

Dental Anatomy

Lecture -12

Permanent Mandibular Molars

Mandibular First Molar

Principal Identifying Features

1. Five cusps: two buccal, two lingual and one distal.
2. The buccal surface is inclined lingually, with the presence of two buccal developmental grooves.
3. The crown is wider mesio-distally than bucco-lingually.
4. The occlusal surface is rectangular in shape.
5. There are two well developed roots: one mesial and one distal.

Buccal Aspect

1. The mesial contact area is at the junction between the occlusal and middle thirds.
2. The distal contact area is a little lower than the mesial contact area.
3. The cervical line is curving regularly apically.
4. There are two buccal developmental grooves acting as lines of division between the cusps: (a) The mesiobuccal developmental



groove: separating between the mesiobuccal cusp and distobuccal cusp, and (b) The distobuccal developmental groove: separating between the distobuccal cusp and distal cusp. The mesiobuccal developmental groove is shorter than the distobuccal one.

5. The mesiobuccal, distobuccal and distal cusps are clearly visible, and the mesiolingual and distolingual cusps tips can be seen.
6. The mesiobuccal cusp is slightly wider than the distobuccal cusp, and they make together 80% of the mesiodistal width of the crown, while the distal cusp makes the rest 20%.
7. The buccal cusps are flat occlusally, while the distal cusp is rounded.
8. The bifurcation area is about 3mm below the cervical line.

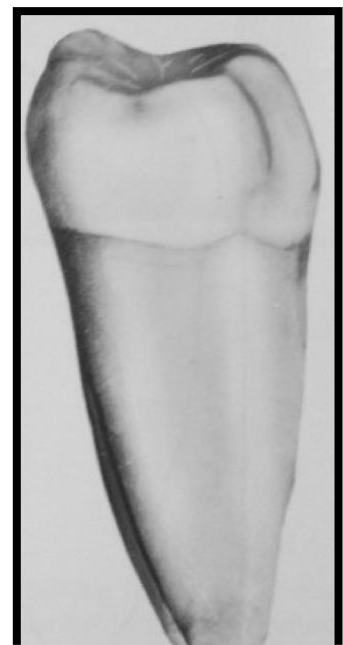
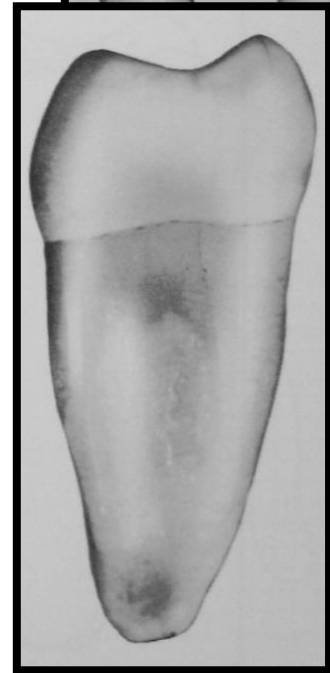
Lingual Aspect

1. From the lingual aspect, three cusps can be seen: the mesiolingual cusp, the distolingual cusp and the lingual portion of the distal cusp. The mesiolingual cusp is the widest mesio-distally and has the highest cusp tip, while the distal cusp has the lowest cusp tip.
2. The two lingual cusps are pointed and form an obtuse angle at their cusps tips.

3. The lingual developmental groove extends downwards for about one third of the crown length, and it acts as a line of division between the two lingual cusps.

Mesial Aspect

1. The crown is rhomboidal with a lingual tilt of the buccal outline.
2. The buccal outline of the crown is convex from the cervical line up to the junction between the cervical and middle thirds forming the “buccal cervical ridge”, then the buccal outline straightens up to the buccal cusp tip.
3. The lingual outline is less convex, with the crest of curvature at the center of the middle third.
4. The cervical line is irregular, and higher lingually than buccally.
5. The buccal cusp is flat and the lingual cusp is sharp with greater cusp height.
6. The mesial marginal ridge is located about 1 mm below the level of the cusps tips.

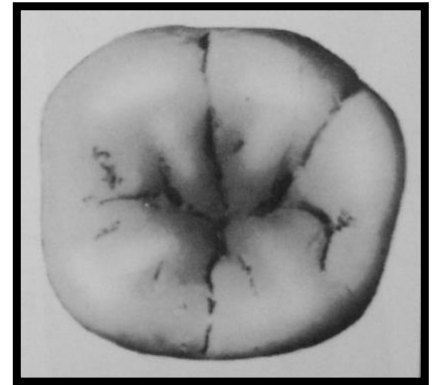


Distal Aspect

1. The crown is shorter distally than mesially, so most of the occlusal surface can be seen from the distal aspect.
2. The distal cusp is located buccal to the center bucco-lingually.
3. The distal marginal ridge is short and curves cervically to form an obtuse angle.
4. The cervical line is irregular.
5. The distal root is narrower bucco-lingually than the mesial root.

Occlusal Aspect

1. The occlusal outline is rectangular in shape, and it is larger mesio-distally than bucco-lingually by 1 mm.
2. The bucco-lingual measurement of the crown is greater on the mesial side than on the distal, and the mesio-distal measurement of the crown is greater on the buccal side than on the lingual.
3. There are five cusps: the mesiobuccal cusp (the largest), then the mesiolingual and the distolingual cusps, then the distobuccal cusp, and then the distal cusp (the smallest).
4. The distal contact area is located at the distal cusp.
5. There are three fossae; one major and two minor fossae:
 - (A) The major fossa is the central fossa which is roughly circular in shape, and is centrally placed on the occlusal surface. It is a concave area bounded by the distal slope of the mesiobuccal



cusps, both mesial and distal slopes of the distobuccal cusp, the mesial slope of the distal cusp, the distal slope of the mesiolingual cusp, and the mesial slope of the distolingual cusp.

(B) Minor fossae: (i) Mesial triangular fossa: located distal to the mesial marginal ridge. (ii) Distal triangular fossa: located mesial to the distal marginal ridge.

6. There are four developmental grooves:

(A) Central developmental groove: passes from the central pit to the mesial and distal triangular fossae.

(B) Mesiobuccal developmental groove: passes from the central pit to the buccal surface between the mesiobuccal and distobuccal cusps.

(C) Distobuccal developmental groove: passes from its junction with the central groove in a distobuccal direction separating the distobuccal and distal cusps.

(D) Lingual developmental groove: is an irregular groove passes lingually in between the cusps' ridges of the mesiolingual and distolingual cusps.