

# Dental anatomy

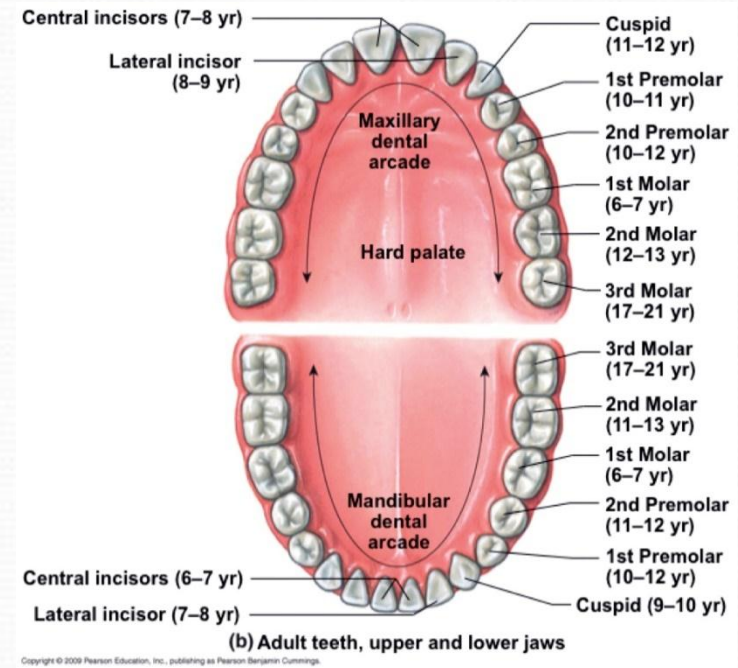
Lecture

Permanent maxillary  
molars



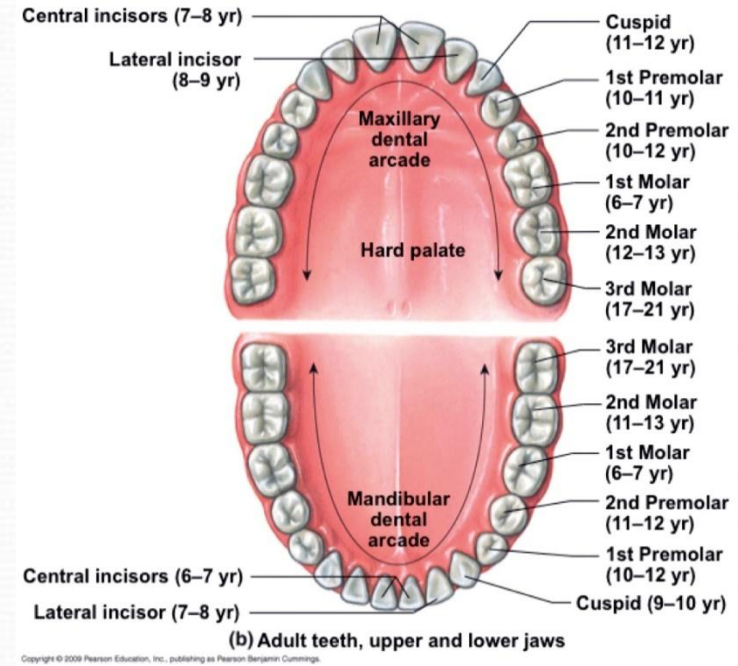
# Permanent maxillary molars

- Permanent maxillary molars are the **largest** and **strongest maxillary** teeth.
- Generally speaking, the maxillary molars have **large crowns** with **four well-formed cusps**. They have **three roots**, two buccal and one lingual, the lingual root is the largest.
- They are **not succedaneous** teeth, because they have no predecessors, they erupt behind the deciduous molars.



# Permanent maxillary molars

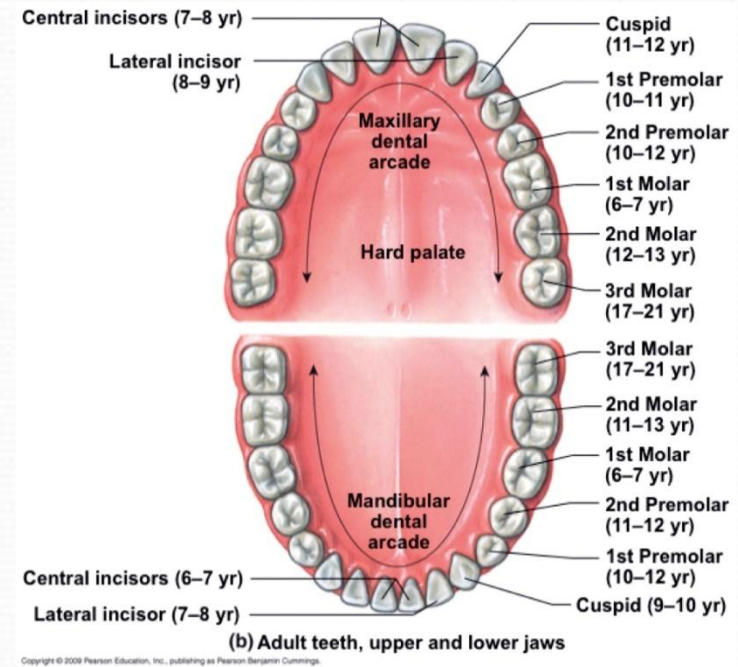
- Their main function is:
  - **grinding** of the food, they assist the mandibular molars in performing the major portion of the work in the mastication
  - **supporting** the muscles of mastication.
  - **maintaining** vertical dimension.





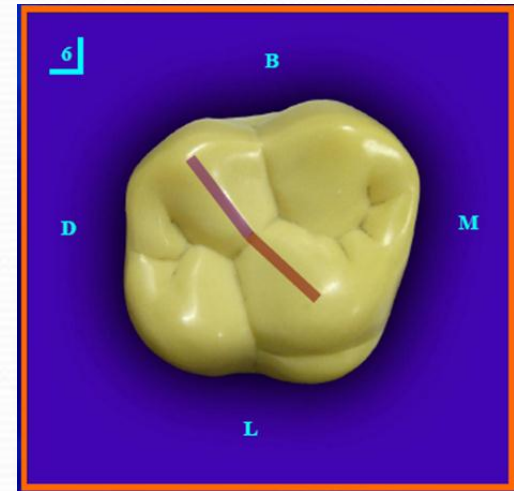
# Permanent maxillary 1st molar

- It is the largest tooth in the maxillary arch.
- The permanent first molars **usually** appear in the oral cavity when the child is **6 years** old, the **mandibular molars precede** the maxillary molars.
- The **first permanent molar** (maxillary or mandibular) erupts posterior to the second **deciduous molar**, taking up a position **in contact with** it.



# Principle identifying features of the maxillary 1st molar

- **rhomboidal** occlusal table or outline.
- the presence of a **fifth cusp** named (the cusp or tubercle of Carabelli) a non-functional cusp **on the lingual surface** of the mesio-lingual cusp.
- the presence of an **oblique ridge** extending from the **mesio-lingual cusp** to the **disto-buccal cusp**.
- the presence of **three well separated and well developed roots**: two buccal and one lingual, the lingual one is the longest.



# Buccal aspect

- the crown is **roughly trapezoidal** and the **cervical line** shows **very little convexity** which is directed to the root.
- the **mesial** outline of the crown is **straight**, curving occlusally as it reaches the **contact area**, which is located **at the junction** of the **middle** and **occlusal thirds**.
- the **distal** outline of the crown is **convex**, with the contact area located **nearly** at the centre of the **middle third**.





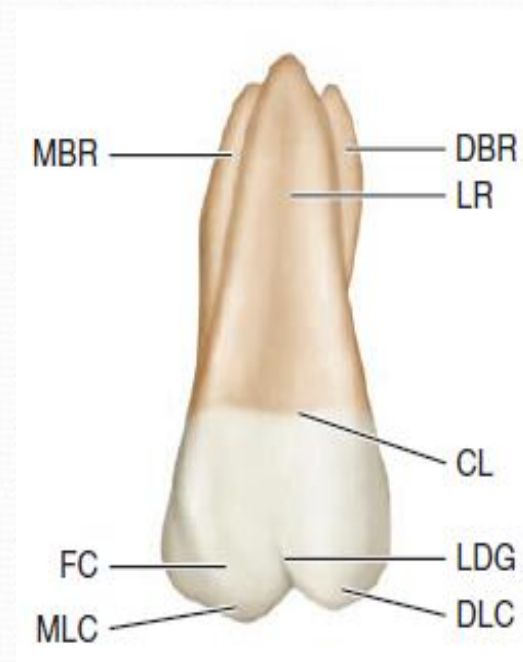
# Buccal aspect

- the **mesio-buccal cusp** is **broader** than the **disto-buccal cusp**, and its mesial and distal slopes meet at an **obtuse angle**, while the mesial and distal slopes of the **disto-buccal cusp** meet at a **right angle** (which is sharper) and we may see the lingual cusps.
- the **buccal developmental groove** divides the **buccal cusps** into **two equal distance** and it terminates apically, **nearly half distance** to the cervical line.
- the **three roots are visible** and their axes are inclined distally, the lingual root is the longest.



# Lingual aspect

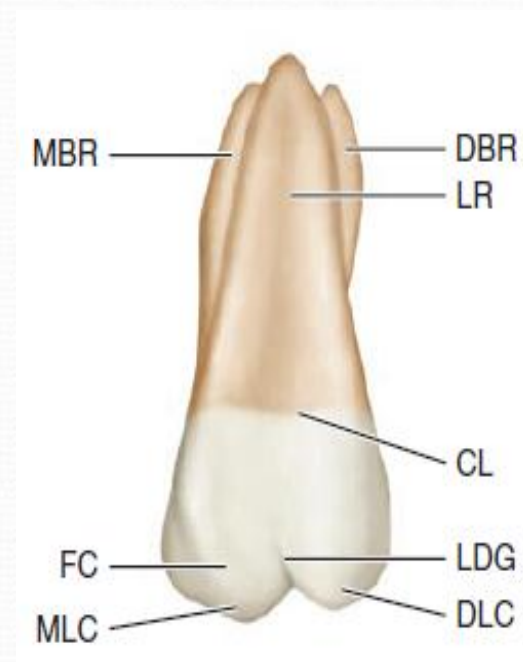
- the lingual cusps only can be seen, with the **mesio-lingual cusp is the largest** and account for the **3/5 of the mesio-distal width** of the crown, while the distolingual cusp accounts for 2/5 of the mesio-distal dimension.
- the **lingual developmental groove** starts approximately at the **centre** mesio-distally and curves sharply distally then continues to the occlusal surface.





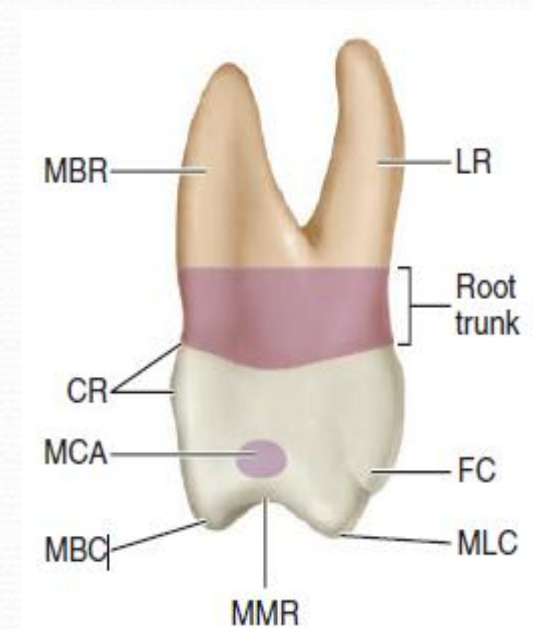
# Lingual aspect

- the fifth cusp (the cusp of carabelli) is **1.5 mm cervical** to the mesio-lingual cusp tip and an **irregular developmental groove** separates this cusp from the mesiolingual cusp.
- the **three roots are visible**, with the lingual root making most of the aspect.



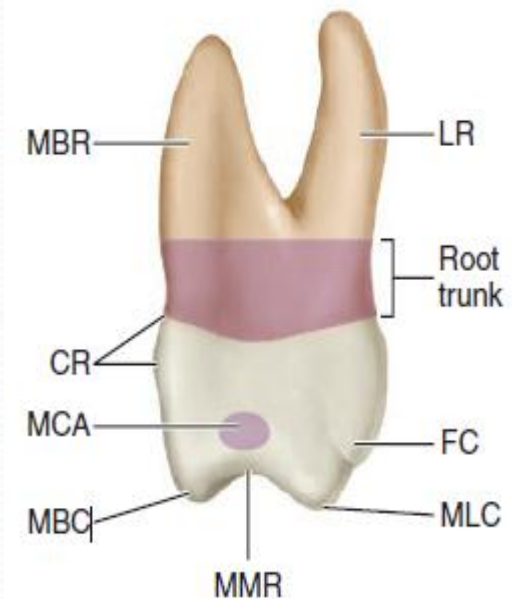
# Mesial aspect

- the **buccal** outline has a **crest** of curvature **within** the **cervical third**, then it continues with a convex outline to the tip of the cusp
- the **lingual** outline has a **crest** of curvature **within** the **middle third**, and it shows a convex pattern until it reaches the cusp of carabelli, at which it shows another convexity.
- the mesial marginal ridge is located at a level  $\frac{1}{5}$  the height of the crown.



# Mesial aspect

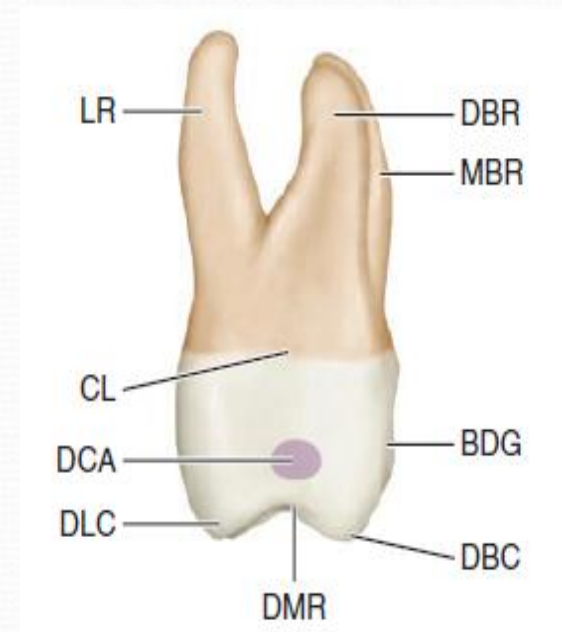
- the **cervical line curves** occlusally about **1 mm**.
- the intercusp distance of the two buccal cusps is a little more than half the buccolingual dimension of the crown.
- the mesial contact area is buccal to the buccolingual centre of the crown.
- the **lingual** and **mesiobuccal roots** can be seen.





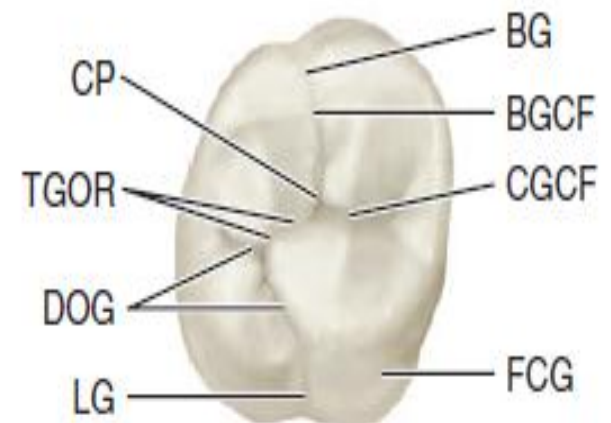
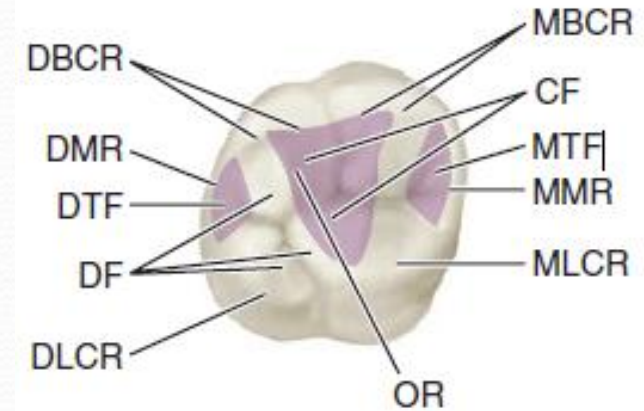
# Distal aspect

- The general outline is similar to that of the mesial aspect, but:
  - the **buccolingual measurement** is **less distally** than mesially.
  - the **distal marginal ridge** is located **more cervically**, so we can see part of the occlusal surface.
  - the **curvature** of the **cervical line** is **zero**.
  - **all the three roots** are **visible**, and the distobuccal root is the smallest one.



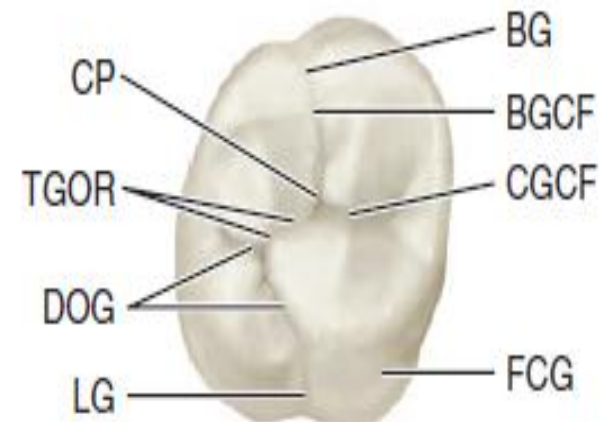
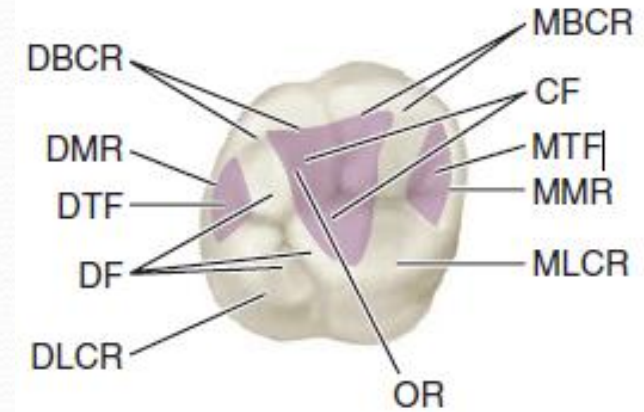
# Occlusal aspect

- the occlusal outline is **rhomboidal** in shape and the crown is **wider mesially** than distally and **wider lingually** than buccally.
- four well developed cusps can be seen: the **mesiolingual cusp** is the **largest**, then the **mesiobuccal**, then the **distolingual**, then the **distobuccal**, then the cusp of Carabelli.



# Occlusal aspect

- In this rhomboidal figure of the occlusal surface the mesiobuccal and the distolingual line angles are acute, while the mesiolingual and distobuccal line angles are obtuse.
- there is an **oblique ridge** formed by the union of the triangular ridge of the **distobuccal cusp** and the distal ridge of the **mesiolingual cusp** crossing the occlusal surface obliquely.





# Occlusal aspect

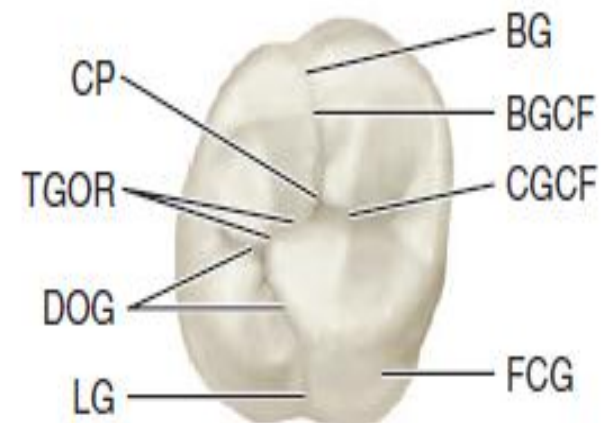
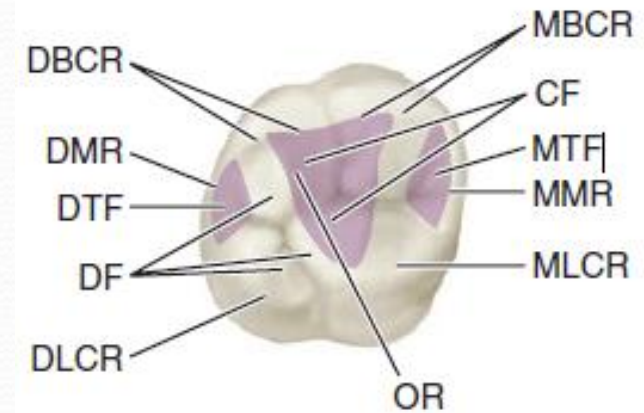
There are **four** fossae:

- **major** fossae:

- central fossa: **roughly triangular** in shape, located **mesial to** the oblique ridge.
- distal fossa: **roughly linear** in shape, located distal to the oblique ridge.

- **minor** fossae:

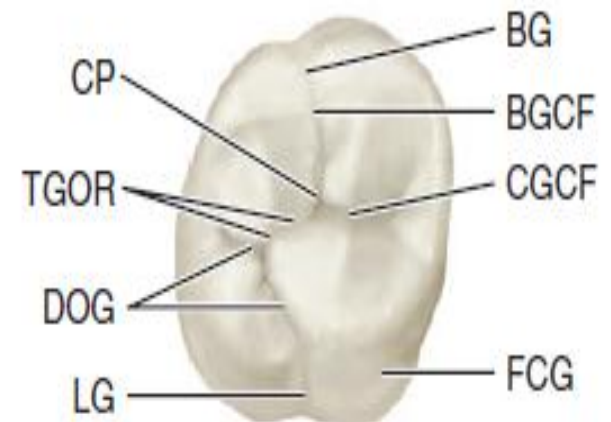
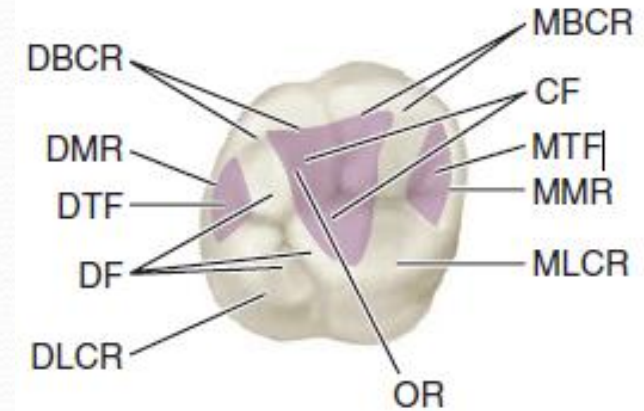
- mesial triangular fossa: located distal to the mesial marginal ridge.
- distal triangular fossa: located mesial to the distal marginal ridge.



# Occlusal aspect

There are **six** developmental grooves:

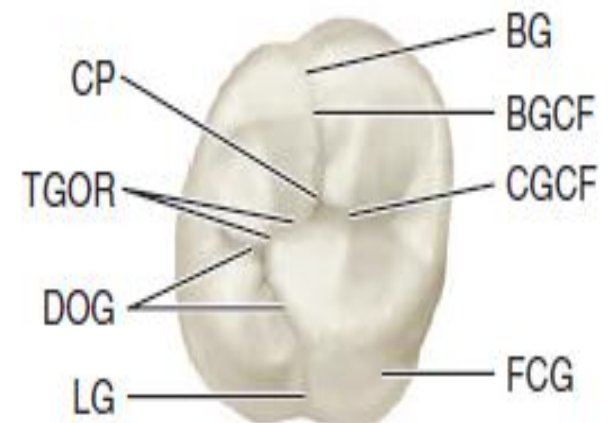
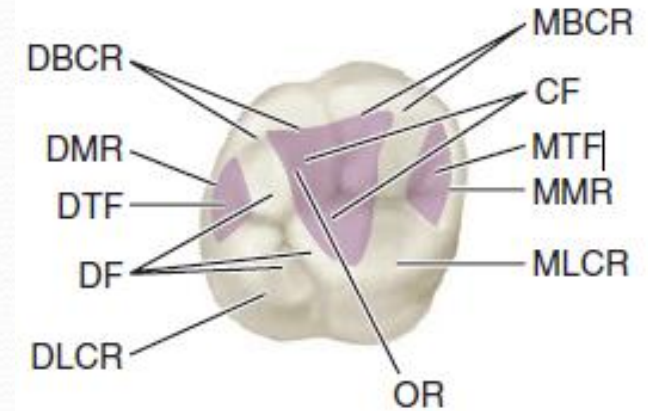
- Central developmental groove: from the central pit to the mesial triangular fossa.
- Buccal developmental groove: from the central pit to the buccal surface, between the mesiobuccal and distobuccal cusps.
- Distal oblique groove: from the distal triangular fossa going obliquely.



# Occlusal aspect

There are **six** developmental grooves:

- Lingual developmental groove: joins with the distal oblique groove going between the mesiolingual and distolingual cusps in a cervical direction.
- Transverse groove of the oblique ridge: crosses the oblique ridge.
- Fifth cusp groove: passes between the fifth cusp and the mesiolingual cusp.

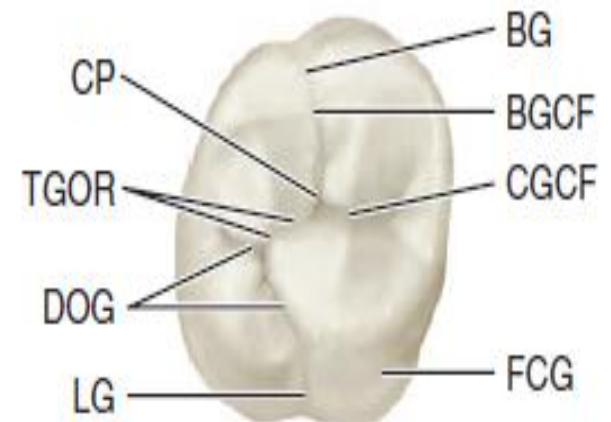
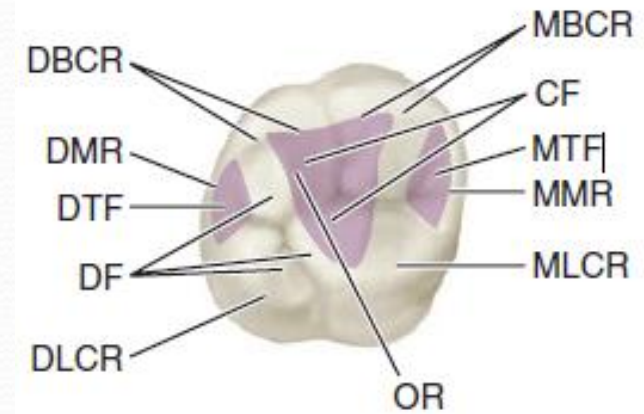




# Occlusal aspect

There are **three** pits:

- Central pit: it is located at the **deepest part** of the central fossa, at the junction of the central groove and buccal developmental groove.
- Mesial pit: it is located **at the deepest part** of the mesial triangular fossa.
- Distal pit: it is located **at the junction** of the **distal** and **distal triangular fossae**.

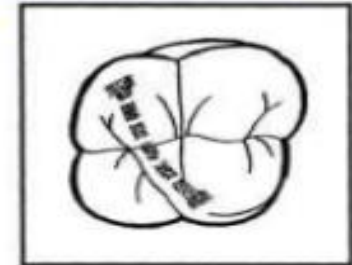


# Permanent maxillary 1st molar

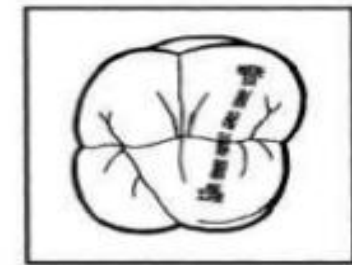
## OCCLUSAL ASPECT

### Occlusal Aspect

- **Cusp size:**
  - Mesio palatal: largest
  - Mesio buccal
  - Distobuccal
  - Distopalatal: smallest
- **Ridges:**
  - Mesial and distal marginal ridges and oblique ridge
- **Fossae:**
  - **Major:** Central and Distal fossa
  - **Minor:** Mesial and distal triangular
- **Grooves:**
  - Central, buccal and palatal developmental groove
  - Distal oblique groove
  - Transverse groove
  - Fifth cusp groove
  - Supplemental grooves
- **Pit:**
  - Central Pit



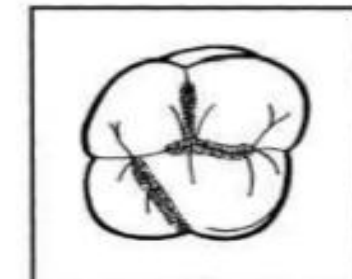
Oblique Ridge



Transverse Ridge

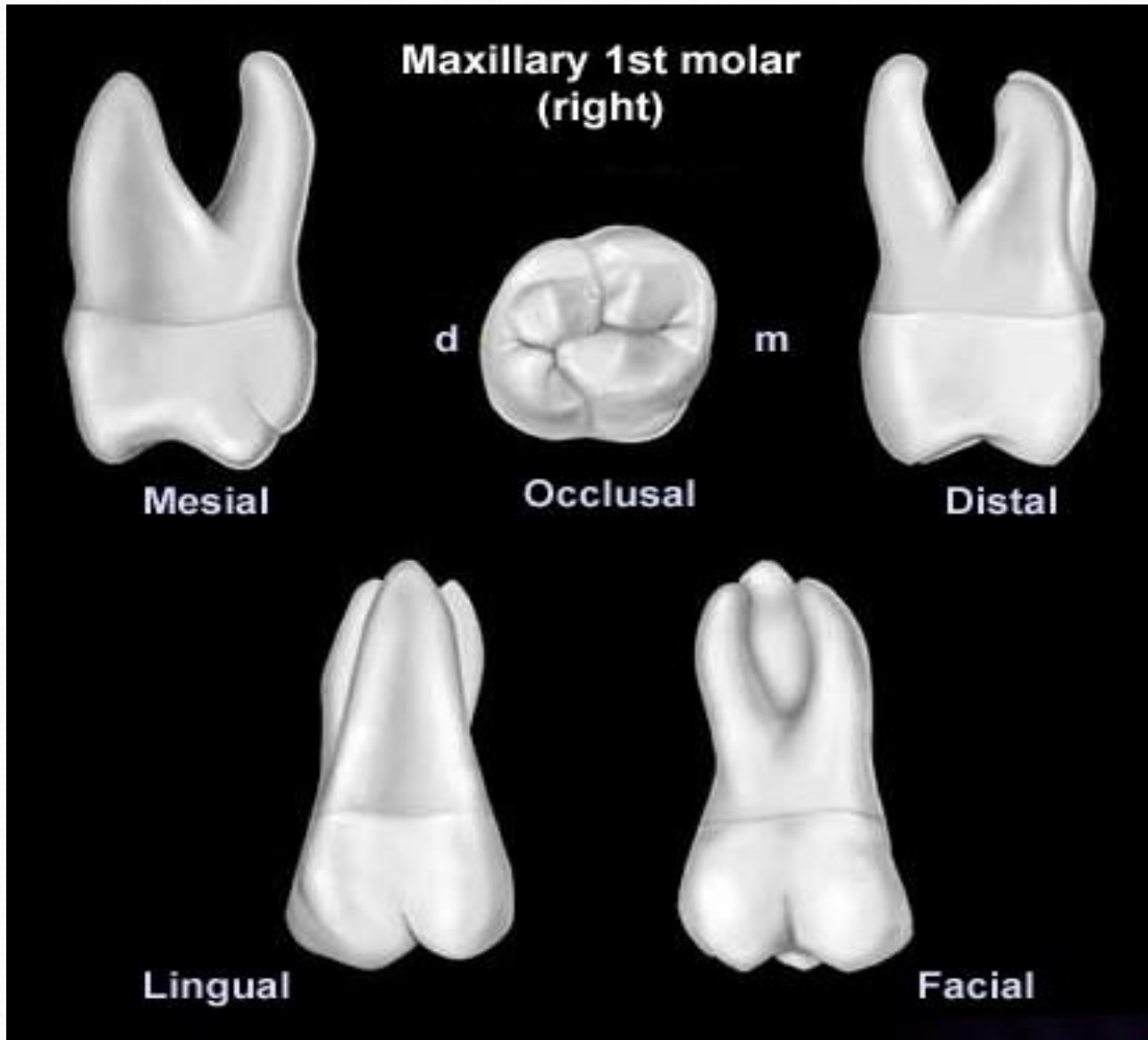


Fossae and Pits



Sulci and Depressions

# Permanent maxillary 1st molar





# Permanent maxillary 1st molar



5<sup>th</sup> cusp  
(Cusp of Carabelli)





Great Thanks