Molars: Maxillary and Mandibular

Dr. Andrea Morgan
Reading Assignment:

Wheeler’s Dental Anatomy, Physiology and Occlusion, Ninth Edition

Chapters 11 and 12
objectives

• To be able to identify the major characteristics of the molars
• To know the teeth by name and number
• To be able to identify the major differences between the maxillary and mandibular molars
• To be able to distinguish the first, second and third molars
molar generalities

• Permanent molars are the largest/strongest teeth in the mouth
  - Crown size
  - Root anchorage
• First permanent teeth to erupt is the 1st molar
• Non-succedaneous teeth
• The teeth usually develop from 5 lobes
maxillary molars

• 3 in total
• 4 well developed cusps
• 3 roots--2 buccal; 1 lingual
maxillary 1st molar

• Largest tooth in the maxillary arch
• 4 well developed cusps and 1 supplemental cusp Cusp of Carebelli
• Large ML cusp
• Wider b-l than m-d
occlusal view

- Occlusal view is rhomboidal
- Oblique ridge connects the DB and ML cusps
- 3 major cusps (heart shaped)
- Obtuse vs. Acute angles
facial view

- Note the roundness of the MB vs. DB cusp
- Buccal developmental groove divides the 2 buccal cusps.
- Cervical line is irregular/curved, on the facial is curved toward the apical 1/3
- From this view the crown shape is trapezoidal in nature
facial view

- Mesial outline is straight, distal outline has a marked convexity
- Mesial contact is at the junction of the middle/occlusal 1/3
- Distal contact is in the middle 1/3
- DB cusp is sharp and MB cusp is rounded
• Lingual cusps are larger than the facial (ML, DL)
• Lingual groove extends onto the occlusal surface and becomes the disto-oblique developmental groove
• Mesio-lingual developmental groove
• DL cusp is the smallest in bulk of the 4 major cusps
• The lingual surface is wider than the buccal surface
mesial view

- Shows a clear profile of the Cusp of Carabelli
- Cervical line is slightly convex
- Buccal Height of Contour: gingival 1/3
- Lingual Height of Contour: middle 1/3
distal view

- Crown has a tendency to taper toward the distal side
- Buccolingual measurement of the crown on the mesial side is greater than the same measurement distally
- Cervical line straighter and less curved than that on the mesial side
distal view

- Distal side is convex, there is a slight concavity on the distal surface of the root from cervical line to distobuccal root
- Distal marginal ridge is shorter and less prominent than mesial
- More occlusal surface can be seen from the distal
max 1st molar

- Largest permanent maxillary tooth
- First permanent tooth to begin to calcify along with the mandibular 1st molar
- Acute vs. obtuse angles
- Oblique ridge connects the DB and ML cusps
maxillary 1st molar

- Proximal views
- From the mesial you can only see the MB and Palatal roots
- The roots project out pass the confines of the crown
maxillary 1\textsuperscript{st} molar

- Facial and lingual views
- The roots are “pliered- handled
- The lingual root is very wide mesio-distally
- The roots are within the confines of the crown from these views
Summary max 1ˢᵗ molar

- Largest permanent maxillary tooth
- First permanent tooth to begin to calcify along with the mandibular 1ˢᵗ molar
- Acute vs. obtuse angles
- Oblique ridge connects the DB and ML cusps
- 4 major cusps, 1 minor cusp—ML largest
- Mesial portion of the crown is “heart-shaped”
- 3 roots - trifurcation
- Only tooth wider lingually than buccally, thus the lingual embrasure is smaller than the facial embrasure
maxillary 2\textsuperscript{nd} molars

- Supplements the 1st molar in function
- Similar to the first molar in size and shape
- 2nd molars have more supplemental grooves
- Erupts into the mouth between 11-13 years of age
- Teeth #2 and #15
facial view

- Crown is
  - Shorter than max 1st molars occlusally
  - Narrower mesio-distally
- Distobuccal cusp smaller
- Buccal roots are same length and closer together.
- Distobuccal root straighter with no mesial curvature
lingual view

• No evidence of a cusp of carebelli
• DL cusp is getting smaller
• The roots are closer together
lingual view

- A line drawn thru the DL cusp will bisect the apex of the lingual root
mesial view

- Crown is shorter than the first molar
- Roots are closer together
- MB root is larger than the DB root
Distal view

- All 3 roots are visible
- The roots are within the confines of the tooth from all angles
- Facial H of C: gingival 1/3
- Lingual H of C: middle 1/3
Occlusal view

- Distal lingual cusp is smaller
- There is more supplemental anatomy
- Occlusal outline is less rhomboidal and more heart shape (because of the decrease in size of the DL cusp)
Occlusal View

- Rhomboidal shape
- The MB and DL line angles are more acute, while the ML and DB angles are more obtuse
- More supplemental grooves on the occlusal surface
Summary Max 2nd molars

- The tooth is smaller than the max. 1st molar.
- The DL cusps is smaller and less developed than the max. 1st molar.
- No Cusp of Carebelli.
- The roots are closer together than the max. 1st molar, thus less divergent and within the confines of the crown.
- Erupts at 12-13 years of age.
Maxillary 3rd molars
Maxillary 3rd molars

- Teeth # 1 and #16
- Varies more than any other maxillary tooth in size and shape
- Crown is shorter than the maxillary 2nd molar
- Erupts at 17-21 years of age
- Remember this tooth only has a mesial proximal contact
- DL cusp is often not present at all, thus the occlusal outline is truly “heart” shaped
- This tooth also only has one antagonist
- The roots have a tendency to fuse into one single root
Mandibular Molars
Mandibular 1st molar

- Largest tooth in the mandibular arch
- Teeth #19 and #30
- 4 major cusps
- 5\textsuperscript{th} minor cusp that is a non-functional cusp
- 3 buccal cusps and 2 lingual cusps
- First permanent tooth to erupt
Facial view

- Cusps are MB; DB; Distal
- MB > DB > Distal
- 2 buccal grooves MB is shorter than the DB groove
- MB grooves ends in a buccal pit
- Facial surface > Lingual surface
- CEJ is relatively straight
Facial view

- Crown tapers from the contacts to the cervical line
- Mesial outline is straight or slightly concave
- Distal outline is convex
- Mesial contact: junction of occlusal and middle 1/3rd
- Distal contact: middle 1/3rd
- Roots curve distally
- Buccal cusps are relatively flat
Lingual View

- 2 cusps
- Lingual cusps divides the 2 cusps
- ML cusp is longer/larger than the DL
- Cervical line is straight
- Note the bifurcation (the area where the roots split)
- First permanent tooth to erupt
Mesial view

- Mesial root is the largest
- Can only see the mesial aspect from this view
- See slight lingual tilt of the crown
- Height of contours:
  - Buccal: gingival $1/3^{rd}$
  - Lingual: middle $1/3^{rd}$
Distal view

- The distal side is more tapered than the mesial
- DMR is lower, thus you can see more of the occlusal table
- The Distal root and the mesial root are both seen
Occlusal view

- Occlusal view
- Crown is wider facially than lingually
- Major Fossae: mesial, central, and distal
- Mesial MR > Distal MR
- Pentagonal in shape
- Shows evidence of calcification at birth
Summary Man 1st molar

- 5 cusps
- Occlusal pentagonal shape
- Buccal surface > lingual surface
- Mesial surface > Distal surface
- Distal root inclinations
- 2 roots: Mesial and Distal
- One of the first teeth to begin calcification (8 mos. prenatally)
- Rounded buccal cusp
- Erupts at 6 years of age
- Non-succedaneous tooth
Mandibular 2nd molars

- Similar to the 1st molars
- Crowns shorter occlusocervically
- More narrow mesial to distal
- 4 cusps
- Teeth # 18 and #31
- Erupt at ages 11-13
Facial Aspect

- More narrow m-d than a 1st molar
- Buccal groove
- Mesial outline is straight
- Distal outline is more convex
- Buccal cusps are rounded (centric supporting cusps)
Lingual view

- 2 lingual cusps
- Tooth tapers from contact areas to CEJ on the proximal
- Lingual groove
- Roots are closer to each other when compared to the 1st molar
- Roots are shorter than the man 1st
Mesial view

- Mesial surface is wider than the distal surface
- Mesial root
- Concavity on the root
- Heights of Contour
  - Facial: gingival 1/3
  - Lingual: middle 1/3
Occlusal View

- 4 cusps of equal size
- Rectangular in shape
- MB outline is very bulbous
- Groove pattern is a “+” sign
Summary 2nd molar

- 2 roots more distally inclined
- 4 cusps
- Rectangular occlusal shape
- “+” groove pattern
- Buccal = Lingual
- Mesial = Distal
- MB aspect is very bulbous
- Erupts at 12 years of age
Mandibular 3rd molar

- May have malformed crown
- Smallest molar
- Roots are short, fused
- Most of the anomalies are undersized
- More likely than the maxillary molars to be impacted in the mandible
- Erupts 17-21 years if age
Questions???