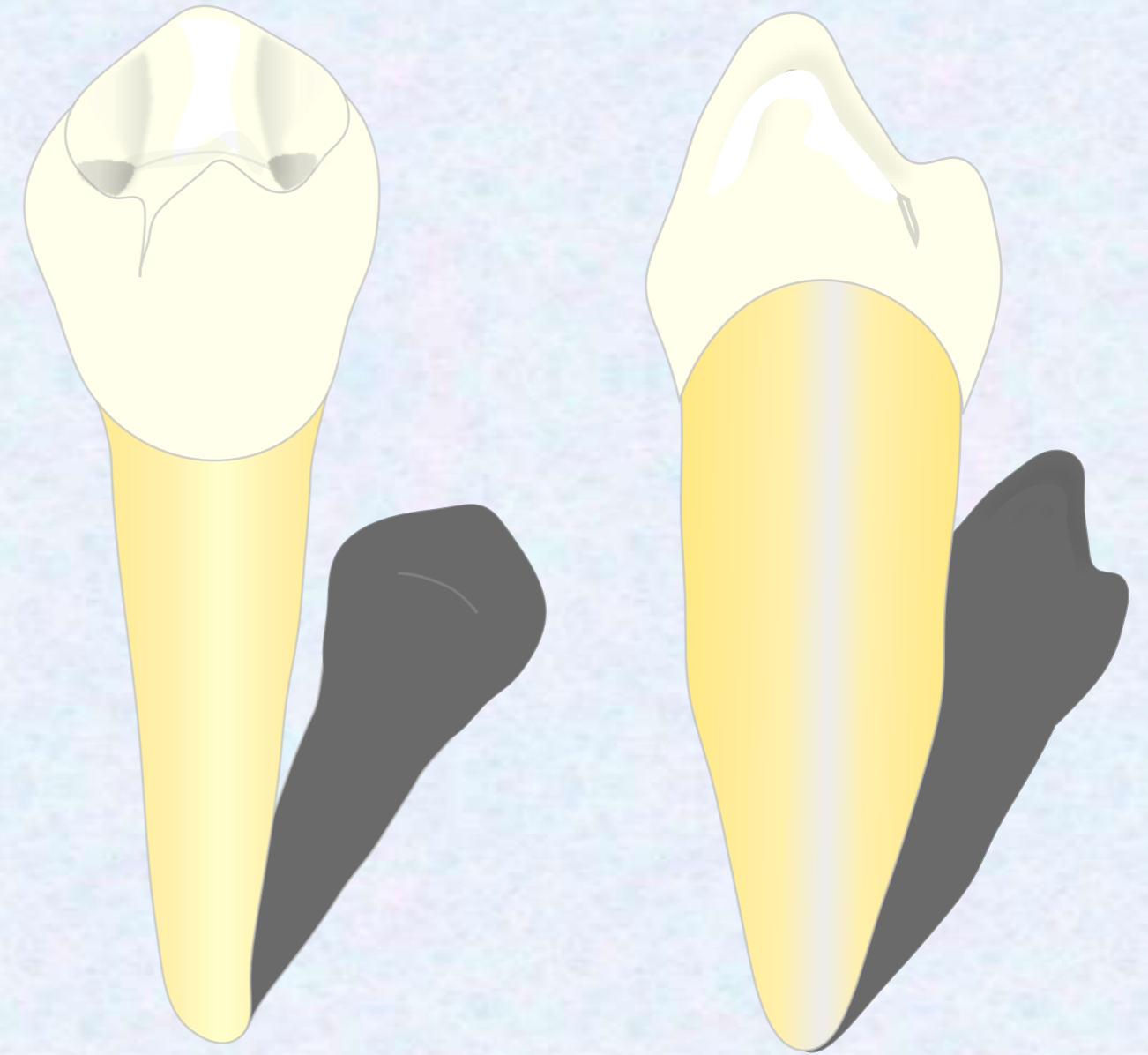

Lecture of

Mandibular Premolars

Dr. Sherif Hassan
2026



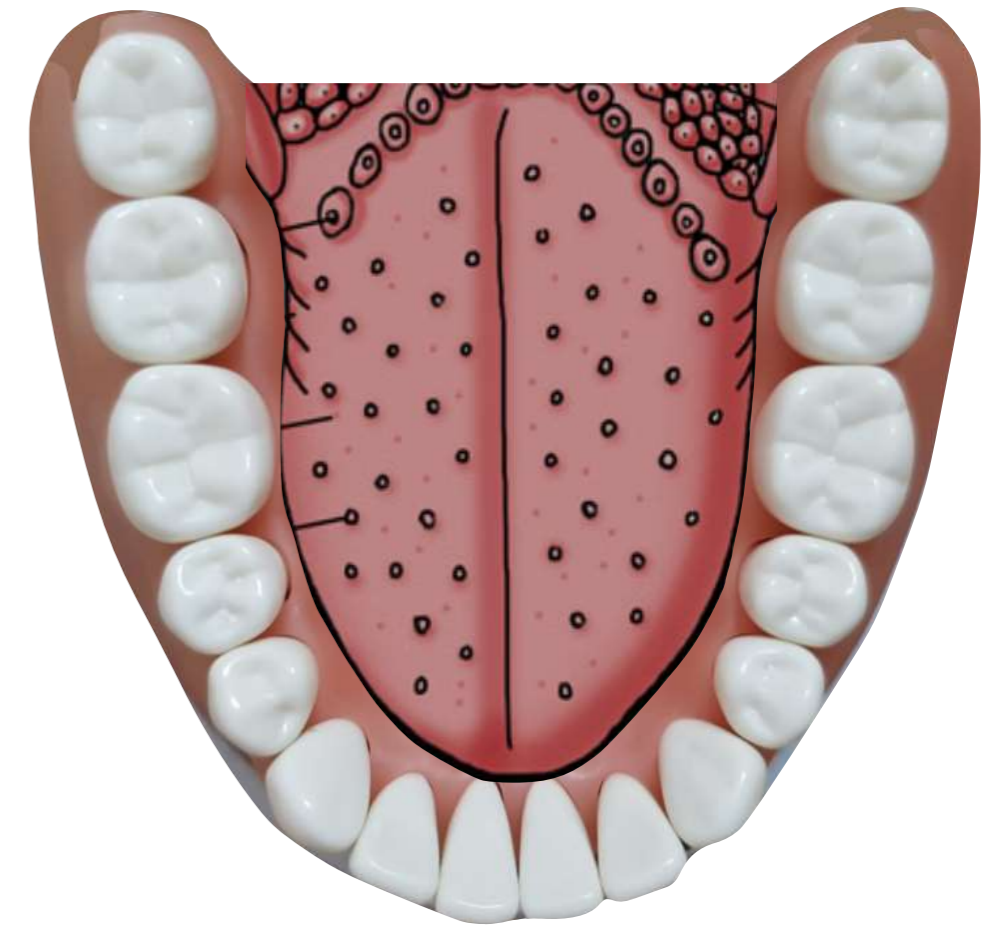
General properties of mandibular premolars

- Premolars are posterior teeth positioned between the canines and molars in the dental arch.
- They are succedaneous teeth that replace the primary first and second deciduous molars.

- Mandibular 1st Premolar have two cusps (BC and LC).
- Mandibular 2nd premolar may have 3 cusps in 80% (BC, MLC, and DLC).
- Mandibular premolars have a single root.

Functions :





- Assists canine in tearing food.
- Assists molars in crushing food.
- Assists aesthetics during smile.



Chronology

	Mandibular 1 st premolar	Mandibular 2 nd premolar
Begin Of Dental Organ	7 M.I.U.	8 M.I.U.
Begin Of Calcification	1.75 - 2 Years	2.25 - 2.5 Years
Crown Completed	5-6 Years.	6 - 7 Years.
Eruption	10-11 Years.	11-12 Years.
Root Completed	13 Years.	14 Years.

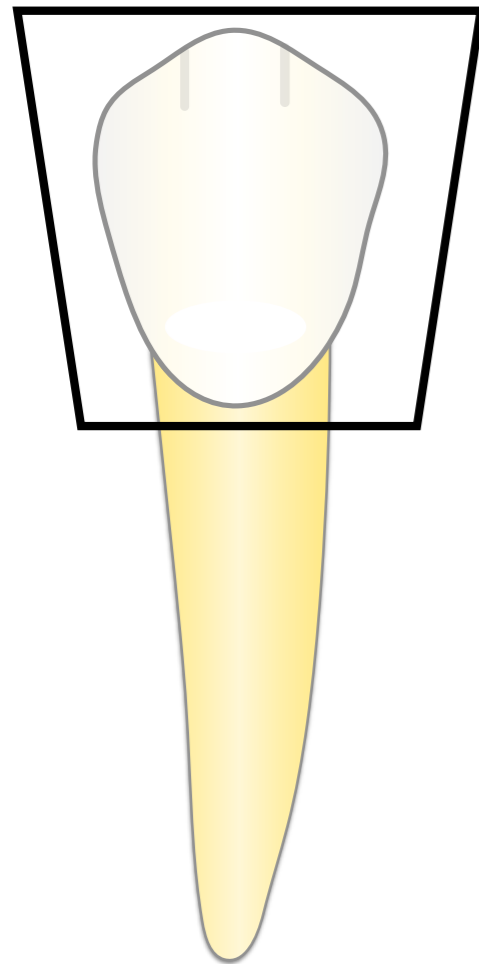
Digit System

	Mandibular 1 st premolar		Mandibular 2 nd premolar	
	Right	Left	Right	Left
Palmar notation system				
FDI system	44	34	45	35
Universal system	# 28	# 21	# 29	# 20

Geometric outline

of mandibular premolars

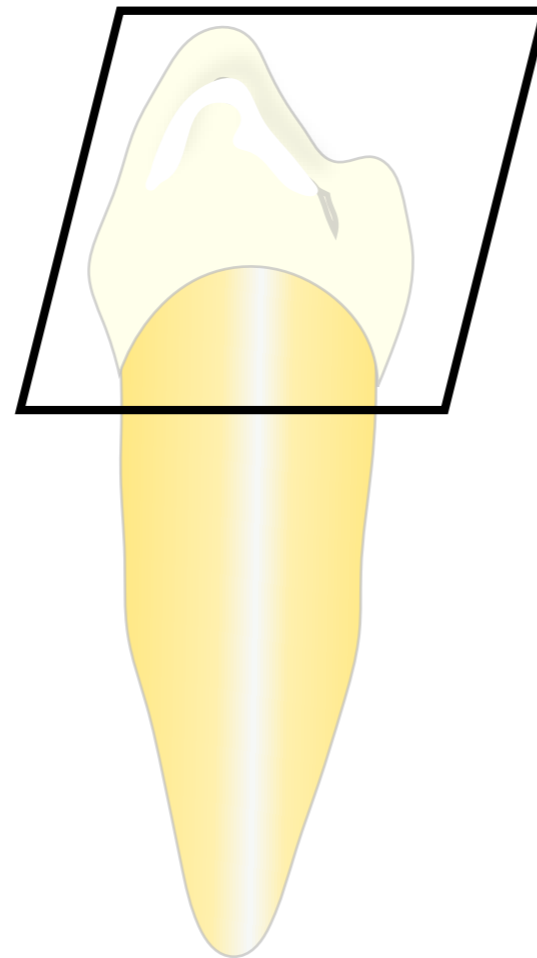
Buccal & Lingual aspects



Trapezoid shape

- Long side toward occlusal.
- Short side toward cervical line.

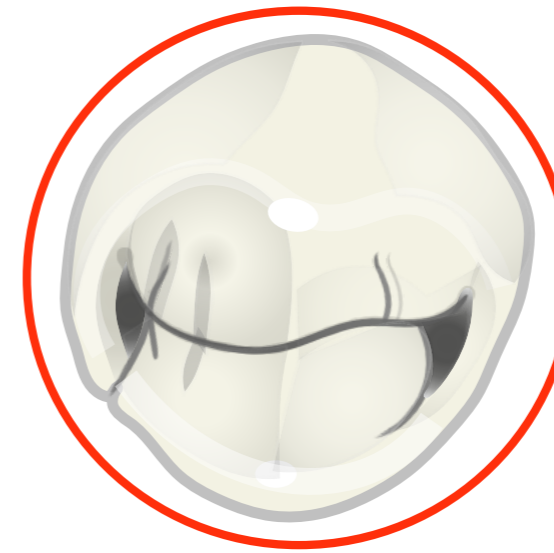
Mesial & Distal aspects



Rhomboidal shape

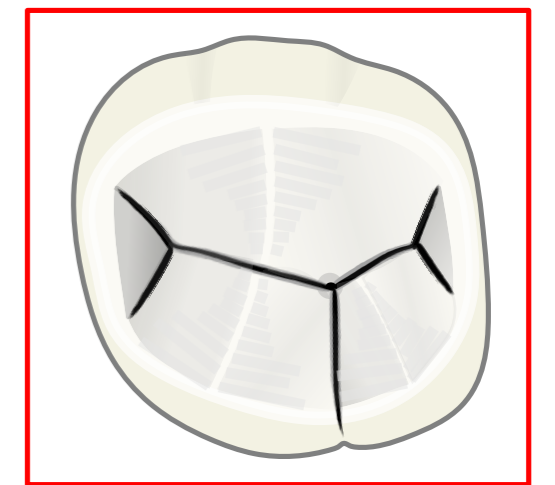
- Long side toward cervical line.
- Short side toward occlusal.

Occlusal aspects
Of mandibular 1st premolar



Round shape

Occlusal aspects
Of mandibular 2nd premolar





Mandibular First Premolar

Buccal Aspect of Mandibular 1st Premolar

Outline

Mesial and distal outlines:

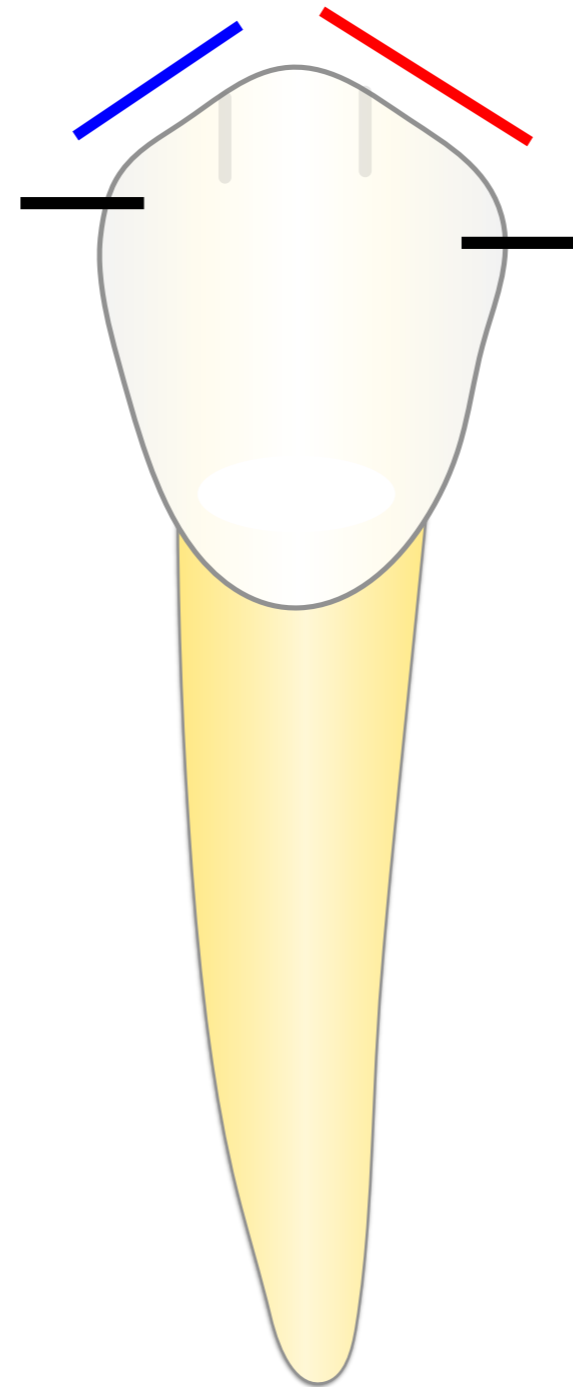
- Slightly concave.
- Mesial CA is at occlusal 1/3.
- Distal CA is at middle 1/3.

Occlusal outline:

- One buccal cusp with blunt cusp tip.
- Mesial slope is shorter than distal slope.
- The cusp tip lie mesial to the center of the tooth.

Cervical line:

- Convex toward the root.



Landmarks

Crown elevations:

1. Cervical ridge.
2. Buccal ridge..

Crown depressions:

1. Mesial developmental depression.
2. Distal developmental depression.

Root

One Root:

- One conical root with blunt apex
- Apical 1/3 curved toward distal.

Lingual Aspect of Mandibular 1st Premolar

Similar to the buccal side, but with some differences, including:

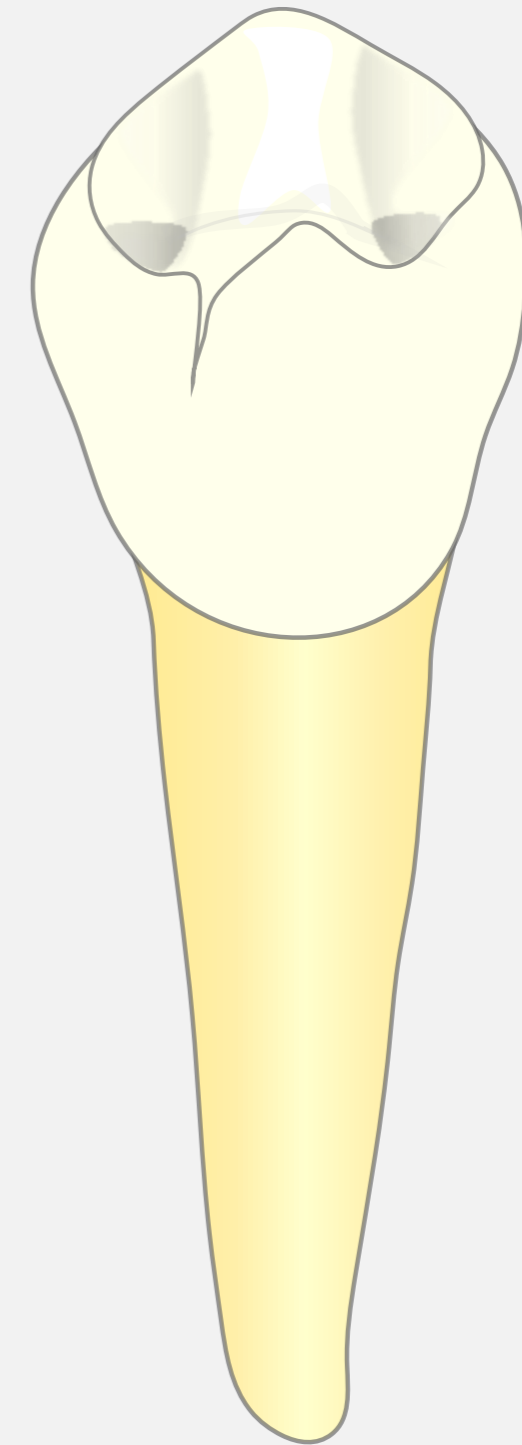
Outline

- The crown more converge Lingually and spheroid.
- The lingual cusp is about 2/3 of buccal cusp length.
- The lingual cusp is underdeveloped.
- The mesial and distal triangular fossae on the occlusal can be seen.
- Cervical line is straight or slightly convex toward root.

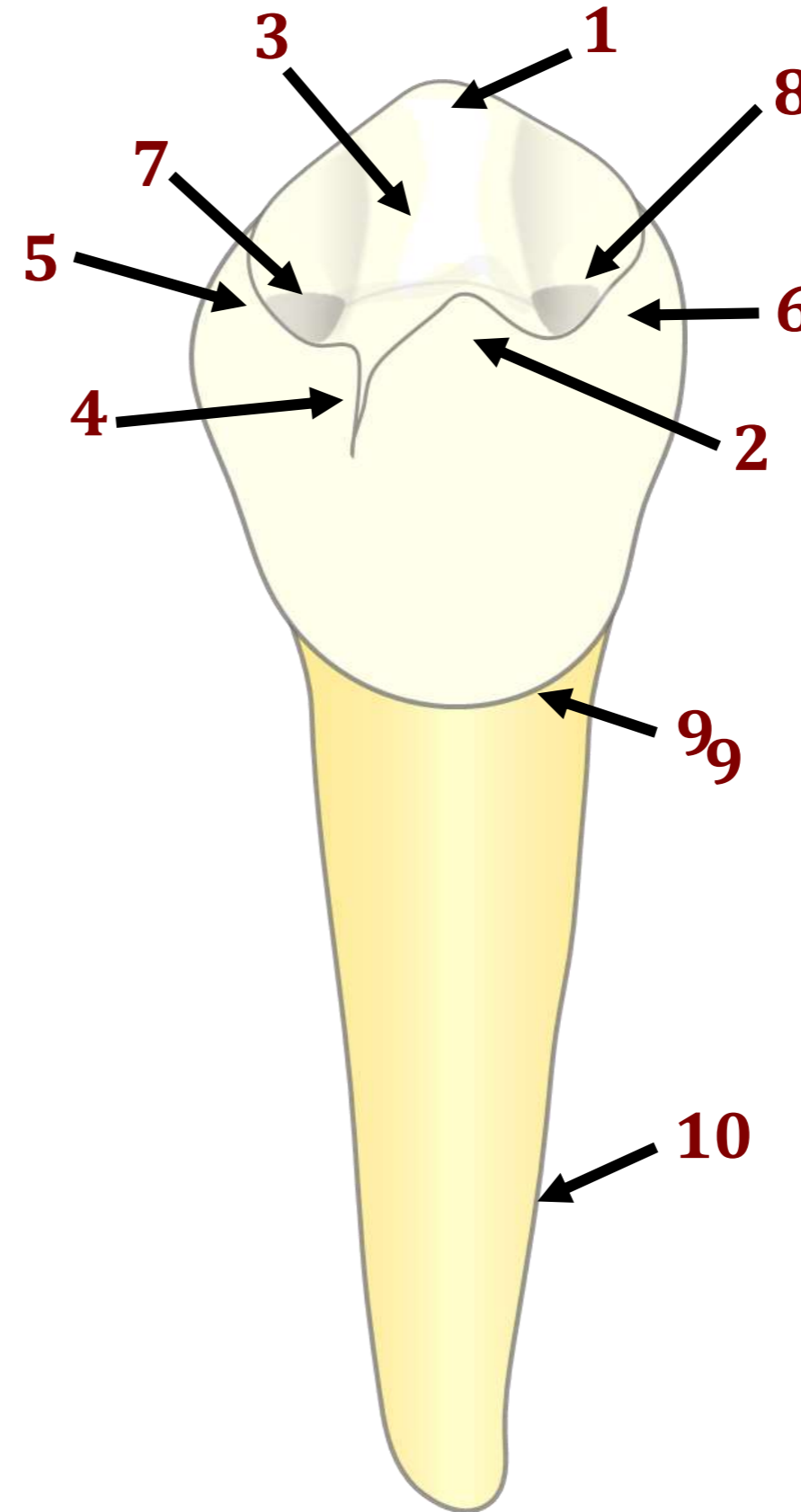
Landmarks

Mesiolingual Developmental Groove:

- It represent the characteristic feature of the lingual surface.
- It is a groove found on the mesiolingual line angle of mandibular first premolar.
- It extends from the mesial triangular fossa onto the lingual surface of the crown.
- It separates the mesial marginal ridge from the mesial slope of lingual cusp.



1. Buccal cusp.
2. Lingual cusp.
3. Transverse ridge.
4. Mesiolingual developmental groove.
5. Mesial marginal ridge.
6. Distal marginal ridge.
7. Mesial triangular fossa.
8. Distal triangular fossa.
9. Cervical line.
10. Root.



Mesial Aspect of Mandibular 1st Premolar

Outline

Buccal outline:

- Convex with the maximum convexity at cervical 1/3.

Lingual outline:

- Convex with the maximum convexity at the middle 1/3.

Occlusal outline:

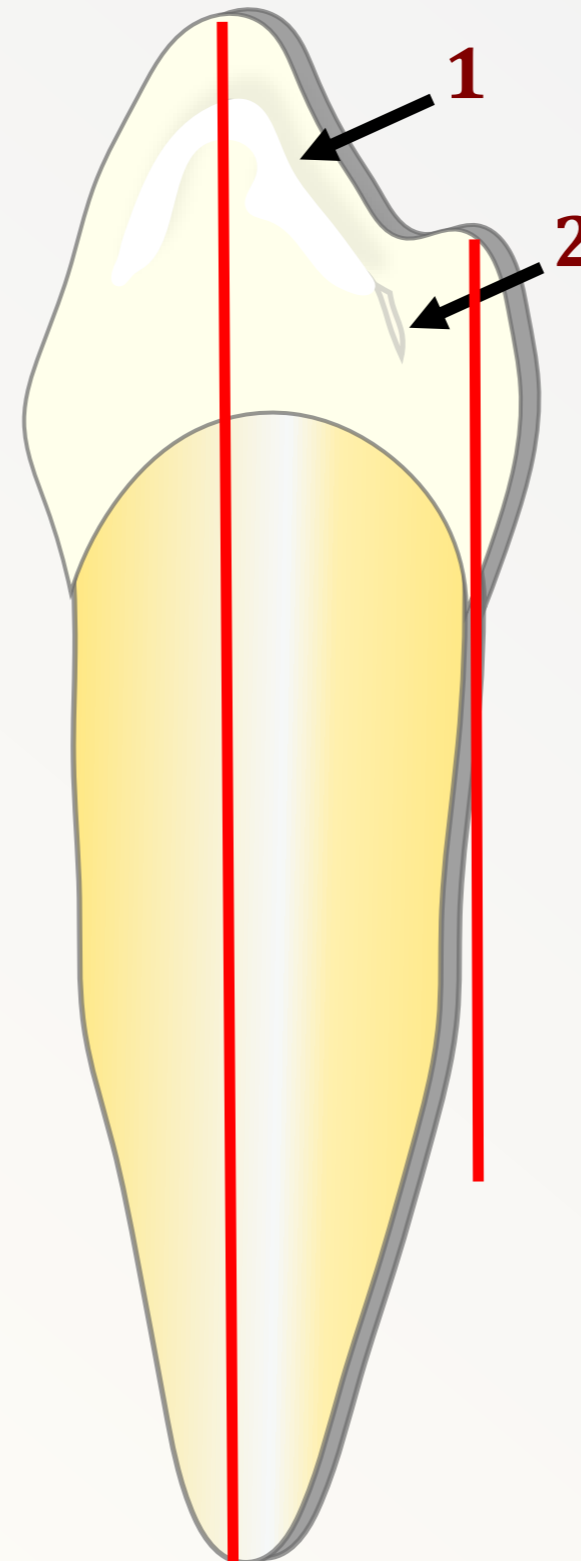
- Buccal and lingual cusps are seen.
- Buccal cusp is longer than lingual cusp.
- Lingual cusp is underdeveloped and out of occlusion.

Contact area:

- Located at the middle third related to the buccal cusp.
- Contact area is located more buccally.

Cervical line:

Convex toward the crown.



Landmarks

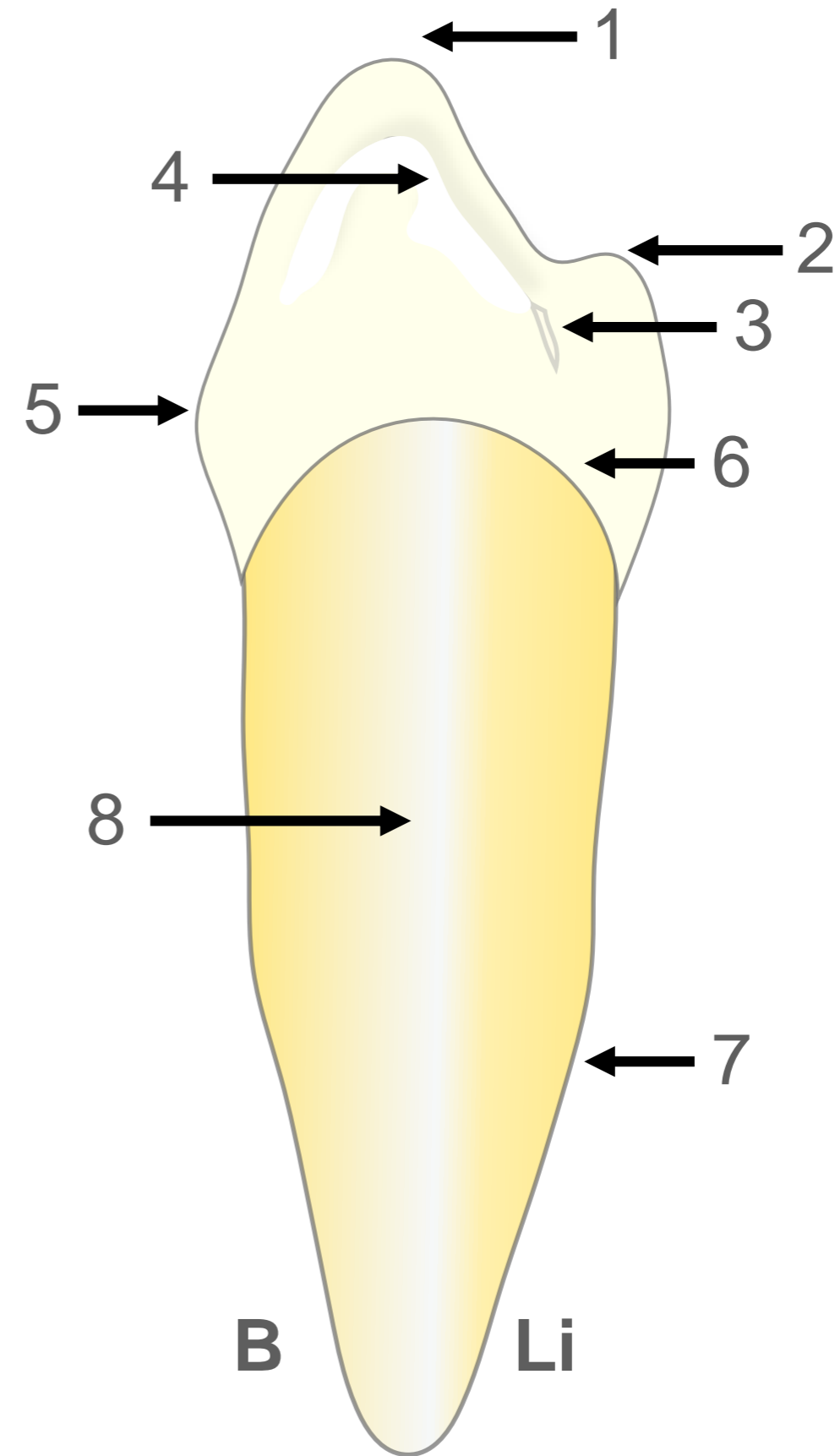
Crown elevations:

1. Mesial marginal ridge sloped lingually.

Crown depressions:

2. Mesiolingual developmental groove.
3. shallow mesial developmental depression on the root surface.

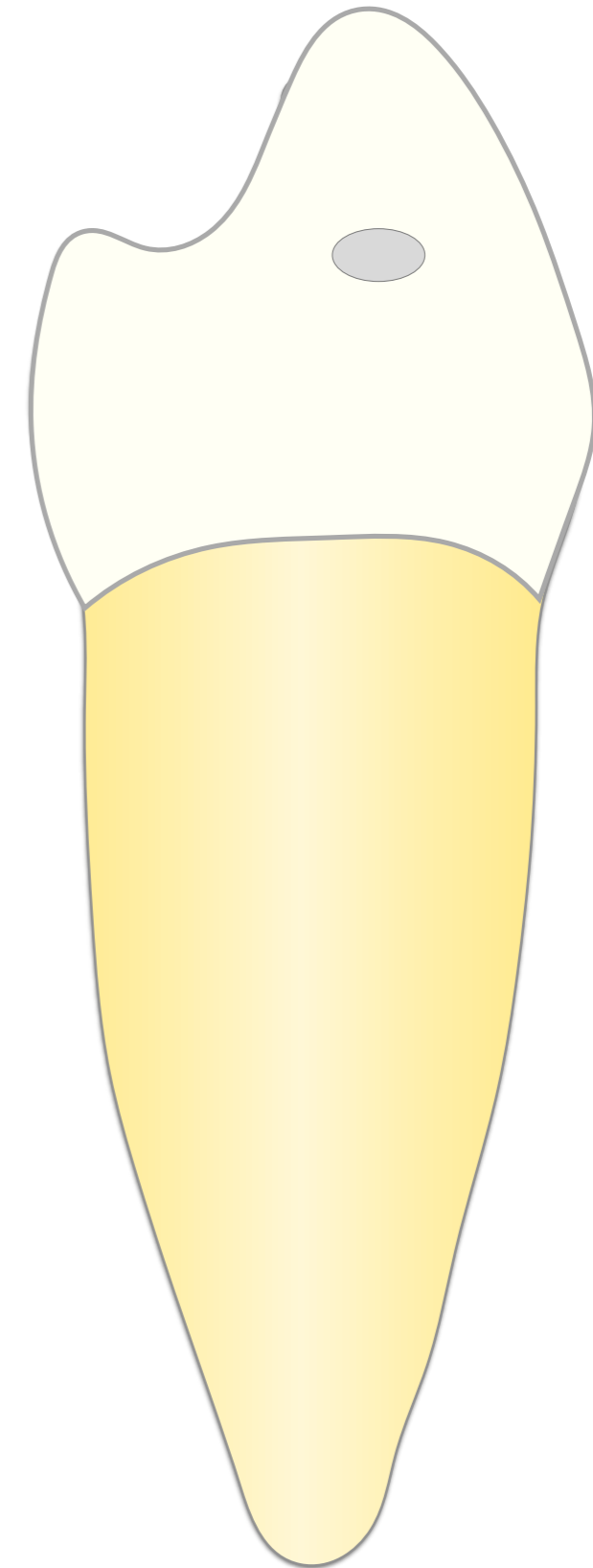
1. Buccal cusp.
2. Lingual cusp.
3. MLDG.
4. Mesial marginal ridge.
5. Cervical ridge
6. Cervical line.
7. Root.
8. MDD.



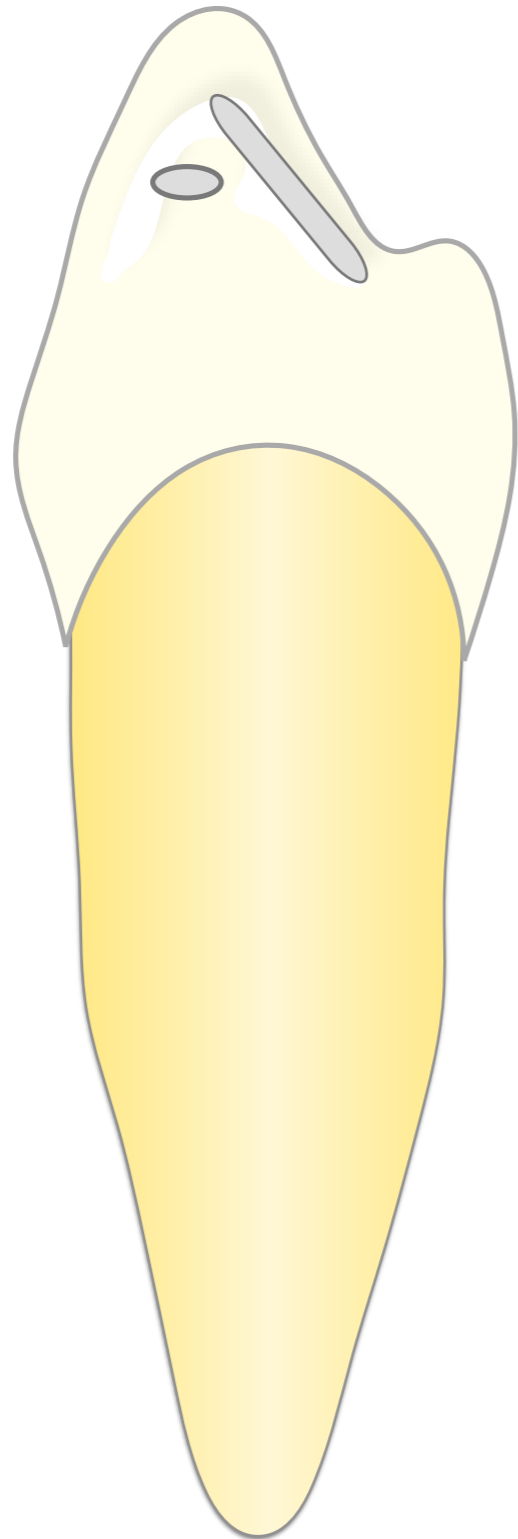
Mesial Aspect of Mandibular 1st Premolar

Like the mesial aspect with many differences

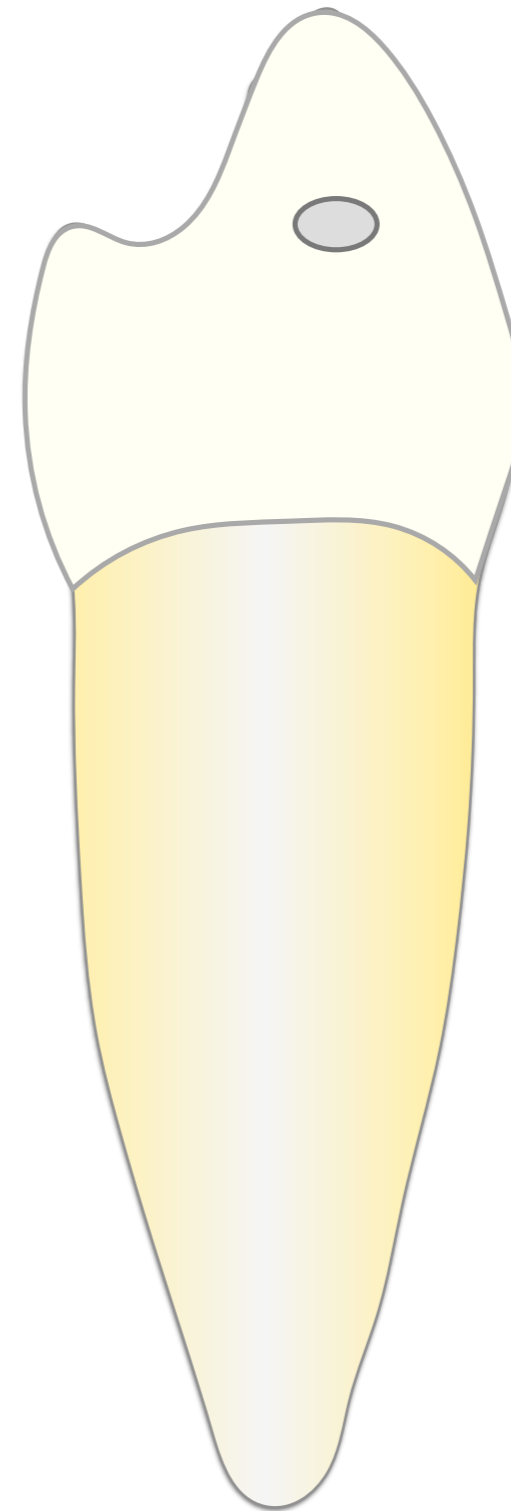
1. Distal marginal ridge is straight and horizontal.
2. No mesiolingual developmental groove.
3. The contact area is broader and more cervically.
4. Cervical line is less curved.
5. broad distal developmental depression on the root.



Mesial Aspect



Distal Aspect

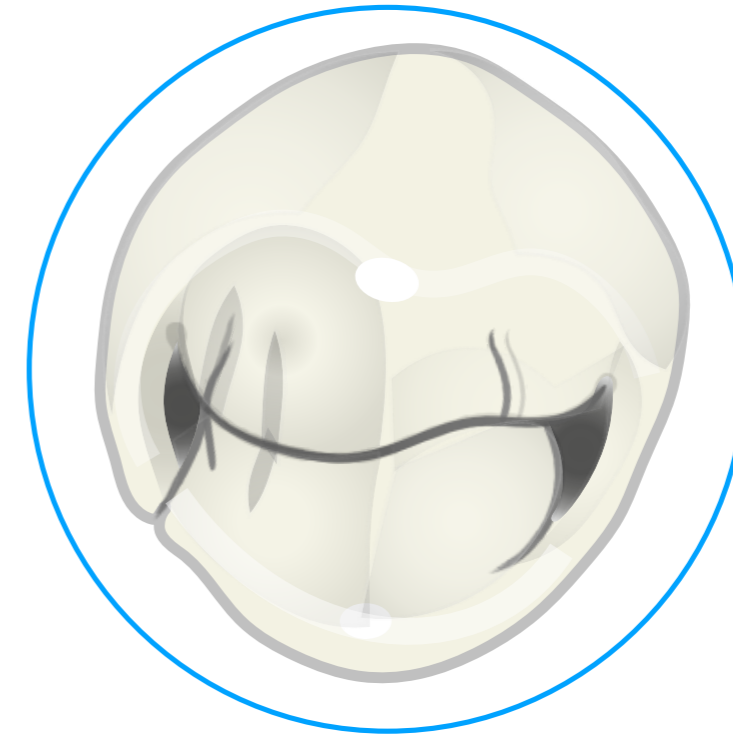


Occlusal Aspect of Maxillary 1st Premolar

Geometry ▪ Circular in shape.

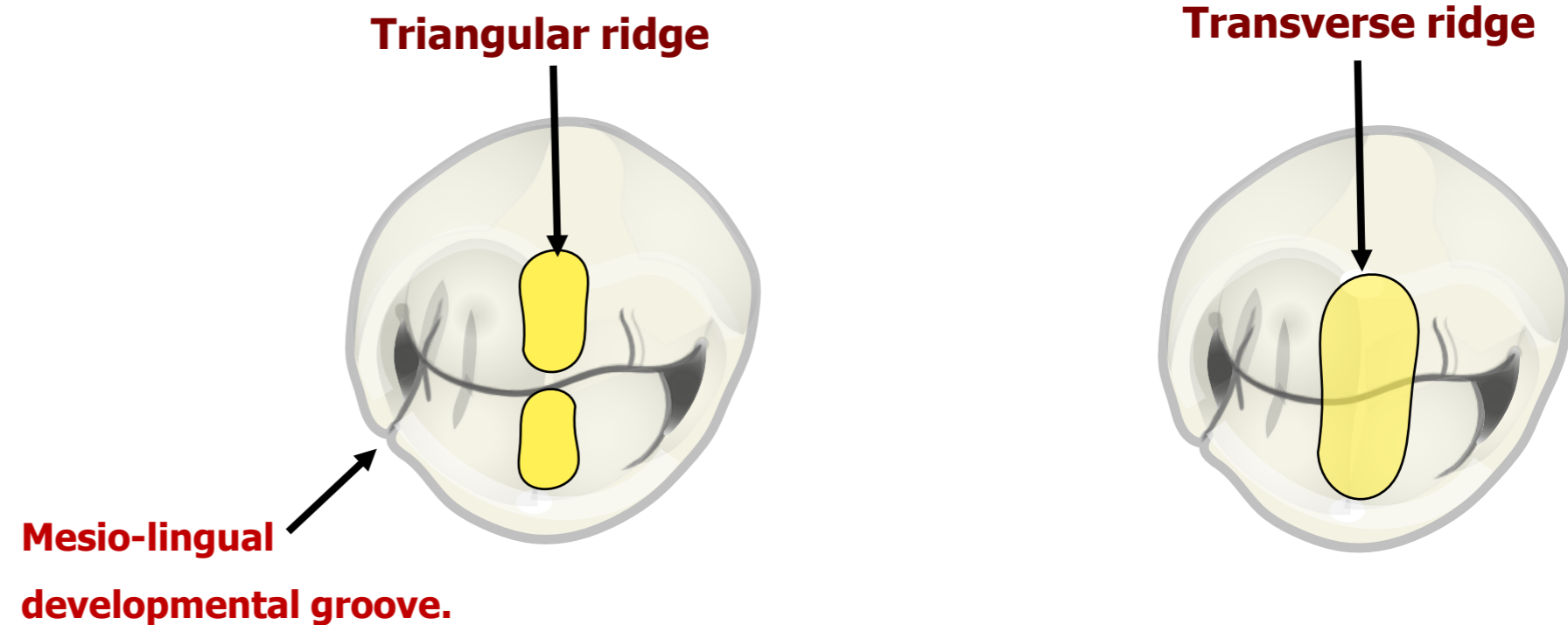
Crown elevations

1. Wide buccal cusp.
2. Narrow lingual cusps.
3. Mesial and distal marginal ridges.
4. Buccal and lingual triangular ridges.
5. Transverse ridge from buccal and lingual cusps.



Crown depressions

1. Central developmental groove.
2. Mesio-lingual developmental groove.
3. Mesial and distal triangular fossae.
4. Mesial and distal pits.



Mandibular Second Premolar

Buccal Aspect of Mandibular 2nd Premolar

Geometry

- The crown is wider than mandibular first premolar.

Outline

Mesial and distal outlines:

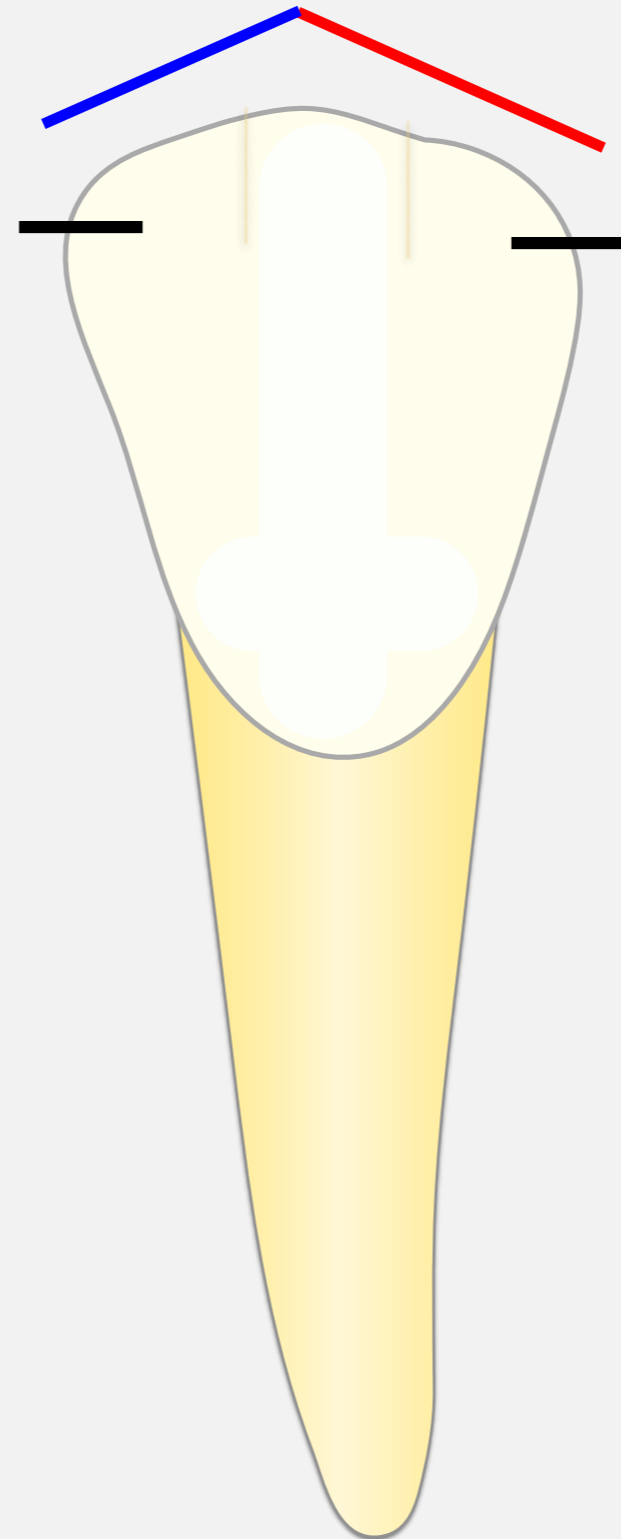
- Slightly concave.
- Mesial and distal CA is at occlusal 1/3.

Occlusal outline:

- One buccal cusp with blunt cusp tip.
- Mesial slope is shorter than distal slope.
- The cusp tip lie mesial to the center of the tooth.

Cervical line:

- Convex toward the root.



Landmarks

Crown elevations:

1. Cervical ridge.
2. Buccal ridge..

Crown depressions:

1. Mesial developmental depression.
2. Distal developmental depression.

Root

One Root:

- One conical root with blunt apex
- Apical 1/3 curved toward distal.

Lingual Aspect of maxillary 2nd premolar

Three cusp type:

1. 80% of mandibular second premolars are three cusps.
2. 20 % are two cusps and resemble the first premolars.
3. Three Cusp Type; buccal, mesiolingual, and distolingual cusps (arranged from largest).

Geometry

- ▶ Lingual aspect not converge.

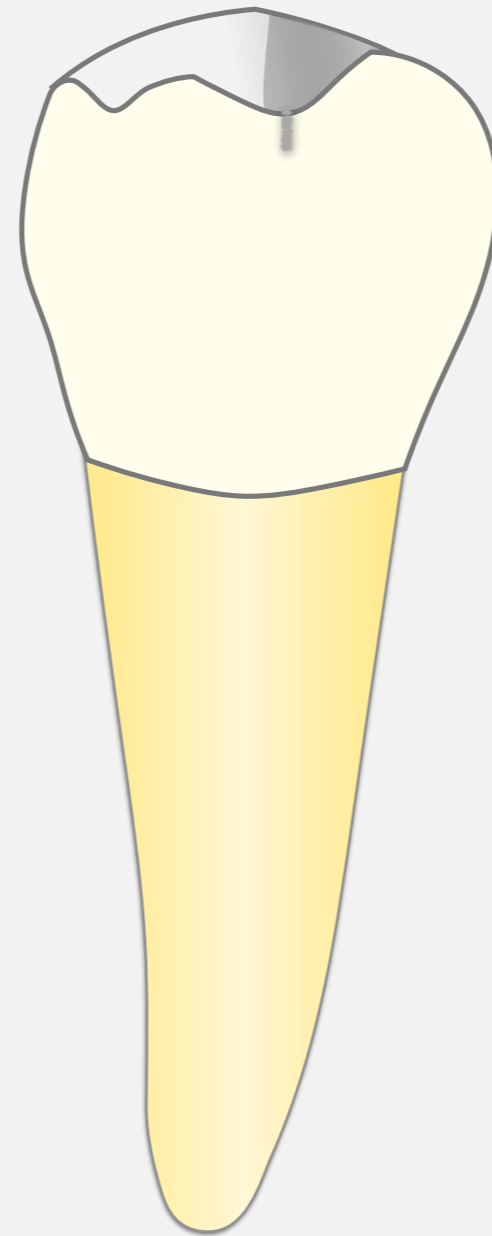
Outline

Mesial and distal outlines:

- ▶ Like the buccal aspect.

Cervical lines:

- ▶ Like the buccal aspect.



Occlusal outline:

- ▶ Three blunt cusps are seen.
- ▶ Buccal cusp is larger and longer than lingual cusps.
- ▶ Mesiolingual cusp is longer and wider than distolingual cusp.
- ▶ The two lingual cusps are separated by lingual developmental groove.

One blunt root:

- Apical 1/3 of the root is inclined distally.

Mesial Aspect of mandibular 2nd premolar

Like the mandibular 1st premolar but with many differences:

Buccal and lingual outline:

- The same of the first premolar.

Occlusal outline:

- Two cusps are seen (buccal and mesiolingual cusps).
- Mesiolingual cusp is well developed.
- Buccal is longer than mesiolingual cusps.

Contact area:

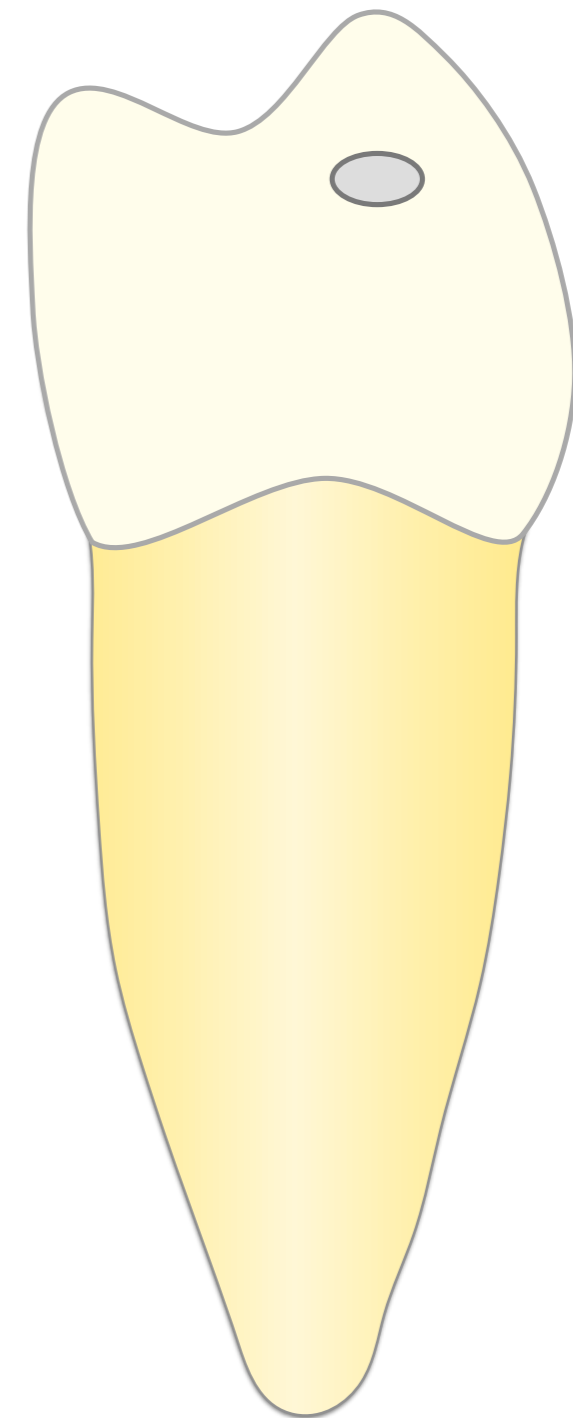
- Located more buccally at the junction between occlusal and middle 1/3.

Cervical line:

- The same of the first premolar.

One root only.

- Root is longer than mandibular first premolar with blunt apex.
- Mesial developmental depression found on the root surface.



Distal Aspect of mandibular 2nd premolar

Like the mesial aspect but with many differences:

Occlusal outline:

- Three cusps are seen (buccal, part of mesiolingual and distolingual cusps).
- Distolingual cusp is smaller than mesiolingual cusp.
- Buccal is longer than the two lingual cusps.

Contact area:

- Located more buccally at the middle 1/3.

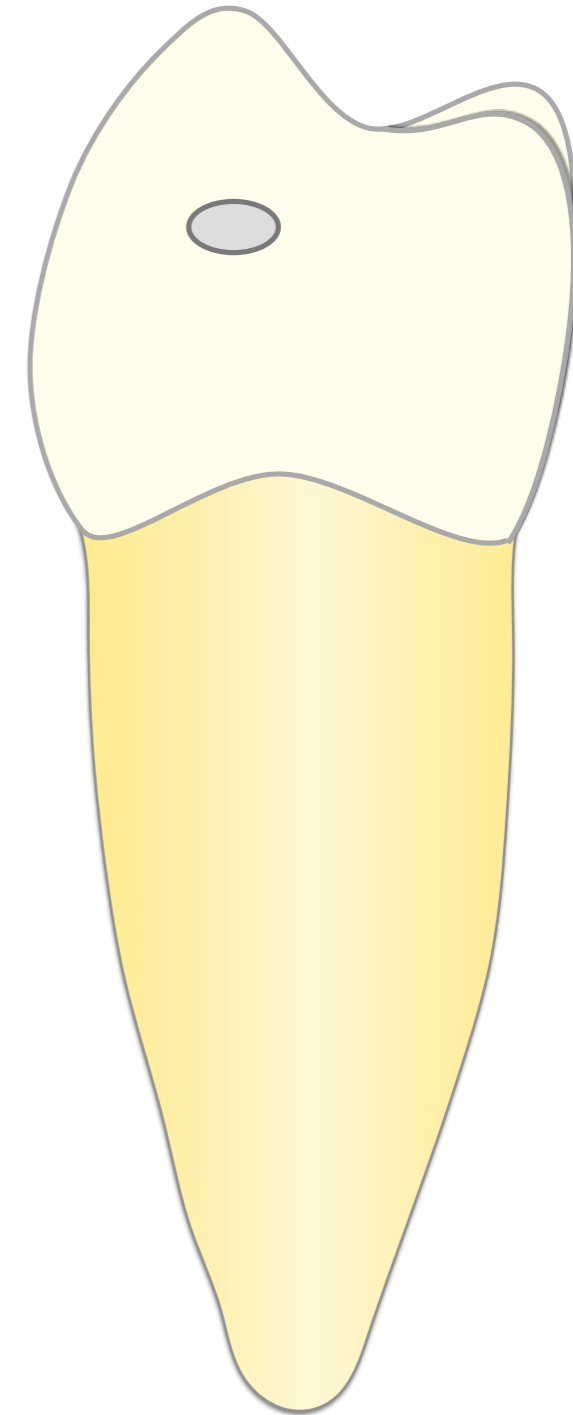
Mesial developmental depression = MDD:

Found on the root surface.

Cervical line:

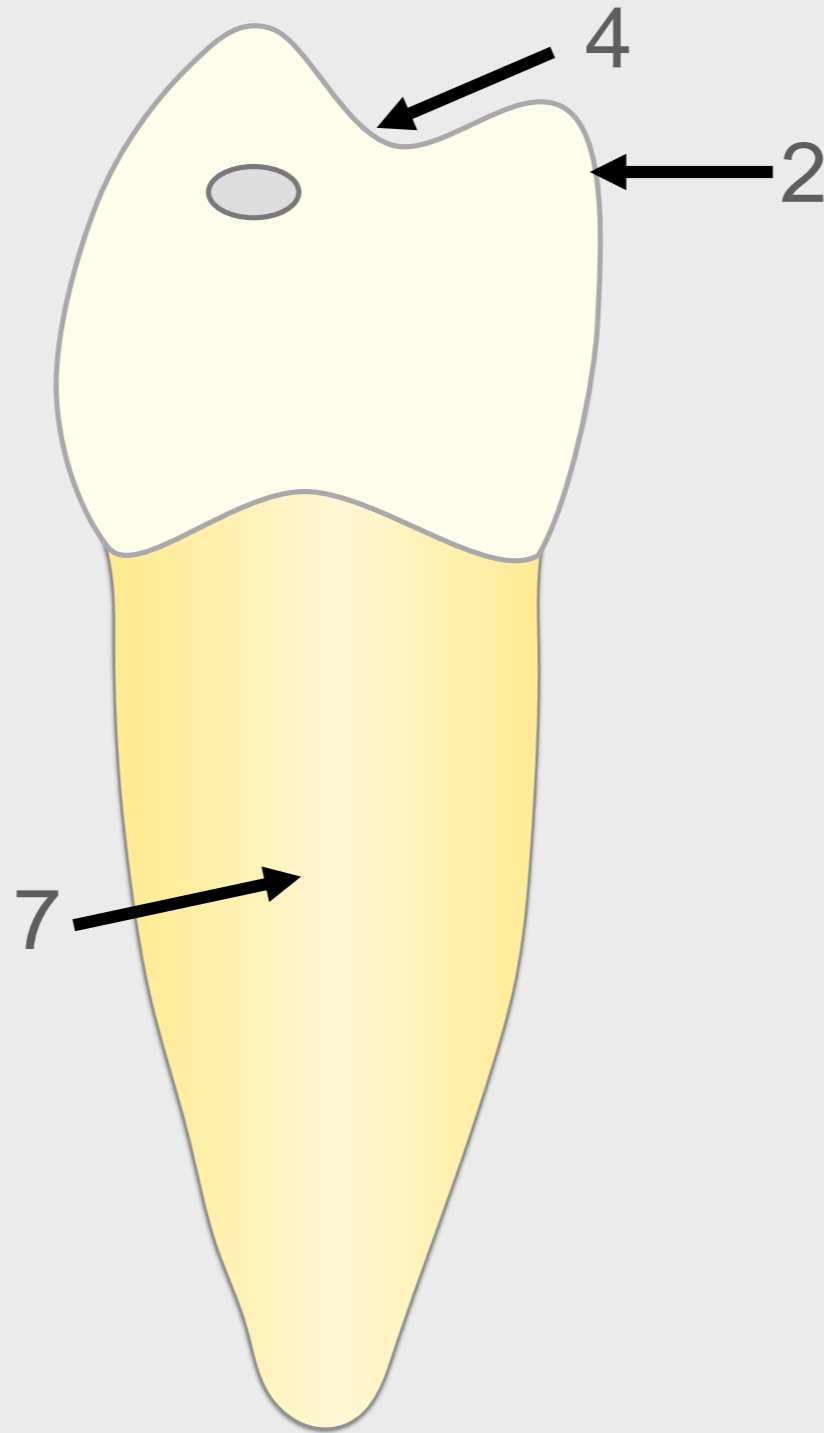
- The same of the first premolar.

One root only.

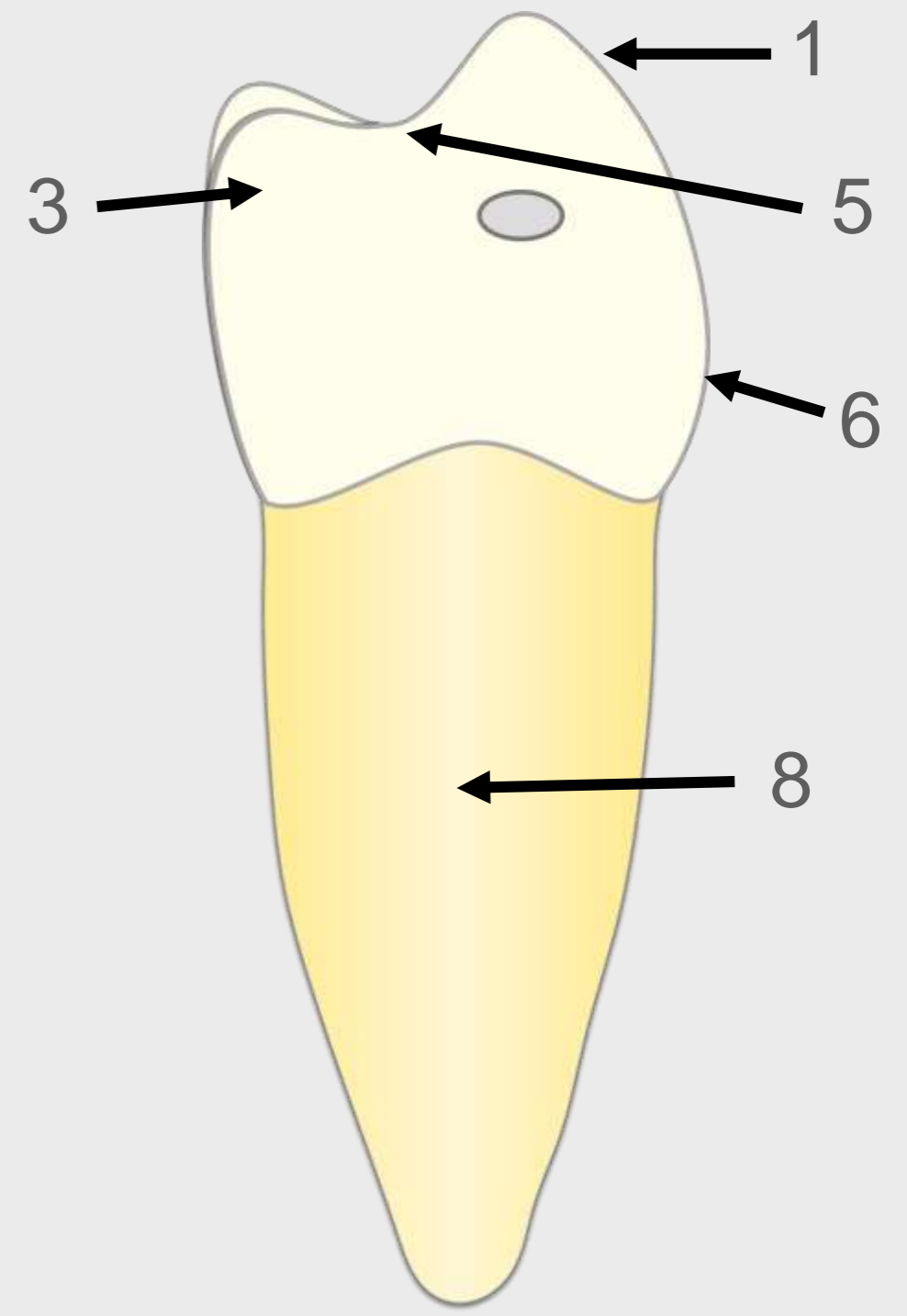


Mesial Aspect

1. Buccal cusp.
2. mesiolingual cusp.
3. Distolingual cusp.
4. Mesial marginal ridge.
5. Distal marginal ridge.
6. Cervical ridge
7. MDD.
8. DDD.



Distal Aspect



Occlusal Aspect of mandibular 2nd premolar

Three cusps

Crown Elevations:

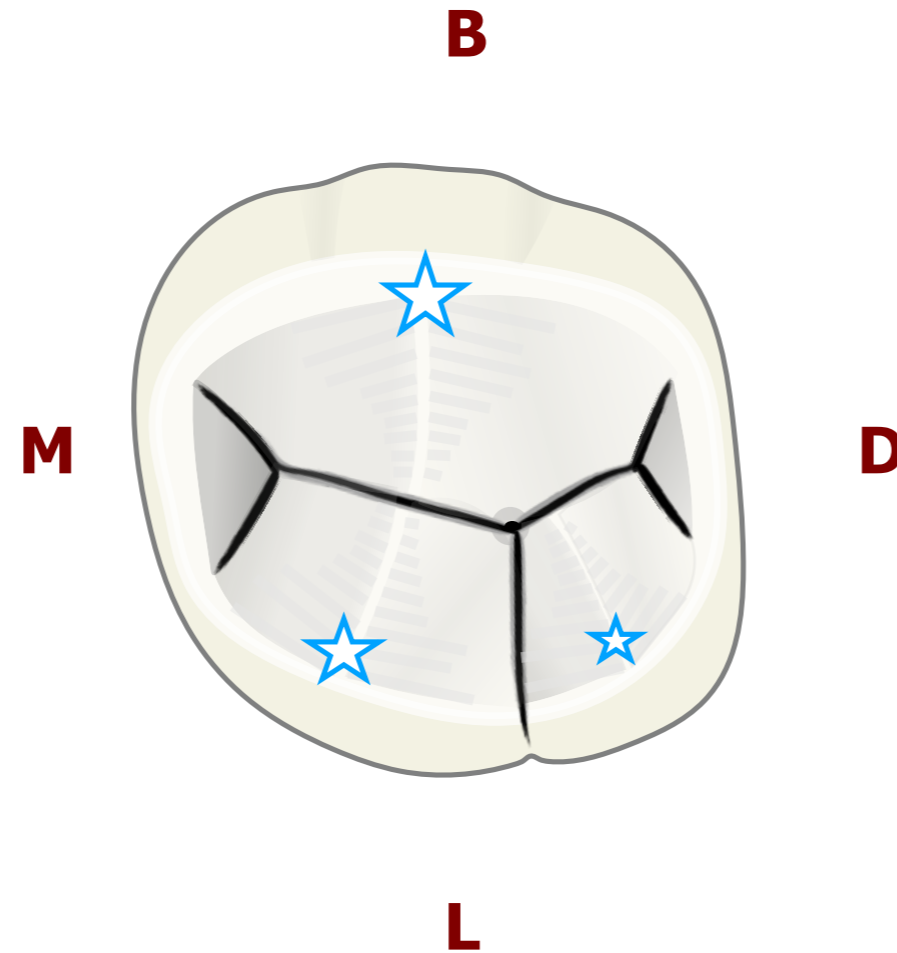
1. Three cusps:

- Buccal cusp is widest.
- Mesiolingual cusp
- Distolingual cusp is the smallest.

2. Transverse ridge:

Run between buccal and mesiolingual cusps.

3. Mesial and Distal marginal ridges.



Crown depressions:

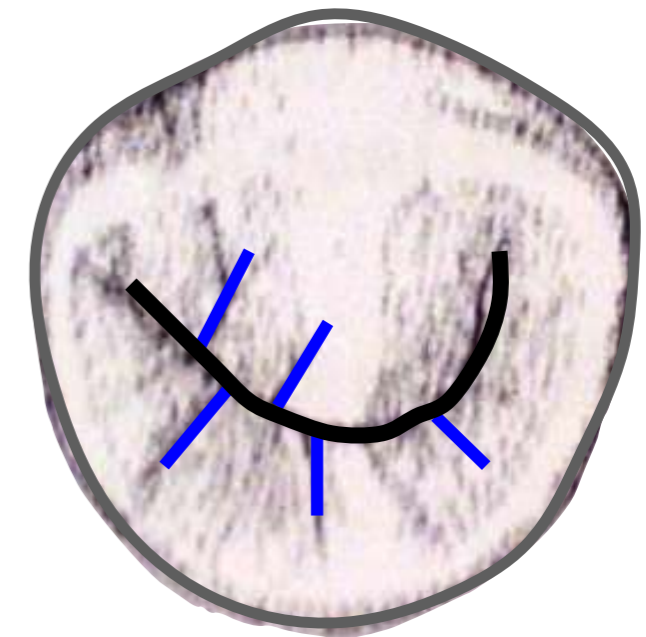
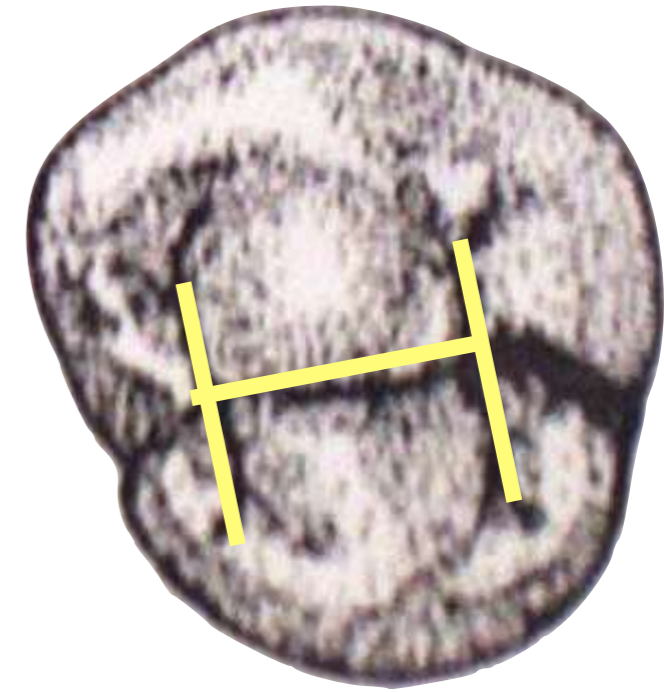
1. Central developmental groove.
2. Lingual developmental groove.
- Both grooves make Y shaped grooves.
3. Central fossa and pit.
4. Mesial and distal triangular fossae and pits.

Occlusal Aspect of mandibular 2nd premolar

Two cusps

⊙ Geometrical Shape: Round.

- It has one large buccal cusp and other small lingual cusp.
- There is lingual convergence.
- Transverse ridge run between buccal and lingual cusps.
- Central developmental groove: may be H or U shape.
- Occlusal surface has supplemental grooves.
- The mesial and distal fossae are round.



Pulp Cavity

Mandibular premolars

Pulp Cavity of mandibular premolars

1. Pulp chamber:

- The pulp chamber is wider buccolingually than mesiodistally.
- The pulp chamber is trapezoid from the mesiodistal section.
- The pulp chamber is rhomboidal from the buccolingual section.
- Apically, the pulp chamber narrows and continues into one root canal.

2. Pulp horns:

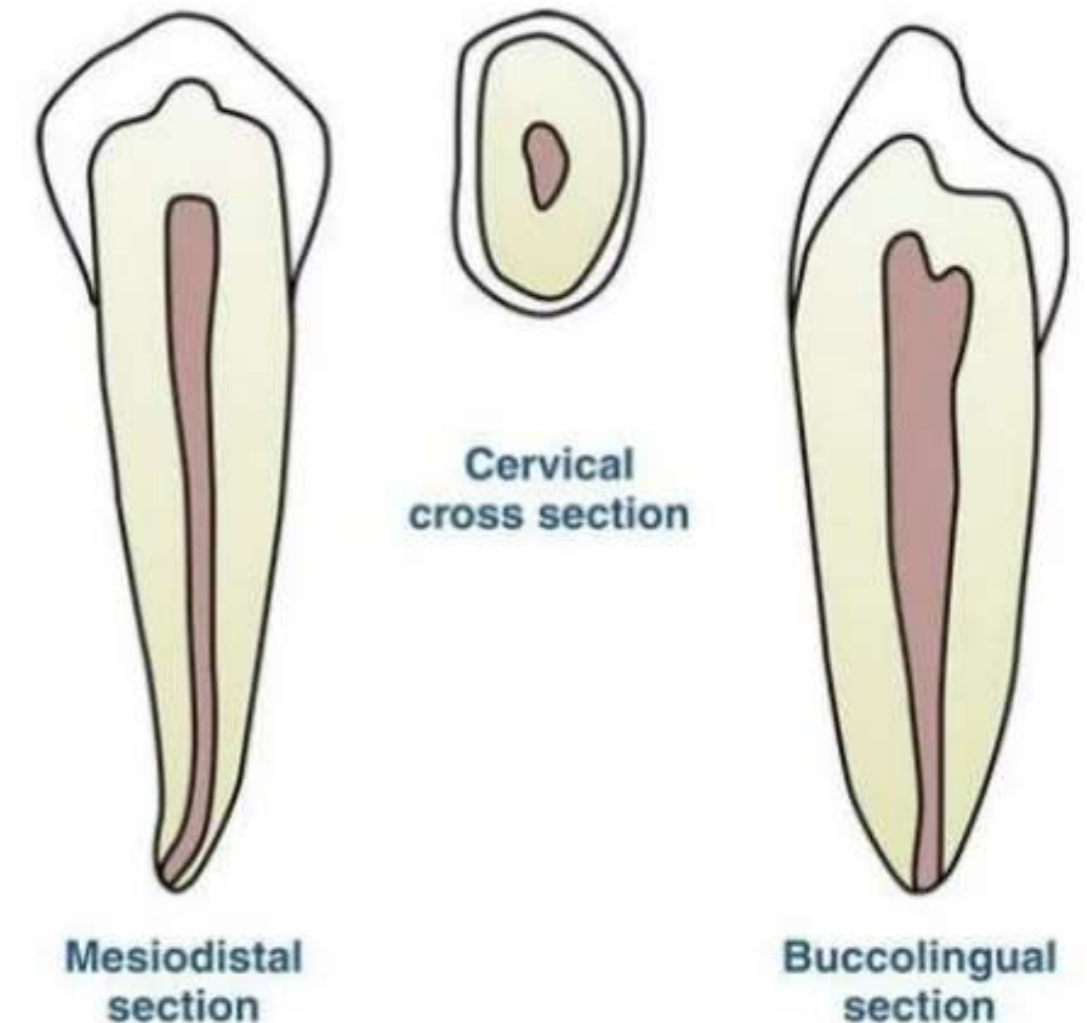
- Two pulp horns corresponding to the buccal and lingual cusps.
- Three pulp horn in three cusp type of 2nd premolar.
- The buccal pulp horn is more prominent (higher and larger cusp).

3. Root canals:

- One root canal.
- The canal is narrow mesiodistally and wider buccolingually.
- The canal open through apical foramen distal to the long axis.

3. Cross section:

- Elongated or oval.



Welcome

