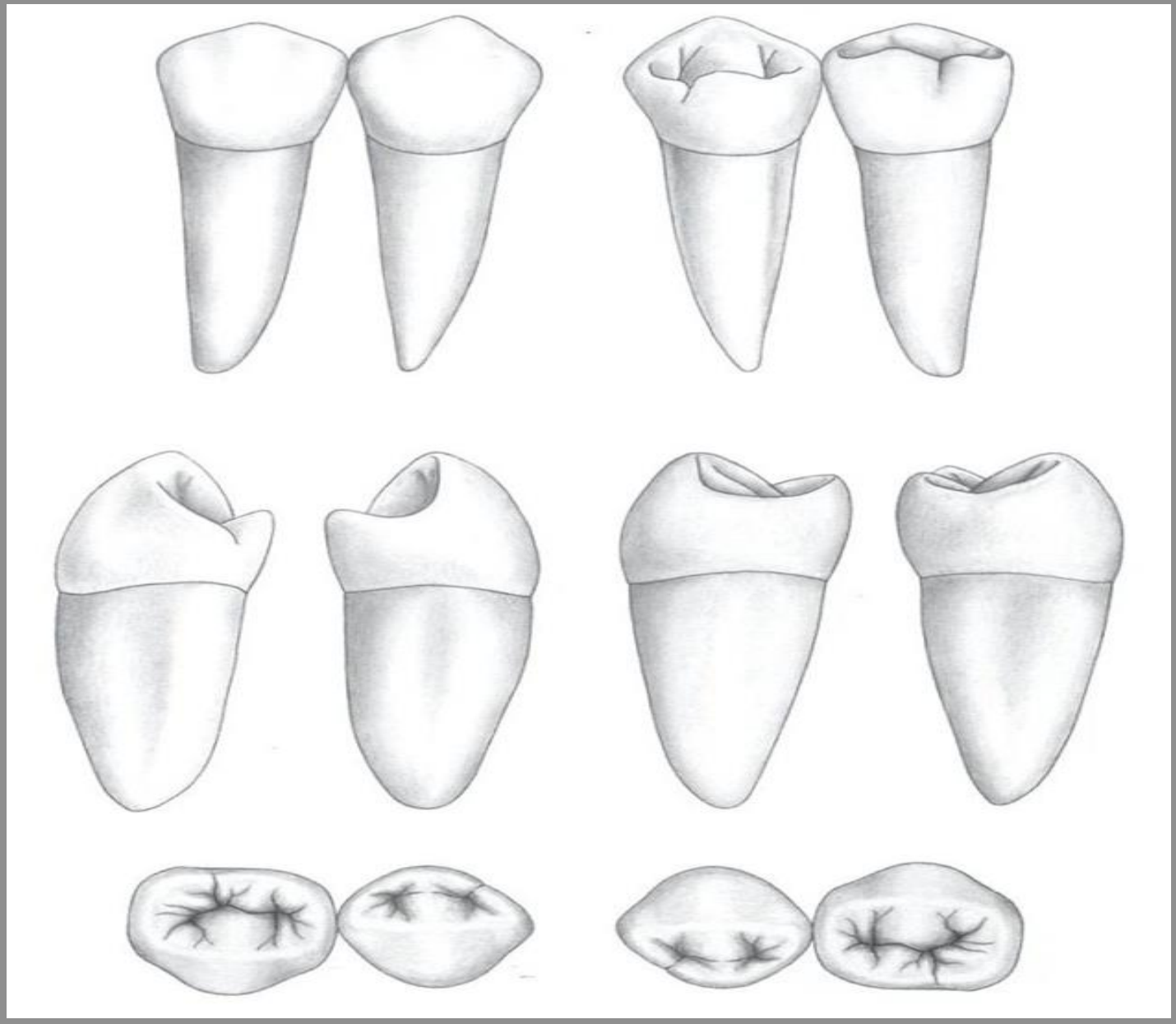
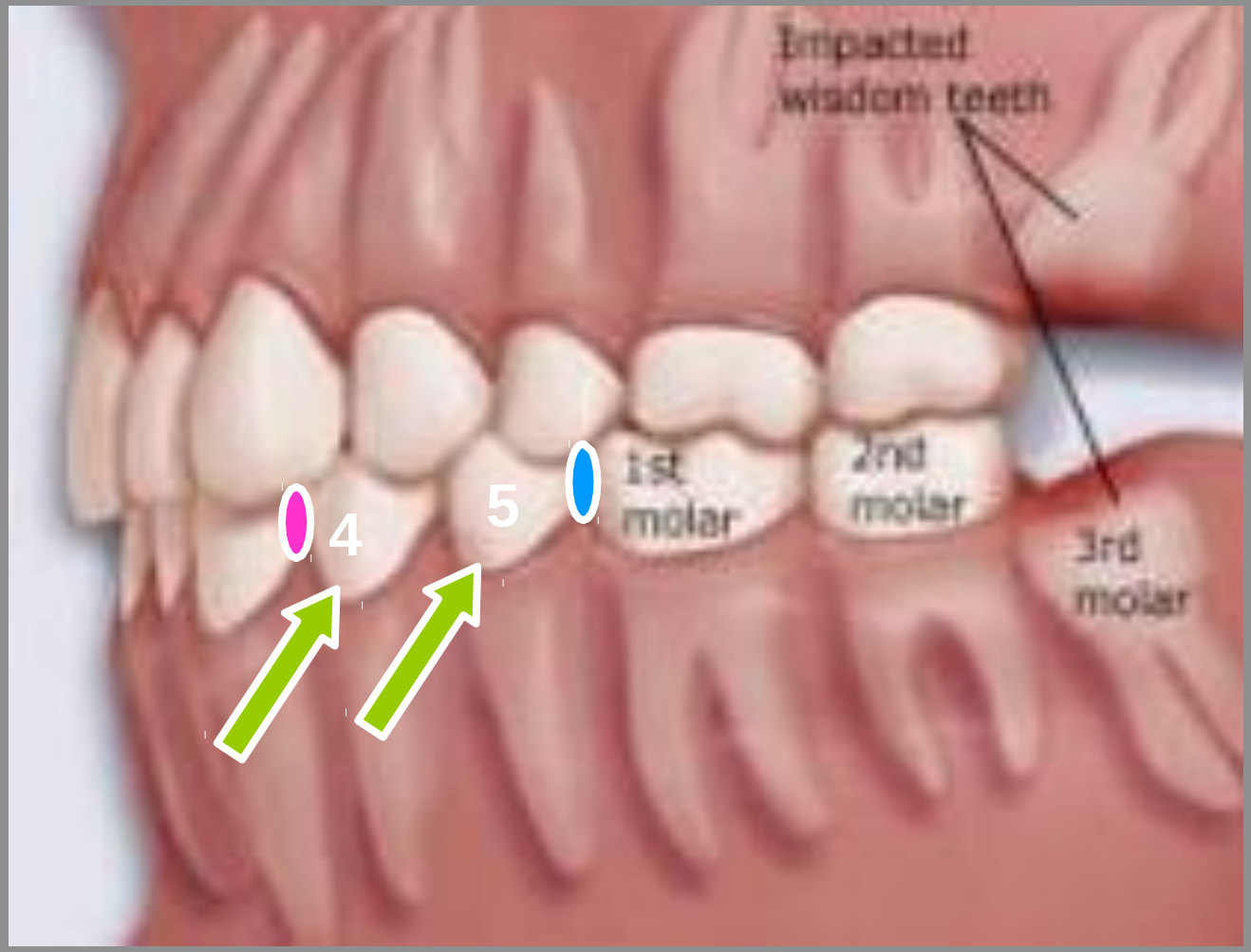
PERMANENT MANDIBULAR PREMOLARS WITH DIFFRENCES

DEPARTMENT OF ORAL AND MAXILLOFACIAL PATHOLOGY & ORAL MICROBIOLOGY

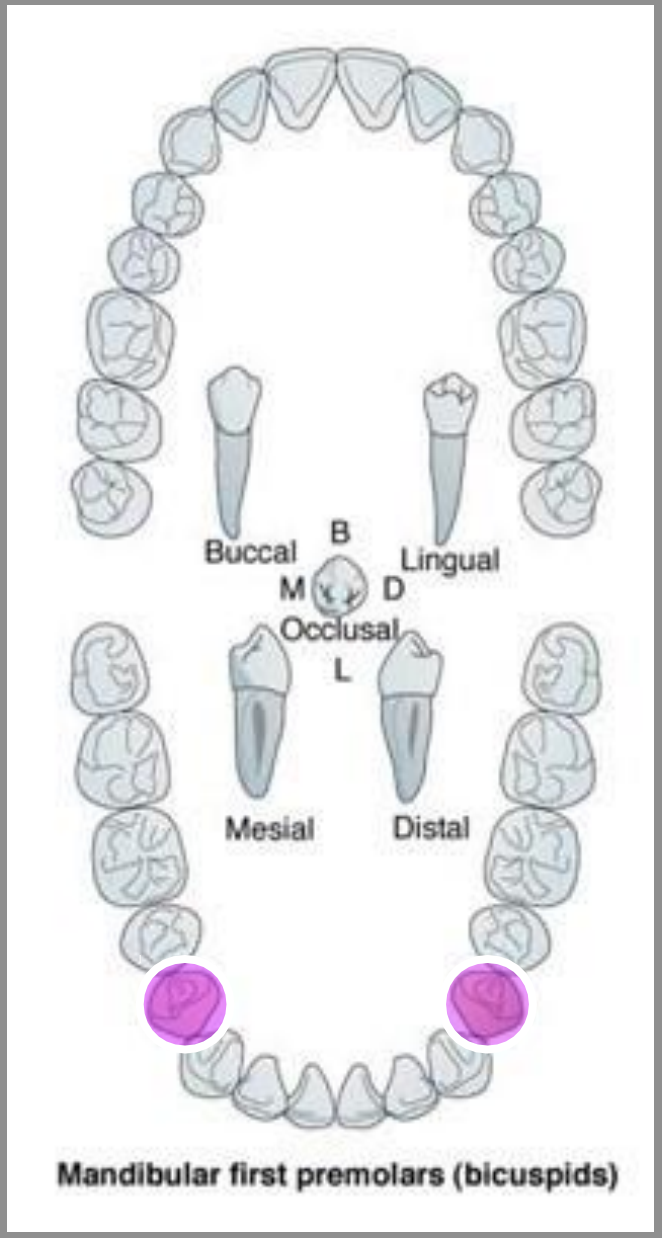


They are 4 in numbers; 2 in each side-

They are present distal to the lower canine and-
mesial to the lower molars



Mandibular 1st premolar



Mandibular first premolars (bicuspids)

Chronology

Appearance of the dental organ	**7 m.i.u**
First evidence of calcification	**13/4-2 years**
Enamel completed	**5-6 years**
Eruption	**10-11 years**
Root completed	**12-13 years**

Type and function

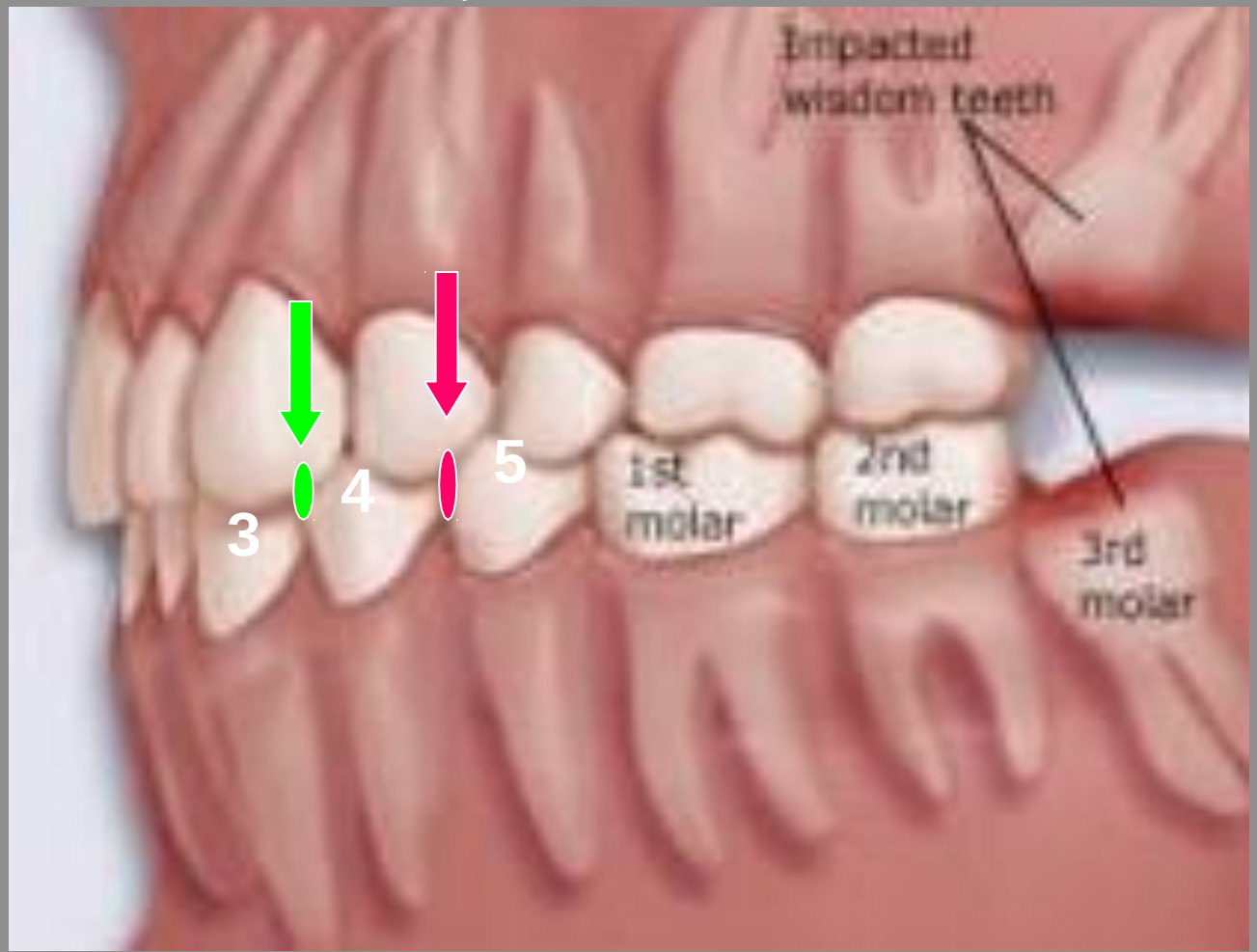
This tooth has the function of tearing and grinding food

No. of lobes

It has four lobes (three buccal -the middle is well developed (the buccal cusp)- and one lingual Cusp(less developed)

Relation

The lower 1st premolar makes contact mesially with the distal surface of the lower canine and distally with the mesial surface of the 2nd premolar.



No. of surfaces

It has four surfaces and Occlusal aspect

Buccal

Lingual

Mesial

Distal

No. of roots

It has one root

Occlusal

The buccal aspect

Geometrical outline

-Trapezoid in shape

-The short side **cervically**.

-The long side **occlusally**.

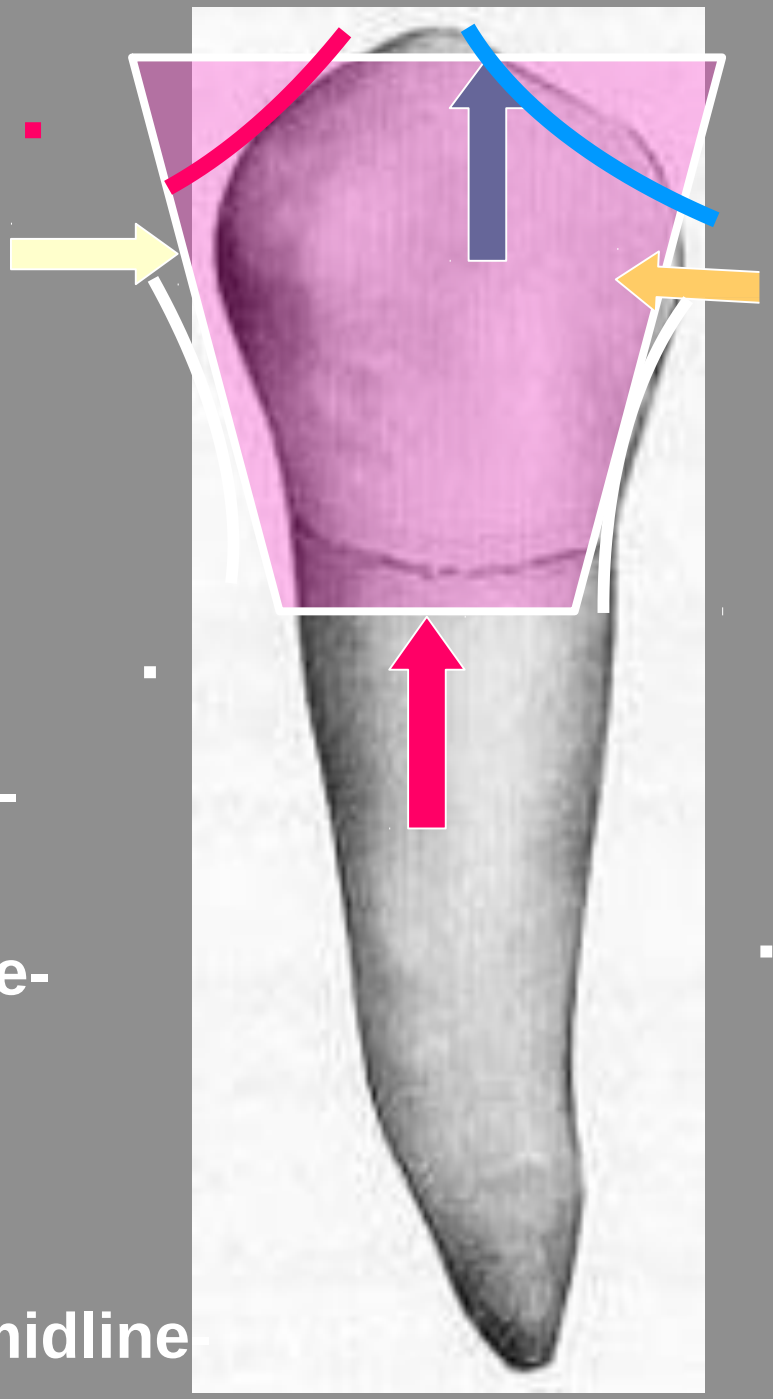
The outline

Mesial outline is slightly concave till- the mesial contact area

The distal outline is slightly concave- till the distal contact area

The mesial slope is shorter than the- distal slope

The buccal cusp tip is mesial to the midline



Surface anatomy

The elevations

The cervical ridge

The buccal ridge

The depressions

Two developmental grooves mesial and distal to the buccal ridge

The root

The root is cone shape with distal-inclination of the apical 3rd

The root is shorter than that of the canine

Lingual aspect

Similar to the buccal aspect but in a-reverse manner and with more lingual convergence

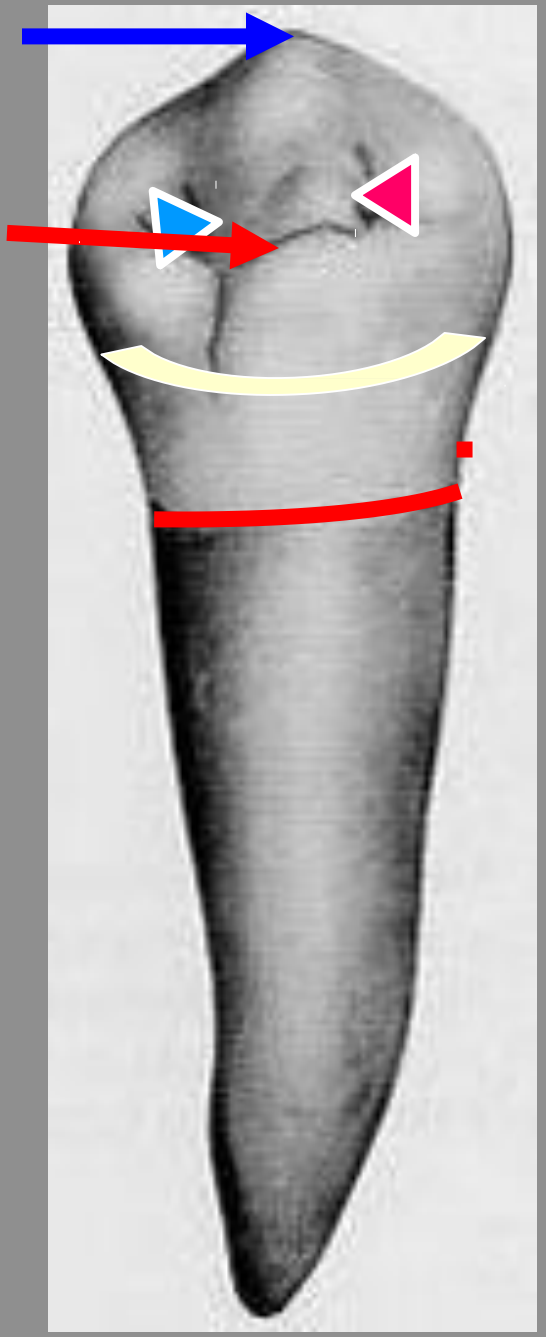
The lingual cusp is 2/3 the buccal-cusp

The short lingual cusp can be-called well developed cingulum

The mesial and the distal triangular-fossae can be seen

The lingual surface is spheroidal

Cervical line is slightly convex or-even straight



A characteristic feature of the-lingual surface is the mesiolingual developmental groove

The mesial aspect

Geometrical outline

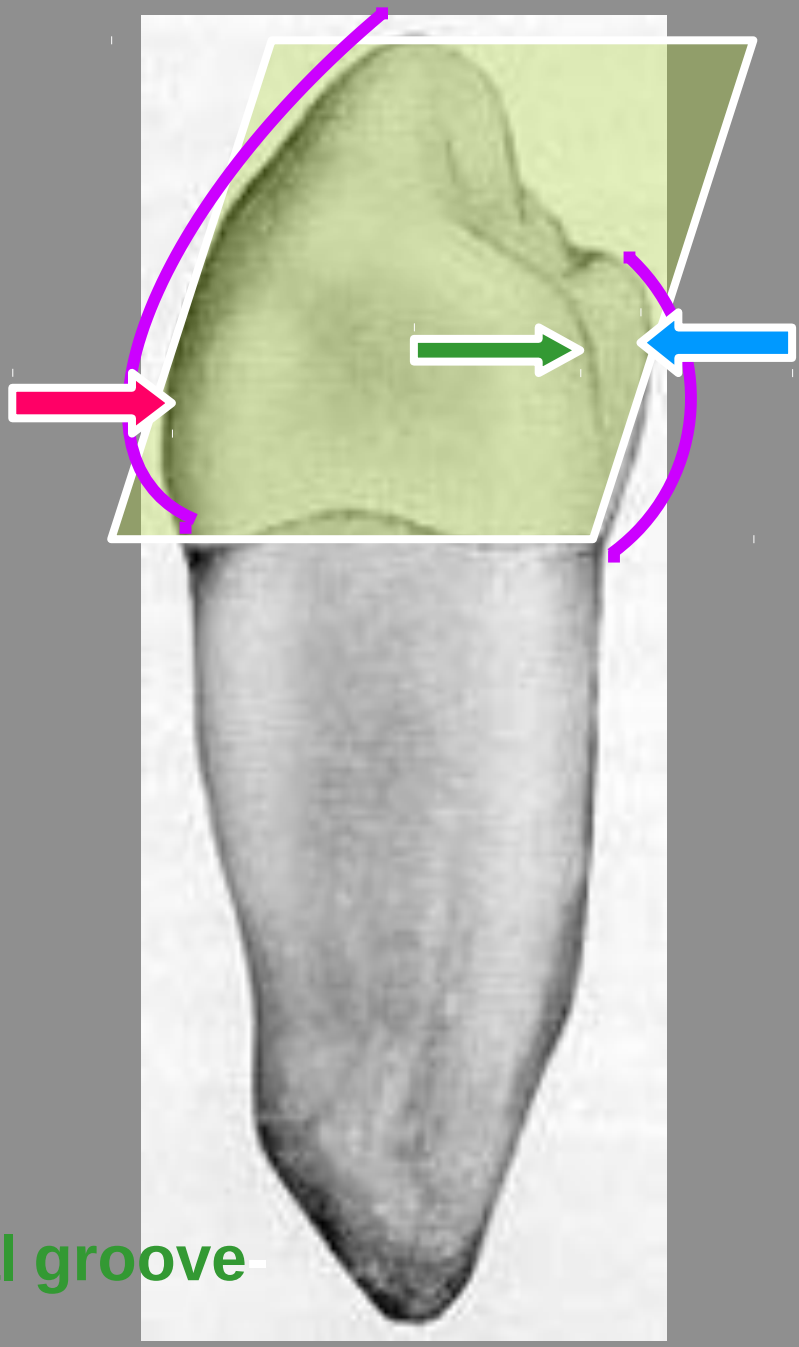
It is rhomboid in shape due to the-
lingual inclination

The outline

The buccal outline is convex-
from the cervical line to the cusp tip (the maximum convexity at (cervical 3rd; the cervical ridge)

The lingual outline is convex-
(the maximum convexity at the middle 3rd

See the mesio-lingual developmental groove-



The lingual cusp is 2/3 of the-
buccal cusp

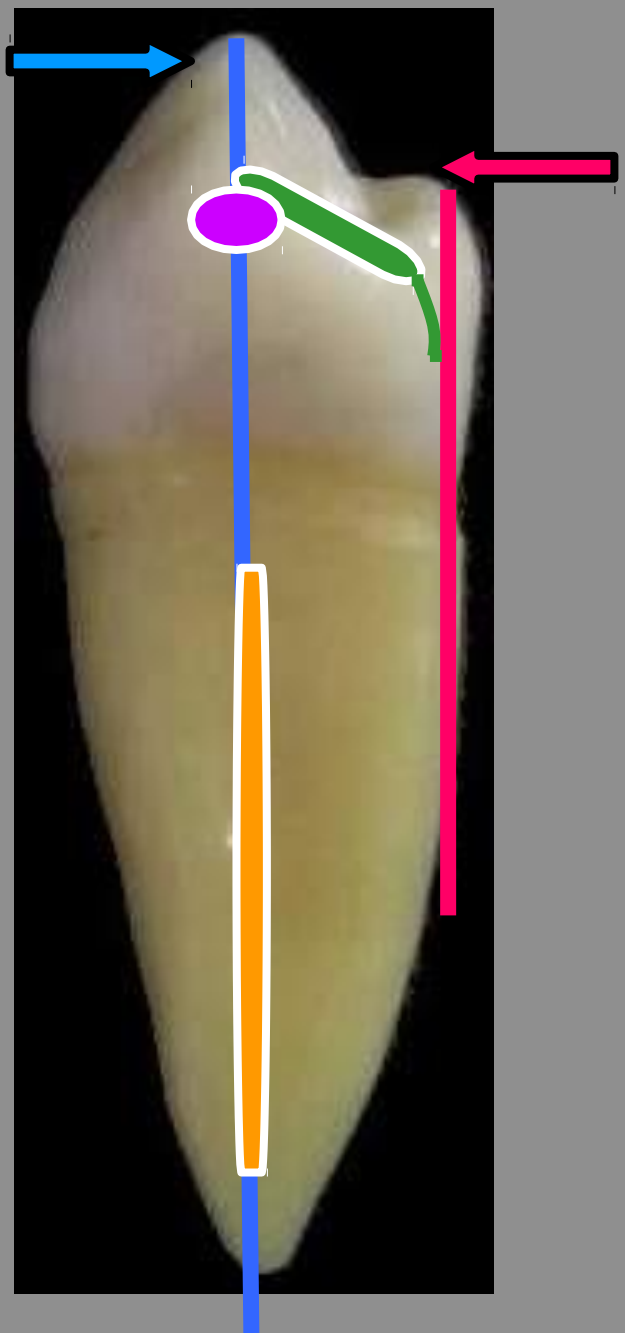
The buccal cusp tip is in line with the-root apex; where the lingual cusp tip is in line with the lingual border of the root (lingual inclination)

The mesial marginal ridge is sloping-lingually

The contact area is in line with the-buccal cusp tip

The root

It tapers to pointed apex and having deep developmental groove



The distal aspect

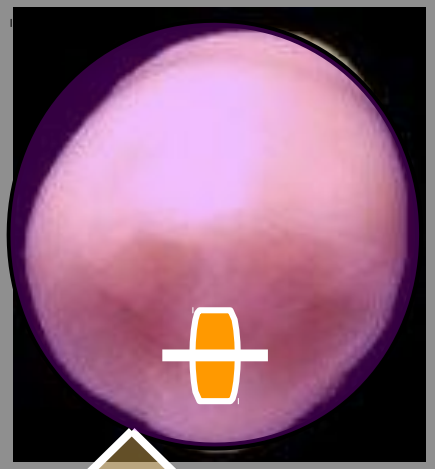
Similar to the mesial aspect but differs in-
The distal marginal ridge ,is
1.straight and
2.perpendicular to the long axis of the tooth

3.No developmental groove

4.The contact area is broader and more cervically

5.The distal cervical line is less curved

The occlusal aspect



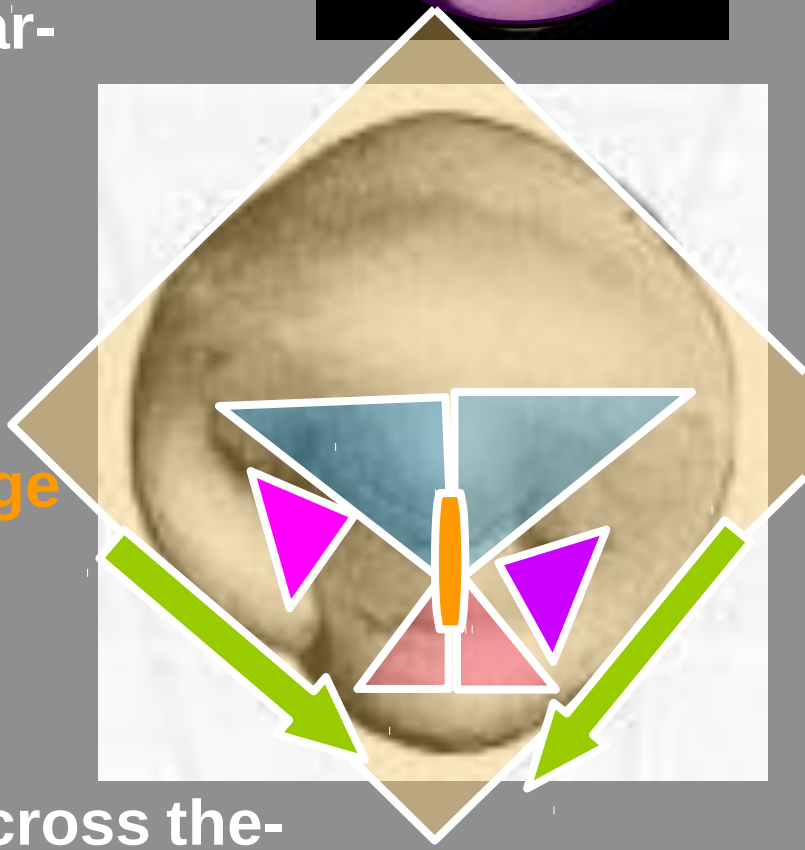
It is diamond or round shape-

The occlusal surface tapers lingually-

The buccal cusp has large triangular-ridge

The small lingual cusp has small-triangular ridge

The buccal and lingual triangular-ridges connected by transverse ridge



Mesial and distal triangular fossae-

Central developmental groove may cross the-transverse ridge

The pulp cavity

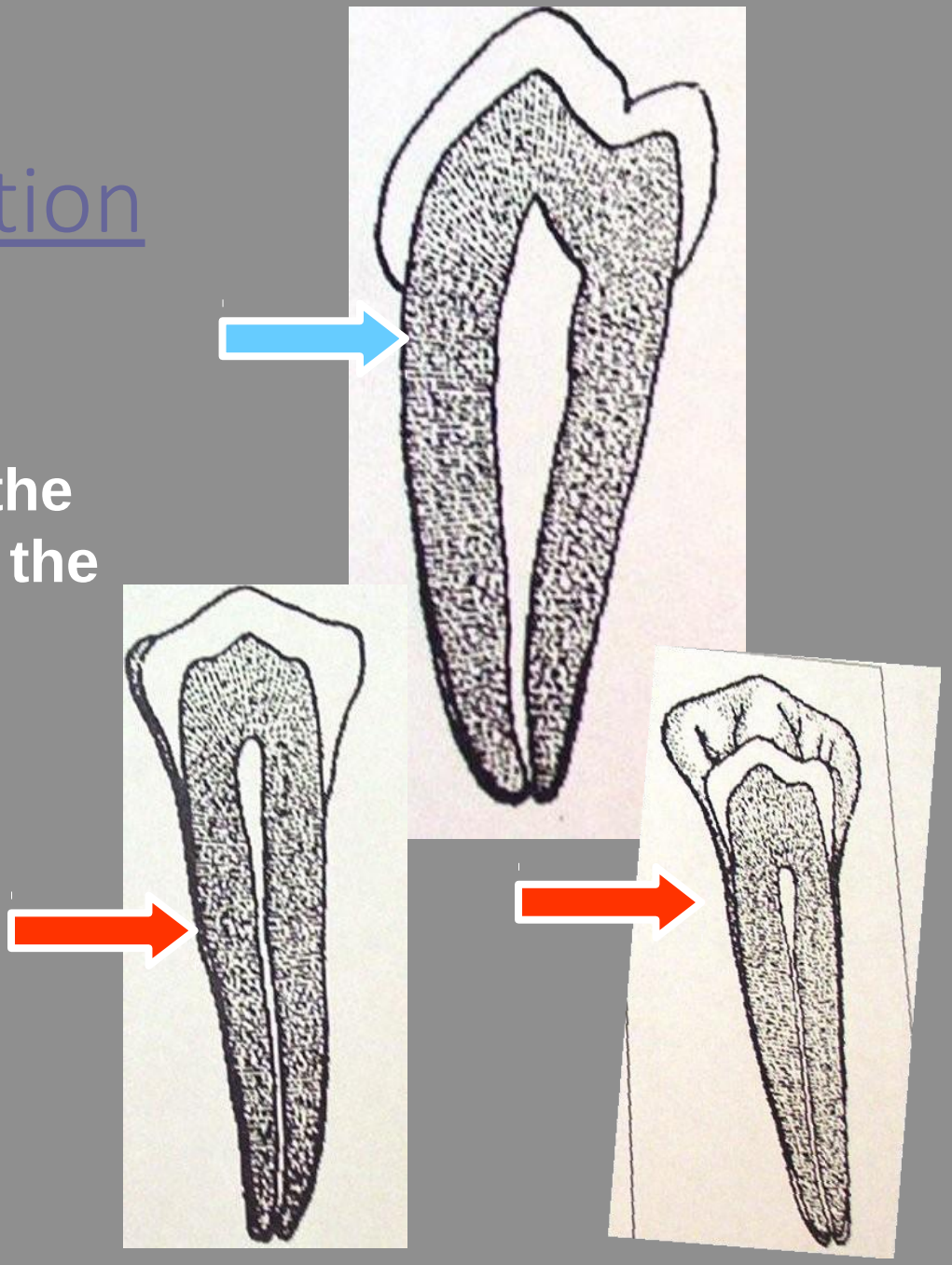
Bucco-lingual section

- The pulp chamber is wide with two pulp horns.

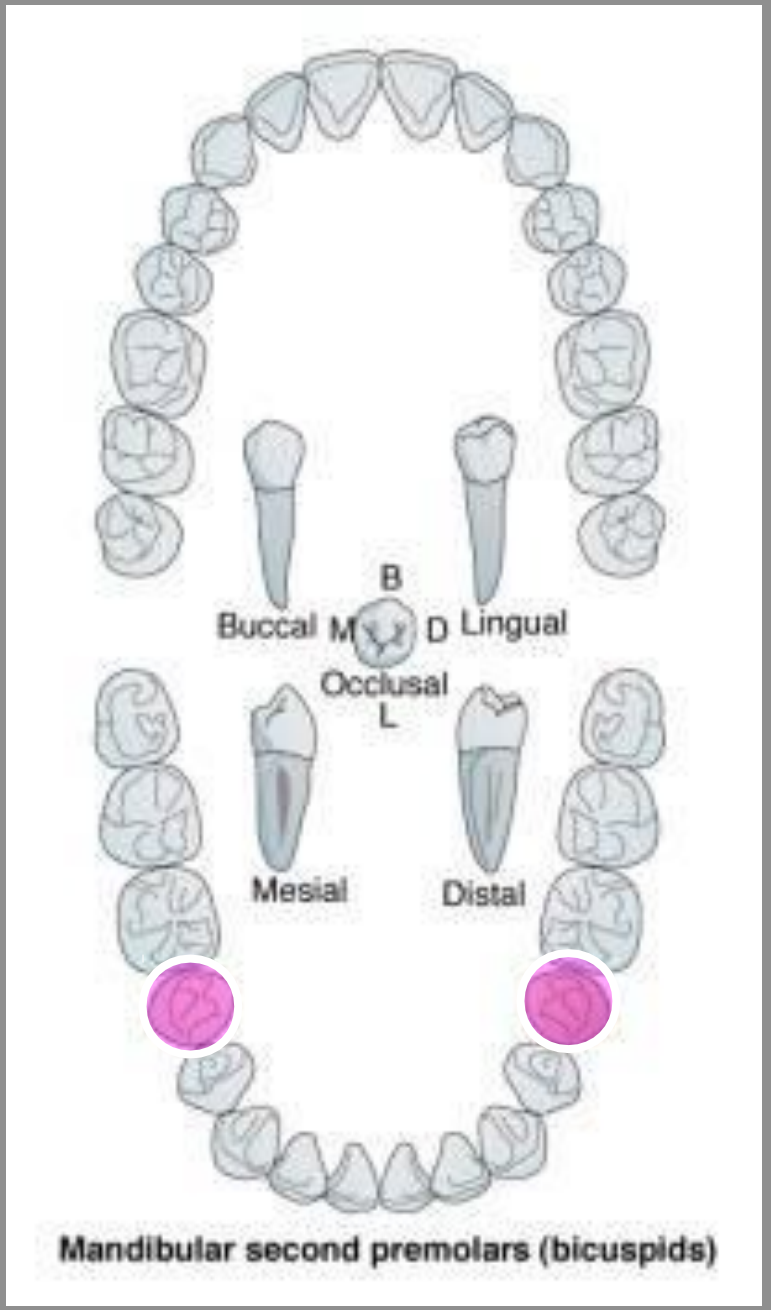
- The root canal is wide till the middle third then narrow to the apical foramen

Mesio-distal section

- Similar to the canine but longer in lower 5 than lower 4.



Mandibular 2nd premolar



Mandibular second premolars (bicuspids)

Chronology

Appearance of the dental organ	**8 m.i.u**
First evidence of calcification	**21/4-21/2 years**
Enamel completed	**6-7 years**
Eruption	**11-12 years**
Root completed	**13-15 years**

Type and function

This tooth has the function of tearing and grinding food

No. of lobes

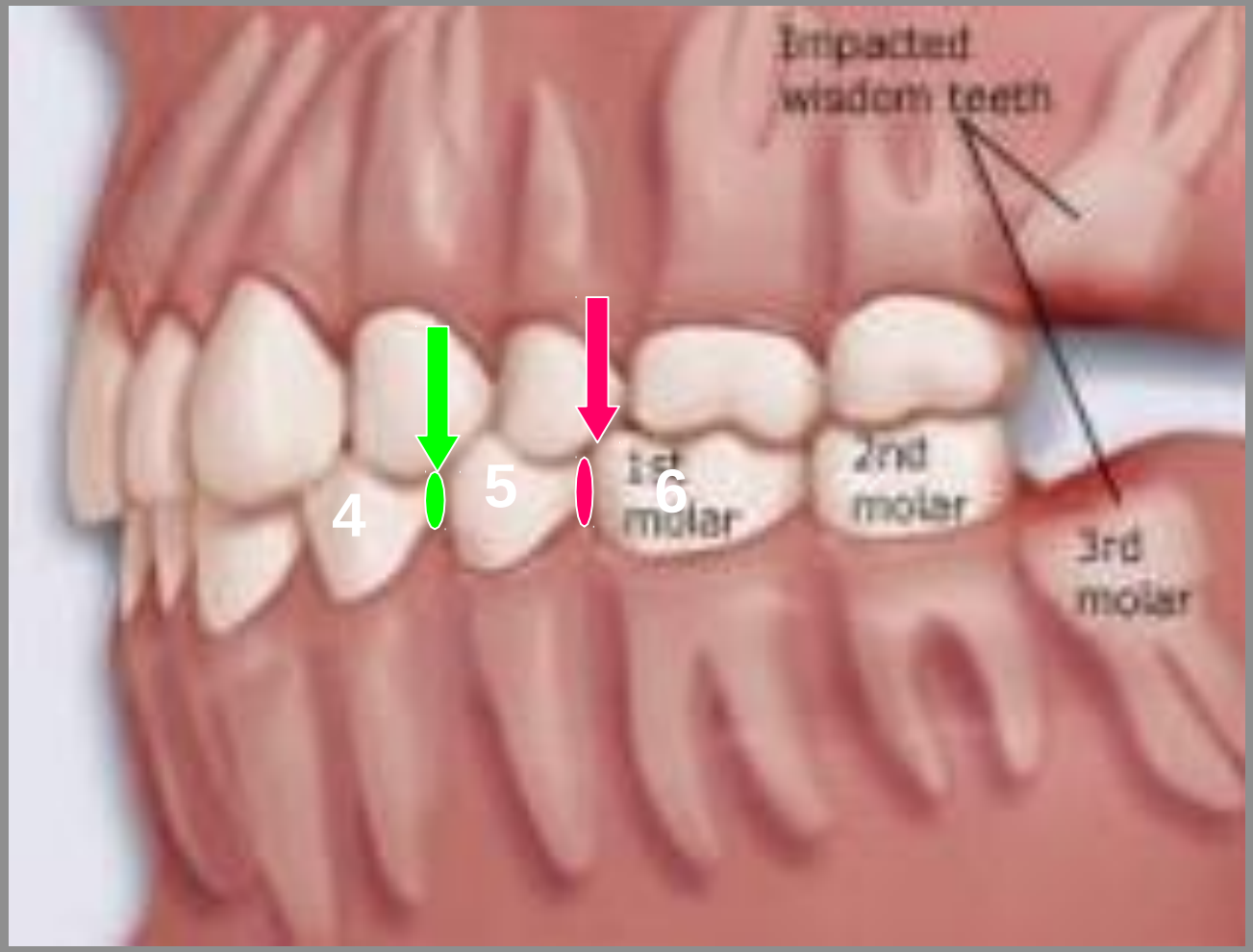
There are two types

It has four lobes: three buccal and one lingual {2 cusp type

OR five lobes: three buccal and two lingual {3 cusp type

Relation

The lower 2nd premolar makes contact mesially with the distal surface of the lower 1st premolar and distally with the mesial surface of the 1st permanent molar.



No. of surfaces

.It has four surfaces and Occlusal aspect

Buccal

Lingual

Mesial

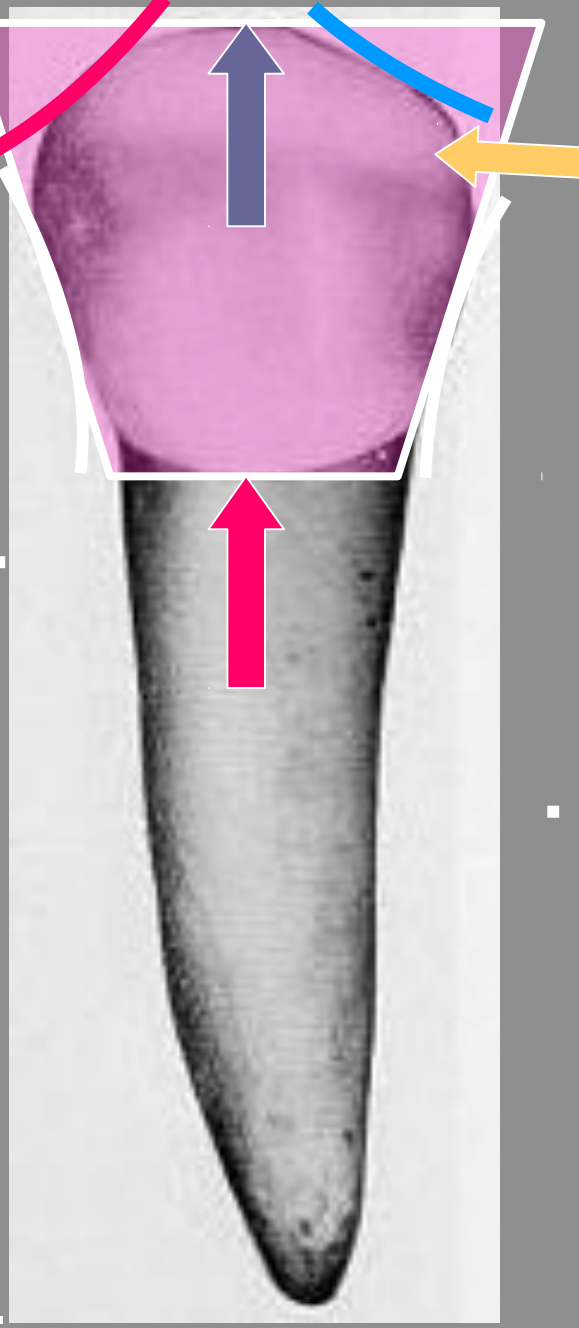
Distal

No. of roots

It has one root

Occlusal

The buccal aspect



Geometrical outline

Trapezoid in shape

-The short side cervically.

-The long side occlusally.

The outline

-Mesial outline is slightly concave till the mesial contact area

-The distal outline is slightly concave till the distal contact area

-mesialslope is shorter than distal slope (or may be equal)

The buccal cusp tip is mesial to the midline-

Surface anatomy

The elevations

The cervical ridge-

The buccal ridge-

The depressions

Two developmental grooves mesial and distal to the buccal ridge

The root

The root is cone shape with rare-distal inclination of the apical 3rd

Lingual aspect

Similar to the buccal aspect but in-a reverse manner

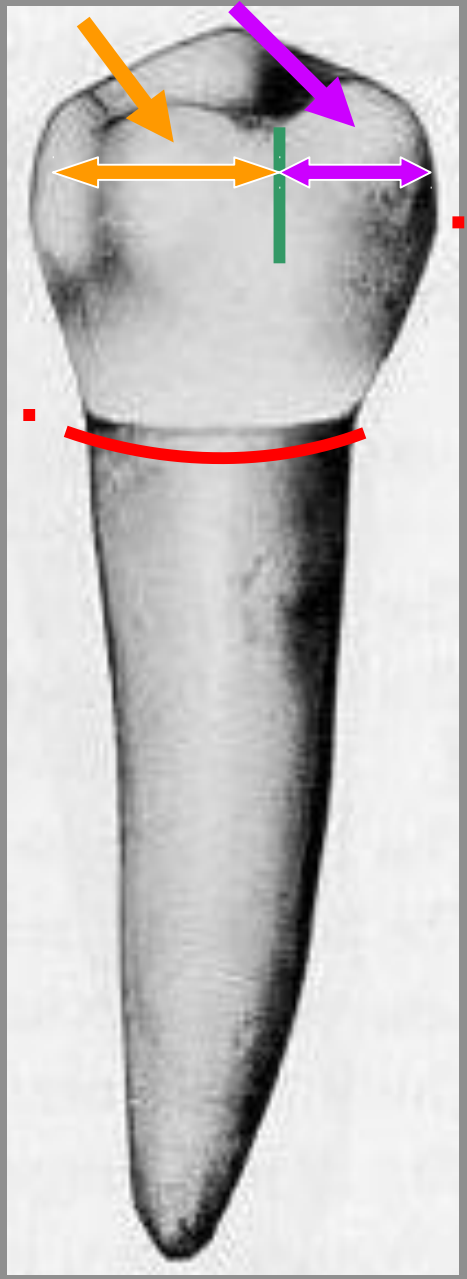
- **There may be one or two lingual cusps.**
- **The lingual cusp(s) is shorter than the buccal cusp.**

-In case of three cusp type: the mesiolingual cusp is larger than the distolingual cusp.

- **Very little lingual convergence.**

-The two lingual cusps separated by lingual developmental groove

-Cervical line is slightly convex or-even straight



The mesial aspect

Geometrical outline

It is rhomboid in shape due to the-lingual inclination

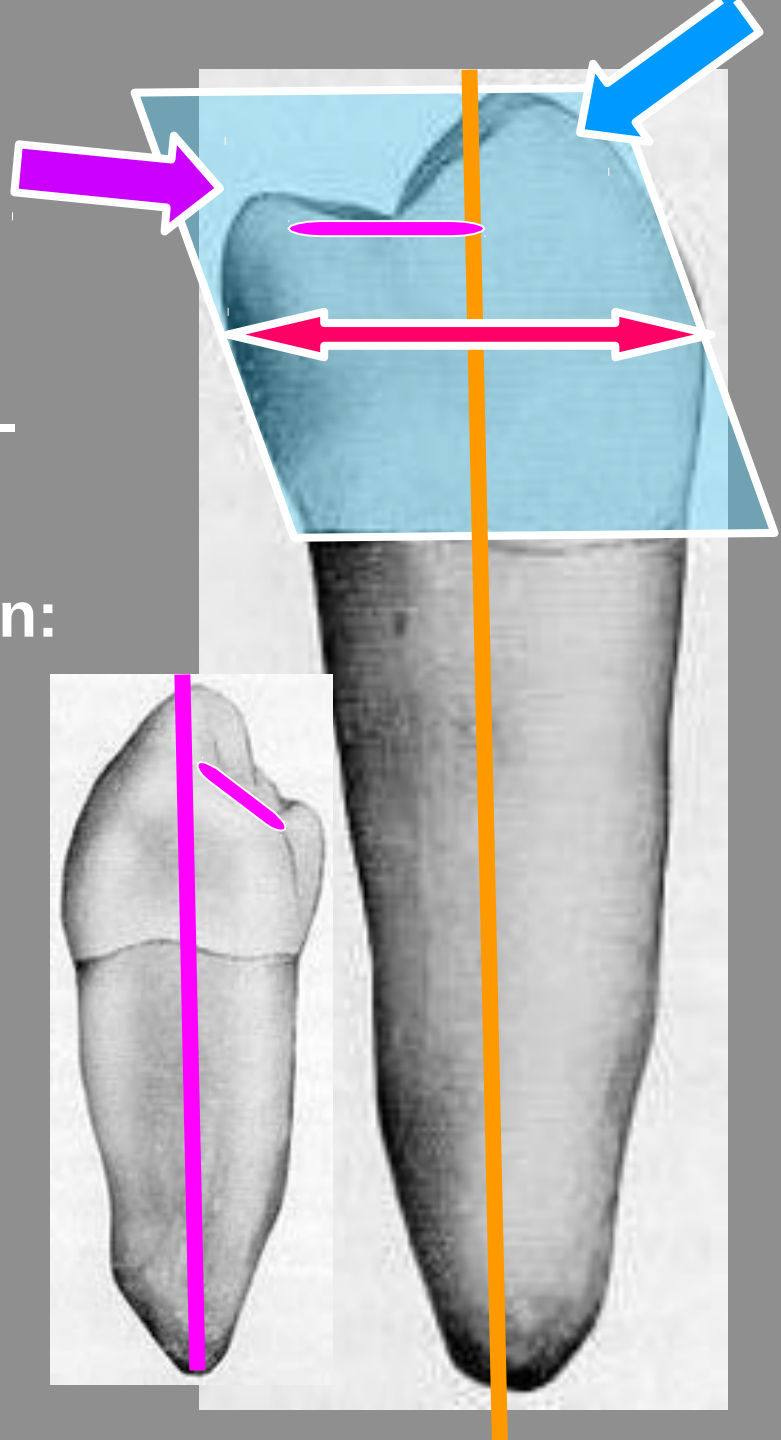
Similar to the lower 4 but differs in:

1. Wider buccolingual.

2.The buccal cusp is just buccal to the root apex.

3.The lingual cusp(s) are well developed.

4.The mesial marginal ridge is straight and perpendicular to the long axis.



The mesial aspect

5.There is no mesiolingual developmental groove.

6.the root is longer with blunt apex.

7. the maximum convexity of the lingual outline is located at occlusal third.

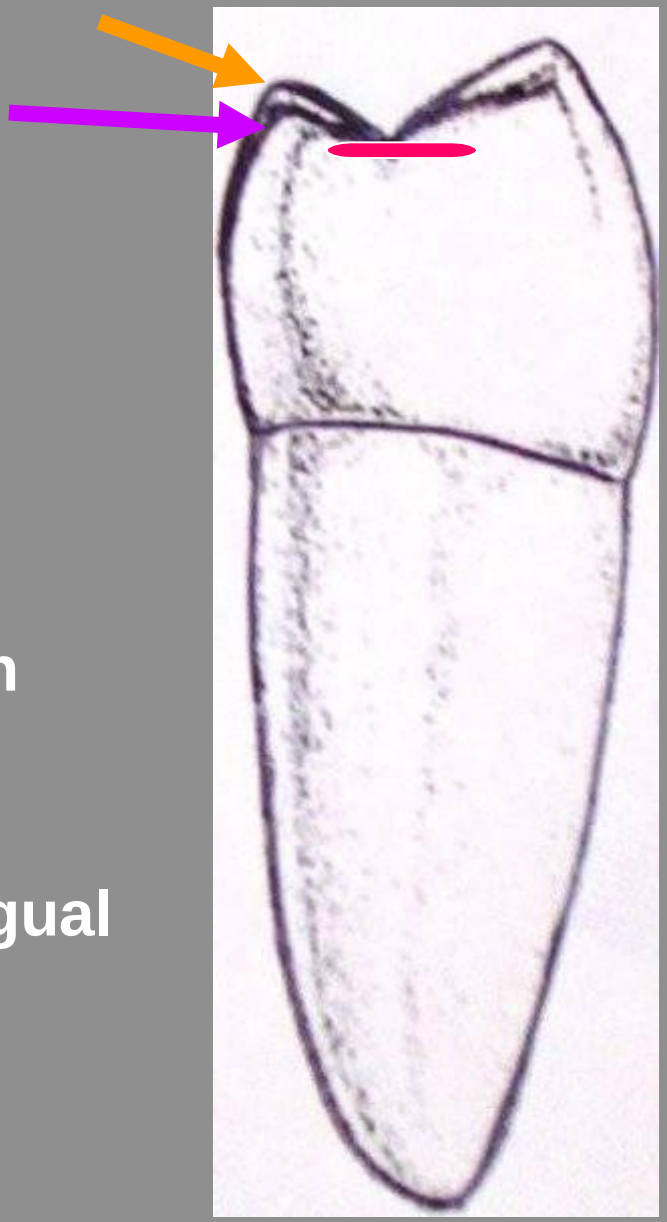
The distal aspect

- It is similar to the mesial surface but differs in:

1.The distal marginal ridge present more cervically.

2.The tips of both lingual cusps can be seen.

3.In two cusp type there is distolingual developmental depression.



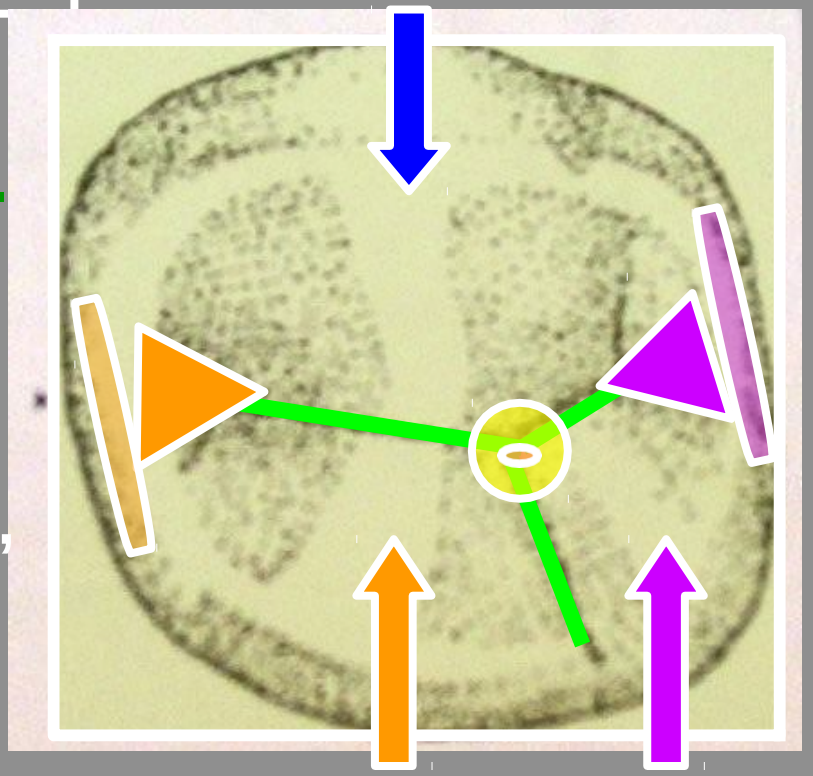
The occlusal aspect

1.The three cusp type.

- The geometrical outline is **square.**

-It has one buccal cusp and two lingual cusps.

-The arrangement of the cusps according to the size is: **the buccal**, the **mesiolingual** then the **distolingual.**



- Every cusp has triangular ridge.

- Y shape developmental groove separating the cusps.

- There is central fossa.

- Central pit.

- **Mesial** and **distal** triangular fossae.

- **Mesial** and **distal** marginal ridges.

2.The two cusp type

- The geometrical outline is **round.**

- There is lingual convergence.

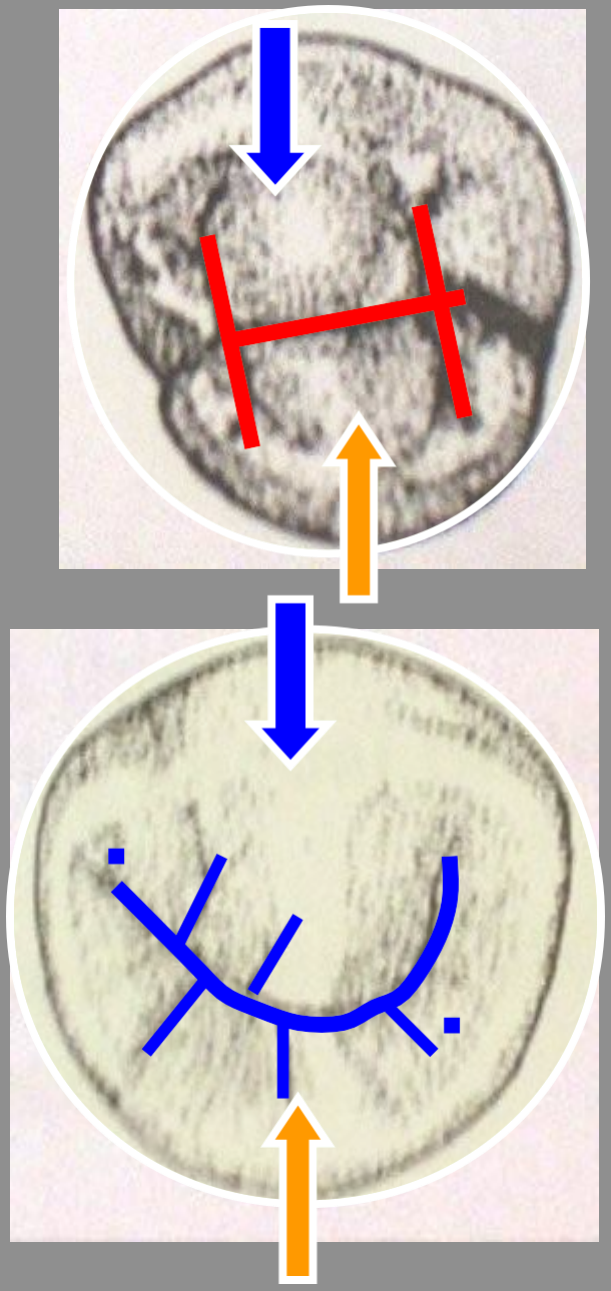
-There is one **buccal** and one **lingual cusp**.

- There may be transverse ridge.

-The central develomental groove may be **H** or **U** shape.

-The surface has supplemental grooves.

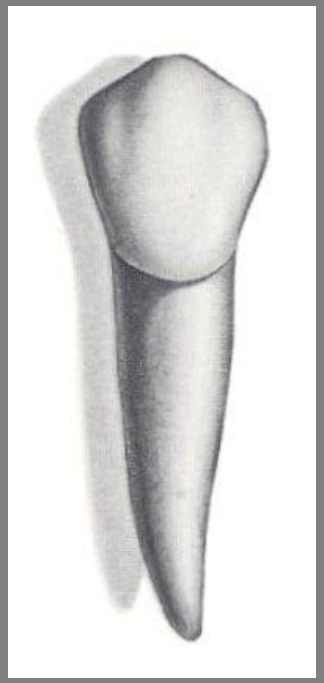
-The mesial and distal fossae are round.



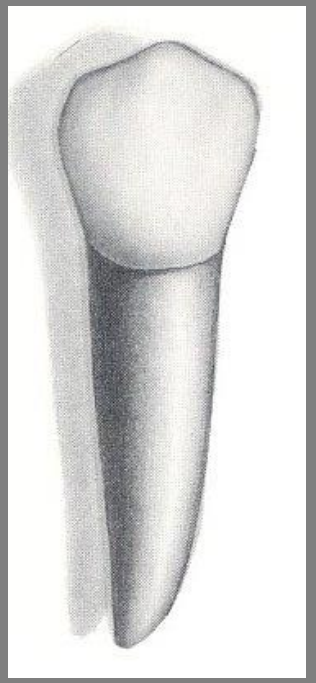
Mandibular Premolars
Comparison and Contrast

Facial View

- Cusp tip outlines
- Similar crown shapes
- Similar root lengths and both shorter than the canine
- Lobe depressions



1st

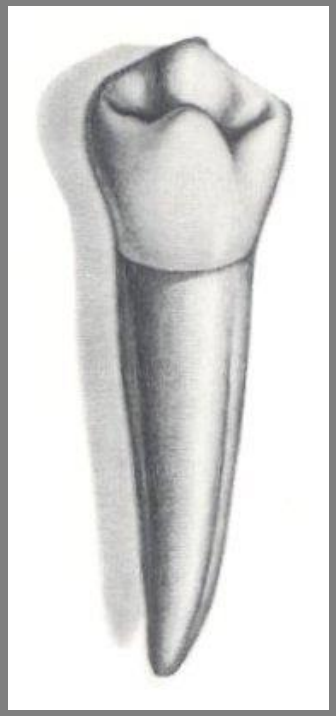


2nd

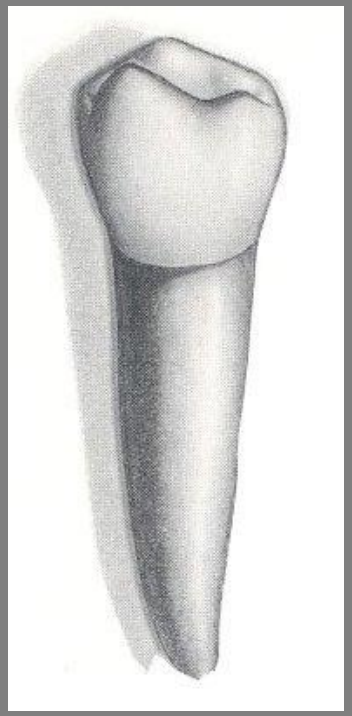
Mandibular Premolars Comparison and Contrast

Lingual view

- Taper
- Number of cusps
- Cusp outlines
- Cusp heights



1st

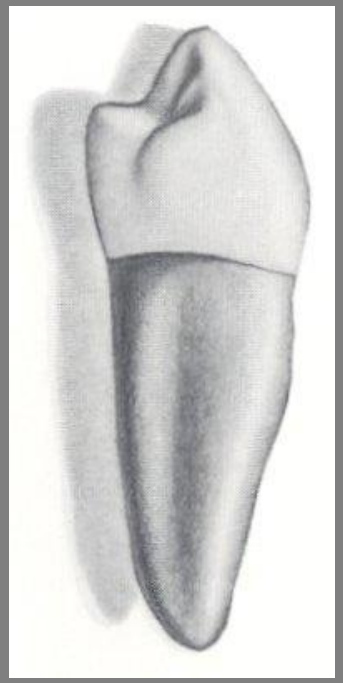


2nd

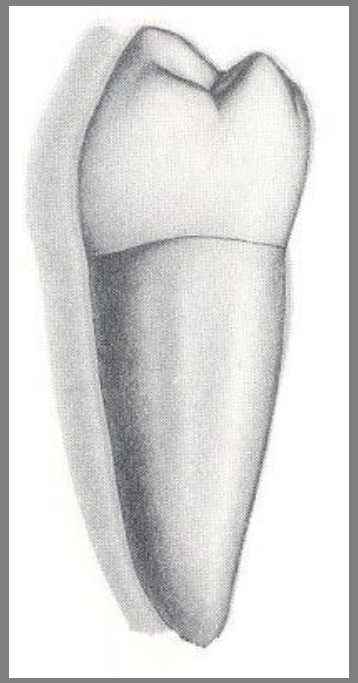
Mandibular Premolars
Comparison and Contrast

Mesial view

- Position of cusp tips
- Angle of marginal ridges
- Angle of triangular ridges
- Mesiolingual groove
- Curvature of cervical lines



1st

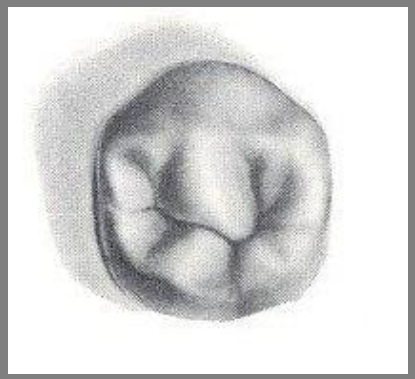


2nd

Mandibular Premolars
Comparison and Contrast

- Occlusal view
  - Overall size
  - Geometric shapes
  - Cusps: 2 vs. 3
  - Grooves
  - Fossae, pits
  - Taper
  - Transverse ridge

1st



2nd

Aspect	First Premolar	Second Premolar
Facial	> Crown not as bilaterally symmetrical	> Crown bilaterally symmetrical
Lingual	➢Entire facial profile visible ➢Almost entire occlusal surface visible ➢Lingual cusp much smaller and lower than facial cusp	>None of facial profile visible >Little if any of occlusal surface visible >Facial and lingual cusps almost equal in height
Mesial	> Occlusal plane tilted lingually > Transverse ridge links tips of the facial and lingual cusps > Mesial marginal ridge inclines cervically about 45° > Mesiolingual groove	>Occlusal plane horizontal > No transverse ridge (except 2-cusp variety) > Mesial marginal ridge is horizontal > Lingual groove separating lingual cusps (3-cusp variety)

Permanent Mandibular Premolars – Type Traits

Aspect	First Premolar	Second Premolar
Occlusal	>Occlusal crown outline diamond shaped > Mesial and distal profiles converge lingually > Occlusal table triangular in outline > Facial cusp more than twice the size of lingual cusp > Mesial marginal ridge shorter and less prominent than distal marginal ridge > Absence of Y pattern formed by grooves > No pit	>Occlusal crown outline square or oval >Mesial and distal profiles straight and parallel >Occlusal table square in outline >Facial and lingual cusps nearly equal in size >Mesial and distal marginal ridges about same length and prominence >Main grooves form Y pattern (3-cusp) >Central pit