GOOD MORNING
Morphology of an Anatomic Crown

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Anatomical landmarks of the crown
Elevated landmarks

Depressed landmarks
A) Elevated landmarks:

1. **Dental lobe**: is one of the primary centers of growth and calcification present during *the crown development*. (mamelon, cingulum and cusps are mature forms of lobes in the anterior and posterior teeth respectively.)

**Mamelon** is any one of the three primary rounded projections in the incisal ridge of *newly erupted* incisors teeth.
Mamelon - is one of three tubercules sometimes present on the incisal edge of an incisor tooth that has not been subject to wear.
2. **Cingulum** is a rounded projection, making the lingual bulk at the cervical third of the crown in *the anterior teeth.*
Cingulum - is the enlargement or bulge on the cervical third of the lingual surface of the crown of anterior teeth
3. **Cusp** is a divisional primary pyramidal elevation on the occlusal third of posterior teeth and the incisal third of the canine.
Cusp - is a point, or peak on the chewing surface of premolar or molar tooth
Cusp Slopes Or Ridges - are the inclined surfaces that form an angle at the cusp tip
4. Tubercle: It is a small elevation produced by excessive formation of enamel. Tubercle is noticed at:
- the palatal surface of E & 6
- sometimes at the lingual surface of incisors over the cingulum.

Tubercle differs from cusp, it is formed of enamel only while cusp is formed of pulp horn covered by dentin and enamel.
5. Ridge: is a linear elevation on the crown defined according to its:

- shape
- location
According to location:

a. Proximal (marginal) ridge: it is the mesial and distal elevated margins in the lingual and occlusal surfaces of both anterior and posterior teeth respectively.
b. **Labial ridge**: is a pronounced labial development of the middle lobe of anterior teeth.
c. Buccal ridge: it is the linear vertical pronounced buccal development of the middle lobe of premolars.
d. **Lingual ridge**: it extends vertically from the Cingulum to cusp tip of canine, thus, dividing its lingual fossa into mesial and distal fossa.
e. **Incisal ridge**: is a lingual projection at the incisal margin of the newly erupted incisors. The ridge is transformed into edge by the attrition.
f. **Cervical ridge**: is a diffuse mesiodistal excessive formation of enamel at the cervical third of the crown.
**g. Cusp ridge**

it is the buccal and lingual elevated margins of the occlusal surface of posterior teeth. It descends mesially or distally from the cusp tip either into the proximal (marginal) ridge or to buccal or lingual developmental groove.
Labial Ridge - is a ridge running cervico-incisally in approximately the center of the labial surface of the canines
**Buccal Ridge** - is the ridge running cervico-occlusally in approximately the center of the buccal surface of premolars.
Cervical Ridge - ridge running mesiodistally on the cervical one-third of the buccal surface of the crown, found on all deciduous teeth but only on the permanent molars.
Marginal Ridge - on incisor and canine located on the mesial and distal border of the lingual surface
Marginal Ridge - on posterior teeth located on the mesial and distal border of the occlusal surface.
According to shape:

a. **Triangular (occlusal) ridge**: it descend from the cusp tip of posterior teeth toward the central part of occlusal surface. It is formed as the occlusal sides of the cusp ridge meet together to form line angle.
Triangular Ridge - on the occlusal surface of posterior teeth, is the ridge from any cusp tip to center of the occlusal surface - ML cusp of upper molars have two
Cusp
ridge
Triangular ridge
Inclined cuspal plane
Cusp ridge
Marginal ridge
Marginal ridge
b. **Transverse ridge**: is the union of the directly opposing buccal and lingual triangular ridges buccolingually crossing the occlusal surface of posterior teeth.
Transverse Ridge - ridge crossing the occlusal surface of posterior teeth in a B-L direction and made of connecting triangular ridges
C. **Oblique ridge**: is the union of the non-opposing buccal and lingual triangular ridges obliquely crossing the occlusal surface of maxillary molars from the mesiolingual cusp to the distobuccal cusp.
Oblique Ridge - found only on maxillary molars made of the triangular ridges of the mesiolingual and distobuccal cusps.
B) Depressed landmarks:

1. Developmental groove: is a deep linear depression in the occlusal surface and may extend buccally, lingually or mesially. It denote the line of fusion of primary lobes.
2. **Supplemental groove**: is a shallow linear depression in the occlusal surface, which does not demarcate the line of lobes fusion, but represents a branch from the developmental groove.
Developmental Groove - is a sharply defined, narrow and linear depression, formed during tooth development separating lobes or a major portion of a tooth - a fissure may be found at the depth of a developmental groove.
Supplemental Groove - small irregularly placed grooves not at the junction of lobes or major portions of the teeth.
3. **Fissures**: is a deep cleft or defect on the occlusal or buccal surfaces, resulting from linear imperfect fusion of the enamel of the dental lobes found in the place of developmental groove.
4. **Fossa**: is a small depression or concavity on the occlusal surface of posterior teeth and the lingual surface of anterior teeth. It has different shapes including:

a) **Triangular fossa**: it present between the branches of the central developmental groove when they terminate before the proximal marginal ridges in molars and premolars.
b) Circular (central fossa): It is present at the bisection of the developmental grooves on the occlusal surface of molars. 
c) **Lingual fossa**: is located in the lingual surface of incisors.
Fossa - a depression or hollow found on the lingual surfaces of some anterior teeth and on the occlusal surfaces of posterior teeth.
5. **Pit**: it is a pinpoint depression in enamel which may be true or fault.

   a) **True pit**: is created due to the bisection, branching termination of developmental grooves found occlusally in the bottom of circular and triangular fossa.
Pits - often occur at the depths of fossa where two or more grooves join
b) Fault pit: is created due to the tiny localized imperfect fusion or defective formation of enamel, found at the buccal and lingual terminations of developmental grooves.
Sulcus - is a broad depression or valley on the occlusal surface of posterior teeth
Furcation - is the place on multirooted teeth where the root trunk or base divides into separate roots
Developmental Lobes

- Each tooth begins to develop from 4 or more growth centers or developmental lobes.
- Anterior teeth and maxillary premolars develop from 4 lobes - 3 labials and lingual. As the lobes grow, they coalesce. The lines formed by the fusion are called developmental grooves.
- Mamelons are the incisal ridges of the three labial developmental lobes of anterior teeth.
- The lingual lobe makes up the cingulum of the tooth.
Developmental Lobes
Lobes and Cusps

- Maxillary premolars - 3 facial lobes/1 lingual lobe
  - 3 facial → 1 high buccal cusp
  - 1 lingual → large lingual cusp

- Mandibular 1st premolar → same as above except smaller lingual cusp

- Mandibular 2nd premolar
  a) 2 cusp variety → same as mand. 1st premolar
  b) 3 cusp variety → 3 buccal lobes-2 lingual lobes leading to two lingual cusps (ML and DL)
Four lobes of Maxillary Second Premolar
Lobes and Cusps

• Max. 1st molar:
  • two major facial lobes (MB, DB)
  • one major lingual lobe (ML)
  • one minor lingual lobe (DL)
  • one rudimentary lobe (Carabelli)

• Max 2nd molar:
  • 4 lobes; usually does not have cusp of carabelli

• Max 3rd molar:
  • 3-4 lobes
Lobes and Cusps of Maxillary Molars
Lobes and Cusps

- **Mand. 1st molar:** 5 lobes
  - 4 major cusps (MB, DB, ML, DL)
  - 1 minor cusp (D)
- **Mand 2nd molar:** 4 lobes, cusps.
- **Mand. 3rd molar:** 4 lobes, cusps.
  - The most unpredictable teeth in size and shape. They are also the most likely to be missing.
Lobes and Cusps of Mandibular Molars
Curve Of Spee

Anteroposterior curve of the occlusal plane - curve of the maxillary arch is convex
Gradual curve of posterior teeth from left to right side viewed from the anterior region - curve of maxillary teeth is convex
THE END

My best wishes for you