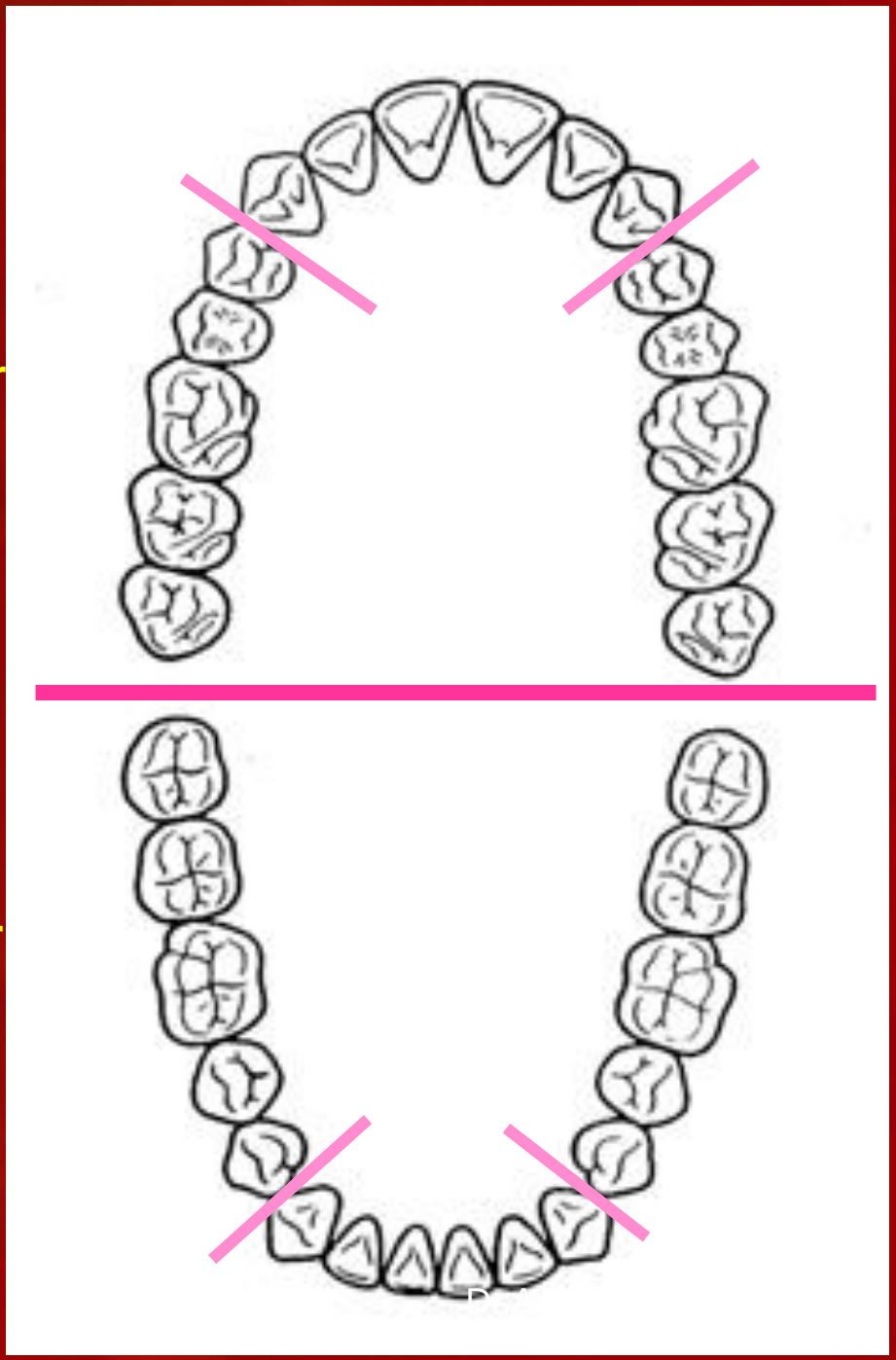
MANDIBULAR PREMOLAR

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

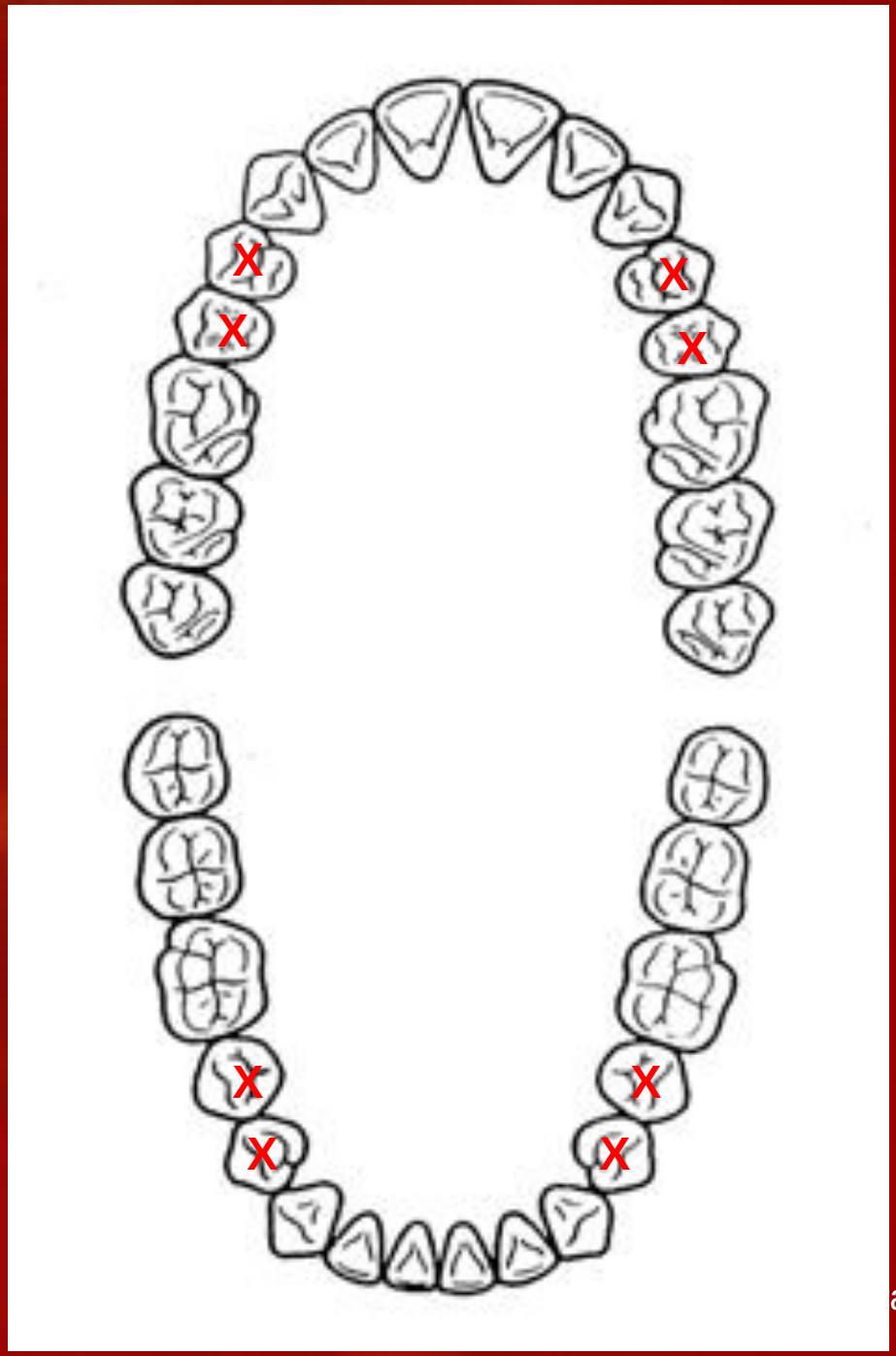
Maxillary
Right Posterior
Segment



Maxillary
Left Posterior
Segment

Mandibular
Right Posterior
Segment

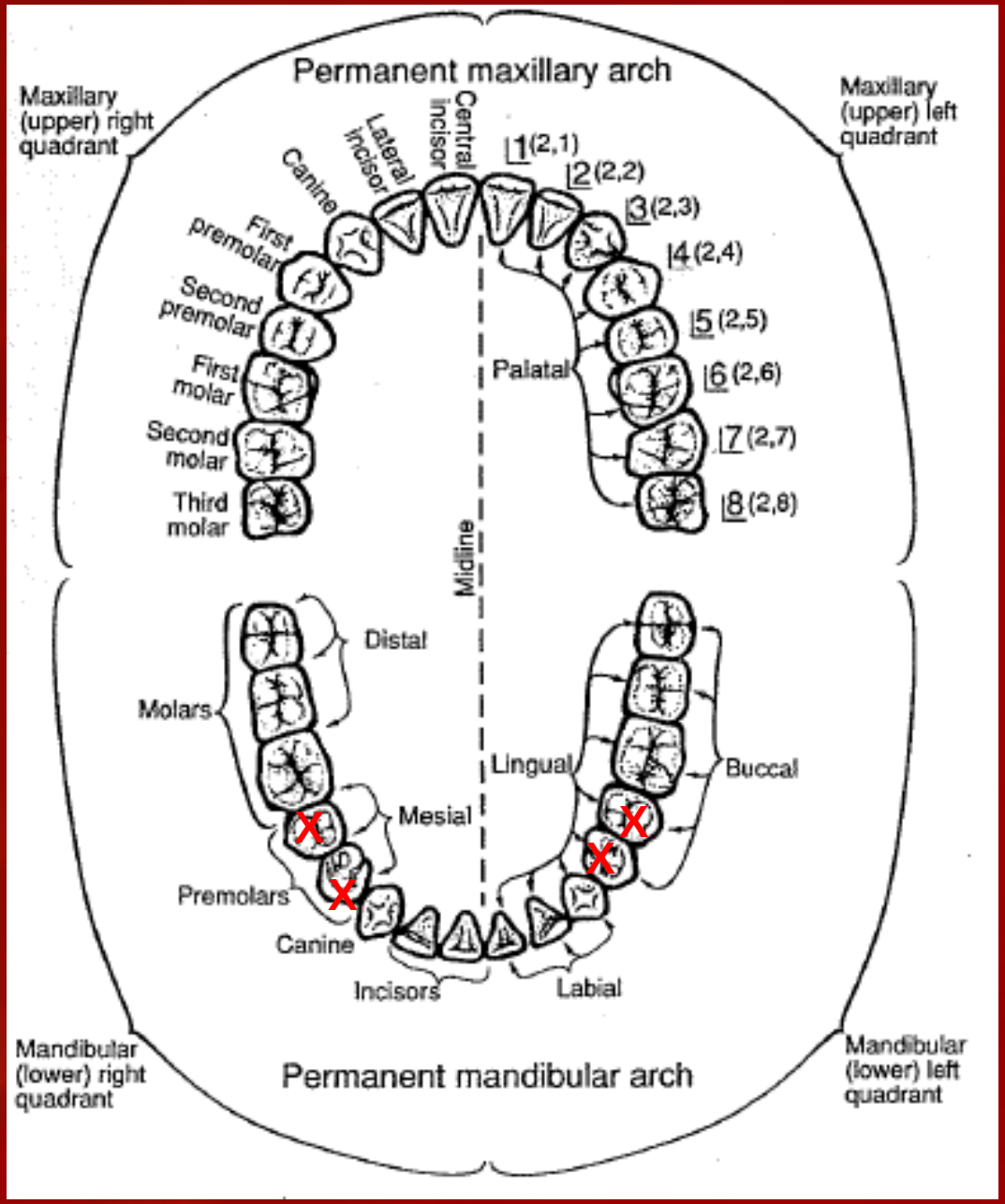
Mandibular
Left Posterior
Segment



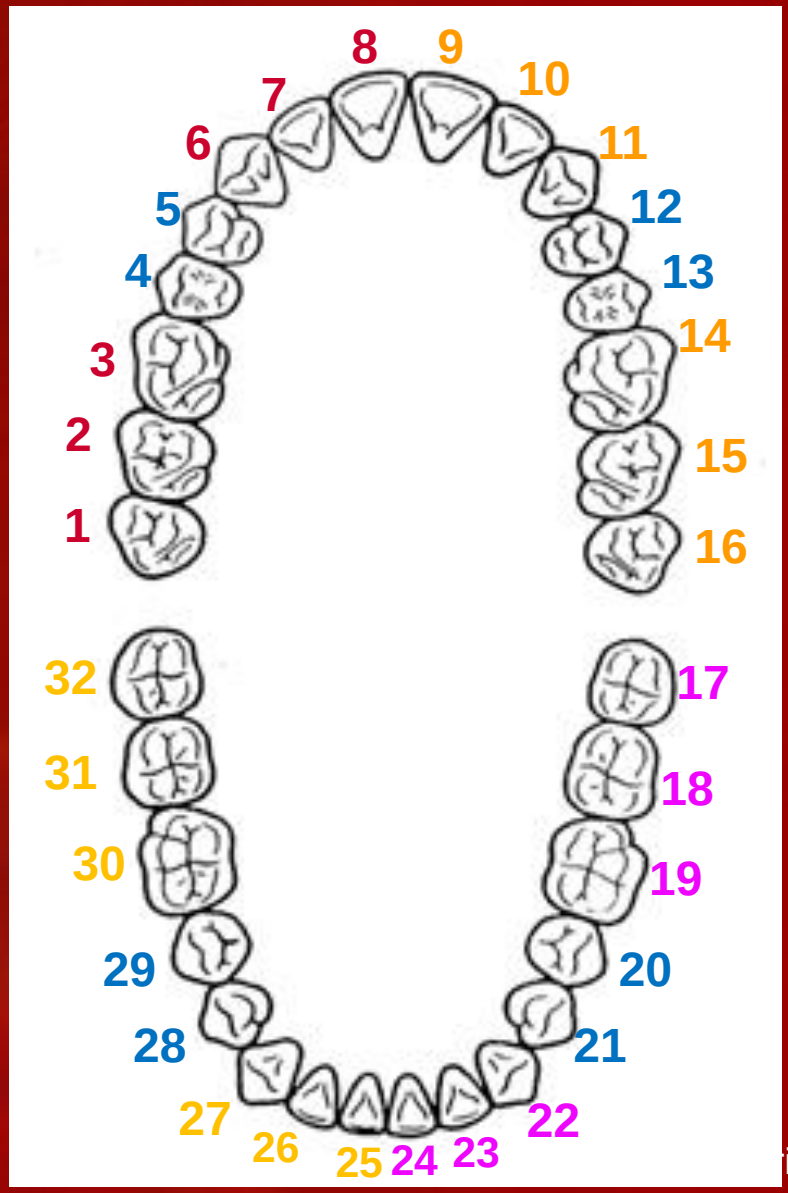
Maxillary BICUSPIDS (Premolars)

Mandibular BICUSPIDS (Premolars)

ari


Permanent maxillary arch
Maxillary (upper) right quadrant
Maxillary (upper) left quadrant
Central incisor
Lateral incisor
Canine
First premolar
Second premolar
First molar
Second molar
Third molar
1(2,1)
2(2,2)
3(2,3)
4(2,4)
5(2,5)
6(2,6)
7(2,7)
8(2,8)
Palatal
Midline
Distal
Molars
Mesial
Premolars
Canine
Incisors
Lingual
Buccal
Labial
Mandibular (lower) right quadrant
Permanent mandibular arch
Mandibular (lower) left quadrant

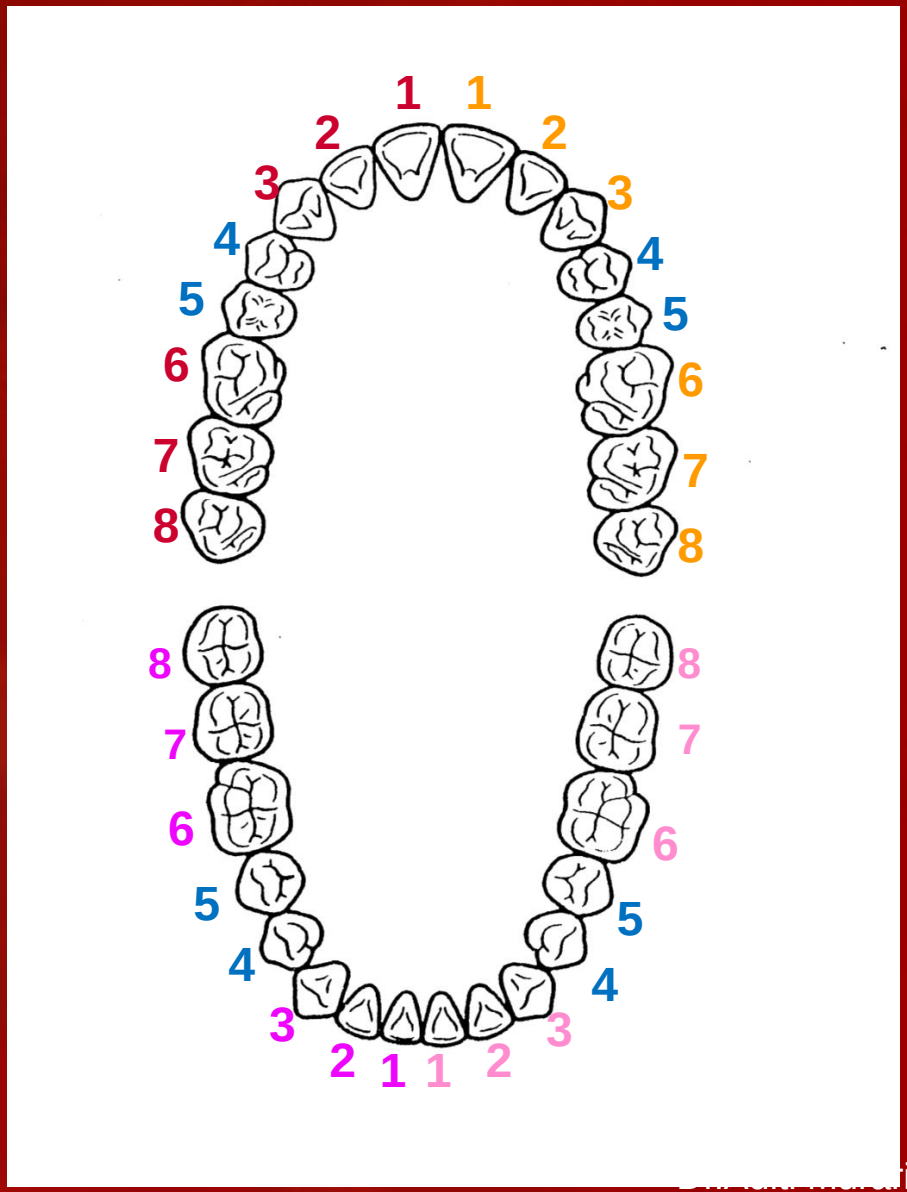
Universal Method of Tooth Numbering



 # 21-

Permanent Mandibular Left 1st Premolar

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



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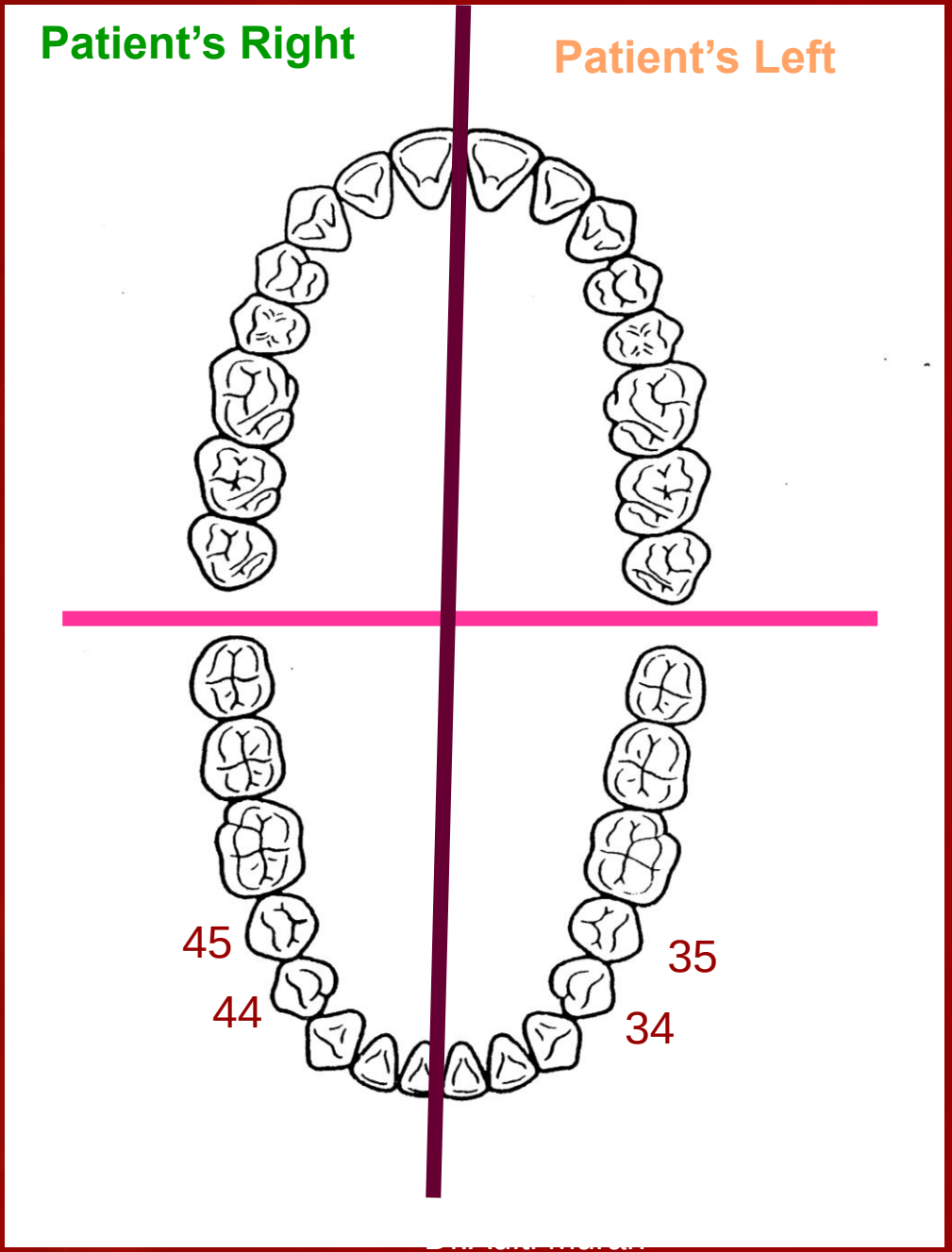
Permanent Mandibular Right 2nd Premolar

Maxillary Right Quadrant (1)

Maxillary Left Quadrant (2)



Mandibular Right Quadrant (4)

Mandibular Left Quadrant (3)

- The mandibular first premolars are developed from four *lobes as were the maxillary* premolars.
- The mandibular second premolars are, in most instances, developed from five lobes, three buccal and two lingual lobes.

Table 1-5 GUIDELINES FOR DETERMINING THE NUMBER OF LOBES FORMING ADULT TOOTH

ANTERIOR TEETH AND PREMOLARS

TOOTH CLASS	NO. LINGUAL CUSPS OR CINGULUM	NO. OF LOBES
All incisors	Cingulum	3 + 1 = 4
All canines	Cingulum	3 + 1 = 4
Two-cusped premolars	1 lingual	3 + 1 = 4
Three-cusped premolars	2 lingual	3 + 2 = 5

Guideline for determining the number of lobes for anterior teeth and premolars:
Number of lobes = 3 facial lobes + 1 lobe per lingual cusp or cingulum.

MOLARS

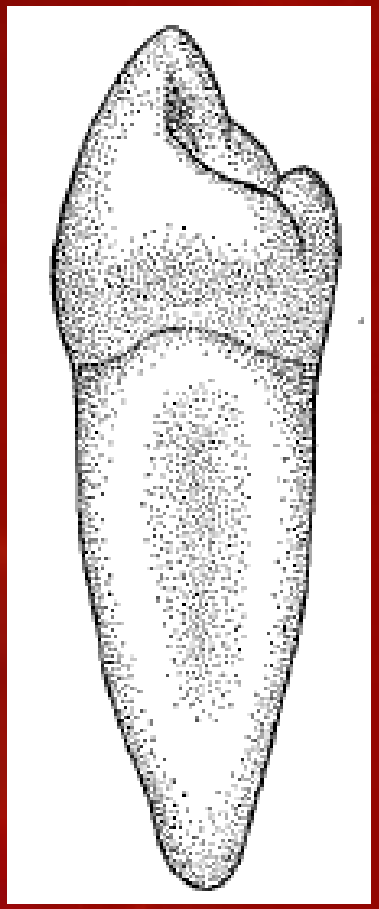
MOLAR NAME	NO. TOTAL CUSPS	NO. OF LOBES
Three-cusped molars	3	3
Four-cusped molars	4	4
Five-cusped molars (including large Carabelli cusps)	5	5

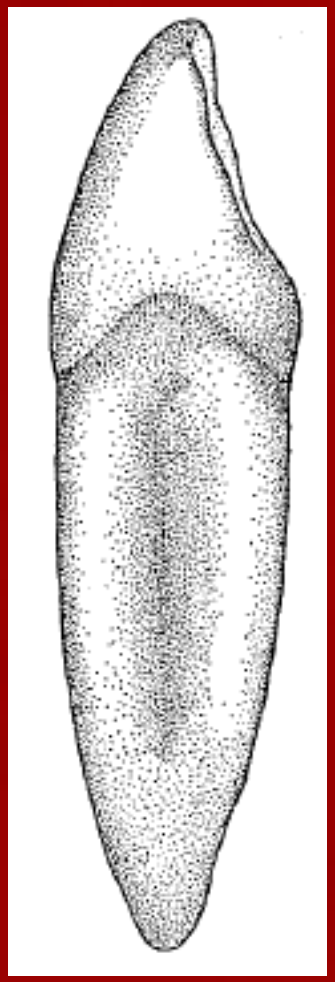
Guideline for determining the number of molar lobes:
Number of molar lobes = 1 per cusp (including Carabelli).

Mandibular bicuspids- Misnomer???

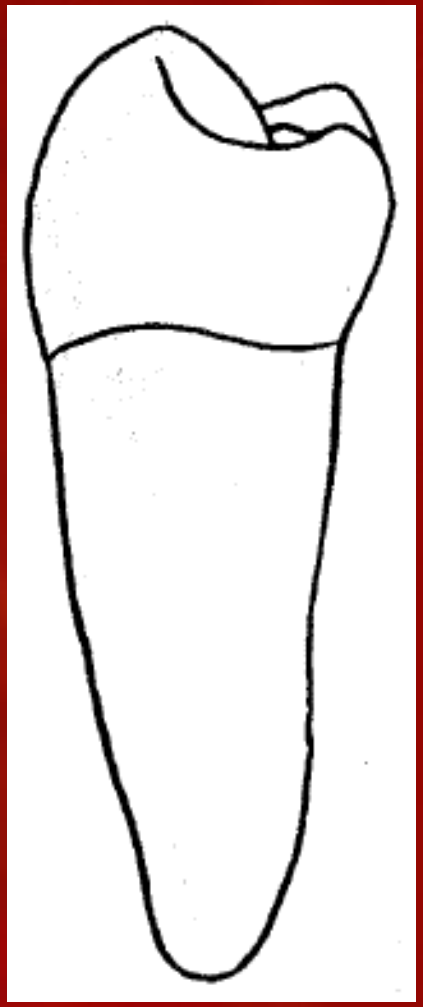
- In 1st premolar- a large buccal *cusp, which is long and well formed, with a small* non-functioning lingual cusp.
- The second premolar has three well-formed cusps in most cases, one large buccal cusp and two smaller lingual cusps.
- The form of both mandibular premolars fails to conform to the implications of the term "bicuspid," the term implying two functioning cusps.

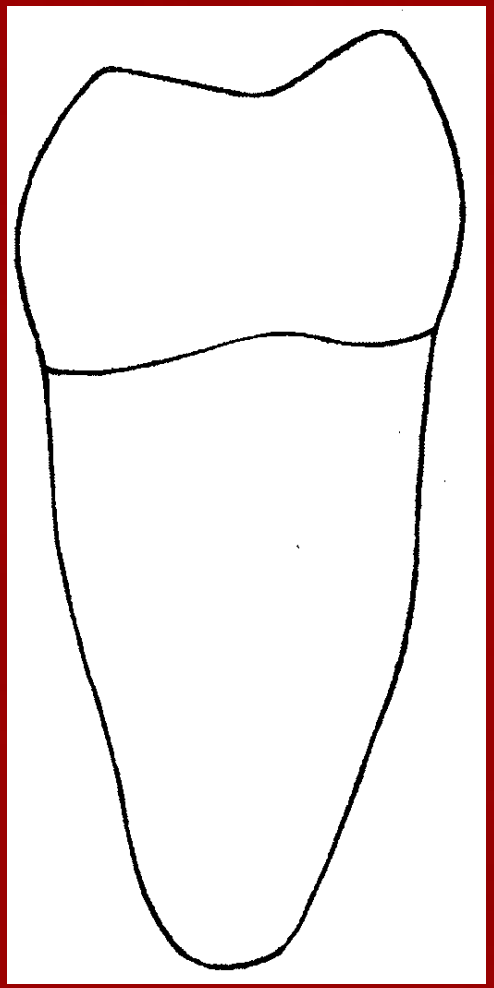
- The mandibular first premolar~ small canine.





- The mandibular second premolar ~ small molar.





- The first premolar is always the smaller of the two *mandibular premolars. whereas the* opposite is true, in many cases of the *maxillary premolars.*

Mandibular 1st Premolars

Dr.Aditi Murari

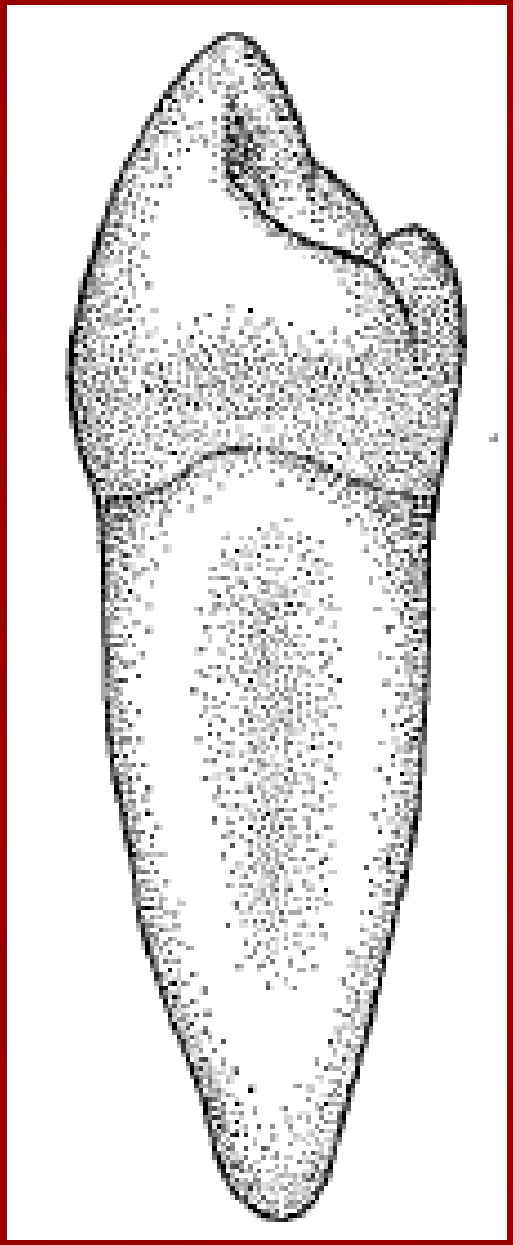
- The mandibular first premolar is the fourth tooth from the median line and the first posterior tooth in the mandible.
- This tooth is situated between the canine and second premolar and has some characteristics common to each of them.

- The characteristics that resemble those of the *mandibular canines are as follows:*

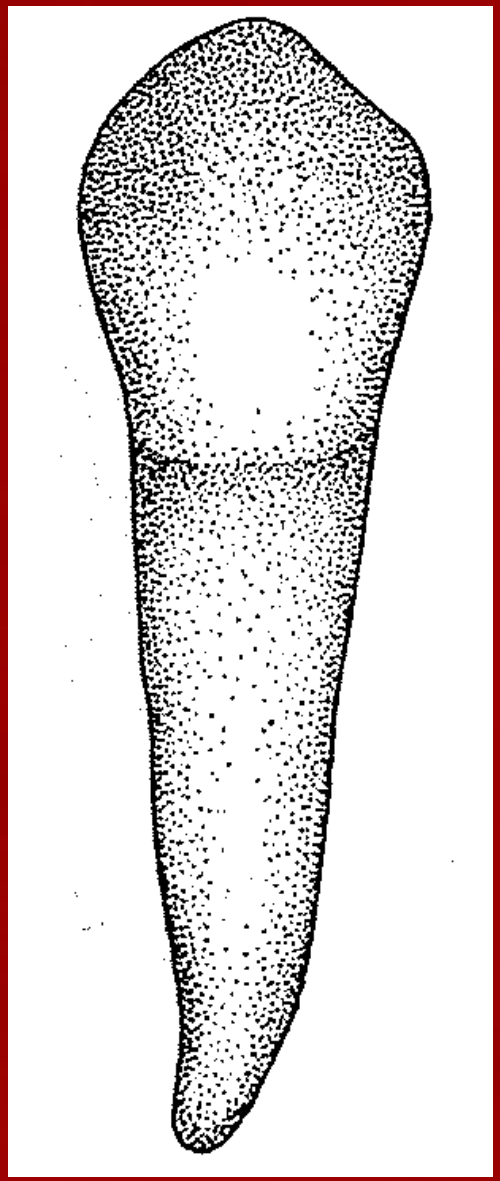
I. The buccal cusp is long and sharp and is the only occluding cusp.

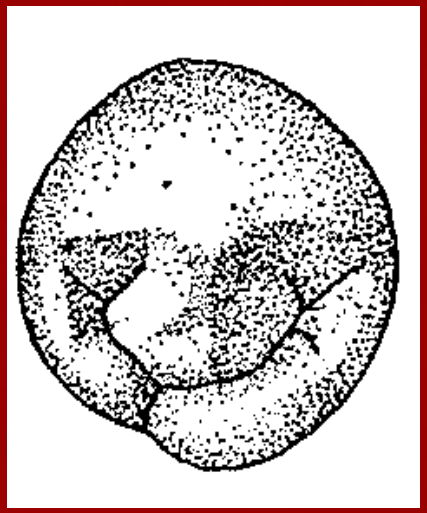
II. The bucco-lingual measurement is similar to that of the canine.

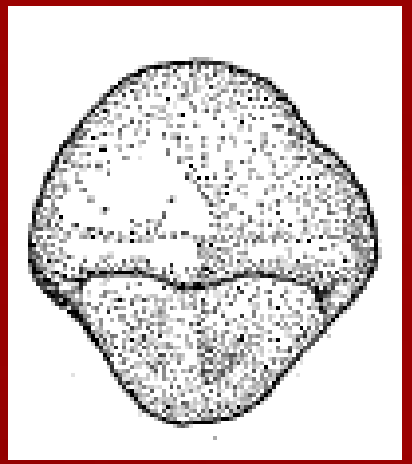
III. The occlusal surface slopes sharply lingually in a cervical direction.



4. The mesiobuccal cusp ridge is shorter than the distobuccal cusp ridge.
5. The outline form of the occlusal aspect resembles the outline form of the incisal aspect of the canine.







- The characteristics that resemble those of the *second mandibular premolar are as* follows:

I. Except for the longer cusp, the outline of crown and root from resembles the second premolar.

II. The contact areas, mesially and distally. are near the same level.

III. The curvatures of the cervical line mesially and distally are similar.

IV. The tooth has more than one cusp.

- The root of the mandibular first premolar is shorter as a rule than that of the mandibular second premolar.

CHRONOLOGY

First evidence of calcification	1¾–2 yr
Enamel completed	5–6 yr
Eruption	10–12 yr
Root completed	12–13 yr

ODONTOMETRIC DATA

Cervico-occlusal Length of Crown	Length of Root	Mesiodistal Diameter of Crown	Mesiodistal Diameter of Crown at Cervix	Labio- or Buccolingual Diameter of Crown	Labio- or Buccolingual Diameter of Crown at Cervix	Curvature of Cervical Line—Mesial	Curvature of Cervical Line—Distal
8.5	14.0	7.0	5.0	7.5	6.5	1.0	0.0

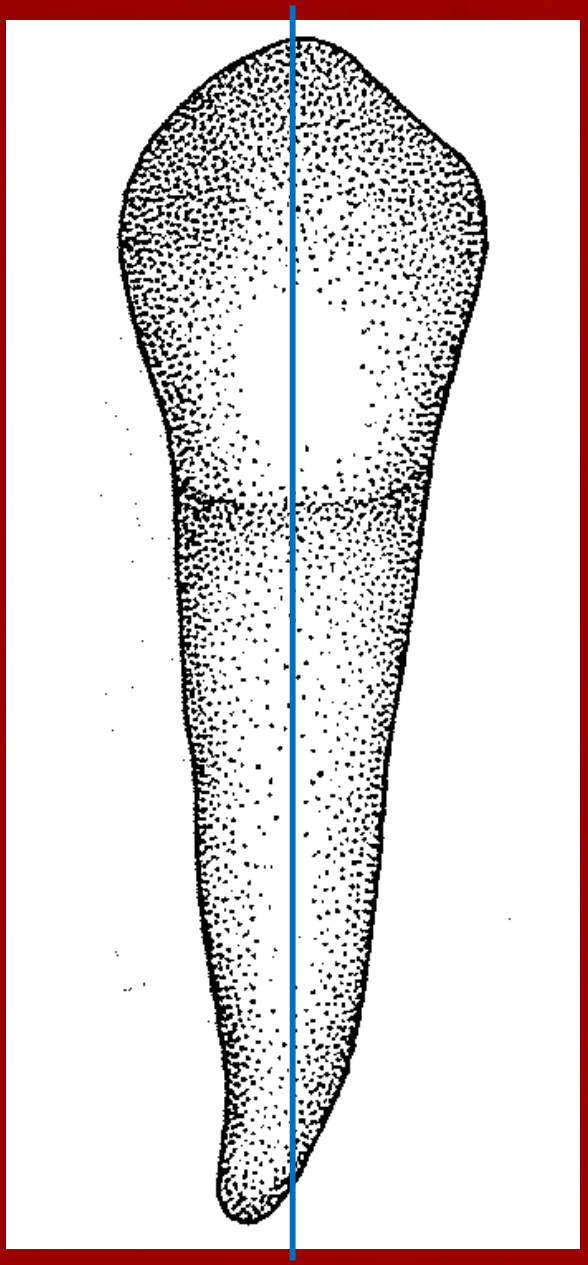
Buccal Aspect

Dr.Aditi Murari

- Crown is nearly symmetrical bilaterally.
- The middle buccal lobe is well developed, resulting in a large, pointed buccal cusp.
- The mesial cusp ridge is shorter than the distal cusp ridge.
- The contact areas are almost at the same level mesially and distally.

- The crown is roughly trapezoidal.
- Little curvature at the cervical line buccally.
- The crest of Curvature of the cervical line buccally approaches the center of the root buccally.
- The mesial outline of the crown is straight or slightly concave.
- The outline of the mesial slope of the buccal cusp usually shows some concavity unless wear has obliterated the original form.

- The tip of the buccal cusp is pointed and is located a little mesial to the center of the crown buccally.
- The distal outline of the crown is slightly concave above the cervical line.
- This curvature is broader than that curvature of the mesial contact area.



- The root of this tooth is 3 or 4 mm shorter than that of the mandibular canine.
- The continuous ridge from the cervical margin to the cusp tip is called the *buccal ridge*.
- The buccal surface of the crown is smooth and shows no developmental grooves and few developmental lines.

Lingual Aspect

Dr.A[illegible] Murari

- The crown of the mandibular first premolar tapers toward the lingual.
- The lingual cusp is always small.
- The occlusal surface slopes greatly toward the lingual in a cervical direction down to the short lingual cusp.
- Most of the occlusal surface of this tooth can therefore be seen from this aspect.

- The cervical portion of the crown lingually is narrow and convex.
- The contact areas and marginal ridges are pronounced and extend out above the narrow cervical portion of the crown.
- Lingual cusp is short and poorly developed, usually shows a pointed tip.

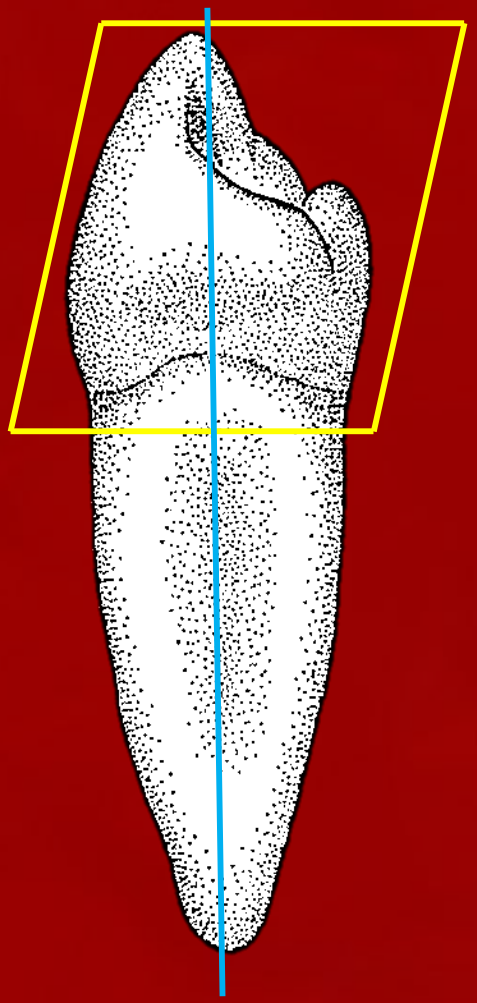
- A characteristic of the lingual surface of the mandibular first premolar is the ***mesiolingual developmental groove***.
- The root of this tooth is much narrower on the lingual side, and there is a narrow ridge, smooth and convex, the full length of the root.

- The mesial and distal occlusal fossae are on each side of the triangular ridge.

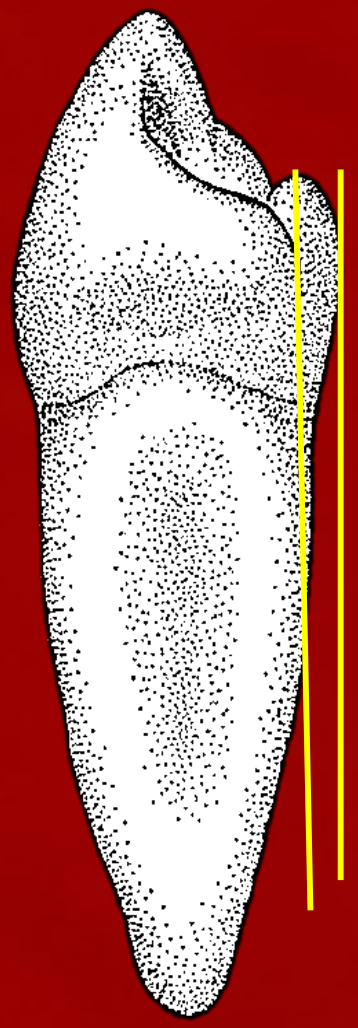
Mesial Aspect

Mesial Aspect

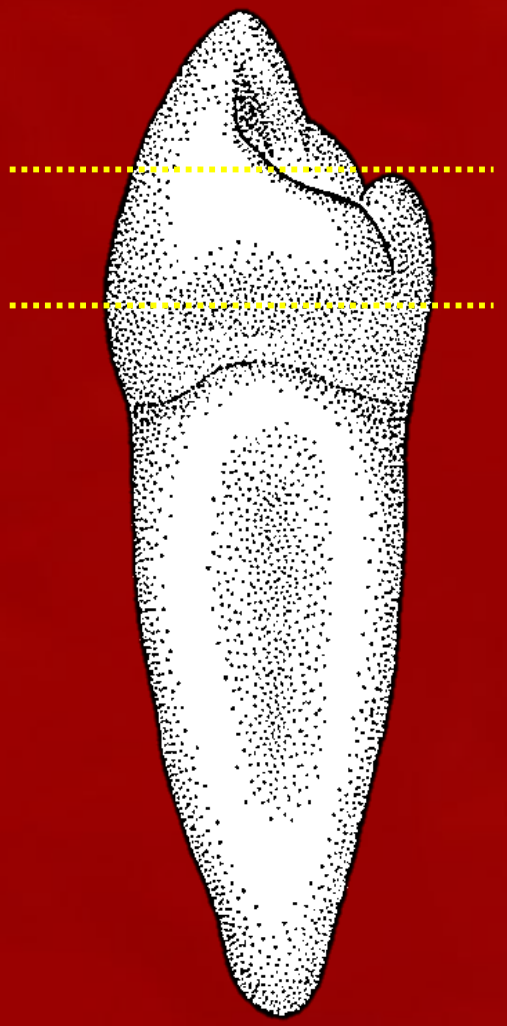
- The crown outline is roughly rhomboidal, *and the tip of the buccal* cusp is nearly centred over the root.



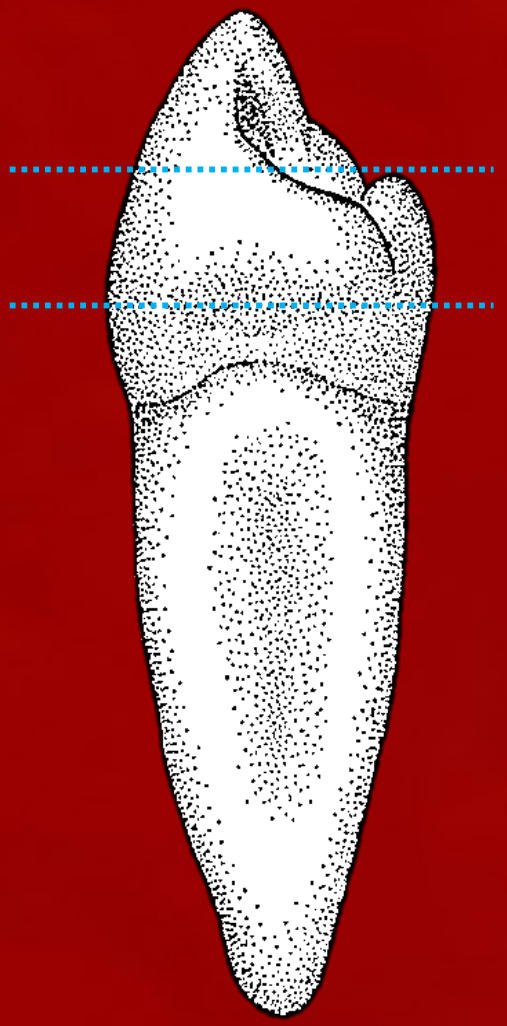
- The convexity of the outline of the lingual lobe is lingual to the outline of the root.
- The surface of the crown presents an overhang above the root trunk in a lingual direction.



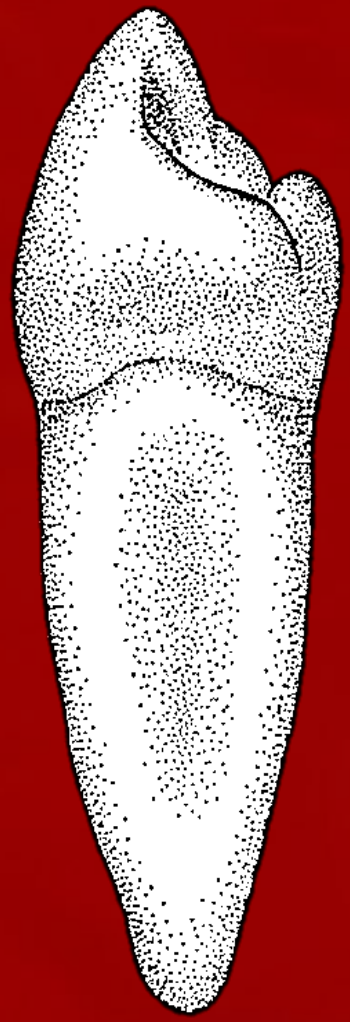
- The buccal outline of the crown from this aspect is prominently curved from the cervical line to the tip of the buccal cusp.
- The crest of the curvature is near the middle third of the crown.
- The crest of curvature lingually approaches the middle third of the crown.



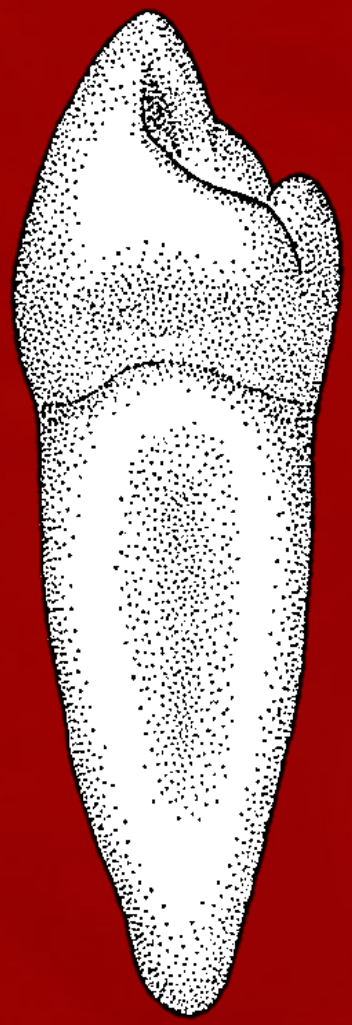
- The distance from the cervical line lingually to the tip of the lingual cusp is about two thirds of that from the cervical line buccally to the tip of the buccal cusp.



- Mesial marginal ridge- lingual inclination.
- Lower than DMR.
- Merge with MLDG.



- The cervical line- regular, curving occlusally.
- The surface of the crown mesially is smooth except for the mesiolingual groove.
- Root outline from the mesial aspect is a tapered form from the cervix, ending in a relatively pointed apex in line with the tip of the buccal cusp.



Distal Aspect

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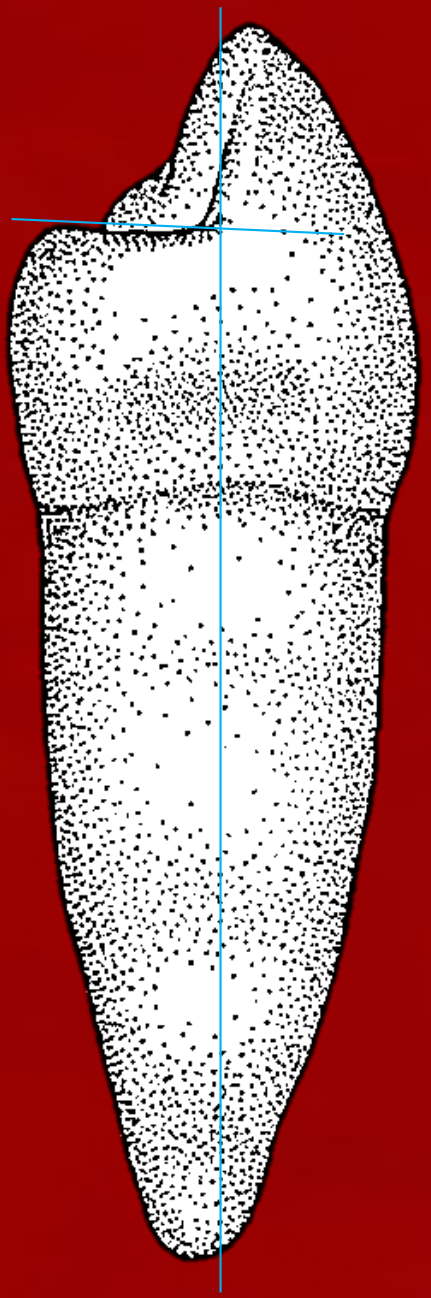
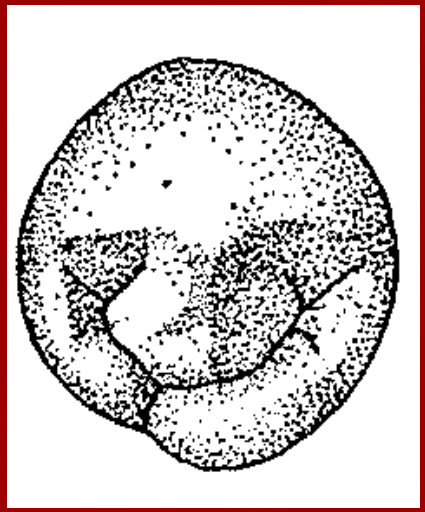
- The distal marginal ridge is higher above the cervix. and it does not have the extreme lingual slope of the mesial marginal ridge, being more nearly at right angles to the axis of crown and root.

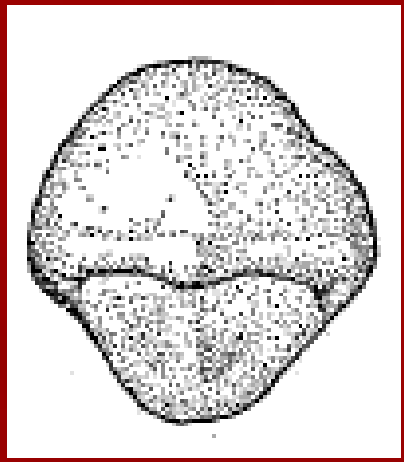


Occlusal Aspect

Dr.Aditi Murari

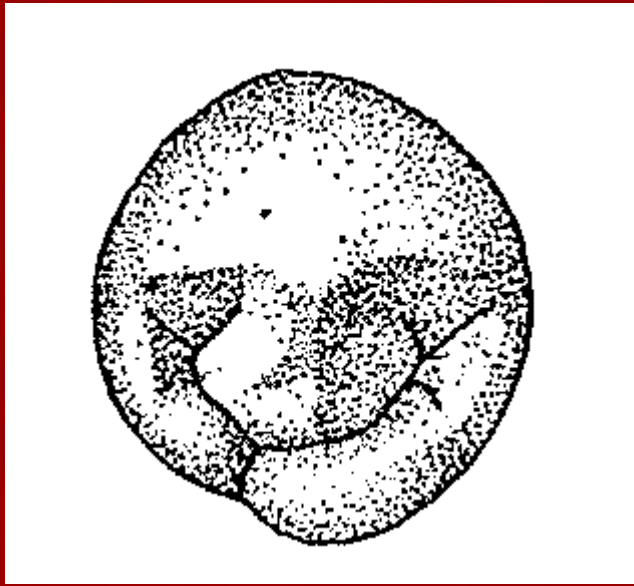
- The usual outline form of the mandibular first premolar from the occlusal aspect is roughly diamond-shaped and similar to the incisal aspect of mandibular canines.



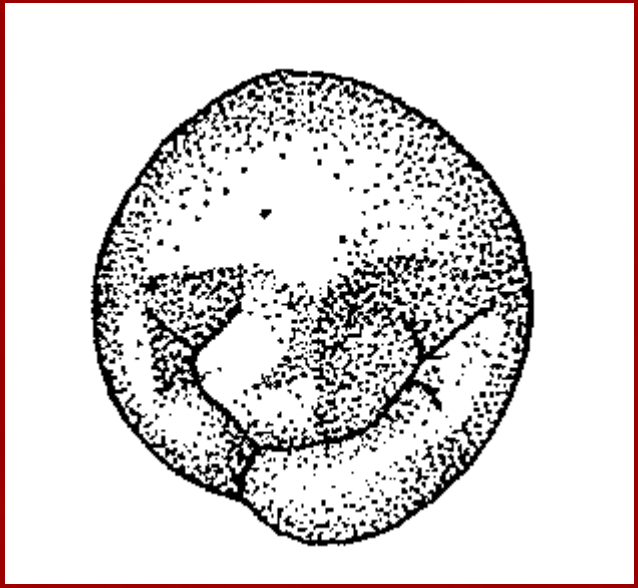


- The characteristics common to all mandibular first premolars:

1. The middle buccal lobe makes up the major bulk of the tooth crown.
2. The buccal ridge is prominent.
3. The mesio-buccal and disto-buccal line angles are prominent even though rounded.
4. The crown converges sharply to the center of the lingual surface.



5. The marginal ridges are well developed.
6. The lingual cusp is small.
7. The occlusal surface shows a heavy buccal triangular ridge and a small lingual triangular ridge.
8. The occlusal surface harbors two depressions. These are called the *mesial and distal fossae.*



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	7.5	6.5	1.0	0.0

CHRONOLOGY:

First evidence of calcification	4-5 months
Crown completion	6-7 years
Eruption	11-12 years
Root completion	13-15 years

- Traits: particular quality of person's character.

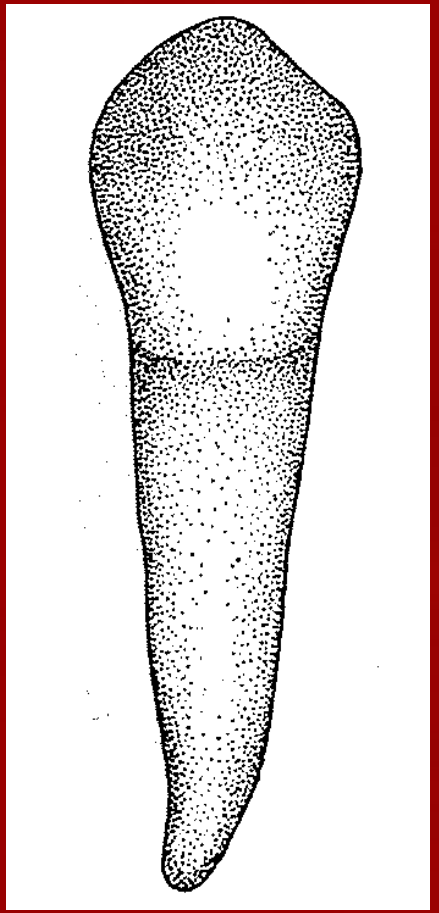
  4 traits-
- Set traits: permanent or deciduous
- Arch traits: maxillary or Mandibular
- Class traits: incisor or canine or premolar or molar
- Type traits: first or second.

TRAITS TO DIFFERENTIATE MANDIBULAR RIGHT FROM LEFT PREMOLARS: BUCCAL VIEWS

MANDIBULAR FIRST PREMOLAR

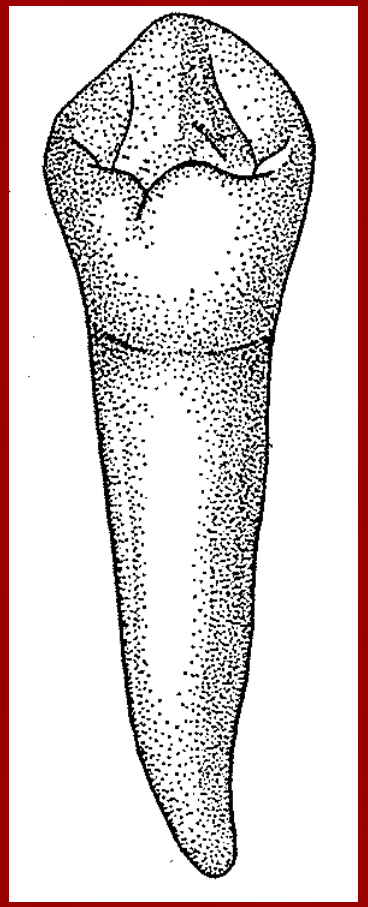
Mesial cusp ridge notch more common

Mesial cusp ridge notch more common



TRAITS TO DIFFERENTIATE MANDIBULAR RIGHT FROM LEFT PREMOLARS: UNIQUE ON LINGUAL VIEWS

- MANDIBULAR FIRST PREMOLAR
- Mesial marginal ridge lower than distal
- Mesiolingual groove often present



Mandibular 2ND Premolars

Dr.Aditi Murari

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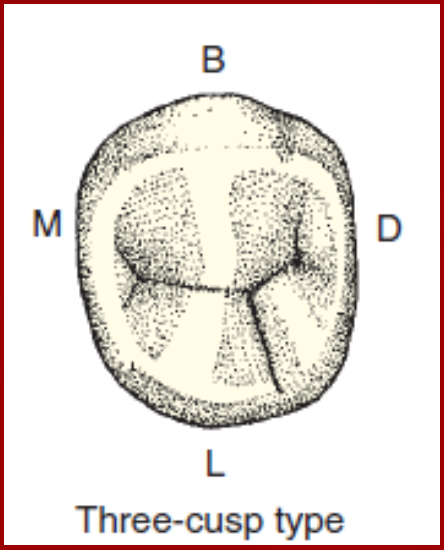
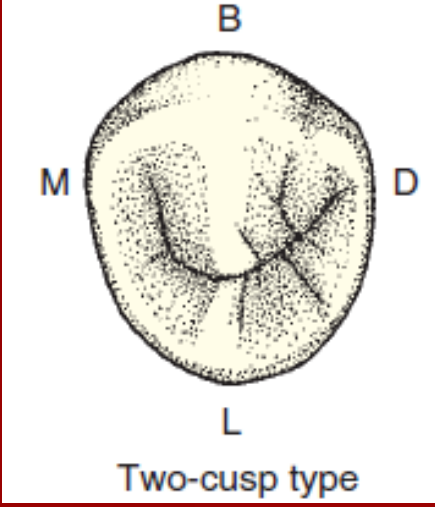
- The mandibular second premolar resembles the mandibular first premolar from the buccal aspect only.
- Although the buccal cusp is not as pronounced, the mesiodistal measurement of the crown and its general outline are similar.
- The tooth is larger and has better development in other respects.

This tooth assumes **two common forms**.

- The first form, which probably occurs most often, is the three-cusp type, which appears more angular from the occlusal aspect.
- The second form is the two-cusp type, which appears more rounded from the occlusal aspect.



Three-cusp type



Two-cusp type

- The single root of the second premolar is larger and longer than that of the first premolar.
- The root is seldom, if ever, bifurcated.

Buccal Aspect

Dr.Aditi Murari

- A shorter buccal cusp than the first premolar, with mesiobuccal and distobuccal cusp ridges showing angulation of less degree.
- The contact areas, both mesial and distal, are broad.
- The contact areas appear to be higher because of the short buccal cusp.

- The root is broader mesiodistally than that of the first premolar.
- The root ends in an apex that is more blunt.

❖In other respects, the two teeth are quite similar from this aspect.

Lingual Aspect

Dr.Aditi Murari

- The variations are as follows:

1. The lingual lobes are developed to a greater degree, which makes the cusp or cusps (depending on the type) longer.
2. Less of the occlusal surface may be seen from this aspect.

3. In the three-cusp type, the lingual development brings about the greatest variation between the two teeth.

- Mesiolingual (larger and the longer)
- Distolingual cusps
- A groove is between them, extending a very short distance on the lingual surface and usually centered over the root.

- The lingual surface of the crown of all mandibular second premolars is smooth and spheroidal, having a bulbous form above the constricted cervical portion.
- The root is wide lingually, although not quite as wide as the buccal portion.
- The lingual portion of the root is smoothly convex for most of its length.

❖Considered overall, the second premolar is the larger of the two mandibular premolars.

Mesial Aspect

Dr.Aditi Murari

The second premolar differs from the first premolar as follows:

1. The crown and root are wider buccolingually.
2. The buccal cusp is not as nearly centered over the root trunk, and it is shorter.
3. The lingual lobe development is greater.
4. The marginal ridge is at right angles to the long axis of the tooth.

5. Less of the occlusal surface may be seen.
6. No mesiolingual developmental groove.
7. The root is longer and slightly convex on the mesial surface.
8. The apex of the root is usually more blunt on the second premolar.

Distal Aspect

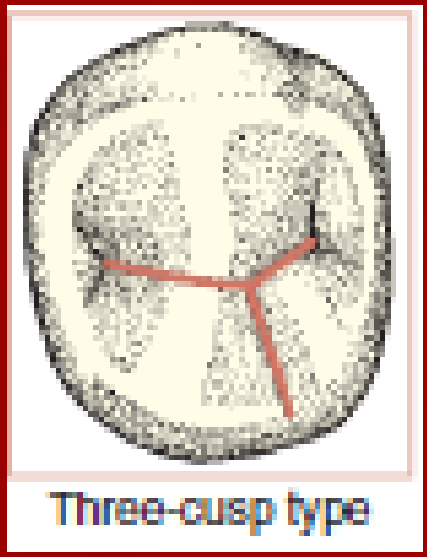
Dr.Aditi Murari

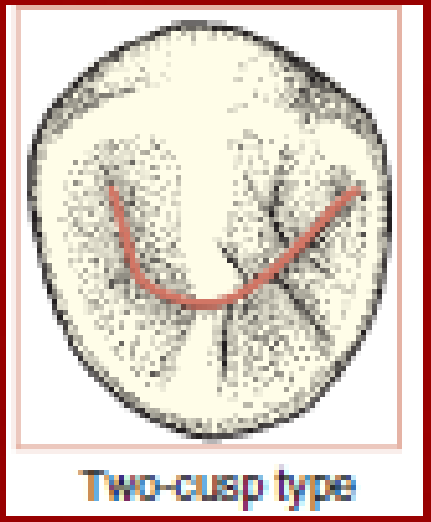
- The distal aspect of the mandibular second premolar is similar to the mesial aspect, except that more of the occlusal surface may be seen.
- This is possible because the distal marginal ridge is at a lower level than the mesial marginal ridge when the tooth is posed vertically.

Occlusal Aspect

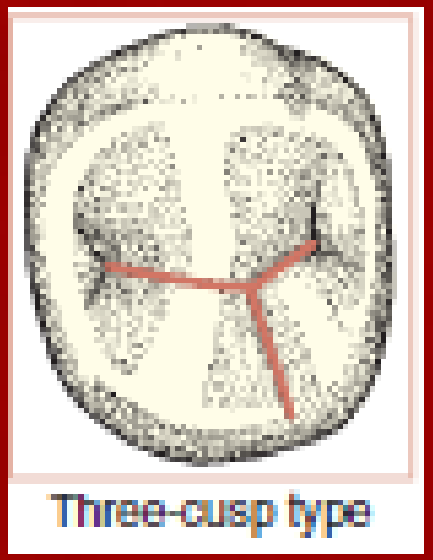
Dr.Aditi Murari

- Two common forms of this tooth are evident.
- The two types are similar in that portion that is buccal to the mesiobuccal and distobuccal cusp ridges.
- The three-cusp type appears square lingual to the buccal cusp ridges when highly developed.
- The round, or two-cusp, type appears round lingual to the buccal cusp ridges.

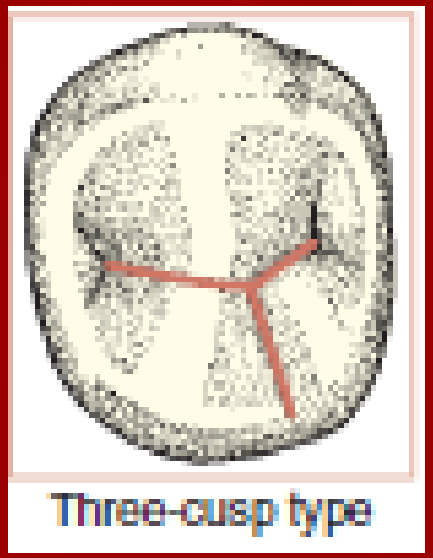

Three-cusp type


Two-cusp type

- The buccal cusp is the largest, the mesiolingual cusp is next, and the distolingual cusp is the smallest.
- Each cusp has well-formed triangular ridges separated by deep developmental grooves. These grooves converge in a **central pit** and form a Y shape on the occlusal surface.

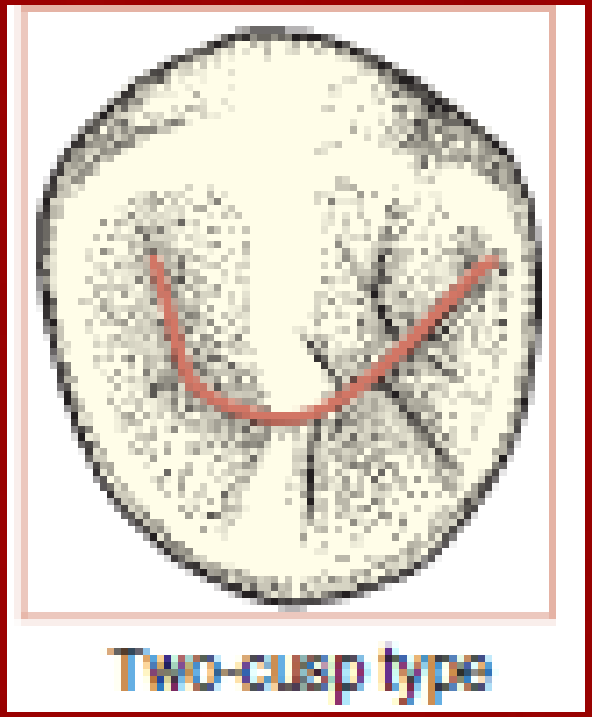


- The central pit is located midway between the buccal cusp ridge and the lingual margin of the occlusal surface.
- **Mesial triangular fossa**
- **Distal triangular fossa**
- The lingual developmental groove extends lingually between the two lingual cusps and ends on the lingual surface of the crown
- The mesiolingual cusp is wider mesiodistally.

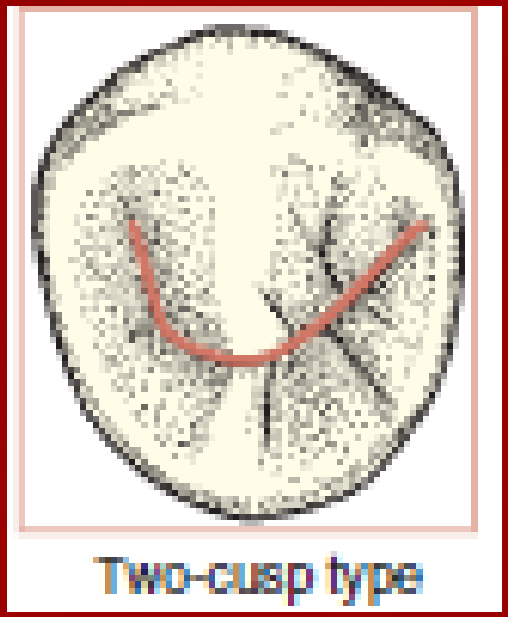


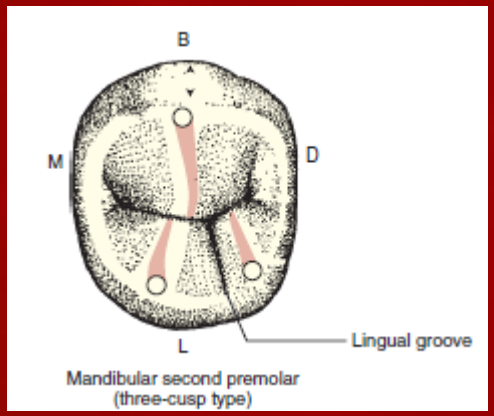
- The round or two-cusp type differs considerably from the three-cusp type when viewed from the occlusal aspect.
- The occlusal characteristics of the two-cusp type are as
- follows:

1. The outline of the crown is rounded lingual to the buccal cusp ridges.
2. Some lingual convergence of mesial and distal sides occurs.



3. The mesiolingual and distolingual line angles are rounded.
4. A **central developmental groove-** in a mesiodistal direction.
5. This groove may be straight, but it is most often crescent-shaped.
6. ***mesial* and *distal fossae*,**
7. The transverse ridge from buccal cusp to lingual cusp.





Mandibular second premolar
(three-cusp type)

Dr.Aditi Murari

TRAITS TO DISTINGUISH MANDIBULAR FIRST FROM SECOND PREMOLAR: BUCCAL VIEWS

MANDIBULAR FIRST PREMOLAR	MANDIBULAR SECOND PREMOLAR
• Longer crown	• Shorter wider crown
• More crown taper from contact to cervix	• Crown relatively wider at cervix
• More pointed cusp	• Less pointed cusp
• More prominent buccal ridge	• Less prominent buccal ridge
• Shorter root with pointed apex	• Longer root with blunt apex

TRAITS TO DISTINGUISH MANDIBULAR FIRST FROM SECOND PREMOLAR: LINGUAL VIEWS

MANDIBULAR FIRST PREMOLAR	MANDIBULAR SECOND PREMOLAR
One lingual cusp	Most have two lingual cusps
Crown much narrower on lingual	Crown quite wide on lingual
Lingual cusp very short, nonfunctional	Lingual cusp (or mesiolingual cusp) not as short as on firsts
Mesiolingual groove	Lingual groove between two lingual cusps
Mesial marginal ridge lower than distal	Distal marginal ridge lower than mesial

TRAITS TO DISTINGUISH MANDIBULAR FIRST FROM SECOND PREMOLAR: PROXIMAL VIEWS

MANDIBULAR FIRST PREMOLAR	MANDIBULAR SECOND PREMOLAR
Mesial marginal ridge lower and parallel to buccal triangular ridge	Mesial marginal ridge higher and more horizontal
Severe lingual crown tilt	Less lingual crown tilt
Lingual cusp much shorter than buccal cusp	Lingual cusp somewhat shorter than buccal cusp
Can see much of occlusal from mesial	Cannot see much of occlusal from mesial
Mesiolingual groove on most seen from mesial	Two lingual cusps on most visible from distal

TRAITS TO DISTINGUISH MANDIBULAR FIRST FROM SECOND PREMOLAR: OCCLUSAL VIEWS

MANDIBULAR FIRST PREMOLAR	MANDIBULAR SECOND PREMOLAR
Outline diamond shaped	Outline nearly square or round
Smaller occlusal table	Larger occlusal table
Outline converges toward lingual, especially on mesial	Outline may be wider on lingual on three-cusp type
Mesiolingual groove common	Lingual groove on three-cusp type
Two fossae (mesial and distal)	Two fossae (mesial and distal) on two-cusp type but three fossae on three-cusp type
Definite transverse ridge	Three-cusp type has no transverse ridge
Groove unlikely across transverse ridge	“Y” groove pattern on three-cusp type “H” or “U” groove pattern on two-cusp type
Lingual cusp smaller than buccal	Lingual half larger than buccal if two lingual cusps


Thank you!!