

## Permanent Maxillary and Mandibular Premolars

The term **premolar** means present **before** the molars. The premolar teeth are located between the canine and the molar teeth. Every quadrant has two premolars, with eight premolars in all. Premolars commonly have two cusps and are therefore also referred to as bicuspid. They help canines and molars during chewing or mastication.

To differentiate posterior teeth from anterior teeth are as follows:

1. Greater relative faciolingual measurement compared with the mesiodistal measurement.
2. Broader contact areas.
3. Contact areas more nearly at the same level.
4. Less curvature of the cervical line mesially and distally.
5. Shorter crown, cervico-occlusally than that of anterior teeth.

### MAXILLARY FIRST PREMOLAR:

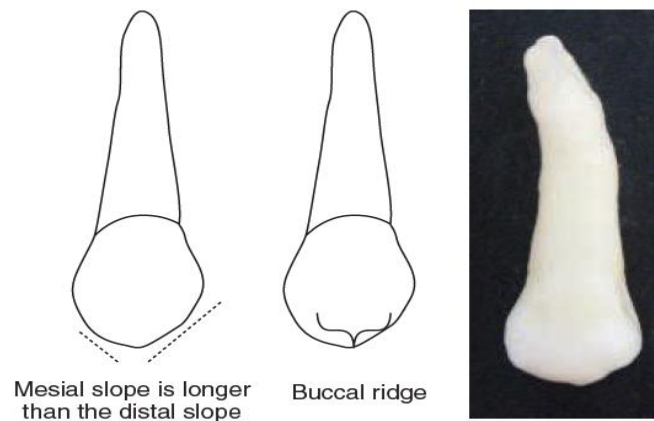
- The first maxillary premolar is distal to the canine and mesial to the second premolar`.
- The first premolar has two cusps: **buccal cusp** and **lingual cusp**.
- It has two roots: **buccal root** and **lingual root**.
- Eruption: 10–11 years.



### **Buccal Aspect:**

1. The crown is roughly trapezoidal.
2. It resembles a maxillary canine from this aspect.
3. The crown of the maxillary first premolar is wider mesiodistally when compared with other premolars.
4. The crown is wide at the level of the contact areas and narrower at the cemento-enamel junction or cervical region.
5. The mesial outline of the crown is slightly concave from the occlusal outline to the contact area. The contact area lies in the junction of the occlusal and middle third.
6. The distal outline of the crown is slightly straighter than the mesial outline and converges to the cervical line. The contact area lies in the middle third.
7. The occlusal outline of the crown is divided into two cusps slopes, the mesial and distal slopes. The mesial slope is longer than the distal slope.

8. The buccal surface is convex due to the presence of a buccal ridge extending from the cusp tip to the cervical line.
9. The buccal cusp is long, coming to a pointed tip and resembling the canine in this respect.
10. The buccal root is visible from this aspect. The buccal root is cone shaped and tapers apically.

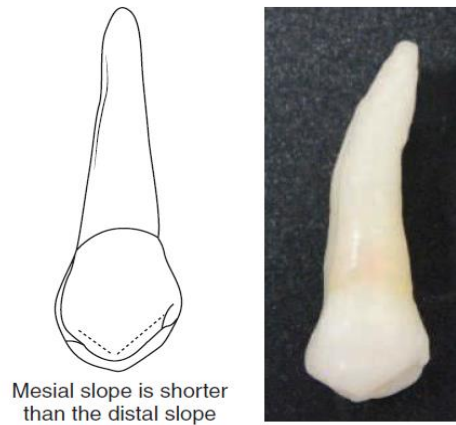


**Figure 16.1** Buccal aspect of the maxillary first premolar.

### Lingual/Palatal Aspect:

1. The lingual aspect is rounded in all directions but is smaller than the buccal surface.
2. The lingual cusp is sharp and narrower mesiodistally than the buccal cusp.
3. The cuspal slopes are not equal in length, the mesial slope is shorter than the distal slope.
4. The lingual surface is slightly more convex and has a lingual ridge extending from the cuspal tip to the cervical line.
5. The cervical line lingually is regular, with slight curvature toward the root and the crest of curvature centered on the root.

6. The lingual portion of the root, if two roots are present, is smooth and convex at all points. The apex of the lingual root of a two-root specimen tends to be more blunt than the buccal root apex.



**Figure 16.2** Lingual aspect of the maxillary first premolar.

### Mesial Aspect

1. It has a mesial marginal groove.
2. The shape of the crown is trapezoidal.
3. A developmental depression can be seen extending cervically from the mesial contact area.
4. The buccal outline of the crown is convex from the cuspal tip to the cervical line.
5. The lingual outline of the crown is convex and is more rounded when compared with the buccal aspect.
6. The cervical curvature is slightly convex towards the occlusal surface.
7. The lingual cusp is shorter than the buccal cusp. Buccal and lingual cusp tips are within the root trunk confines.
8. Contact area: Occlusal to the middle third and placed buccally.

9. Outlines of the root: The surface of the root on the mesial aspect is broad and has a vertical shallow depression extending from the cervical line to the apex. The root trunk area extending from the cervical line to the furcation can be seen from this aspect.

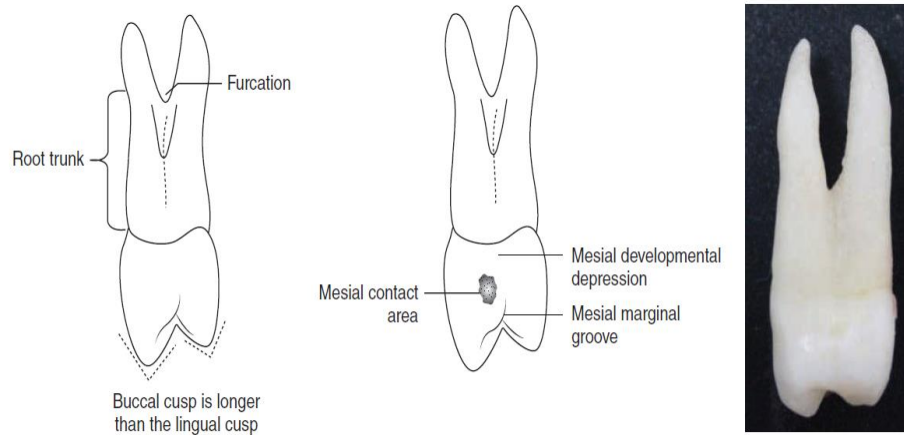
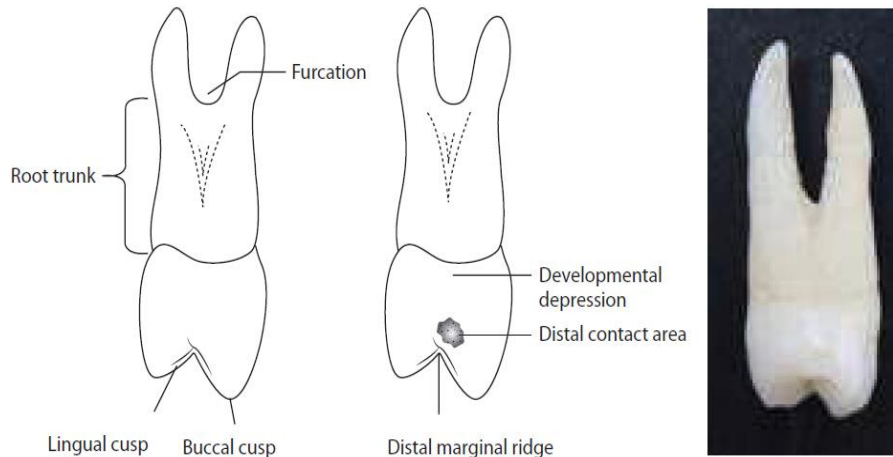


Figure 16.3 Mesial aspect of the maxillary first premolar.

### Distal Aspect:

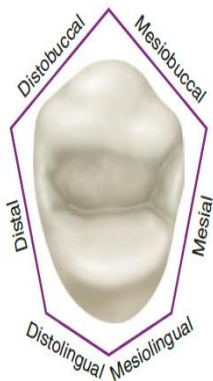
1. The distal aspect of the crown is similar to the mesial aspect but the developmental depression and the groove **are absent** on the distal aspect.
2. Shape of the crown: The shape of the crown is trapezoidal.
3. The outlines of the crown are similar to the mesial aspect except that they are more rounded and smoother.
4. Contact area: Situated at the same level as the mesial aspect but broader and more buccally placed.
5. The surface of the root from the distal aspect shows a vertical shallow depression extending from the cervical line to the apex, but it is not as prominent as in the mesial surface of the root.



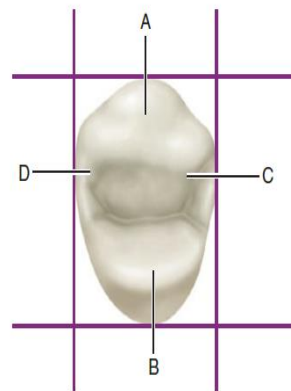
**Figure 16.4** Distal aspect of the maxillary first premolar.

### Occlusal Aspect

1. Shape of the crown: The shape of the crown is roughly hexagonal with six sides. They are the mesiobuccal, mesial, mesiolingual, distolingual, distal, and distobuccal sides.
2. The buccal outline is convex and makes the crown appear bulkier from this aspect.
3. The lingual outline is also convex but its dimensions are smaller than those in the buccal aspect.



**FIGURE 9-14** Maxillary first premolar, occlusal aspect. This aspect resembles a hexagonal figure.

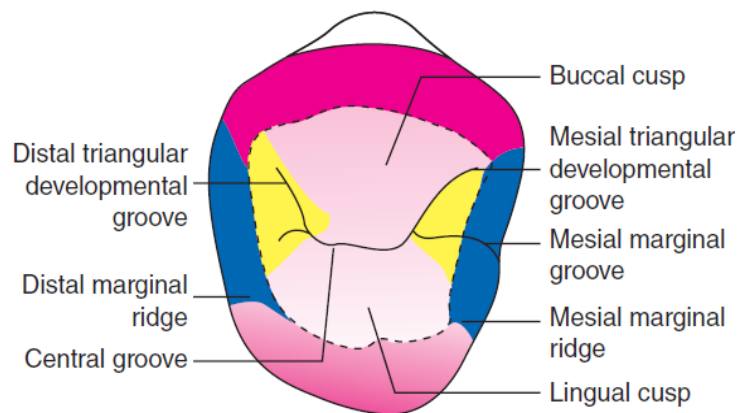


**FIGURE 9-15** Maxillary first premolar, occlusal aspect. A, Crest of buccal ridge; B, crest of lingual ridge; C, crest of mesial contact area; D, crest of distal contact area.

4. Occlusal surface: The occlusal surface shows two well-developed cusps, four grooves, two fossae, and three ridges.

a. Grooves:

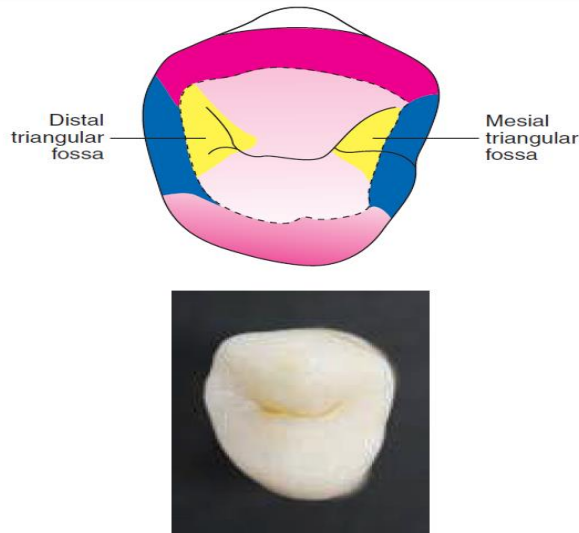
- The occlusal surface is divided by a central developmental groove that joins with the mesial marginal groove.
- Two grooves extend from the central groove (CG) to the buccal side: mesiobuccal and distobuccal developmental grooves (MBDG) (DBDG).
- Mesial marginal developmental groove (MMDG) extends from the central groove to the mesial marginal ridge and extends to the mesial surface.



**Figure 16.5** Occlusal surface showing the different ridges and grooves of the maxillary first premolar.

b. Fossae:

- Mesial triangular fossa (MTF) is a triangular depression near the mesial marginal ridge.
- Distal triangular fossa (DTF) is a triangular depression near the distal marginal ridge.

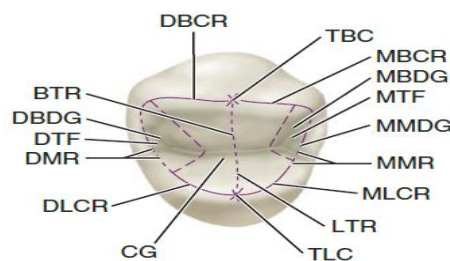


**Figure 16.6** Occlusal surface showing the mesial and distal triangular fossae of the maxillary first premolar.

c. Ridges

- **Buccal triangular ridge (BTR):** The mesial and distal cusp inclines of the buccal cusp join to form a buccal triangular ridge, extending from the cusp tip to the central groove.
- **Lingual triangular ridge (LTR):** The mesial and distal cuspal inclines of the lingual cusp join to form a lingual triangular ridge, which extends from the cusp tip to the central groove.
- **Transverse ridge:** The union of the buccal and lingual triangular ridges near the central groove forms this ridge.
- — **Distal marginal ridge (DMR):** It is the ridge that borders the distal triangular fossa.
- — **Mesial marginal ridge (MMR):** It is the ridge which borders

the  
fossa.



mesial  
triangular