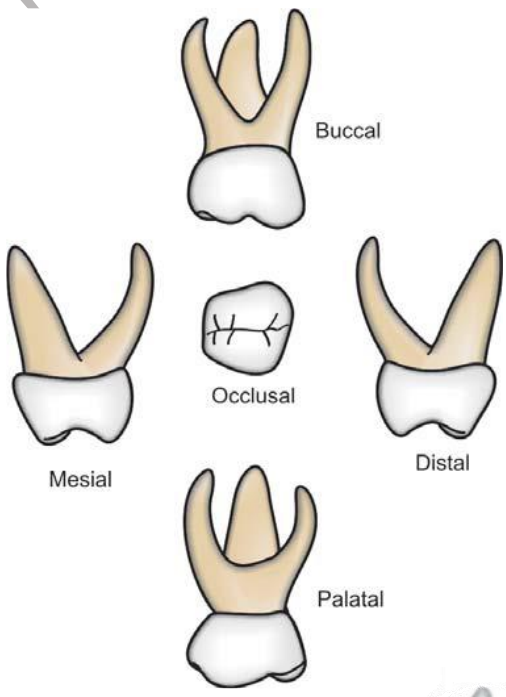
Assist. Prof. Dr. Aseel Haidar

MORPHOLOGY OF POSTERIOR PRIMARY TEETH

Maxillary First Molars (D|D)

The primary maxillary first molars usually erupt by 16 months of age. The primary maxillary first molar is unique, it looks resembles a molar and a premolar.
Its occlusal surface consists of four prominent cusps, mesiobuccal, distobuccal distobuccal and distolingual. This gives the tooth a square look and there are three slender roots.

1) The greatest dimension of the crown of the maxillary first molar is at the mesiodistal contact areas, and from these areas the crown converges toward the cervical region.
2) The mesiolingual cusp is the largest and sharpest.
3) The distolingual cusp is poorly defined, small, and rounded.
4) The buccal surface is smooth, with little evidence of developmental grooves.
5) The three roots are long, slender, and widely spread.



Note:

A characteristic of all primary molars is that the furcation of the roots begins at the cementoenamel junction. This is not apparent in permanent molars. There is a very prominent buccal cervical ridge.

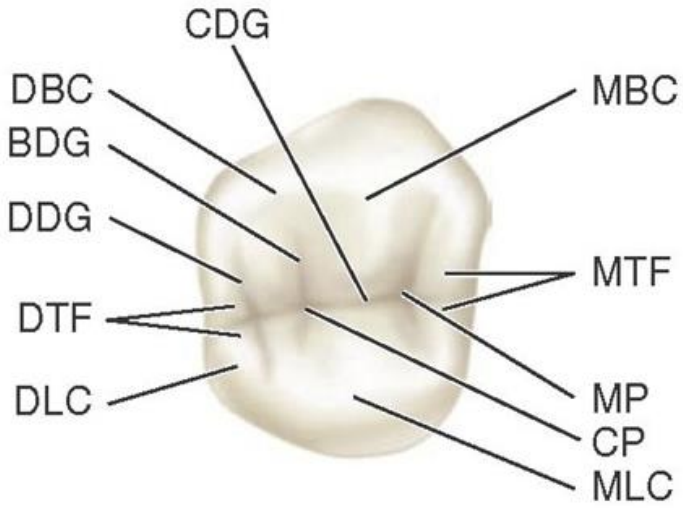
- Anatomy of the pulp:

The pulp horns correspond to each cusp; the mesiobuccal pulp horn is the most prominent (mesio-buccal horn is the largest of pulpal horns occupying a prominent portion of pulp chamber). Mesiolingual pulpal horn is second in size, quite angular and sharp. Distobuccal horn is smallest, sharp and occupies distobuccal

angle. The mesiobuccal pulp horn is 1.8 mm, the distobuccal pulp horn is 2.3 mm, and the palatal pulp horn is 2.0 mm from the cusp tip.

Clinical significance

1) Distal surface is the most surface susceptible to dental caries.
2) Cl II proximal preparation should be initiated after the occlusal preparation for ease access to the lesion and ease of polishing of the restoration.
3) Extremely narrow occlusal surface.
4) Mesiobuccal pulp horn is very large.
5) If the distal surface is involved avoid over extension beyond the oblique ridge.
6) Prominent mesiobuccal cervical ridge must be accommodated during stainless steel crown preparation.



Maxillary first molar. MBC, Mesiobuccal cusp; MTF, mesial triangular fossa; MP, mesial pit; CP, central pit; MLC, mesiolingual cusp; DLC, distolingual cusp; DTF, distal triangular fossa; DDG, distal developmental groove; BDG, buccal developmental groove; DBC, distobuccal cusp; CDG, central developmental groove. distolingual cusp; LDG, lingual developmental groove; MLC, mesiolingual cusp; MP, mesial pit; MBDG, mesiobuccal developmental groove; MBC, mesiobuccal cusp.

Maxillary Second Molars (E | E)

The primary second molars are the last primary teeth to erupt, completing the primary dentition by 28-30 months of age.

1) The primary maxillary second molar resembles the permanent maxillary first molar in appearance but is smaller.
2) The tooth is rhomboidal.
3) There are four cusps, two on the buccal and two on the lingual aspects, and often there is a fifth cusp (supplemental) or prominence, called as the tubercle of Carabelli on the palatal surface of the mesiopalatal cusp.

The buccal view of this tooth shows two well-defined buccal cusps with a buccal developmental groove between them. The two buccal cusps are more nearly equal in size and development than those of permanent max'1st molar. However, the lingual surface has three cusps: a mesiolingual cusp that is large and well developed, a distolingual cusp, and a third smaller supplemental cusp (the cusp of Carabelli). A well-defined groove separates the mesiolingual cusp from the distolingual cusp.

4) This crown is considerably larger than that of the first primary molar.

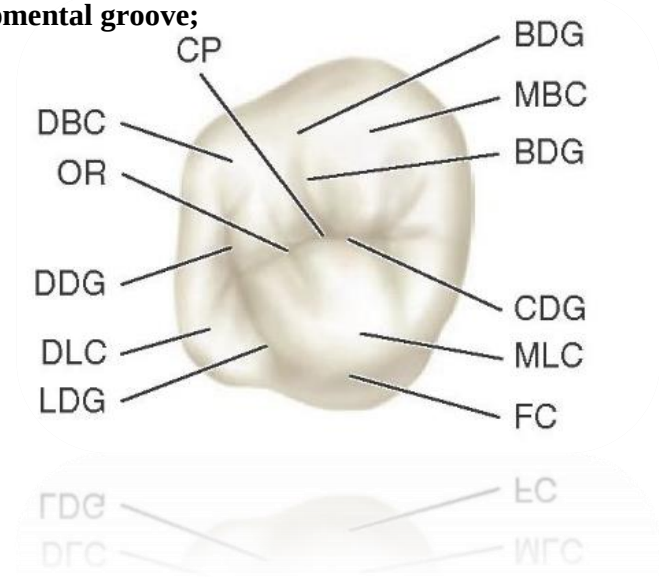
5) There are three roots that are curved to accommodate the developing tooth bud beneath. The lingual root is large and thick in comparison with the other two buccal roots. It is approximately the same length as the mesiobuccal root.

6) The roots are slender, much longer and heavier than those of maxillary first primary molar. The point of bifurcation between the buccal roots is close to the cervical line of the crown.

7) The crown is narrow at the cervix in comparison with its M-D measurement at the contact areas.

8) On the occlusal surface a prominent transverse or oblique ridge connects the distolingual cusp with the mesiopalatal cusp.

BDG, Buccal developmental groove; CDG, central developmental groove; CP, central pit; DBC, distobuccal cusp; DBDG, distobuccal developmental groove; DC, distal cusp; DDG, distal developmental groove; DLC, distolingual cusp; DP, distal pit; DTF, distal triangular fossa; FC, fifth cusp; LDG, lingual developmental groove; MBC, mesiobuccal cusp; MBDG, mesiobuccal developmental groove; MLC, mesiolingual cusp; MP, mesial pit; MTF, mesial triangular fossa; OR, oblique ridge.

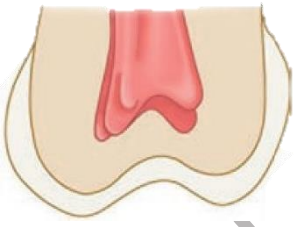


- Anatomy of the pulp:

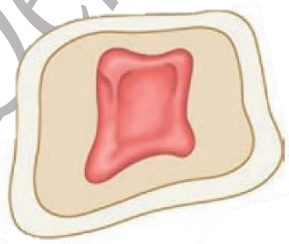
The pulp cavity consist of a pulp chamber and 3 pulp canals corresponding to three roots. There may be four or five pulp horns, which usually are most prominent beneath each cusp tip.

- ❖ The mesiobuccal pulp horn, as usual, is the largest**,** closest to the DEJ, pointed and extends occlusally.
- ❖ Mesiolingual pulp horn is second in size, when combined with the fifth horn it will presents a bulky appearance.
- ❖ Distobuccal pulp horn is third in size, joining mesiolingual pulp horn as slight elevation.
- ❖ Distolingual pulp horn is shortest and extends only slightly above occlusal level.

Lingual

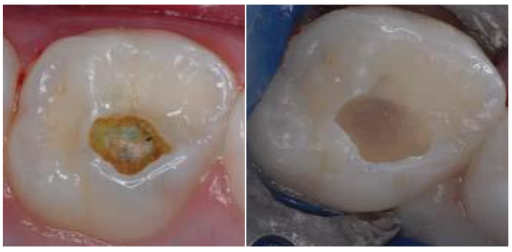


Occlusal view

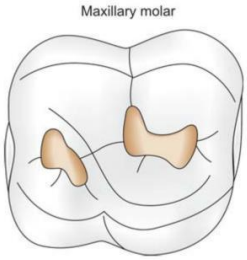


CLINICAL CONSIDERATIONS

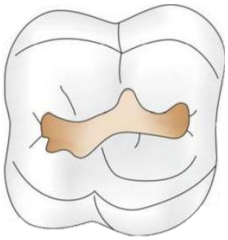
- There are three occlusal pits, the central pit is most often carious. When this occur the outline of the preparation should not cross the oblique ridge, it extends to the mesial pit.



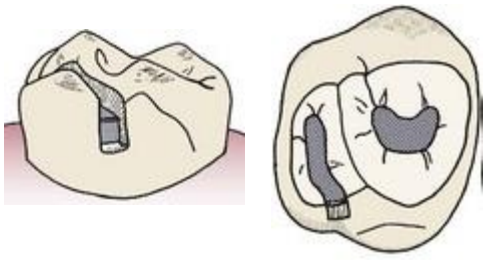
- If distal pit is involved, it completed as an individual occlusal preparation (two separated cavities).



- Two are combined into a single occlusal preparation if the oblique ridge is undermined with dental caries.



- If the lingual pit is involved then the preparation on the distal surface should be extended to form a two surface restoration that includes the distal and lingual pits.



Maxillary second primary molar, lingual view of distolingual groove preparation (Distal class one (involve only distal pit without crossing the oblique ridge) with lingual extension).

The Overall preparation is somewhat larger because of its broad flat contacts.

- CLASS II – Proximal box preparation can be somewhat deeper.
  - **The pulp does not extend far into the dentine.**
  - **The disto-occlusal preparation is difficult because the contact is broad in all directions.**
  - **This preparation should not be neglected because it can influence the decalcification on the mesial surface of the immature permanent first molar.**

Mandibular First Molars ($\overline{DTD}$)

1. Unlike other primary teeth, the first primary molar does not resemble any of the permanent teeth.
2. The mesial outline of the tooth, when viewed from the buccal aspect, is almost straight from the contact area to the cervical region.
3. The distal area of the tooth, when viewed from the buccal aspect, is shorter than the mesial area.
4. It has four cusps, two buccal and two lingual.
5. The two distinct buccal cusps have no evidence of a distinct developmental groove between them; the mesial cusp is the larger of the two.
6. There is a pronounced lingual convergence of the crown on the mesial aspect, with a rhomboid outline present on the distal aspect.
7. The mesial marginal ridge is well developed, to the extent that it appears as another small cusp lingually.

Mesial

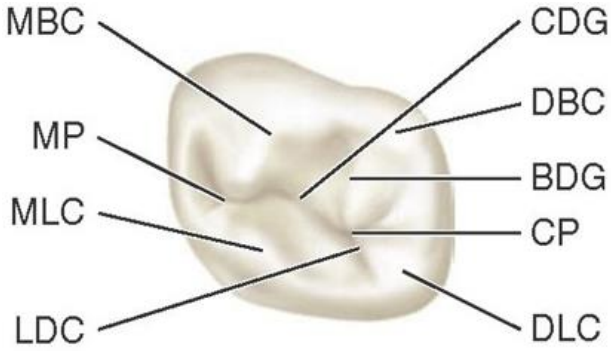
Buccal aspect

8. When the tooth is viewed from the mesial aspect, there is an extreme curvature buccally at the cervical third.

9. The mesiolingual cusp is long and sharp at the tip; a developmental groove separates this cusp from the distolingual cusp, which is rounded and well developed.

10. The occlusal surface is narrow due to the convergence of the mesiobuccal and mesiolingual cusps. It has three pits, transverse ridge is very prominent and divides the occlusal surface.

Lingual

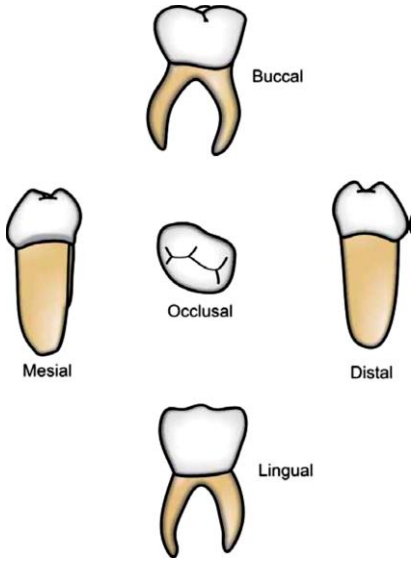


Mandibular first molar. CDG, Central developmental groove; DBC, distobuccal cusp; BDG, buccal developmental groove; CP, central pit; DLC, distolingual cusp; LDC, lingual developmental groove; MLC, mesiolingual cusp; MP, mesial pit; MBC, mesiobuccal cusp.

11. The crown length is greater in the mesiobuccal area than in the mesiolingual area; thus the cervical line slants upward from the buccal to the lingual surface.

12. There are two broad but thin mesial and distal roots, one on the mesial aspect and one on the distal aspect. The longer slender roots spread considerably at the apical third, extending beyond the outline of the crown.

The mesial root, when viewed from the mesial aspect, does not resemble any other primary root. The buccal and lingual outlines of the root drop straight down from the crown, being essentially parallel for more than half their length. The end of the root is flat and almost square.



Note:

This primary molar erupts by the 14-16th month of life.

- *Anatomy of the pulp:*

There are four pulp horns with one pulp horn beneath each cusp in which:

- Mesiobuccal horn- largest and rounded
- Distobuccal pulp horn-is second, but lacks height of mesial horns
- Mesiolingual horn is third in size and second in height.
- Distolingual pulpal horn is smallest.

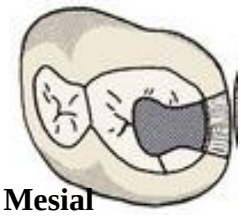
The pulp cavity contains a chamber and 3 canals. Mesiobuccal and mesiolingual canals are confluent and leave the chamber in the form of a ribbon. The distal pulp canal projects in ribbon fashion from floor of chamber in distal aspect. Occlusal view of pulp chamber is rhomboidal.

Occlusal

Lingual

CLINICAL CONSIDERATIONS

- ✓ Distal and central pits- The most area susceptible to caries.
- ✓ Unless the transverse ridge is undermined – It should be kept intact.



- ✓ CLASS II – Both buccal, lingual and proximal box should extend adequately to allow for polishing but not overdone. This causes weakening of both cusps with increased tendency to fracture.
- ✓ Prominent mesiobuccal cervical ridge must be accommodated for in stainless steel crown preparation.

Mesial **Distal**

Clinical significance

- Cavity preparation
- MB pulp horn

Mandibular Second Molars ($\overline{ETE}$)


Buccal aspect

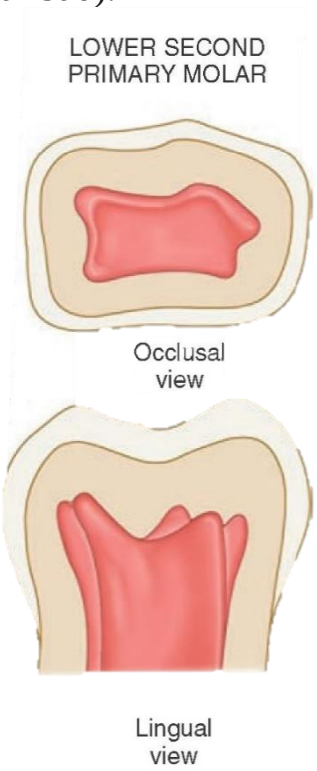

Lingual

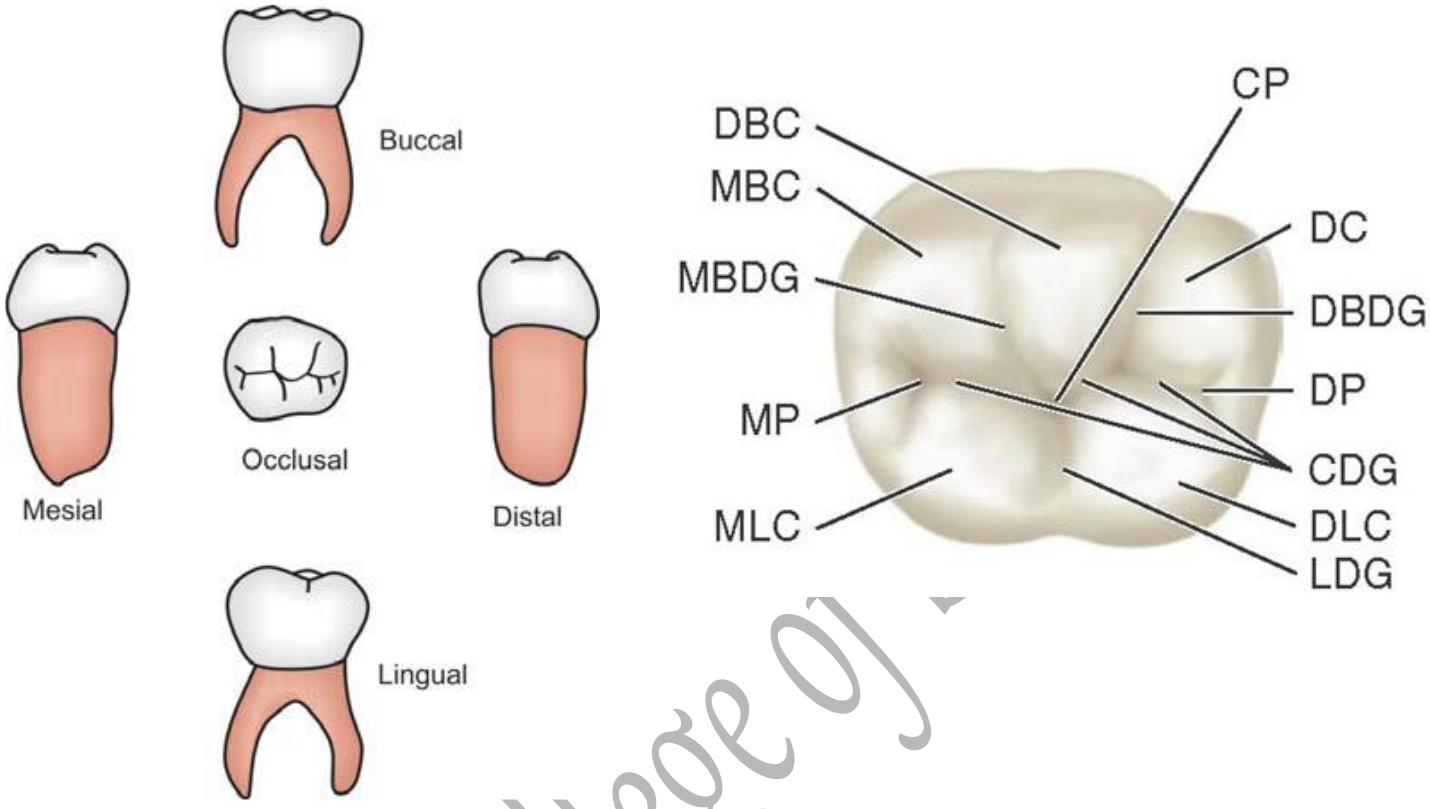
1) The mandibular second molar resembles the mandibular first permanent molar, except that the primary tooth is smaller in all its dimensions.
2) The enamel is uniformly in thickness.
3) The buccal surface is divided into three cusps that are separated by mesiobuccal and distobuccal developmental grooves. The cusps are almost equal in size.
4) Two cusps of almost equal size are evident on the lingual surface and are divided by a short lingual groove.
5) The primary second molar, when viewed from the occlusal surface, appears rectangular with a slight distal convergence of the crown.
6) The mesial marginal ridge is developed to a greater extent than the distal marginal ridge.
7) One difference between the crown of the primary molar and that of the first permanent molar is in the distobuccal cusp; the distal cusp of the permanent molar is smaller than the other two buccal cusps.
8) The two roots of the primary second molar are long and slender, with a characteristic flare mesiodistally in the middle and apical thirds (The roots are somewhat curved to accommodate the developing tooth bud).

- ***Anatomy of the pulp:***

Pulp cavity is made up of a chamber and usually 3 pulp canals. The two mesial pulp canals are confluent as they leave floor of pulp chamber through a common orifice. Distal canal is constricted in the center.

There are five pulp horns corresponding to the five cusp tips. The mesiobuccal pulp horn is the largest.
Mesiobuccal and mesiolingual pulp horns are largest.
• Distobuccal horn is smaller than mesial horns.
• The distal horn is shortest and smallest occupying a position distal to distobuccal horn



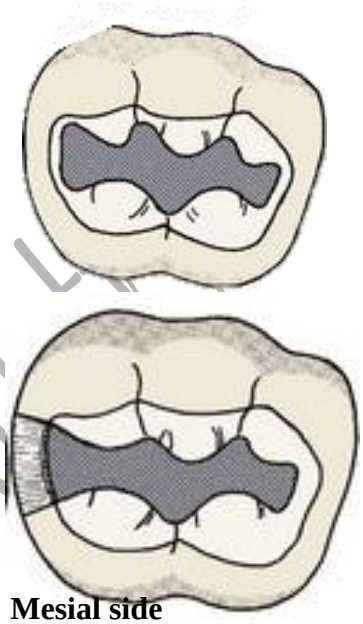


Mandibular second molar. DBC, Distobuccal cusp; CP, central pit; DC, distal cusp; DBDG, distobuccal developmental groove; DP, distal pit; CDG, central developmental groove; DLC, distolingual cusp; LDC, lingual developmental groove; MLC, mesiolingual cusp; MP, mesial pit; MBC, mesiobuccal cusp.

Note:

The anatomy of the primary molars, with their fissured occlusal surfaces and broad, flat interproximal contact areas, makes them the most caries-susceptible primary teeth.

CLINICAL CONSIDERATIONS



Mesial side

- ✓ Central pit is more often involved.
- ✓ Mesial surface is most often involved.
- ✓ Outline is similar to permanent first molar.
- ✓ Occlusal preparation includes all the developmental grooves.
- ✓ Beware of the mesiobuccal pulp horn.
- ✓ The width of the isthmus should be approx. 1/3rd the dimension between buccal and lingual cusps – reduces the possibility of ditching along the occlusal margins and undermining the cusps.
- ✓ Greater constriction of the neck increases the danger of damaging soft tissues interproximally during proximal box preparation.
- ✓ The depth necessary to penetrate into the pulpal chamber during access openings in posterior teeth is quite less than that in the permanent teeth.
- ✓ The distance from the occlusal surface to the pulpal floor of the pulp chamber is much less than in permanent teeth.
- ✓ In the primary molars, care must be taken not to grind on the pulpal floor since perforation is likely.
- ✓ Conical roots of anterior teeth facilitate easy removal. However, flared roots of primary molar dictates that teeth be removed with care. Pre-molar buds are located between the roots. In some instances the primary molars must be sectioned and removed in two pieces to prevent interference during eruption.
- ✓ The inter-proximal contacts are broad and flat.
- ✓ The contacts are restored in a "back-to back" procedure by a firm wedge at the cervical part.

How to differentiate lower primary second molar from the adjacent first permanent molar?

• In the deciduous molar the M-B, D-B, and distal cusps are almost equal in size and developmental.

• The distal cusp of the permanent molar is smaller than the other two.

• Because of the small buccal cusps, the deciduous tooth crown is narrower buccolingually, in comparison with its mesiodistal measurement, than is the permanent tooth.