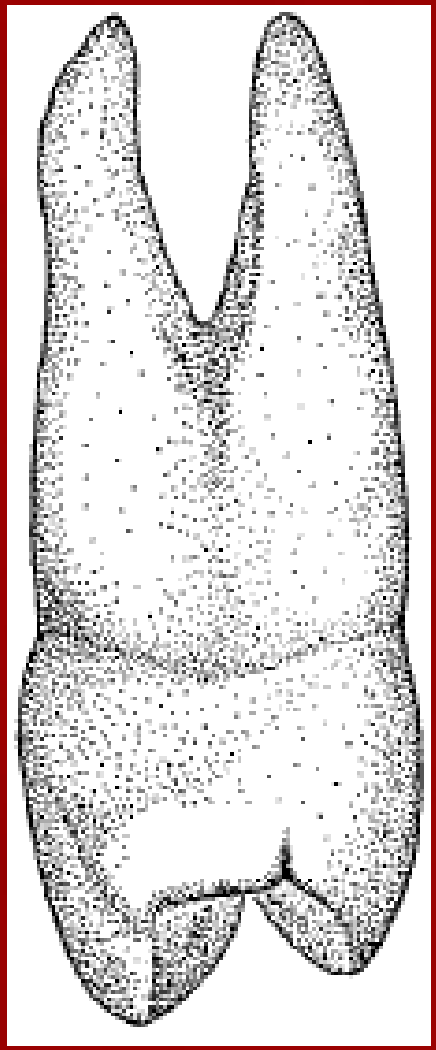
Mesial Aspect

- From the crest of curvature, the buccal outline continues as a line of less convexity to the tip of the buccal cusp, which is directly below the center of the buccal root.



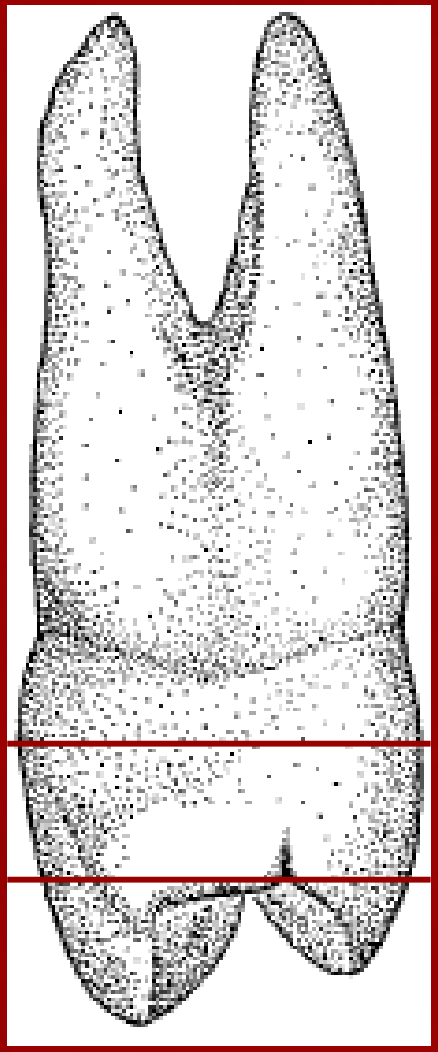
Mesial Aspect

- The lingual outline- a smoothly curved line starting at the cervical line and ending at the tip of the lingual cusp.
- The crest of this curvature is most often near the center of the middle third.



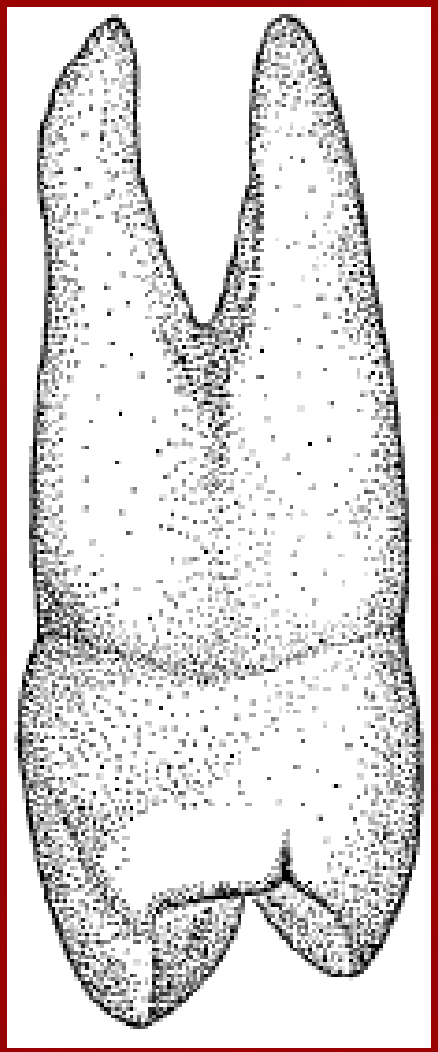
Mesial Aspect

- The lingual cusp is always shorter than the buccal cusp.
- Both cusps of the maxillary first premolar are long and sharp, with the mesial marginal ridge at about the level of the junction of the middle and occlusal thirds.



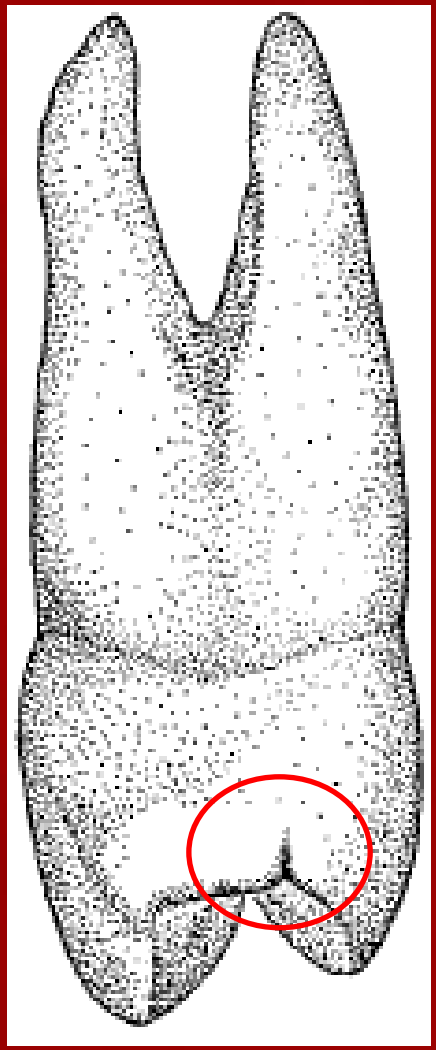
Mesial Aspect

- A distinguishing feature of this tooth is found on the mesial surface of the crown- a marked depression called the *mesial developmental depression.*
- Concavity continues apically beyond the cervical line joins a deep developmental depression between the roots, and ends at the root bifurcation.



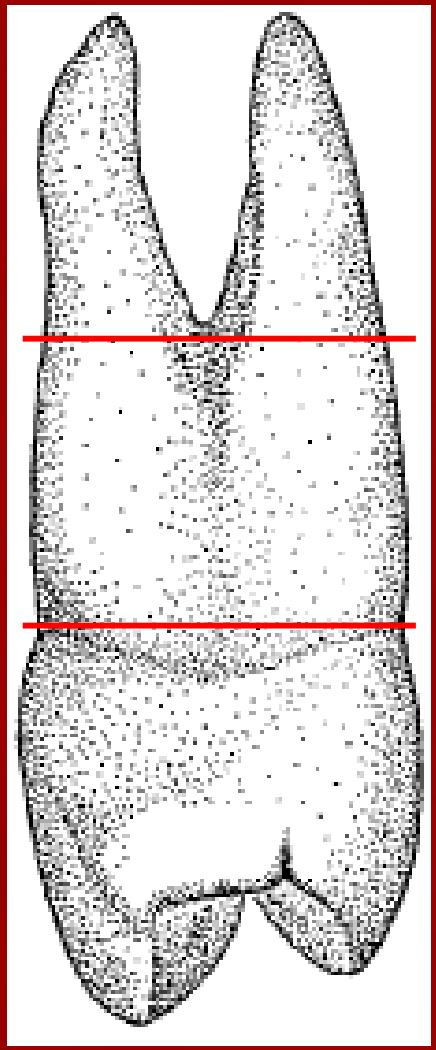
Mesial Aspect

- Another distinguishing feature- a well-defined developmental groove in the enamel of the mesial marginal ridge- MMDG



Mesial Aspect

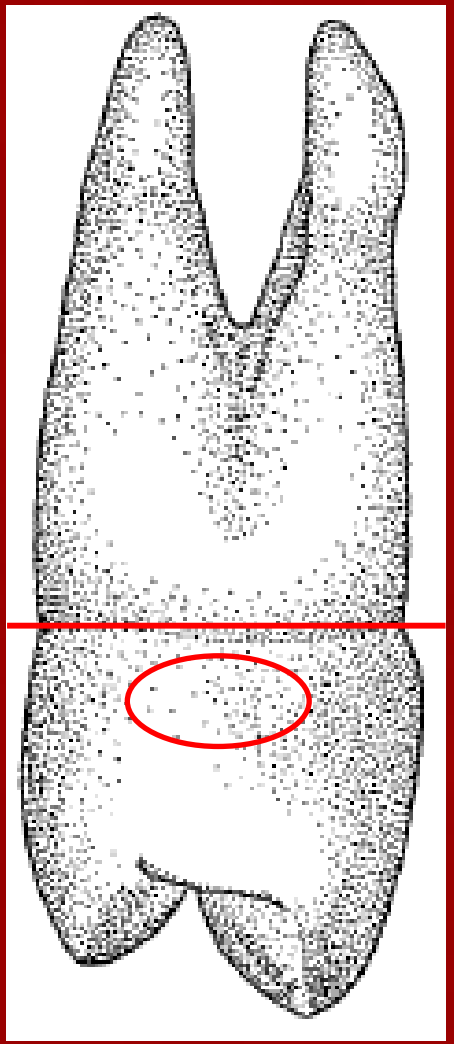
- The root trunk is long on this tooth, making up about half of the root length.
- Generally speaking, when bifurcated, the root is bifurcated for half its total length.



Distal Aspect

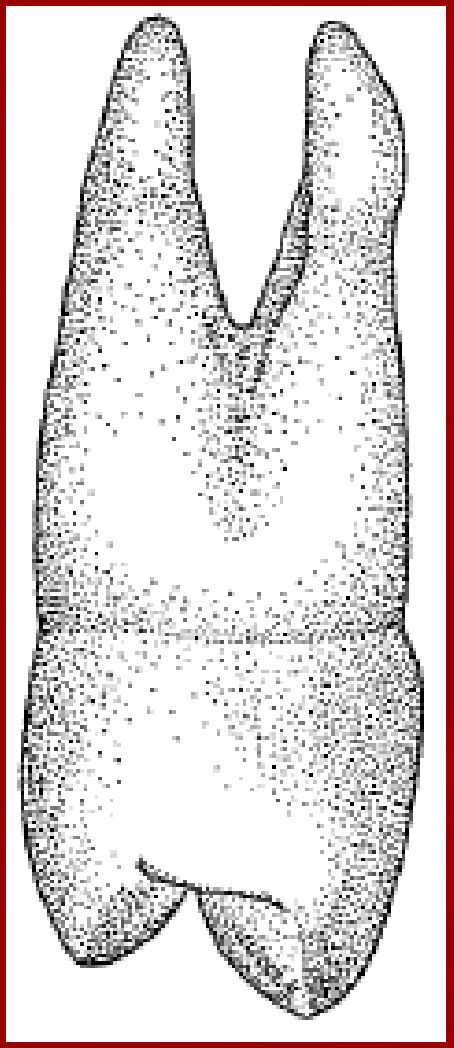
Differences-

- The crown surface is convex at all points except for a small, flattened arc just cervical to the contact area.
- The curvature of the cervical line is less on the distal than on the mesial surface, often a straight line



Distal Aspect

- No deep developmental groove is not evident.
- The root trunk is flattened on the distal surface above the cervical line with no outstanding developmental signs.



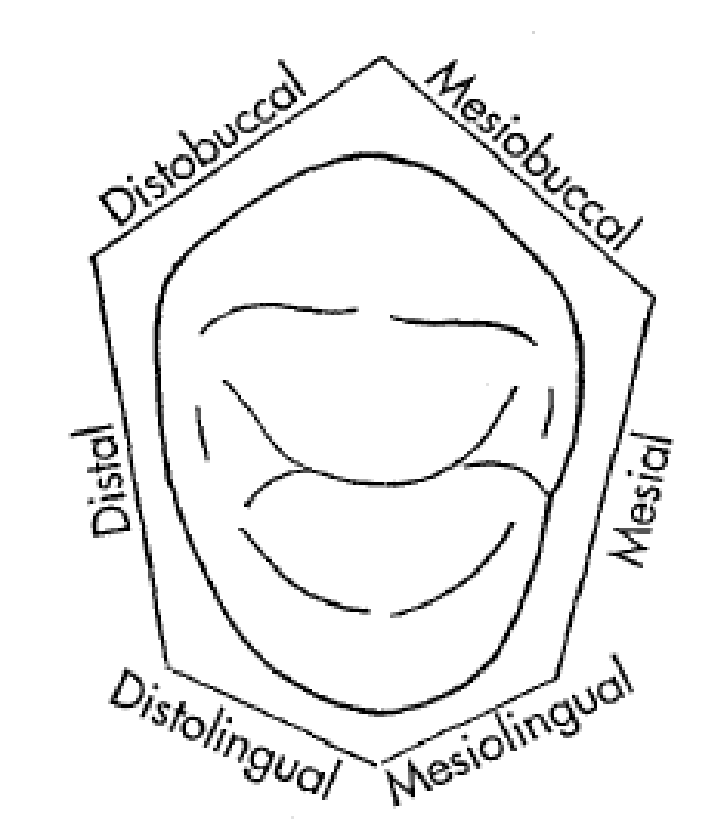
Occlusal Aspect

Dr.Ashutosh Agrawal

Occlusal Aspect

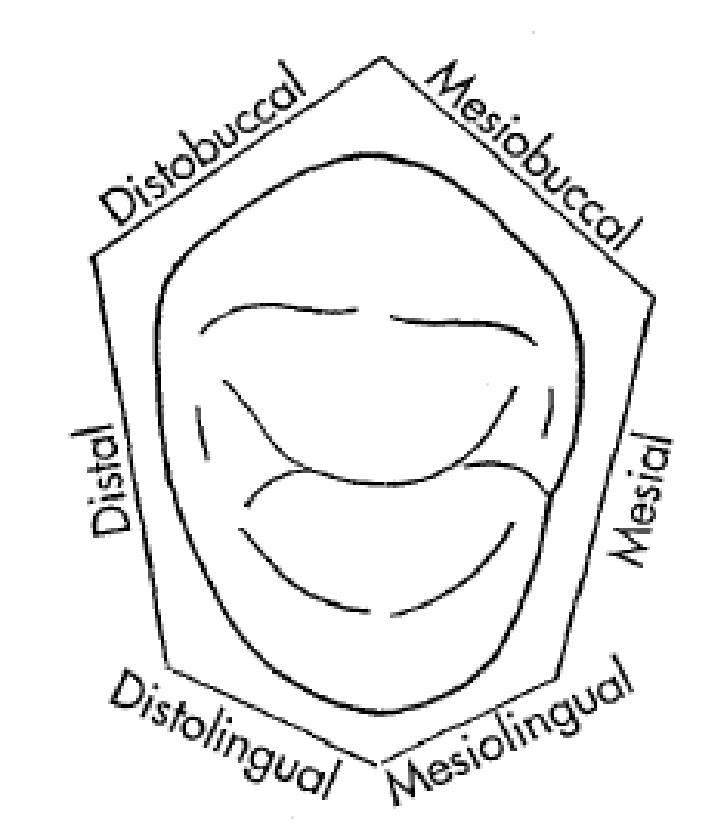
- Roughly a six-sided or hexagonal figure.

  The six sides are
- Mesiobuccal
- Mesial
- Mesiolingual
- Distolingual
- Distal
- Distobuccal



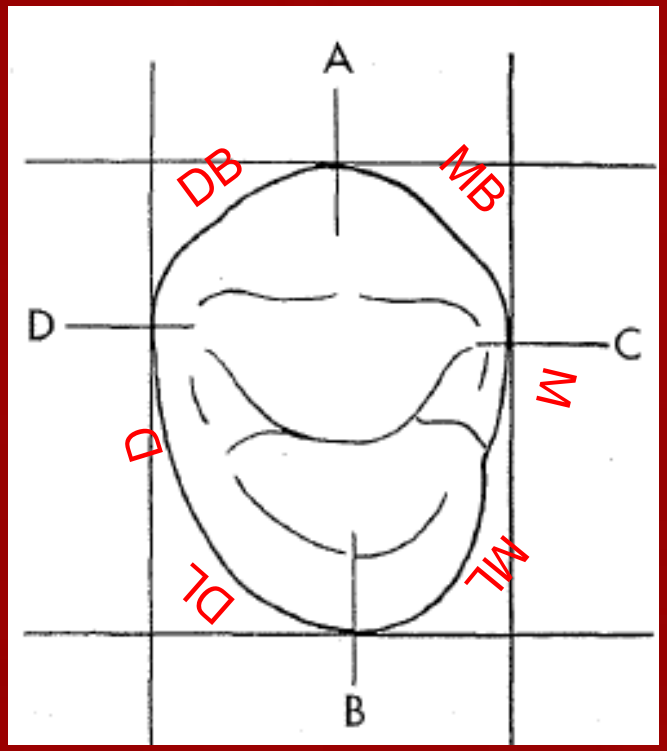
Occlusal Aspect

- Not equilateral
- The two buccal sides are nearly equal, the mesial side is shorter than the distal side and the mesiolingual side is shorter than the distolingual side.



Occlusal Aspect

- The crest of the distal contact area is somewhat buccal to that of the mesial contact area, and the crest of the buccal ridge is somewhat distal to that of the lingual ridge.

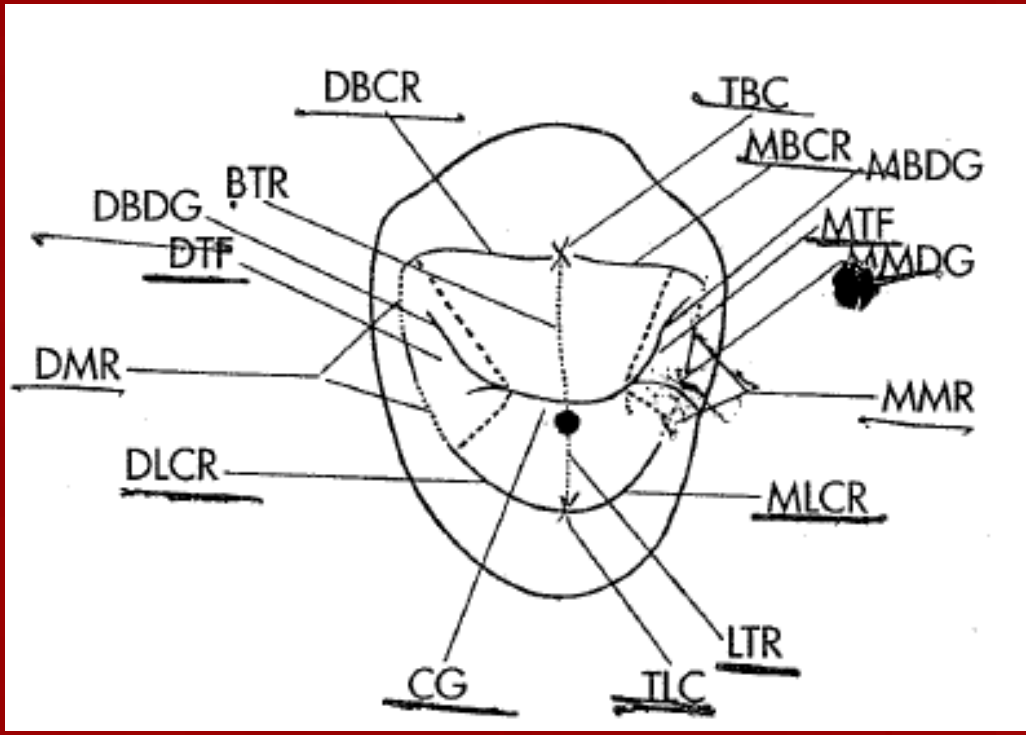


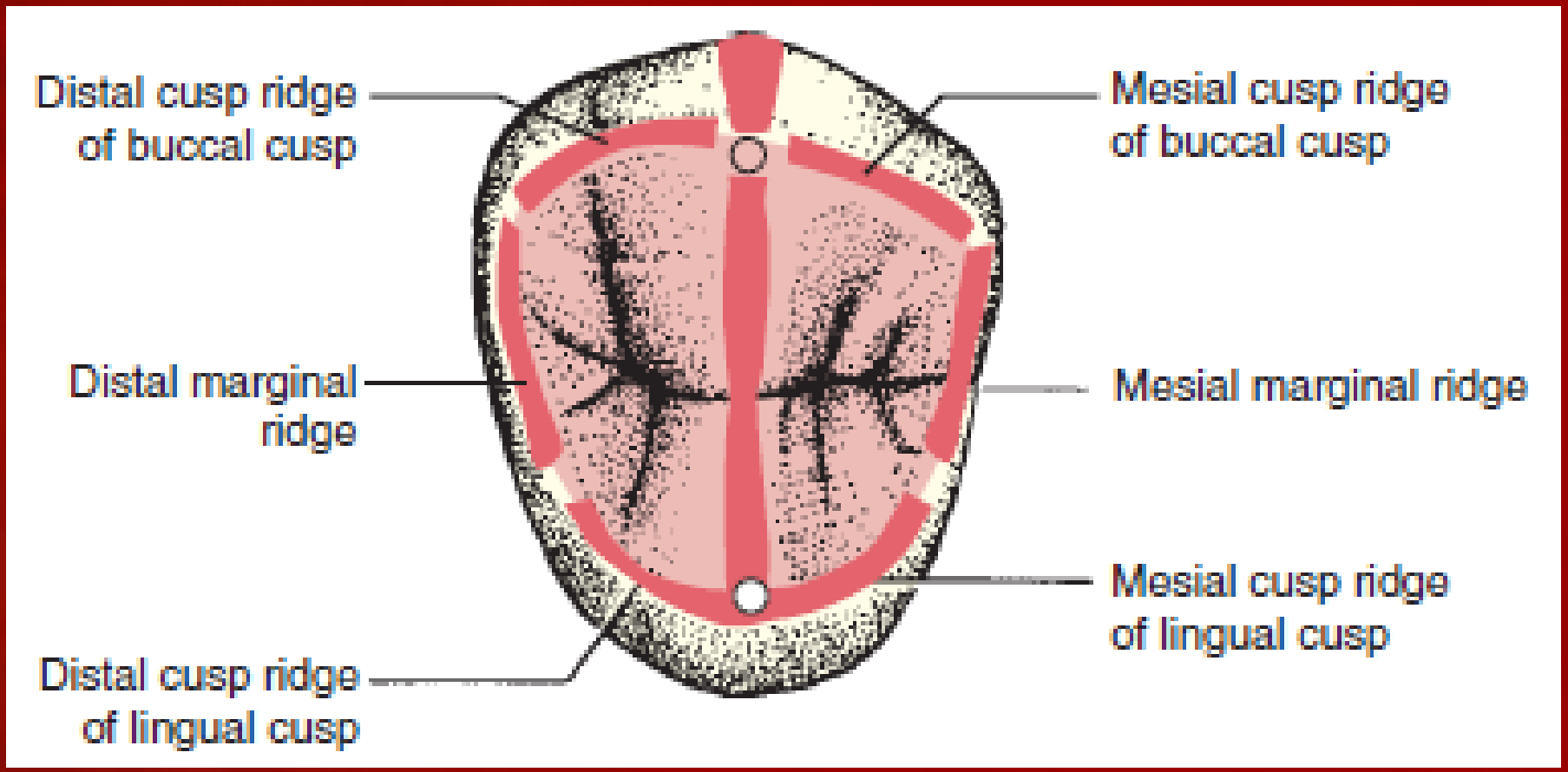
The crests of curvature represent the highest points on the buccal and lingual ridges and the mesial and distal contact areas.

Occlusal Aspect

Structures-

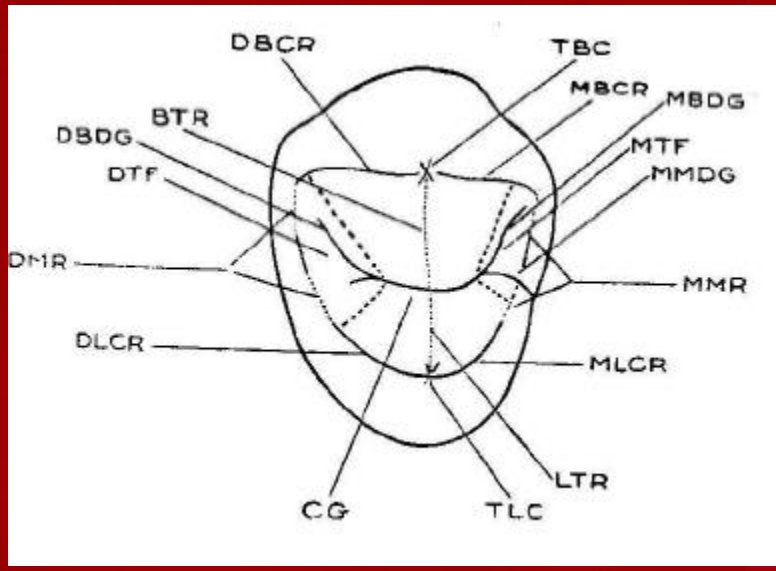
- The mesiobuccal and distobuccal cusp ridges.
- The angle formed by the convergence of the mesiobuccal cusp ridge and the mesial marginal ridge approaches a right angle.
- The angle formed by the convergence of the distobuccal cusp ridge and the distal marginal ridge is acute.




Distal cusp ridge of buccal cusp
Mesial cusp ridge of buccal cusp
Distal marginal ridge
Mesial marginal ridge
Mesial cusp ridge of lingual cusp
Distal cusp ridge of lingual cusp

Occlusal Aspect

- A well-defined *central developmental groove.*
- The *mesiobuccal developmental groove and* the *distobuccal developmental groove. The junctions of the grooves are deeply pointed and* are named the *mesial and distal developmental pits.*

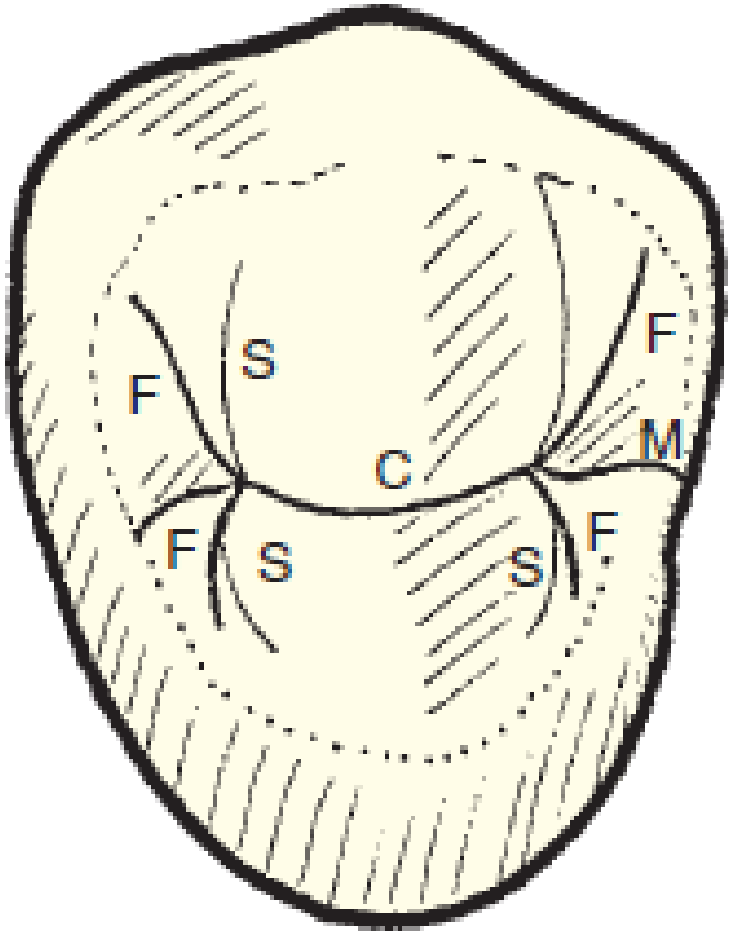


Central developmental groove (**C**)

Fossa developmental grooves (**F**)

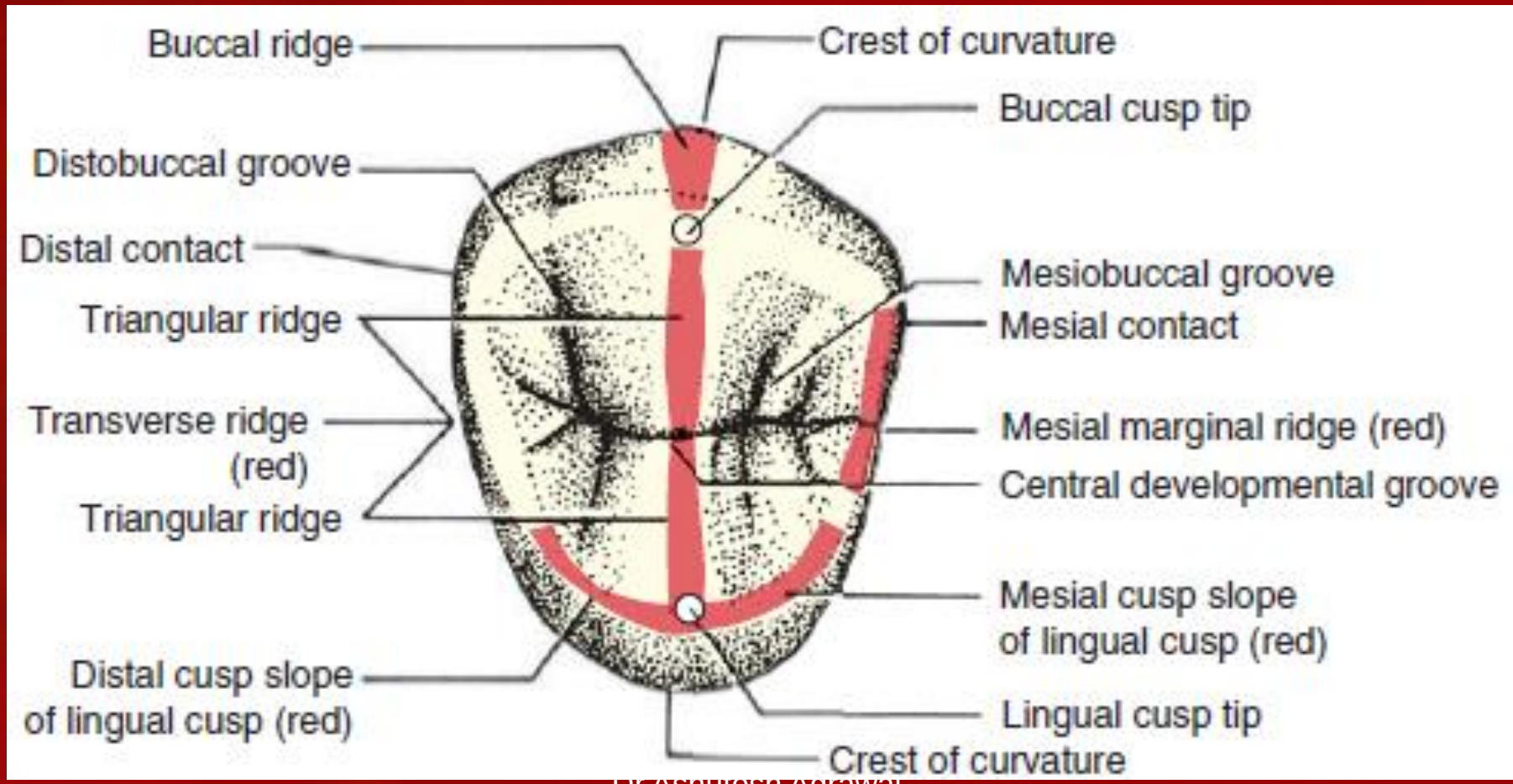
Supplemental grooves (**S**)

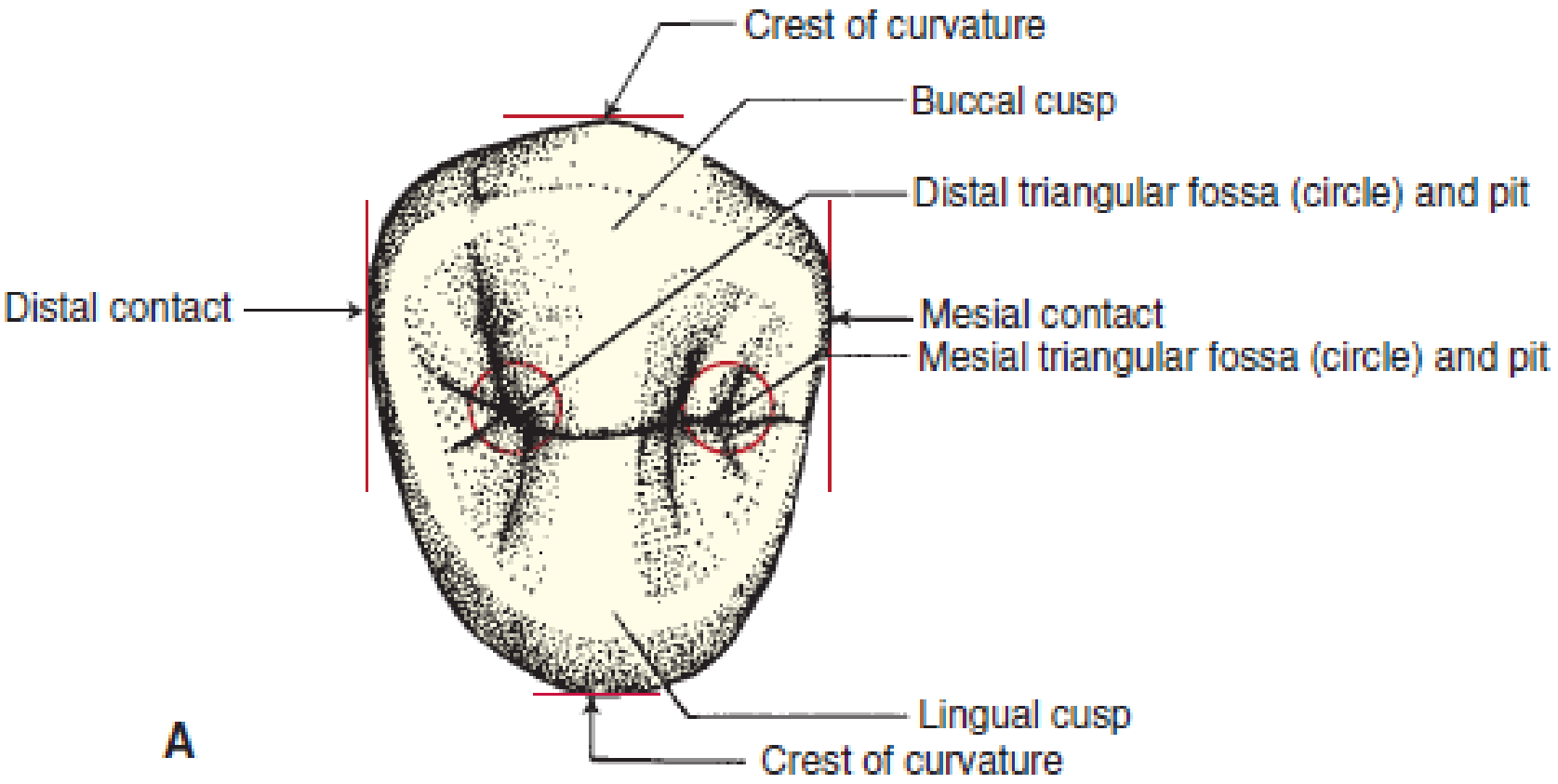
Marginal ridge groove (**M**)



Occlusal Aspect

- *Mesial triangular fossa*
- *Distal triangular fossa*
- *Buccal traingular ridge*
- *Lingual triangular ridge*




Crest of curvature
Buccal cusp
Distal triangular fossa (circle) and pit
Distal contact
Mesial contact
Mesial triangular fossa (circle) and pit
Lingual cusp
Crest of curvature
A

CLASS TRAITS OF PREMOLARS

Dr.Ashutosh Agrawal

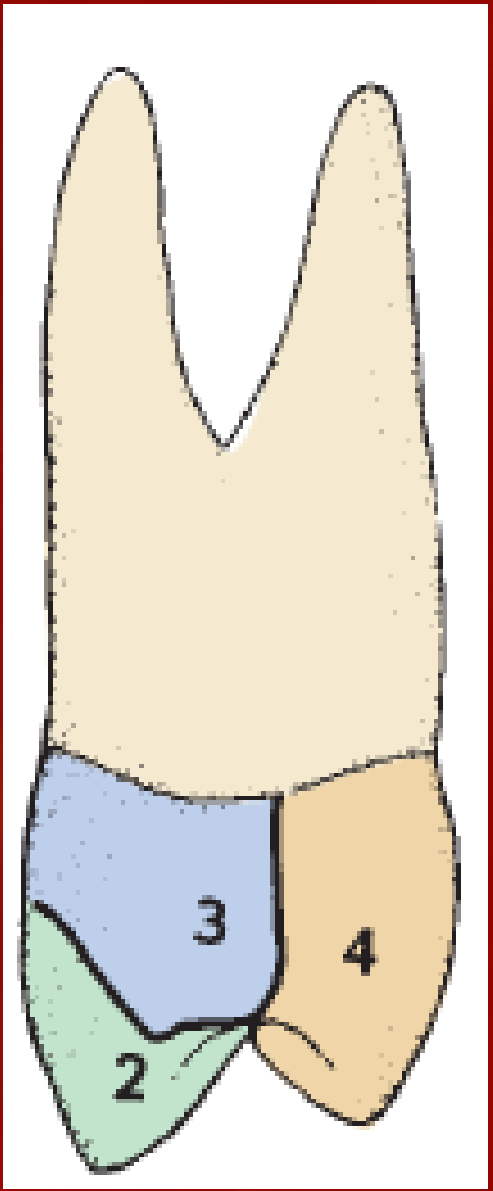
- Traits: particular quality of person's character.

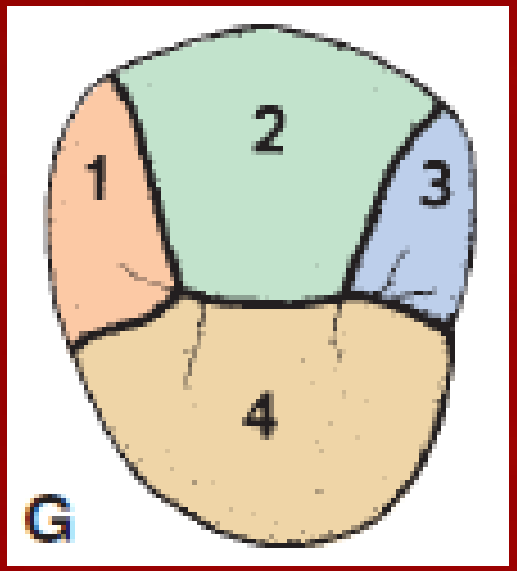
  4 traits-
- Set traits: permanent or deciduous
- Arch traits: maxillary or Mandibular
- Class traits: incisor or canine or premolar or molar
- Type traits: first or second.

CLASS TRAITS SIMILAR TO ANTERIOR TEETH

Number of Developmental Lobes:

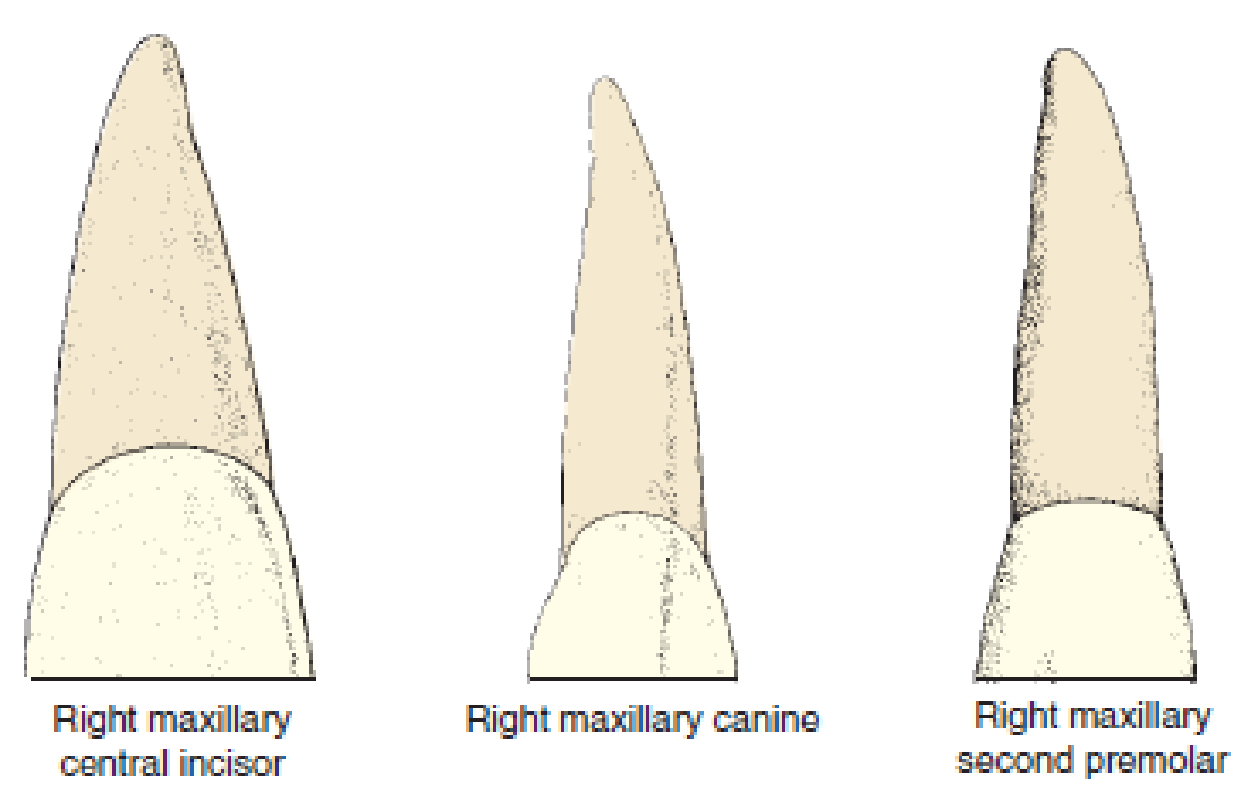
- Like anterior teeth, the facial surfaces of all premolars develop from three facial lobes.
- The prominent buccal ridge on the maxillary first premolar is similar to the pronounced labial ridge on the maxillary canine.
- The lingual surfaces of most premolars (like anterior teeth) develop from one lingual lobe.
- In premolars, this lobe forms one lingual cusp; in anterior teeth, it forms the cingulum.


3
4
2


1
2
3
4
G

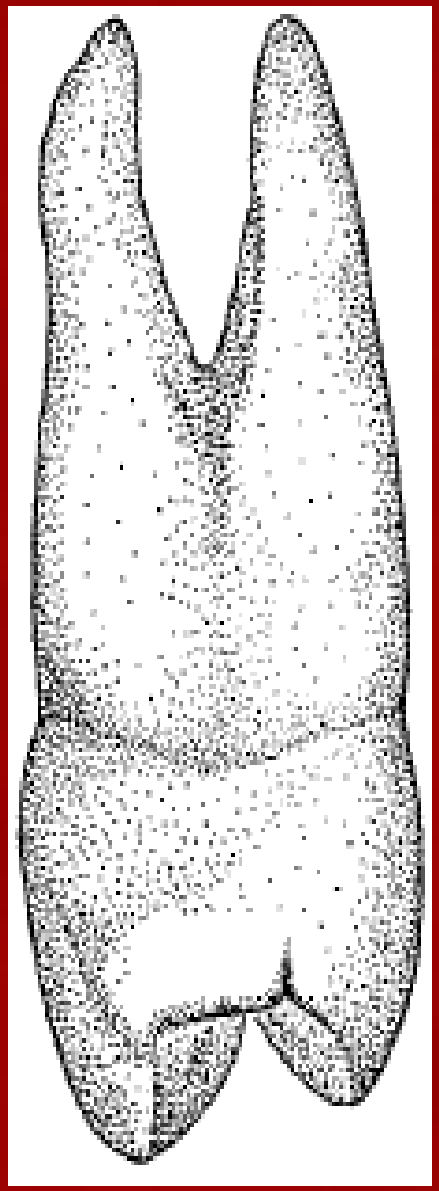
Crowns Taper Toward the Cervical:

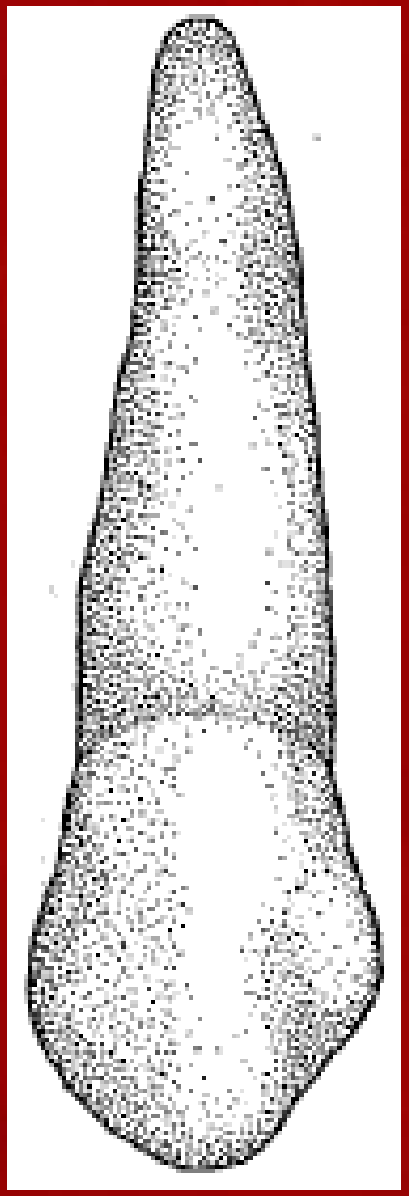
- From the facial, crowns are narrower in the cervical third than occlusally. This is because the widest proximal heights (crests) of contour (or contact areas) are located in the occlusal to middle thirds.



Cervical Lines:

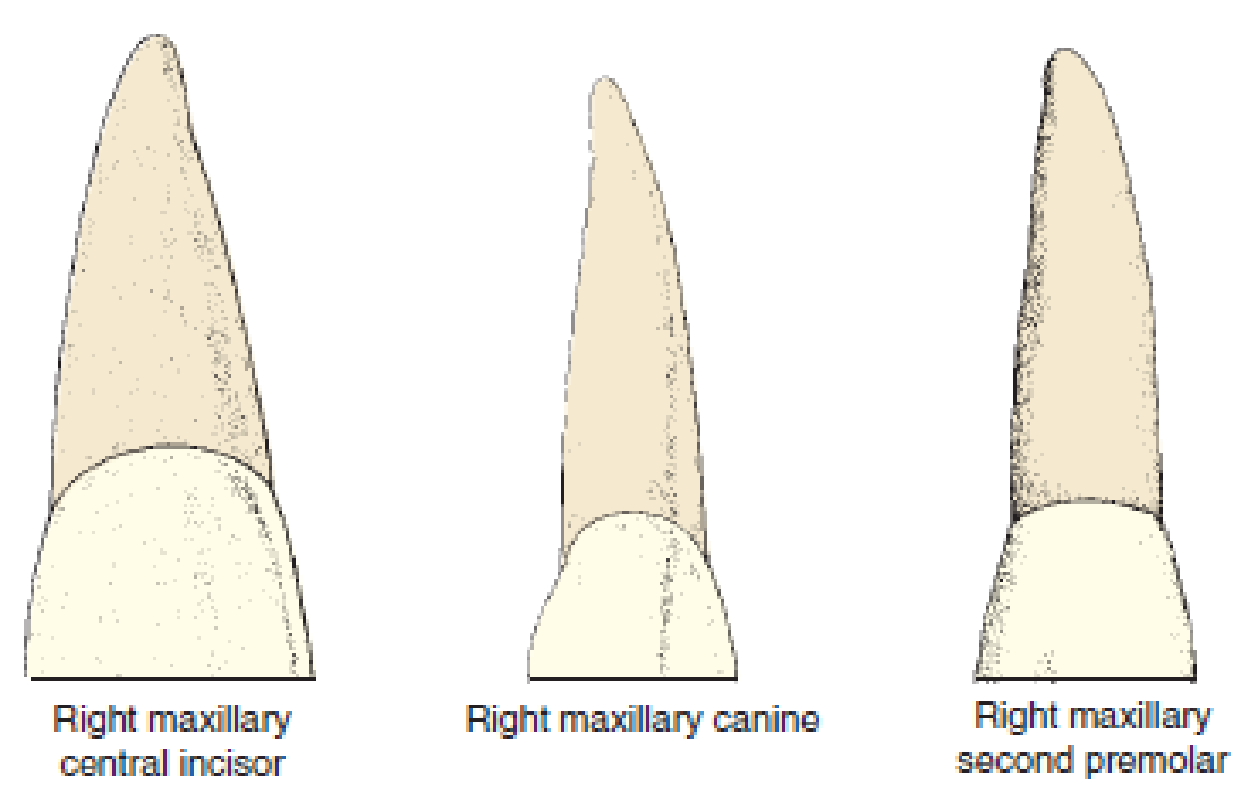
- Similar to all anterior teeth, cervical lines, when viewed from the proximal, curve toward occlusal or incisal.
- The amount of curvature is slightly greater on the mesial than on the distal surface.
- When viewed from the facial or lingual, cervical lines are curved toward the apex.





Root Shape:

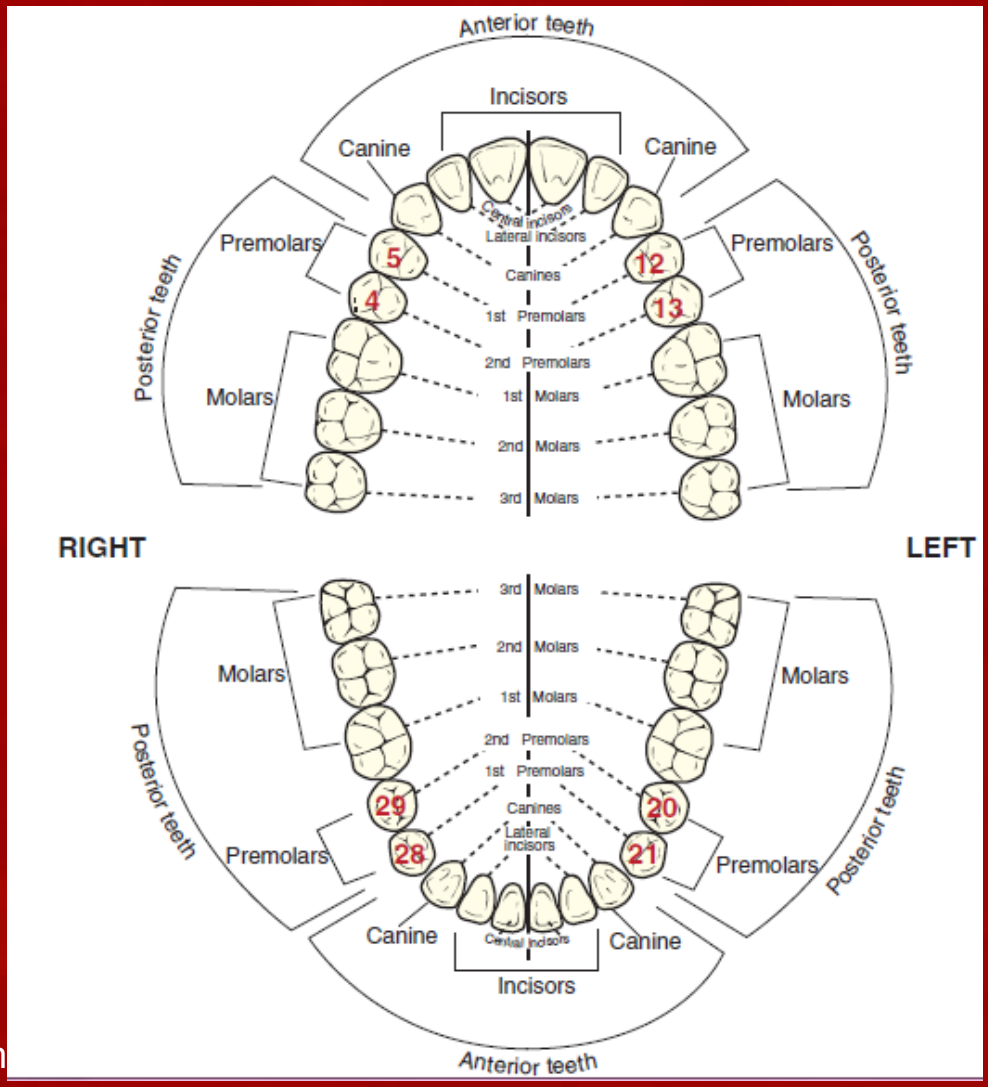
- Like on anterior teeth, premolar roots have convex facial and lingual root surfaces, and taper apically.
- Also, the root tapers toward the lingual.
- The apical third is most often bent distally.



CLASS TRAITS THAT DIFFER FROM ANTERIOR TEETH

Tooth Surface Terminology:

- The facial surfaces of the posterior teeth are called *buccal* (resting against the cheeks) instead of labial, and posterior teeth have *occlusal surfaces instead of incisal ridges.*
- These occlusal surfaces have cusps, ridges, and grooves.



Occlusal Cusps Versus Incisal Edges:

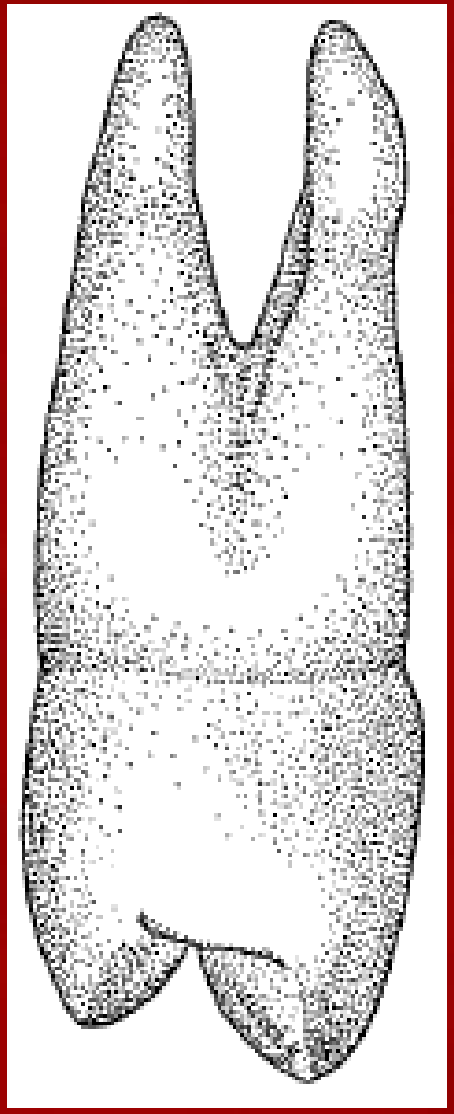
- Unlike anterior teeth with incisal edges or ridges and a cingulum, premolars have one buccal (or facial) cusp, and most have one lingual cusp.
- The EXCEPTION is the mandibular second premolar, which over half of the time has two lingual cusps.

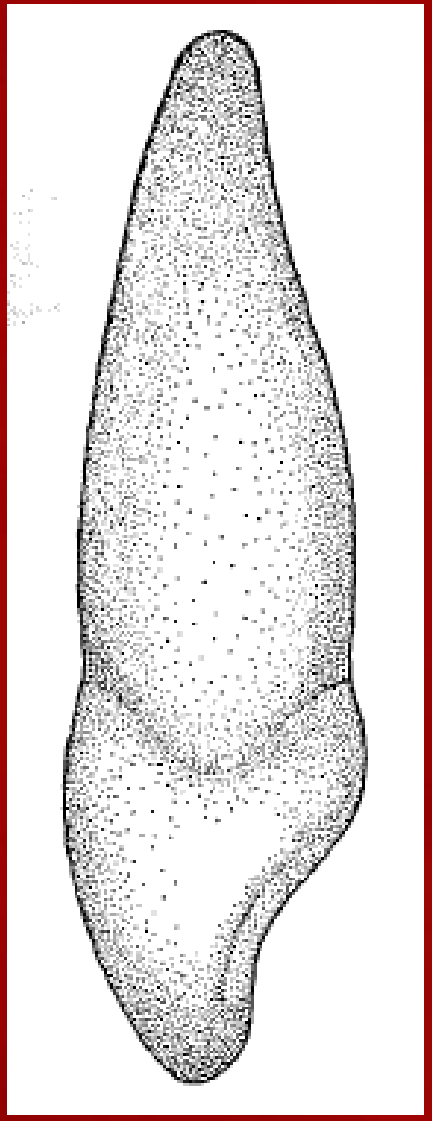
Marginal Ridges:

- The marginal ridges of most premolars are oriented in a horizontal plane versus a more lingually sloping plane in the anterior teeth.

Crown and Root Length:

- Premolar crowns in both arches are shorter than crowns of anterior teeth.



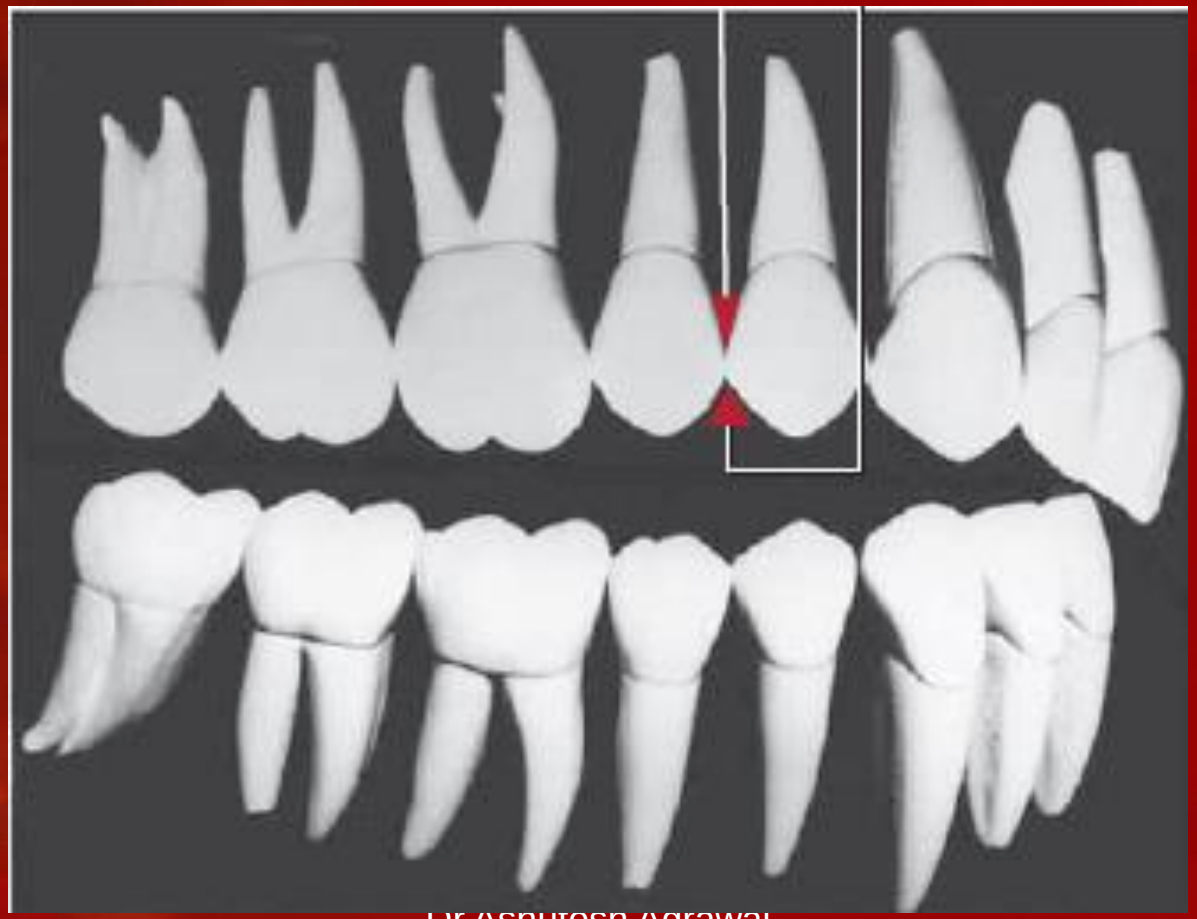


Height (Crest) of Contour:

- From both mesial and distal aspects, the *facial heights of contour of premolar* crowns are in the cervical third, like on anterior teeth. However, the heights of contour are more occlusal in position than the corresponding heights of contour on the anterior teeth.
- In other words, the greatest facial bulge is farther from the cervical line on premolars.

Contact Areas:

- The proximal contact areas are generally more cervically located and broader than on anterior teeth.

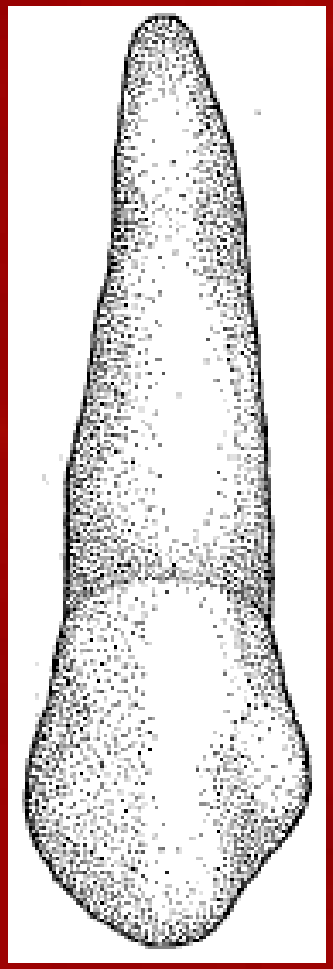


OTHER CLASS TRAITS CHARACTERISTIC OF MOST PREMOLARS

Class Traits of Most Premolars from the Buccal View

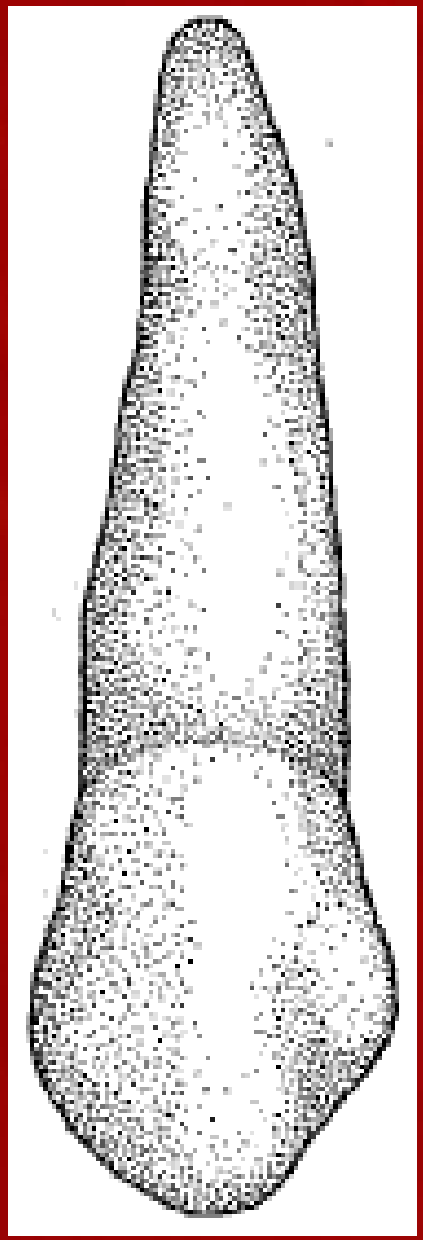
Crown Outline Shape of Premolars:

- The crown from the buccal view is broadest at the level of the contact areas and narrower at the cervix: shaped roughly like a five-sided pentagon, similar to the canine crown shape.
- The mesial and distal outlines of the crown are nearly straight or slightly convex from contact areas to the cervical line.



Location of Most Premolar Contact Areas:

- Both mesial and distal sides of the crown are convex around the contact areas, similar to canines.
- *Mesial proximal* contacts are near the junction of the occlusal and middle thirds, and the *distal contacts are normally* slightly more cervical, in the middle third.

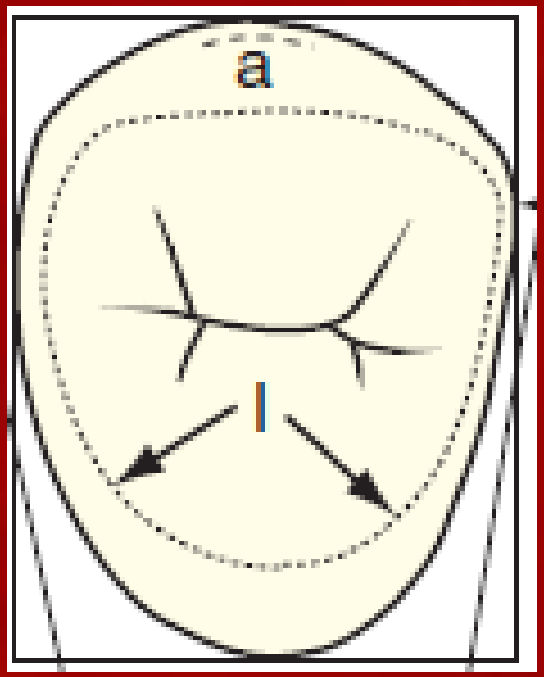


Relative Size of Most Premolar Cusp Ridges:

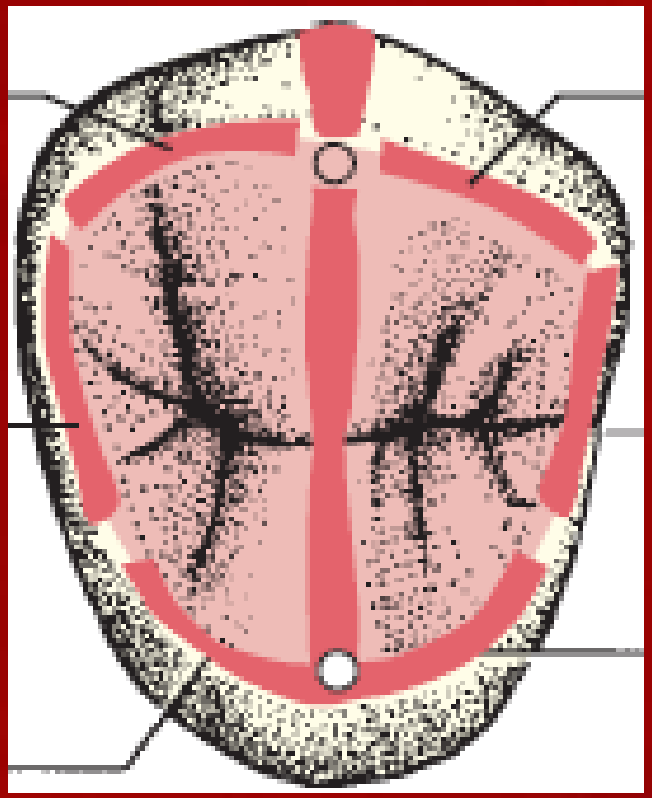
- As on canines, when viewed from the facial, the tip of the facial cusp of a premolar is often slightly mesial to the vertical root axis line of the tooth with the mesial cusp ridge of the buccal cusp shorter than the distal ridge.

- The mesial cusp ridge of the buccal cusp is shorter than the distal cusp ridge (EXCEPT on the maxillary first premolar, where the mesial cusp ridge is longer).
- Mesial marginal ridges are generally more occlusal than distal marginal ridges, which are more cervical(EXCEPT on mandibular first premolars).

- Crowns are oblong from the occlusal view, wider faciolingually than mesiodistally relative to anterior teeth.



- **Cusp Ridges and Marginal Ridges Bound the Occlusal Table.**
- **Triangular Ridges Form Transverse Ridges.**
- **Grooves and Fossae.**

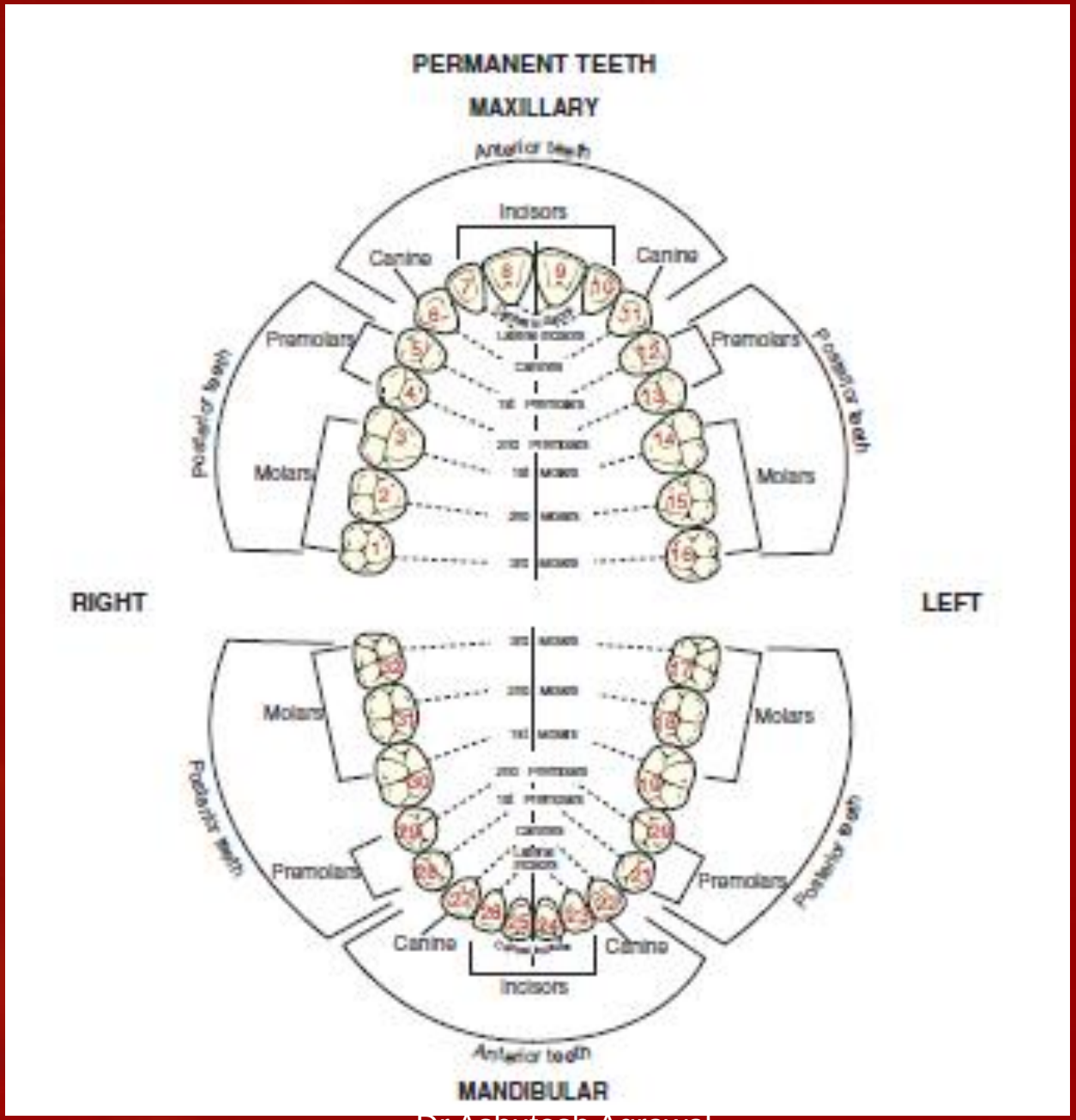


Identification features of maxillary 1st premolar

- Tooth has two cusps, lingual cusp is shorter
- It frequently has two roots and sometimes single root with deep developmental grooves
- Mesial developmental depression on mesial surface of crown which may extend onto root surface
- Mesial marginal developmental groove is the distinguishing feature of maxillary second permanent premolar
- *Side identification*
  - Presence of mesial marginal developmental groove on the mesial side
  - Deep developmental depression on mesial surface of the root

To be continued…..

Maxillary IInd PREMOLAR


PERMANENT TEETH
MAXILLARY
Incisors
Canine
Canine
Premolars
Premolars
Molars
Molars
RIGHT
LEFT
Molars
Molars
Premolars
Premolars
Canine
Canine
Incisors
MANDIBULAR

Patient's Right	Patient's Left
8,7,6,5,4,3,2,1	1,2,3,4,5,6,7,8
8,7,6,5,4,3,2,1	1,2,3,4,5,6,7,8

5

Permanent maxillary
left 2nd premolar

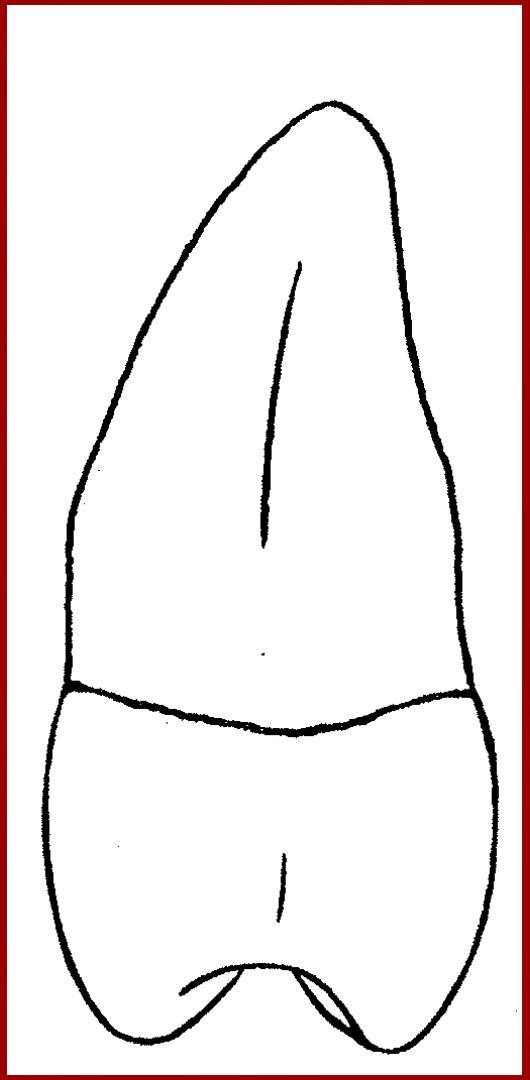
1,2,3,4,5,6,7,8	9,10,11,12,13,14,15,16
32,31,30,29,28,27,26,25	24,23,22,21,20,19,18,17

#13 Permanent maxillary
Left 2nd premolar

18,17,16,15,14,13,12,11	21,22,23,24,25,26,27,28
48,47,46,45,44,43,42,41	31,32,33,34,35,36,37,38

25 Permanent maxillary
left 2nd premolar

- The maxillary second premolar supplements the maxillary first premolar in function.
- The maxillary second premolar is less angular, giving a more rounded effect to the crown from all aspects.
- It has a single root.
- The maxillary second premolar may have a crown that is noticeably smaller cervicoocclusally and also mesiodistally.
- Usually the root length of the second premolar is as great.



First evidence of calcification	2 to 2¼ years
Enamel completed	6 to 7 years
Eruption	10 to 12 years
Root completed	12 to 14 years

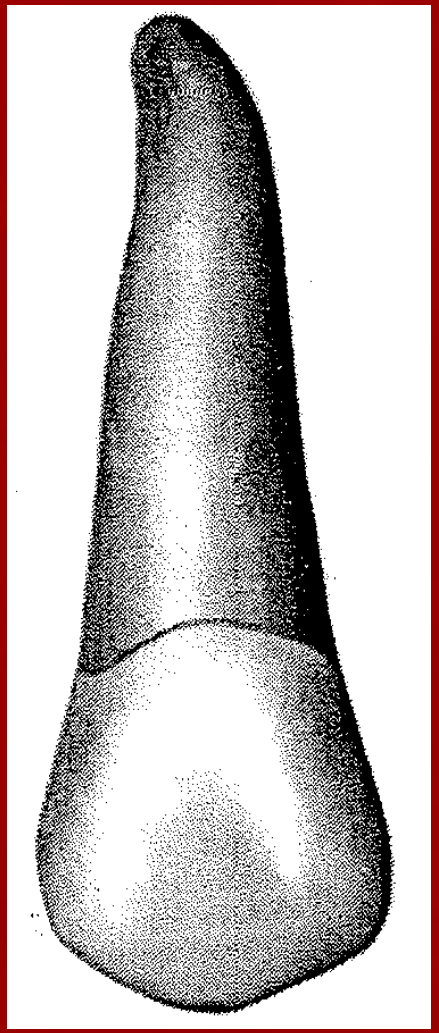
Measurement Table

Cervico-occlusal Length of Crown	*Length of Root*	*Mesiodistal Diameter of Crown*	*Mesiodistal Diameter of Crown at Cervix*	*Labio- or Bucco-lingual Diameter of Crown*	*Labio- or Bucco-lingual Diameter at Cervix*	*Curvature of Cervical Line—Mesial*	*Curvature of Cervical Line—Distal*
8.5*	14.0	7.0	5.0	9.0	8.0	1.0	0.0

Cervico-occlusal Length of Crown	*Length of Root*	*Mesiodistal Diameter of Crown*	*Mesiodistal Diameter of Crown at Cervix*	*Labio- or Bucco-lingual Diameter of Crown*	*Labio- or Bucco-lingual Diameter at Cervix*	*Curvature of Cervical Line—Mesial*	*Curvature of Cervical Line—Distal*
8.5*	14.0	7.0	5.0	9.0	8.0	1.0	0.0

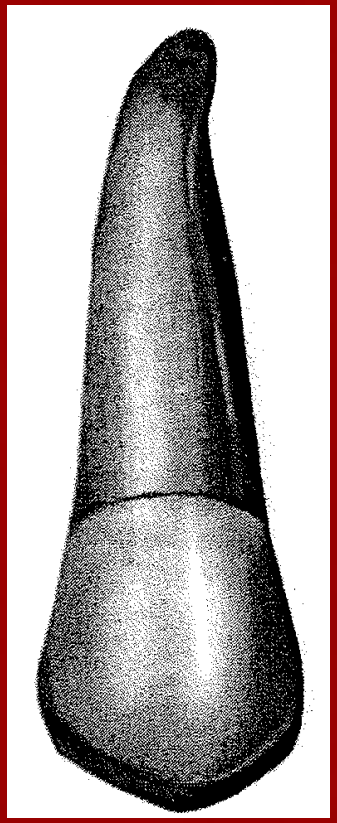
Buccal aspect

- From the buccal aspect. it may be noticed that the buccal cusp of the second premolar is not as long as that of the first premolar and it appears less pointed.
- Also. the mesial slope of the buccal cusp ridge is usually shorter than the distal slope.
- In a good many instances, the crown and root of the second premolar are thicker at their cervical portions.
- The buccal ridge of the crown may not be so prominent when compared with the first premolar.



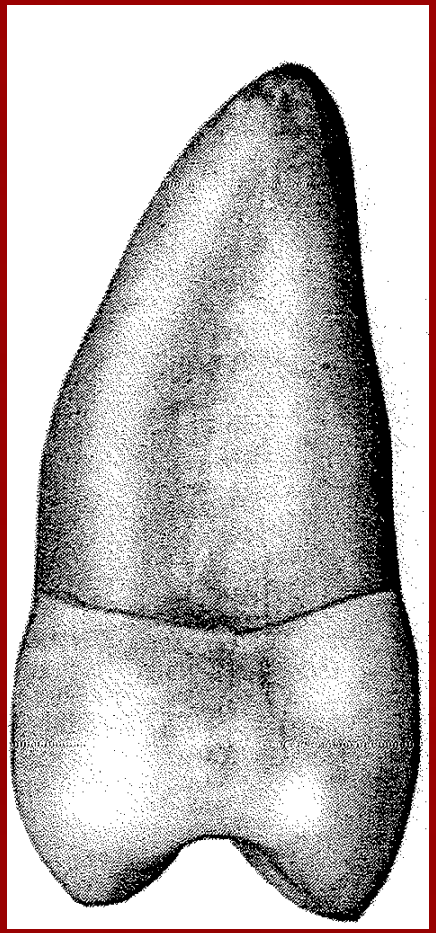
Lingual Aspect

- From the lingual aspect, little variation may be seen except that the lingual cusp is longer making the crown longer on the lingual side.

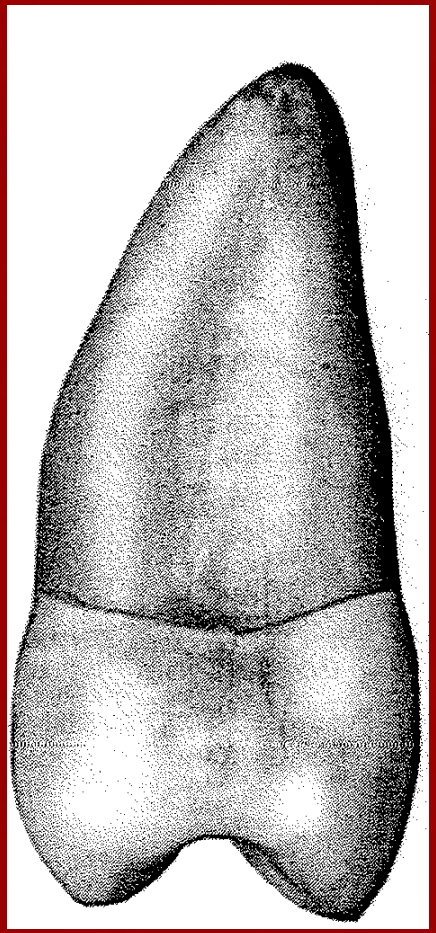


Mesial Aspect

- The mesial aspect shows the difference in cusp length between the two teeth.
- The cusps of the second premolar are shorter, with the buccal and lingual cusps more nearly the same length.
- There may be greater distance between cusp tips, a condition that widens the occlusal surface buccolingually.

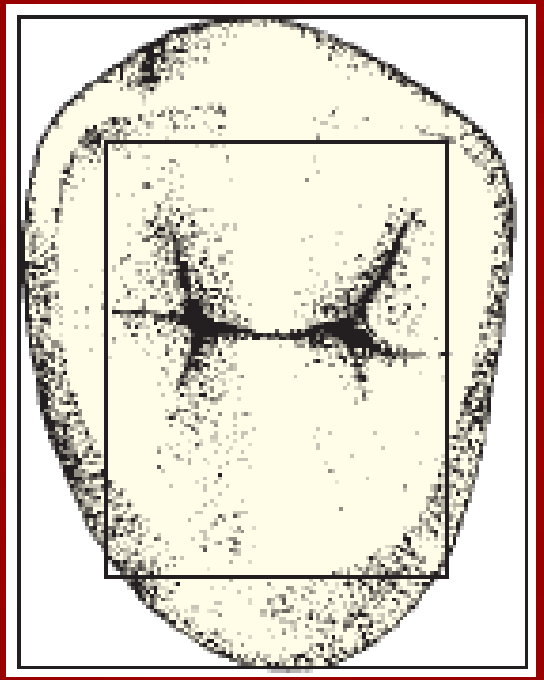


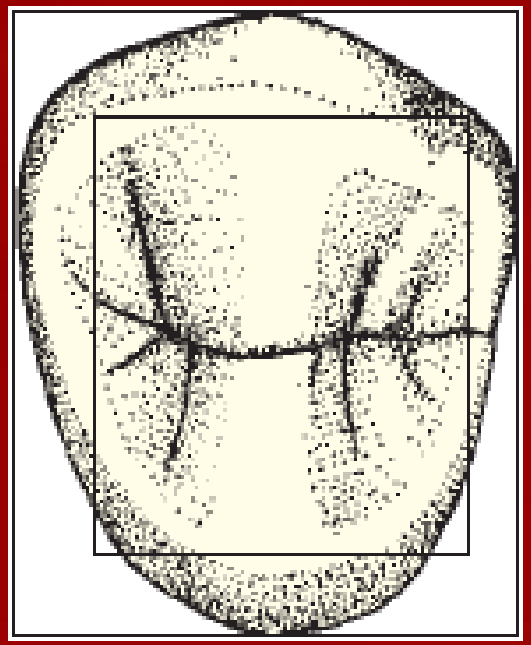
- There is no developmental depression on the mesial surface of the crown as on the first premolar; the crown surface is convex instead.
- A shallow developmental groove appears on the single tapered root.



Occlusal Aspect

- From the occlusal aspect, some differences are to be noted between the two premolars.
- The outline of the crown is more rounded or oval, rather than angular.
- The central developmental groove is shorter and more irregular, and there is a tendency toward multiple supplementary grooves radiating from the central groove.





- These supplementary grooves terminate in shallow depressions in the enamel that may extend out to the cusp ridges.
- This arrangement makes for an irregular occlusal surface and gives the surface a very wrinkled appearance.