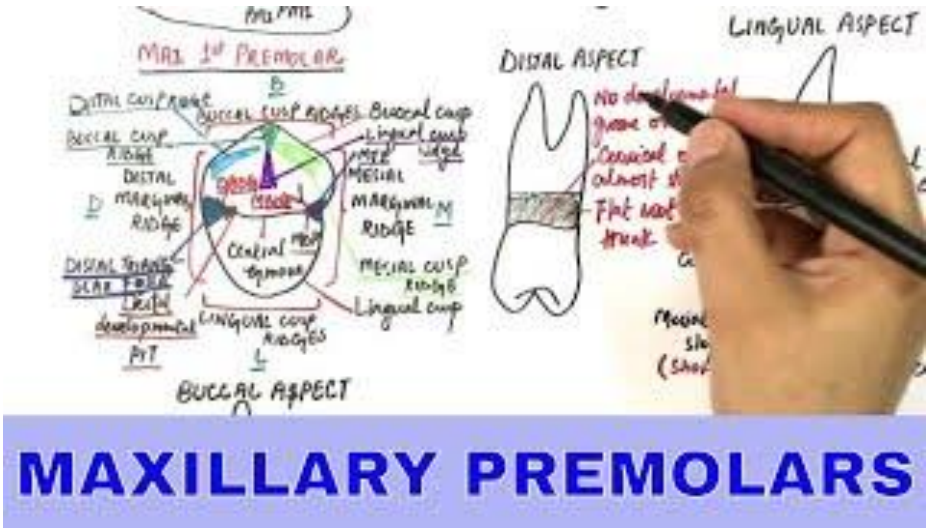
Dental anatomy

Lecture (7)

Dr. Sajad A. Shwaiel

Permanent Maxillary Premolars



The maxillary premolars are four in number: two in the right and two in the left. They are posterior to the canines and anterior to the molars.

The maxillary premolars have shorter crowns and shorter roots than those of the maxillary canines.

The maxillary first premolar is larger than the maxillary second premolar.

Premolars are named so because they are anterior to molars in permanent dentition. They succeed the deciduous molars (there are no premolars in deciduous dentition). They are also called "bicuspid-having two cusps", but this name is not widely used because the mandibular first premolar has one functional cusp.

The premolars are intermediate between molars and canines in:

Form: The labial aspect of the canine and the buccal aspect of premolar are similar.

Function: The canine is used to tear food while the premolars and molars are used to grind it.

Position: The premolars are in the center of the dental arch.

Some Characteristic Features to all Posterior teeth:

1. Greater relative facio-lingual measurement as compared with the mesio-distal measurement.
2. Broader contact areas.
3. Contact areas nearly at the same level.
4. Less curvature of the cervical line mesially and distally.
5. Shorter crown cervico-occlusally when compared with anterior teeth.

Maxillary First Premolar

Principal Identification Features:

1. Two sharply defined cusps, buccal (1mm) longer than the lingual.
2. Mesial slope of the buccal cusp is longer than the distal slope.
3. Two roots; buccal and palatal, and the bifurcation is at the middle third of the root.
4. Developmental depression on the mesial surface of the crown extending to the root.
5. Central developmental groove interrupts the mesial marginal ridge.

Buccal Aspect

From this aspect, the crown is roughly trapezoid in shape.

1. The mesial outline is slightly concave from the cervical line to the "relatively broad curvature" of the contact area.
2. The crest of curvature of the mesial contact area is immediately occlusal to the center of the middle third.

3. The distal outline of the crown is straighter than that mesially.
4. The distal contact area has a broader curvature than that found mesially with its position slightly more occlusally. In spite of that, the contact areas are nearly at the same level with each other.
5. The mesial slope of the cusp is straight and longer than the distal slope, which is shorter and more curved.
6. Buccal surface of the crown is convex showing a strongly developed middle buccal lobe. The ridge which is continuous from the tip of the cusp to the cervical line is called the buccal ridge.

Lingual Aspect:

1. The crown tapers toward the lingual because the lingual cusp is narrower than the buccal cusp.
2. The lingual cusp is smooth and spheroidal. The cusp tip is pointed with mesial and distal slopes meeting at a right (90°) angle.
3. The mesial and distal outlines lingually are convex being continuous with the slopes of the lingual cusp.
4. The lingual cusp is shorter than the buccal cusp.
5. The apex of the lingual root " of a two-rooted tooth" is blunter than the buccal one. **Mesial Aspect:**

1. The crown is roughly trapezoid, with the longest uneven side is toward the cervical line, and the shortest is toward the occlusal portion.
2. The tips of the cusps are well within the confines of the root trunk.
3. The cervical line has less curvature (1mm) than any anterior tooth.
4. The buccal outline is convex and the crest of the curvature is within the cervical third (near the junction between the cervical

and middle thirds) and then become less convex till the cusp tip.

5. The lingual outline is convex and the crest of curvature is within the middle third 9near the center of the middle third).
6. The mesial marginal ridge is at the level of the junction of the middle and occlusal thirds and is a crossed by the mesial developmental groove.
7. The root is bifurcated for half of its total length.
8. The mesial developmental depression starts from the contact area to the bifurcation area.

Distal Aspect:

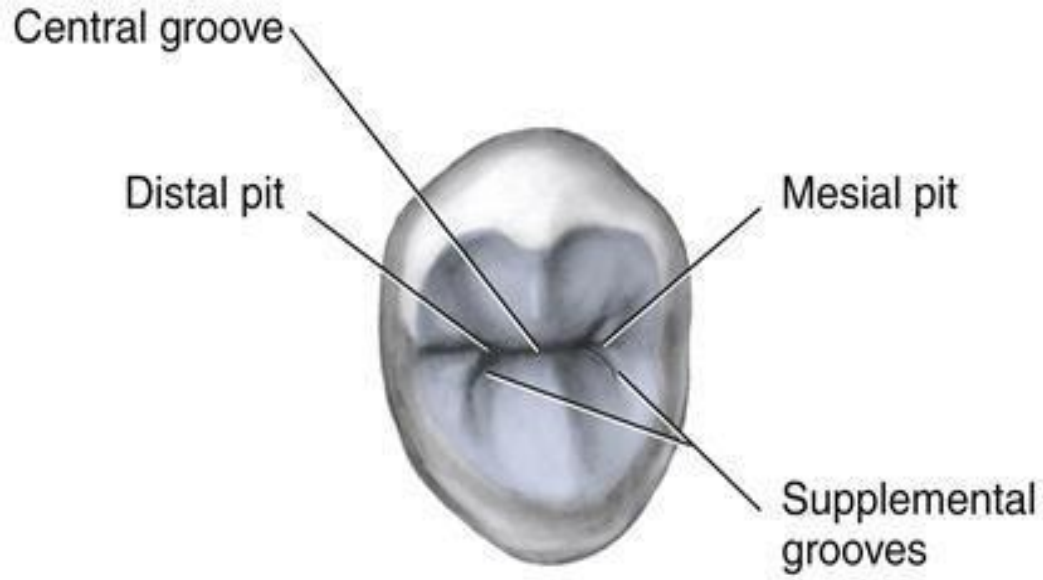
The differences between distal and mesial aspects are:

1. The curvature of the cervical line is less distally than mesially.
2. There is no developmental groove crossing the distal marginal ridge.
3. There is no developmental depression.

Occlusal Aspect:

1. It resembles an unequal hexagon 9six- sided figure). The buccal sides are equal, the mesial side is shorter than the distal side and the mesio-lingual side is shorter than the distolingual side.
2. The distal crest of curvature is buccal to the mesial crest of curvature.
3. The Bucco-lingual dimension is much greater than the mesiodistal dimension.
4. The occlusal surface is circumscribed by the cusps and marginal ridges.
5. A central developmental groove divides the crown into buccal and lingual parts. It extends from near the distal marginal developmental groove.

6. In the mesial and distal triangular fossae, there are two developmental grooves (mesio-buccal and disto- buccal grooves respectively) that join the central groove. The junctions of these grooves make the developmental pits (mesial and distal developmental pits respectively).
7. The lingual cusp is sharper and more pointed than the buccal cusp.

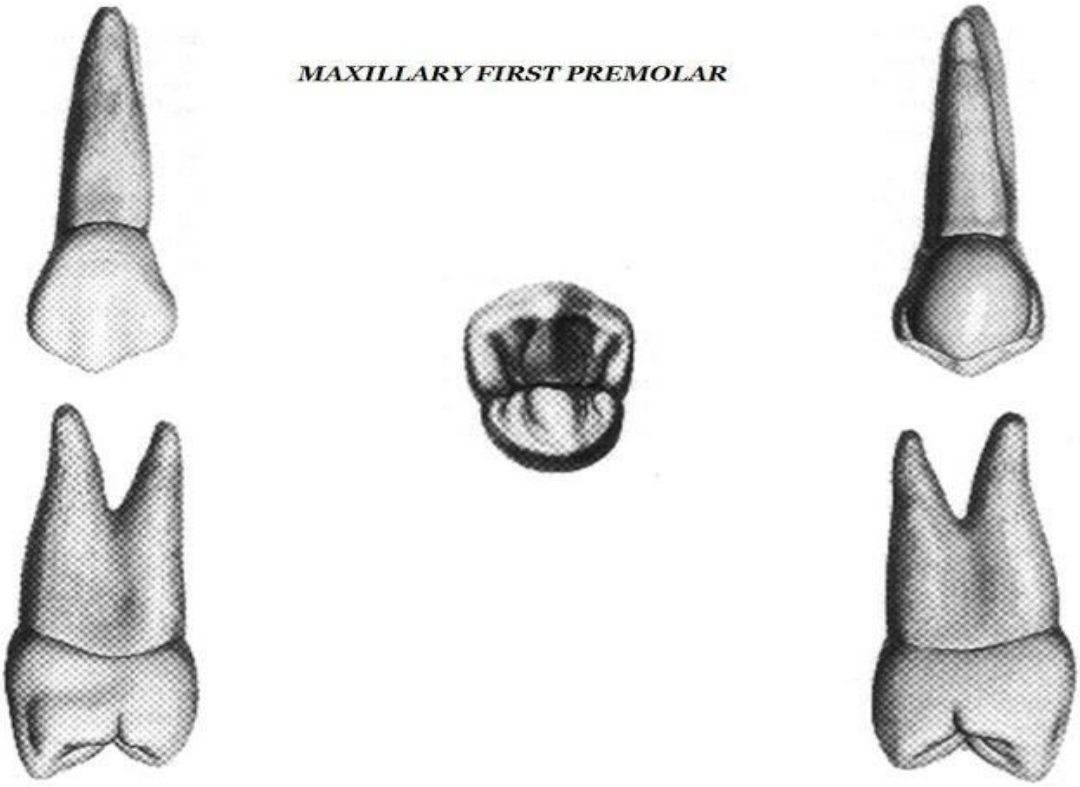


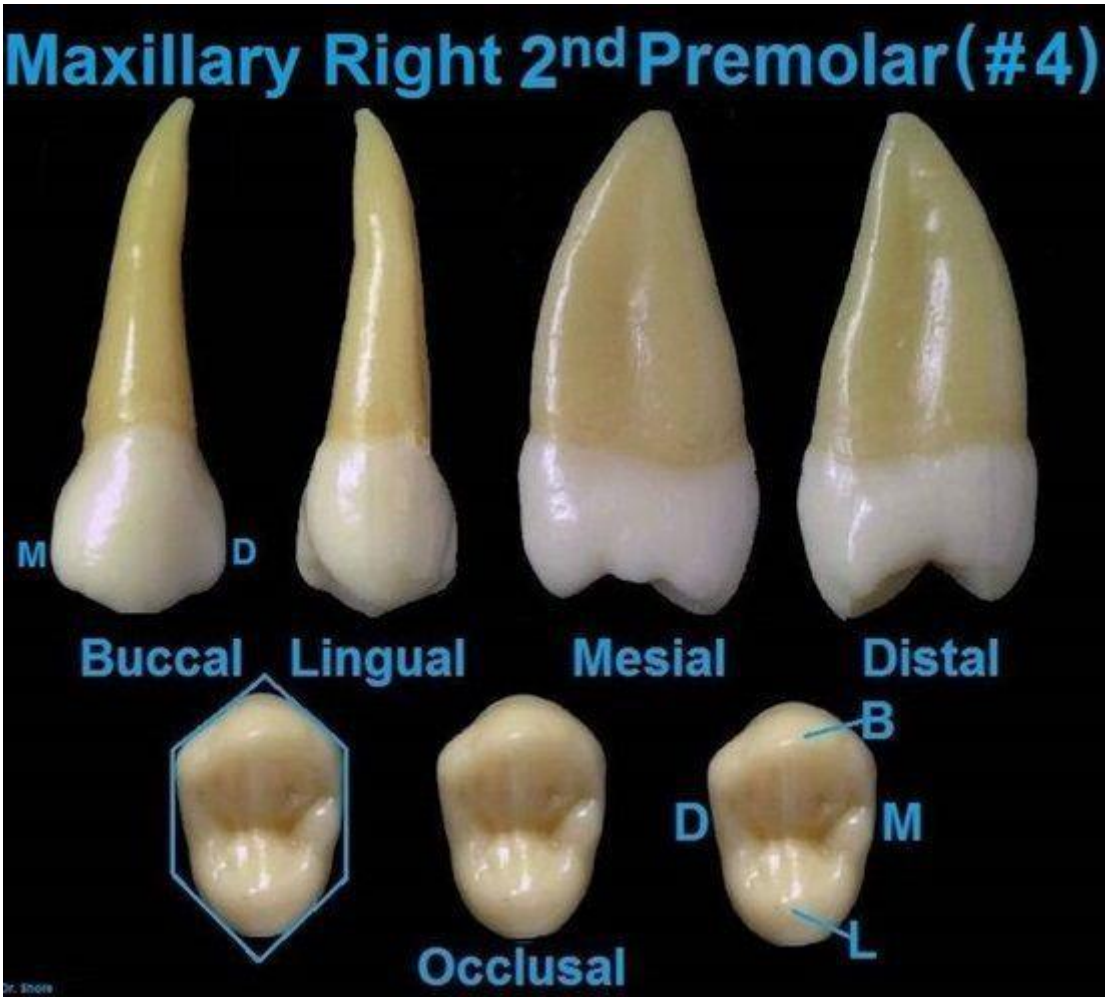
Maxillary Second Premolar

Principal Identifying Features

1. The buccal and lingual cusps are equal in height.
2. The mesial slope of the buccal cusp is shorter that the distal slope.
3. The mesial surface has no developmental depression.
4. Has a single root.
5. The occlusal surface is more rounded or oval.
6. The central developmental groove is shorter and more irregular with more supplemental grooves on the occlusal surface.
7. There is no mesial groove crossing the mesial marginal ridge.

MAXILLARY FIRST PREMOLAR




Maxillary Right 2nd Premolar (#4)
M
D
Buccal
Lingual
Mesial
Distal
B
D
M
L
Occlusal



Buccal



Lingual



Occlusal



Mesial



Distal