

# Summary oral science

## ➤➤➤➤➤ Posterior teeth 1



**Writer:** Hasan Hasan



[Ju\\_dentistry.com](http://Ju_dentistry.com)



هجرة الأسنان

# POSTERIOR TEETH I

**Premolar: teeth before molars, Two premolars**

**per quadrant in the permanent set of teeth, making eight premolars total in the mouth.**

Function	Explanation
<b>Aesthetic</b>	<b>Transitional teeth improving appearance by combining features of canines and molars</b>
<b>Masticatory</b>	<b>Transfer food from canines to premolars and then to molars for grinding</b>
<b>Occlusal (Static)</b>	<b>Inter-occlusal cuspatation during centric occlusion</b>
<b>Occlusal (Dynamic)</b>	<b>Group guidance during lateral movements</b>

## **Maxillary Premolars:**

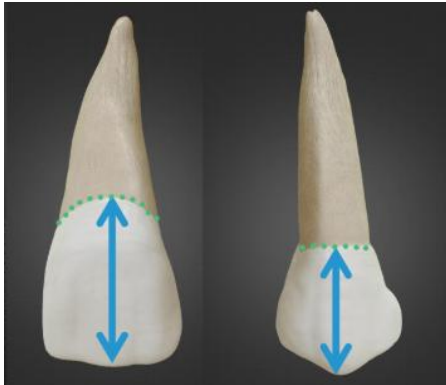
4 PREMOLARS IN THE MAXILLA

POSTERIOR TEETH

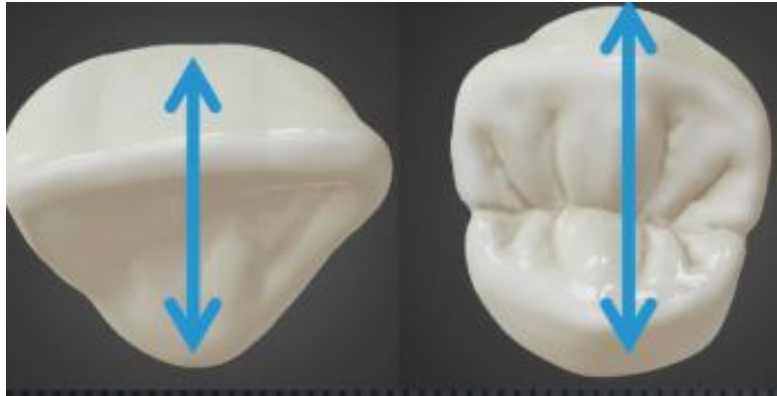
BICUSPIDS



Feature	Premolars	Incisors
Bucco-palatal width	Greater	Smaller
Inciso-cervical length	Smaller	Greater
Cervical margin curvature	Less curved	More curved



Inciso-cervical length



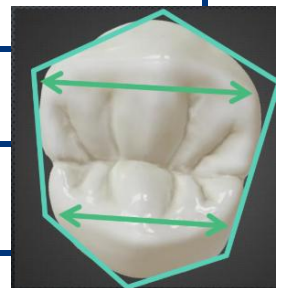
,Bucco-palatal width

## MAXILLARY FIRST PREMOLARS;

**Five Surfaces: Buccal- Palatal- Mesial- Distal and Occlusal Two roots (usually)**

### I Occlusal view

Feature	Description
Shape	Hexagonal
Buccal vs Palatal width	Broader buccally
Convergence	Converges palatally
Buccal shoulders	More angular (“edgy”)
Marginal ridges	Distinct mesial and distal marginal ridges
Cusps	Buccal cusp and palatal cusp
Separation of cusps	Central fissure

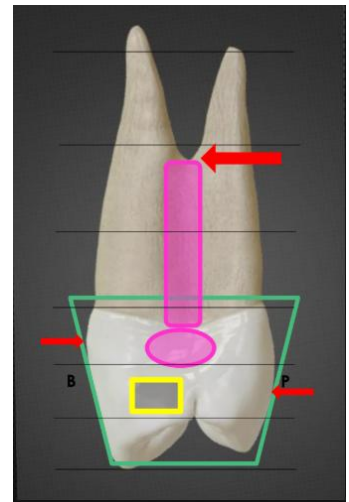




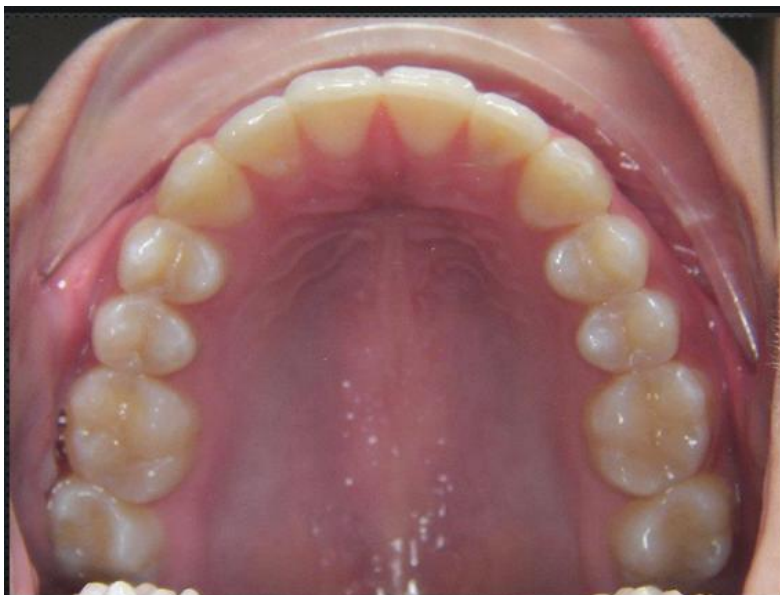
Crown dimensions	Buccal part larger than palatal part
Palatal cusp position	Inclined more mesially than buccal cusp
Palatal cusp height	1 mm shorter than buccal cusp

## Mesial View

**Repetition: Mesial contact area:** Buccal embrasure is smaller than palatal embrasure.  
**Root Bifurcation starts between the junction middle & apical thirds**



Palatal height of contour	Middle of middle third
Crown outline	Trapezoidal
Wider area	Toward crown base
Buccal embrasure	Smaller than palatal embrasure
Root bifurcation	Between middle and apical thirds
Buccal height of contour	Middle of cervical third



Can you compare the embrasure to the Mesial side?



**Distal View:** only know that Distal contact point is  
Broader and more occlusal

## MAXILLARY SECOND PREMOLARS

### Five Surfaces:

less angular and **more rounded** appearance

More variation between individuals than first premolars.

One root pointing distally



### Occlusal view

OVAL OUTLINE/ OVOID APPEARANCE

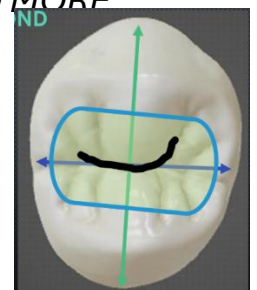
LINGUAL CUSP IS ALMOST AS WIDE AS THE BUCCAL

THE TOOTH IS LESS CONVERGED

**SMALLER** MESIO-DISTALLY AND **LARGER** BUCCO-PALATALY

**CENTRAL DEVELOPMENTAL GROOVE IS SHORTER** AND MORE IRREGULAR (U-SHAPED) (Black Line)

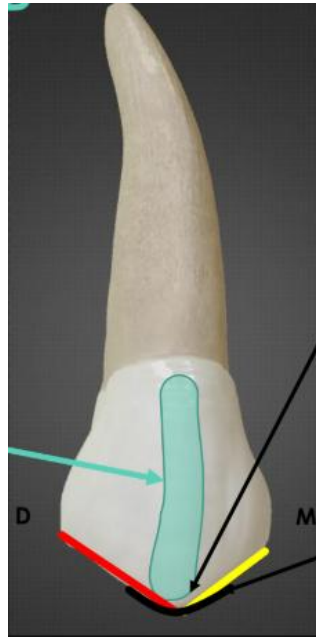
THE GROOVE PATTERN IS **LESS DISTINCT** THAN IN THE **FIRST PREMOLAR**, AND THE GROOVES ARE **NUMEROUS**, **SHORTER**, **SHALLOWER**, AND **MORE IRREGULAR** (WRINKLED APPEARANCE)



## BUCCAL VIEW:

Like the first Premolar and differs in:

Buccal Longitudinal ridge is **less prominent**

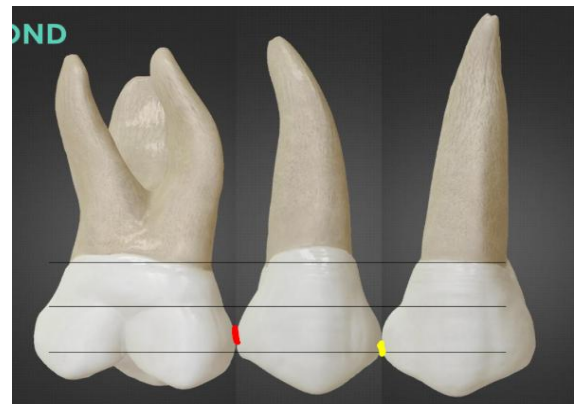


Buccal cusp tip is less pointed and shorter

Mesial slope is **shorter** than distal slope (opposite to 1st premolar)

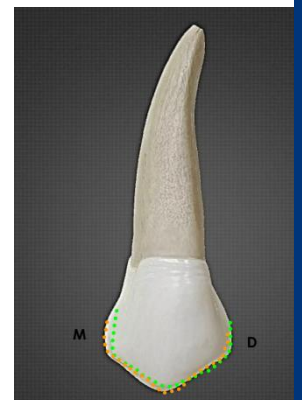
**Mesial contact area:** Junction between **middle third** and **occlusal third**

**Distal contact area:** Middle of middle third

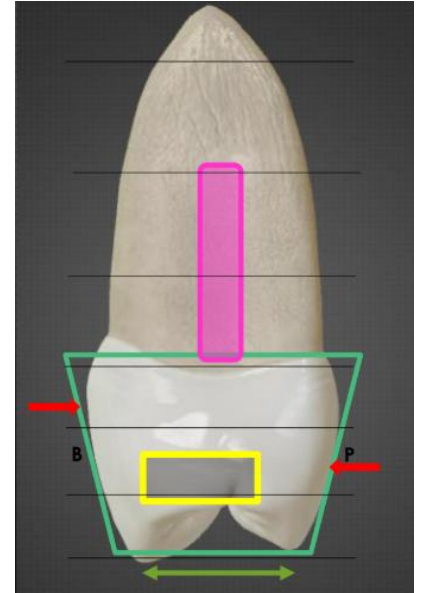


## Palatal View:

**Buccal part** and **palatal part** of the crown appears **nearly equal in dimensions.**



## Mesial View:



Anatomical Feature / Aspect	Description
<b>Outline &amp; Dimension</b>	Trapezoidal outline; larger bucco-palatally than mesio-distally.
<b>Buccal Maximum Curvature</b>	Located at the middle of the cervical 3 <sup>rd</sup>
<b>Palatal Maximum Curvature</b>	Located at the middle of the middle 3 <sup>rd</sup>
<b>Cusp Distance &amp; Height</b>	The distance between buccal and palatal cusps is greater than in the 1 <sup>st</sup> premolar; cusps are almost of the same height.
<b>Mesial Contact Area</b>	Broad.
<b>Crown Surface</b>	No mesial concavity present.
<b>Root Surface</b>	Features a developmental groove.

## Distal View

Similar to distal side of the 1<sup>st</sup> premolar but it only has one root.



## Pulp Morphology of Maxillary 1<sup>st</sup> Premolar

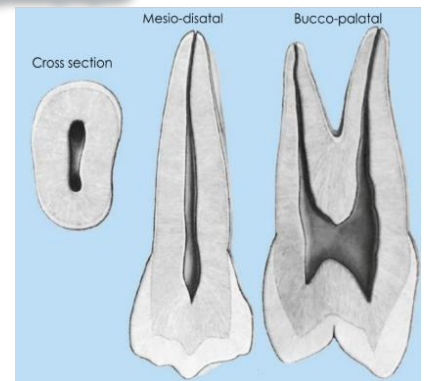
In a cross sectional view at cervix the pulp space is:

- Kidney shaped
- Wide bucco-palataly and narrow mesio-distally

In a mesio-distal cross sectional view:

**Tooth is similar to morphology of canine.**

In a bucco-palatal cross sectional view: - 2 pulp horns - Buccal chamber is larger



## Pulp Morphology of Maxillary 2<sup>nd</sup> Premolar

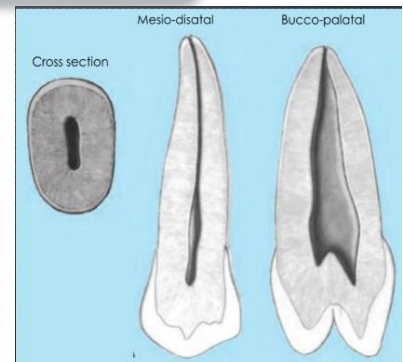
In a cross sectional view at cervix the pulp space is:

- Cigar shaped
- Wide bucco-palataly and narrow mesio-distally

[Watch this video](#)

In a mesio-distal cross sectional view: **Tooth is similar to morphology of first premolar.**

In a bucco-palatal cross sectional view: - 2 pulp horns of almost equal heights - Usually a large (bucco-palataly) single pulp canal



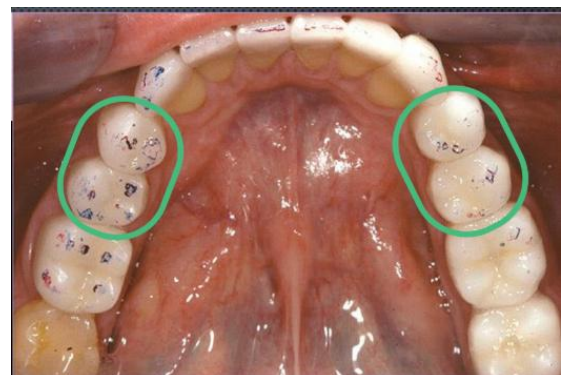
## Mandibular premolar

4 PREMOLARS IN THE MANDIBLE

POSTERIOR TEETH & BICUSPIDS

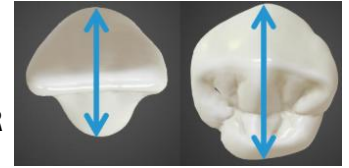
**1<sup>st</sup> PREMOLAR: 2 CUSPS; BUCCAL & SMALL LINGUAL**

**2<sup>nd</sup> PREMOLAR: 3 CUSPS; BUCCAL & 2 LINGUAL**



## COMPARED TO UPPER PREMOLAR:

- CROWNS OF LOWER ARE **ROUNDER** WITH UNEQUAL CUSP SIZES
- 1<sup>st</sup> & 2<sup>nd</sup> LOWER PREMOLARS **DIFFER** MARKEDLY FROM EACH OTHER



**Bucco-lingual** width is **greater** in **Premolars** than the **Labio-lingual** width in **incisors** **Inciso-cervical** length is greater in Incisors than occluso-cervical length in premolars



**Cervical margin** is less curved in Premolars

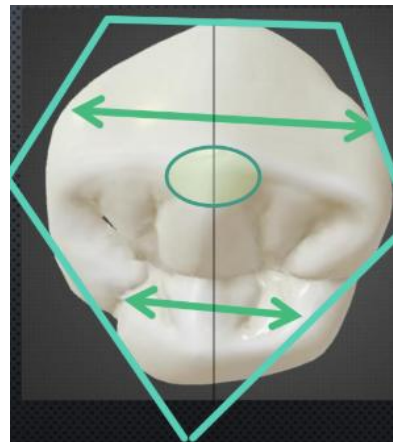
## MANDIBULAR FIRST PREMOLARS

Five Surfaces: **Buccal- Lingual- Mesial- Distal** and **Occlusal One root!**

### Occlusal View;

**ROUNDED/ DIAMOND SHAPE**

**SMALLEST POSTERIOR TOOTH**



**DOMINANT BUCCAL CUSP AND A SMALL CINGULUM- LIKE LINGUAL CUSP.**

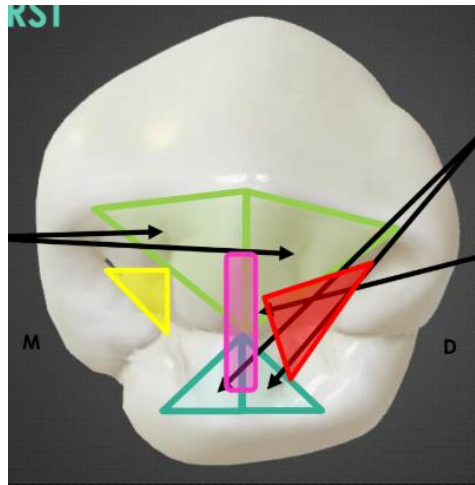
THE **BUCCAL CUSP** IS MORE TO THE CENTRE OF THE **BUCCO-LINGUAL** MIDLINE

TOOTH IS **CONVERGED LINGUALLY**

**Buccal Cusp has LARGE Triangular Ridges**

Buccal cusp dominates the occlusal surface

Buccal cusp is twice the size of lingual cusp



**Lingual Cusp**

has small Triangular Ridges

Lingual and Buccal triangular ridges are joined together by a small **Transverse Ridge**

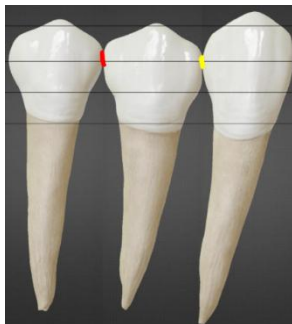
**Mesial** and large Distal Triangular fossae

## Buccal View

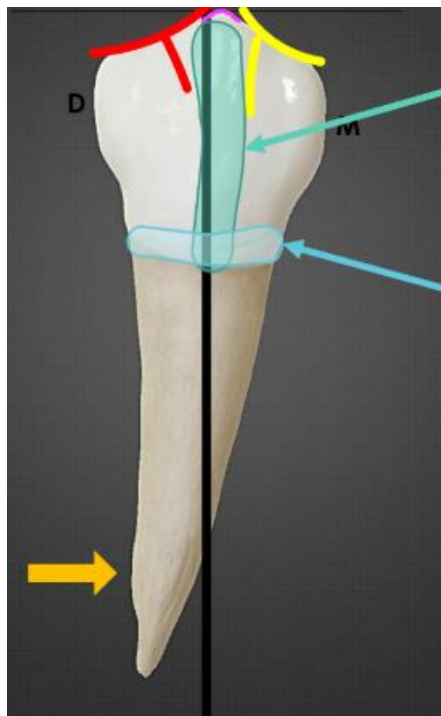
**Buccal cusp tip** is mesial to the crown Medline

**Mesial slope** is shorter than the **Distal slope** and they are both slightly concave till the contact area.

**Mesial and Distal** contact areas: Junction between middle third and occlusal third



**Cone-shape root, shorter than canine and tip is inclined to the distal side**



**Longitudinal ridge** passes down the buccal cusp

**Cervical ridge** passes around the buccal cusp

**Mesial and Distal** developmental grooves on the buccal surface near to longitudinal ridge

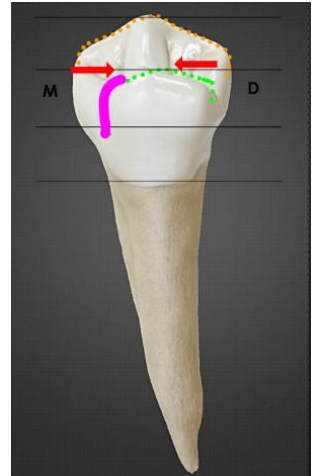
## Lingual view

**Lingual cusp** is 2/3<sup>rds</sup> the length of the crown

You can see the entire **buccal** profile and occlusal surface of the crown from the **Lingual** aspect

**Mesial and Distal** triangular fossae can be seen

A characteristic feature: **Misiolingual Development groove**



## Mesial View

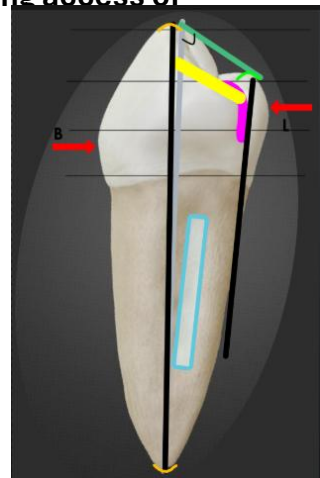
**Occlusal plane** is inclined LINGUALLY and is NOT perpendicular to the long axis of the tooth  
**Buccal Maximum curvature:** middle of cervical 3<sup>rd</sup>

**Lingual maximum curvature:** middle of middle 3<sup>rd</sup>

The **Misiolingual Development groove** is apparent from this aspect

**Mesial marginal ridge** slopes lingually

**Deep developmental groove** on the root surface

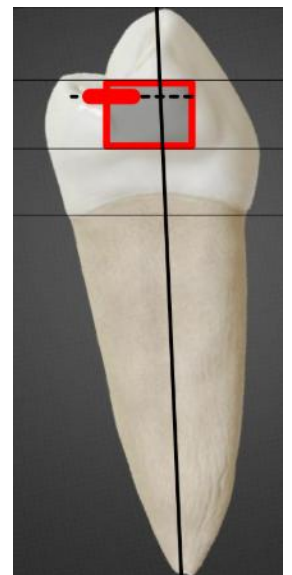


## Distal View

No developmental groove or fossa on the distal side on the crown/root.

**Distal marginal ridge** is more straight and lies almost perpendicular to the long axis of the tooth

**Distal Contact Point:** Broader → occlusal table becoming more posterior



# MANDIBULAR 2<sup>ND</sup> PREMOLAR

Five Surfaces. larger in all dimensions

Two types: Three-cusp form (two lingual cusps)

Two -cusp form (one lingual cusp)

**One root** which is also **larger** than the root of the mandibular 1<sup>st</sup> premolar

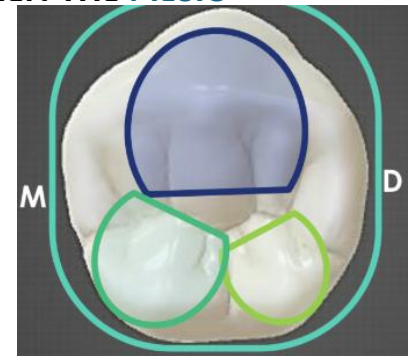


## Occlusal View:

SQUARE OUTLINE/ SQUARE APPEARANCE

IN A THREE-CUSP TYPE THE **BUCCAL CUSP** IS THE **LARGEST** THEN THE **MESIO-LINGUAL CUSP** THEN THE **DISTO-LINGUAL**.

THIS TOOTH IS SOMETIMES MISSING;  
THIRD MOLARS AND LATERAL INCISORS  
ARE FOUND TO BE MISSING MORE FREQUENTLY  
THAN THIS TOOTH.

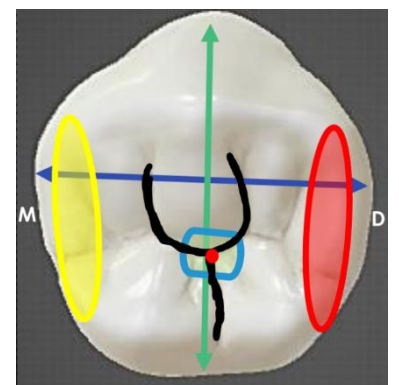


ALMOST EQUAL SIZES; **MESIO-DISTALLY**/ **BUCCO-LINGUALLY**

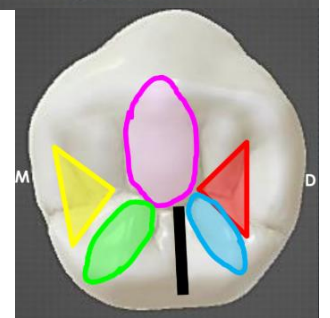
DEVELOPMENTAL GROOVES PRESENT A DISTINCTIVE 'Y' SHAPE  
AND HAVE A CENTRAL FOSSA WITH A CENTRAL PIT

**Mesial and Distal** marginal ridges are of almost parallel  
and of equal lengths

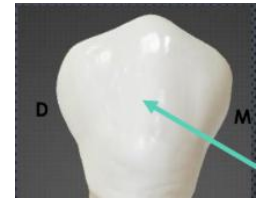
EACH CUSP HAS A TRIANGULAR RIDGE  
LINGUAL GROOVE SEPARATES  
THE **MESIO-LINGUAL** AND **DISTO-LINGUAL** CUSPS



**Mesial and Distal** triangular fossae each contains: A pit &  
developmental grooves



## Buccal View

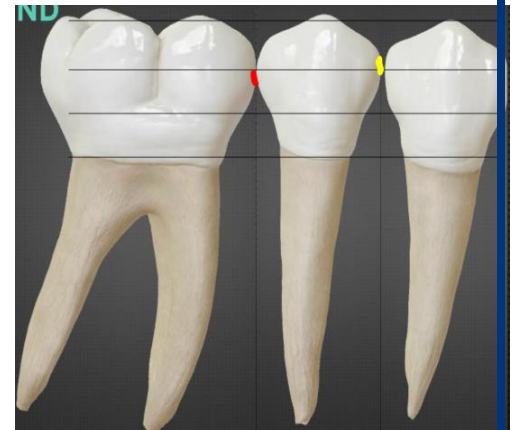


Similar to 1<sup>st</sup> premolar, Buccal cusp is less pronounced & the tooth is larger than the lower 1<sup>st</sup> premolar.

**Mesial contact area:** Junction between middle third and occlusal 3<sup>rd</sup>

**Distal contact area:** Junction between middle third and occlusal 3<sup>rd</sup> (slightly less occlusal than the mesial)

## Lingual view:



**Mesio-lingual cusp** is larger than the **Disto-lingual cusp**

Occlusal surface cannot be seen from this aspect

→ **No lingual convergence**

Lingual groove separates the mesio-lingual and disto-lingual cusps.



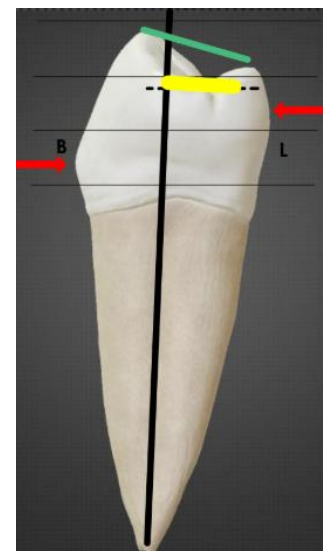
## Mesial View

**Occlusal Plane** has a slight lingual inclination and is almost perpendicular to the long axis of the tooth

**Buccal Maximum curvature:** middle of cervical 3<sup>rd</sup>

**Lingual maximum curvature:** middle of middle 3<sup>rd</sup>

**Mesial Marginal Ridge** is almost perpendicular



## Distal View

Both Lingual cusps are seen from this aspect



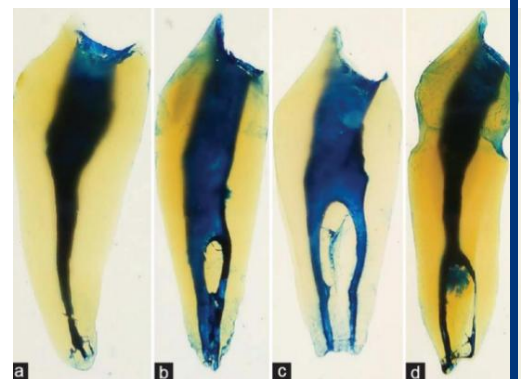
## Pulp Morphology of Mandibular 1<sup>st</sup> & 2<sup>nd</sup>

### premolars

Feature	Mandibular 1 <sup>st</sup> premolar	Mandibular 2 <sup>nd</sup> Premolar
Cross-Section at Cervix	Pulp space looks <b>ovoid</b>	Pulp space is <b>ovoid</b>
Mesio-Distal View	Similar to the morphology of a canine	Similar to the morphology of a first premolar
Bucco-Palatal / Labial View: Pulp Horns	Contains 2 pulp horns: <ul style="list-style-type: none"> <li>• Large buccal horn</li> <li>• Small lingual horn</li> </ul>	Contains 2 pulp horns: <ul style="list-style-type: none"> <li>• <i>Both horns are of almost equal heights</i></li> </ul>
Pulp Chamber / Access Notes	Access for the pulp cavity is according to the <b>occlusal surface</b>	Pulp chamber is <b>wider</b> than that of the 1 <sup>st</sup> premolar

- Pulp morphology is variant between individuals

**Vertucci's classification** of root canal configuration



# OCCLUSION

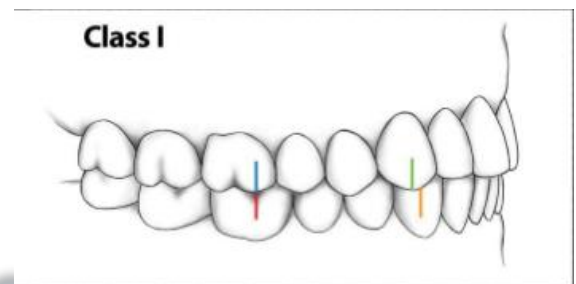
## In a typical Class I occlusal relationship:

- **Static: maximum Inter-cuspatation during centric occlusion:**
- **Dynamic**



→ **Static:**

If you start with the...	...it sits ½ tooth	...relative to the...
<b>Mandibular</b> 1st Premolar	<b>Mesial</b>	Maxillary 1st Premolar
<b>Mandibular</b> 2nd Premolar	<b>Mesial</b>	Maxillary 2nd Premolar
<b>Maxillary</b> 1st Premolar	<b>Distal</b>	Mandibular 1st Premolar
<b>Maxillary</b> 2nd Premolar	<b>Distal</b>	Mandibular 2nd Premolar



**Thank you :)**

سبحان الله وبحمده سبحان الله العظيم