Anatomy of the teeth. Cephalometric Landmarks. Occlusal Surfaces

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Signing (numbering) of teeth

- Zsigmondy’s cross:
  - R 87654321/12345678
  - L 87654321/12345678
  1/, /6/, 8/, /3
FDI (Fédération Dentaire Internationale) signing system (numbering of teeth)

FDI tooth numbering formula (adapted by WHO) for permanent teeth is referred to by a two-digit number, the first one for the quadrant and the second for the tooth order from mesial to distal.
In the tooth numbering formula of the ADA (American Dental Association) the teeth are marked with consecutive numbers following a clockwise order beginning with the maxillary right third molar (1) and continuing to the mandibular right third molar (32). Individual teeth or tooth groups are often given an acronym: "I" stands for incisors, "C" for canine, "PM" for premolar, and "M" for molar.
Dental characteristics of the human

- „Dyphiodont” being
  - 20 deciduous (milky) teeth
    - 2 incisors
    - 1 canine / quadrant
    - 2 molars
  - 32 permanent teeth
    - 2 incisors
    - 1 canine / quadrant
    - 2 premolars
    - 3 molars
Nomination of the tooth surfaces

• **Vestibular:**
  - **Labial:**
    - Surface, contacting the lips
  - **Buccal:**
    - Surface contacting the cheeks

• **Oral:**
  - **Lingual:**
    - On the mandible
  - **Palatal:**
    - On the maxilla
Nomination of the tooth surfaces

• Approximal surfaces
  – Tooth surfaces contacting with each other:
    • Mesial
      – Surface looking at the midline
    • Distal
      – Surface looking at far from the midline

• Occlusal surface
  • Occluding surfaces

To avoid confusion two terms used conventionally in the dental nomenclature merit clarification: mesial: means toward the midline; distal: means away from the midline. It is to be noted that in surgical terminology distal is the antonym of proximal and means "away from the center", which is towards the midline in case of the mandible.
Occlusal surface of a maxillary premolar

(1) mesial, (2) distal outer aspects of the buccal cusp (B); (3) mesial, (4) distal outer aspects of the lingual cusp (L); (5) mesial, (6) distal inner aspects of the buccal; (7) mesial, (8) distal inner aspects of the lingual cusp; (9) mesial, (10) distal marginal ridges.

Directions:
- Apical
- Gingival
- Occlusal, Incisal
Basic anatomy

1. **Dental crown-Corona dentis:**
   1. intraorally located, polychromatic, covered with enamel, anatomically finished at the cemento-enamel junction,
   2. the free gingival margin is attached a little bit more occlusally
   3. clinical crown: coronal part of the tooth that is visible in the mouth (not always is the same as the anatomical crown)

2. **Radix dentis:**
   1. situated in the alveolar process, covered with cementum,
   2. Its shape is dependent on the type of the tooth,

3. **Cervix dentis:**
   1. Line - cemento-enamel junction, the border between the crown and the root surface
   2. Its shape is uneven, its shade is more yellowish
The permanent teeth, viewed from the right.
The **maxillary central incisor** is a human tooth in the front upper jaw, or maxilla, and is usually the most visible of all teeth in the mouth. It is located **mesial** (closer to the midline of the face) to the maxillary lateral incisor. As with all incisors, their function is for **shearing** or cutting food during **mastication** (chewing). There are no **cusps** on the teeth. Instead, the surface area of the tooth used in eating is called an **incisal ridge** or incisal edge.
As with all incisors, their function is for shearing or cutting food during mastication, commonly known as chewing. There are no cusps on the teeth. Instead, the surface area of the tooth used in eating is called an incisal ridge or incisal edge.
The **mandibular central incisor** is the tooth located on the jaw, adjacent to the midline of the face. It is mesial (toward the midline of the face) from both mandibular lateral incisors. As with all incisors, its function includes shearing or cutting food during **mastication**, commonly known as chewing. There are no cusps on the tooth. Instead, the surface area of the tooth used in eating is called an incisal ridge or incisal edge.
The **mandibular lateral incisor** is the tooth located distally (away from the midline of the face) from both mandibular central incisors of the mouth and mesially (toward the midline of the face) from both mandibular canines. As with all incisors, their function is for **shearing** or cutting food during **mastication**, commonly known as chewing. There are no **cusps** on the teeth. Instead, the surface area of the tooth used in eating is called an incisal ridge or incisal edge.
Both the maxillary and mandibular canines are called the "cornerstone" of the mouth because they are all located three teeth away from the midline, and separate the premolars from the incisors. The location of the canines reflect their dual function as they complement both the premolars and incisors during mastication, commonly known as chewing. Nonetheless, the most common action of the canines is tearing of food. The canine teeth are able to withstand the tremendous lateral pressure caused by chewing.
Maxillary first premolar (14,24)

The function of this premolar is similar to that of canines in regard to tearing being the principal action during mastication, commonly known as chewing. There are two cusps on maxillary first premolars, and the buccal (closest to the cheek) cusp is sharp enough to resemble the prehensile teeth found in carnivorous animals.
The function of this premolar is similar to that of first molars in regard to grinding being the principal action during mastication, commonly known as chewing. There are two cusps on maxillary second premolars, but both of them are less sharp than those of the maxillary first premolars.
Maxillary molars (16,17,18,26,27,28)

The function of this molar is similar to that of all molars in regard to grinding being the principal action during mastication, commonly known as chewing. There are usually four cusps on maxillary molars, two on the buccal (side nearest the cheek) and two palatal (side nearest the palate). There may also be a fifth smaller cusp on the palatal side known as the Cusp of Carabelli.
• The function of the premolar is similar to that of canines in regard to tearing being the principal action during mastication, commonly known as chewing. Mandibular first premolars have two cusps. The one large and sharp is located on the buccal side (closest to the cheek) of the tooth. Since the lingual cusp (located nearer the tongue) is small and nonfunctional (which refers to a cusp not active in chewing), the mandibular first premolar resembles a small canine.
Mandibular second premolar

- The function of this premolar is assist the mandibular first molar during mastication, commonly known as chewing. Mandibular second premolars have three cusps. There is one large cusp on the buccal side (closest to the cheek) of the tooth. The lingual cusps (located nearer the tongue) are well developed and functional (which refers to cusps assisting during chewing). Therefore, whereas the mandibular first premolar resembles a small canine, the mandibular second premolar is more alike to the first molar.
The mandibular first molar or six-year molar is the tooth located distally (away from the midline of the face) from both the mandibular second premolars of the mouth but mesial (toward the midline of the face) from both mandibular second molars. It is located on the mandibular (lower) arch of the mouth, and generally opposes the maxillary (upper) first molars and the maxillary 2nd premolar in normal class I occlusion. The function of this molar is similar to that of all molars in regard to grinding being the principal action during mastication, commonly known as chewing. There are usually five well-developed cusps on mandibular first molars: two on the buccal (side nearest the cheek), two lingual (side nearest the tongue), and one distal. There are great differences between the deciduous (baby) mandibular molars and those of the permanent mandibular molars, even though their function are similar.
Mandibular second molars
(37,47)

The **mandibular second molar** is the tooth located distally (away from the midline of the face) from both the mandibular first molars of the mouth but mesial (toward the midline of the face) from both mandibular third molars. This is true only in permanent teeth. The function of this molar is similar to that of all molars in regard to grinding being the principal action during **mastication**, commonly known as chewing. Though there is more variation between individuals to that of the first mandibular molar, there are usually four **cusps** on mandibular second molars: two on the buccal (side nearest the cheek) and two palatal (side nearest the palate).
Wisdom teeth (18, 28, 38, 48)

Wisdom tooth, in humans, is any of the usual four third molars. Wisdom teeth usually appear between the ages of 16 and 25. Most adults have four wisdom teeth, but it is possible to have fewer (hypodontia), or more, in which case they are called supernumerary teeth. Wisdom teeth commonly affect other teeth as they develop, becoming impacted or "coming in sideways." They are often extracted when this occurs.
Cephalometric landmarks:

- TA: terminal hinge axis
- O: orbitale
- Po: porion
- N: nasion
- Sn: Subnasale
- Gn: Gnathion

Craniofacial planes:

- Axis-orbitale plane: AOP
- Facial plane: Fac-P (NP)
- Frankfort plane: FP (O-Po)
- Occlusal plane: mesial edge of the mandibular first incisors – distobuccal cusptips of the last molars
Corresponding antagonistic teeth of a skull in Intercuspal Position (ICP)
Lingual cusps of the maxillary teeth and the

Buccal cusps of the mandibular teeth have maximal and simultaneous contact on both sides of the arch.

Cusp contacts with marginal ridge except distobuccal cusps of the lower (8 and 12) and mesiolingual cusps of the upper (7 and 11) molars (they occlude with the central fossae of their antagonists).
1: Supporting cusps
2: Guiding cusps

Buccal upper and Lingual lower cusps do not support occlusion they are the guiding cusps.
39 Sagittal relationships
Macroscopic anatomical preparation showing the relation of the fossa, disk, and condyle to one another in the sagittal plane. Because the shapes of fossae and condyles vary so greatly, it is not possible to determine a universally applicable measurement of the condylar position. Although the physiological (i.e. centric) condylar position is defined as the most anterosuperior position with no lateral displacement (arrows), this position depends upon the basic neuromuscular tonus.