Lecture

Permanent maxillary premolars
Permanent premolars

- The maxillary premolars are **four** in number: two in the right and two in the left. They are posterior to the canines and anterior to the molars.
- The maxillary molars have **shorter crowns and shorter roots** than those of the maxillary canines.
- The maxillary **1st** premolar is **larger** than the maxillary **2nd** premolar.
Permanent premolars

- Premolars are named so, because they are anterior to the molars in permanent dentitions.
- They succeed the deciduous molars (there are no premolars in deciduous dentitions).
- They are also called “bicuspид-having two cusps”. This term is not widely used, because the mandibular 1st premolar has one functional cusp.
Permanent premolars

The premolars are intermediate between molars and canines according to the following:

- **Form**: the labial aspect of the canine and the buccal aspect of premolars are similar.
- **Function**: the canine is used to tear food while the premolars and molars are used to grind it.
- **Position**: the premolars are in the centre of the dental arch.
Some characteristic features to all posterior teeth

1- Relatively, greater facio-lingual measurement in comparison with the mesio-distal measurement.
2- Broader contact area.
3- Contact areas nearly at the same level.
4- Less curvature of the cervical line mesially and distally.
5- Shorter crown cervico-occlusally when compared with anterior teeth.
Permanent maxillary 1st premolar

Maxillary right first premolar, mesial and occlusal aspects. LR, Lingual root; CL, cervical line; MMDG, mesial marginal developmental groove; LC, lingual cusp; BC, buccal cusp; MCA, mesial contact area; BCR, buccal cervical ridge; MDD, mesial developmental depression; BR, buccal root; MBCR, mesiobuccal cusp ridge; MMR, mesial marginal ridge; MTF, mesial triangular fossa (shaded area); CDG, central developmental groove; MLCR, mesiolingual cusp ridge; DLCR, distolinguinal cusp ridge; DTF, distal triangular fossa; DMR, distal marginal ridge; DBCR, distobuccal cusp ridge.
Maxillary first premolar, occlusal aspect. TBC, Tip of buccal cusp; MBCR, mesiobuccal cusp ridge; MBDG, mesiobuccal developmental groove; MTF, mesial triangular fossa; MMDG, mesial marginal developmental groove; MMR, mesial marginal ridge; MLCR, mesiolingual cusp ridge; LTR, lingual triangular ridge; TLC, tip of lingual cusp; CG, central groove; DLCR, distolinguval cusp ridge; DMR, distal marginal ridge; DTF, distal triangular fossa; DBDG, distobuccal developmental groove; BTR, buccal triangular ridge; DBCR, distobuccal cusp ridge.
Buccal aspect

- The **buccal cusp** is long, coming to a pointed tip and resembling the canine in this respect, although contact areas of this tooth are nearly at the same level.
- There is a **prominent buccal ridge** descends to the cervical line of the tooth.

Maxillary right first premolar.
Lingual aspect

- The lingual cusp is smaller and the tip of this cusp is shifted toward the mesial.
- The lingual surface is rounded in all aspects.
Mesial aspect

- The mesial aspect of this tooth has a distinctive concavity in the cervical third that extends onto the root.
- It is variously called mesial developmental depression, mesial concavity or the 'canine fossa' a misleading description since it is on the premolar.
- The distal aspect of the maxillary first permanent molar also has a developmental depression.
- The mesial marginal developmental groove is a distinctive feature of this tooth.
Distal aspect

The differences between mesial and distal aspects are:

1 - the curvature of the cervical line is less distally than mesially.

2 - there is no developmental groove crossing the distal marginal ridge.

3 - there is no developmental depression.
Occlusal aspect

- There are two well-defined cusps: buccal and lingual.
- The larger cusp is the buccal; its cusp tip is located midway mesio-distally. The lingual cusp tip is shifted mesially.
- The occlusal outline presents a hexagonal appearance.
- On the mesial marginal ridge is a distinctive feature, the mesial marginal developmental groove.
Occlusal aspect

1-it resembles an unequal hexagon (six-sided figure).

2-the buccal sides are equal, the mesial side is shorter than the distal side and the mesio-lingual side is shorter than the disto-lingual side.

3-the distal crest is buccal to the mesial crest of curvature.

4-the bucco-lingual dimension is much greater than the mesio-distal dimension.

Maxillary right first premolar.
Occlusal aspect

5-a **central developmental groove** divides the crown into buccal and lingual parts. It extends from near the distal marginal ridge to the mesial marginal ridge where it joins the mesial marginal developmental groove.

6-although **no supplemental grooves** are present in most instances, smooth developmental depressions may be visible radiating from the central groove and giving the occlusal surface an uneven appearance.

Maxillary right first premolar.
Occlusal aspect

• 7-in the **mesial and distal triangular fossae**, there are **two developmental grooves**, the **mesio-buccal and disto-buccal developmental grooves** respectively. They join the central groove. The **junctions of these grooves make the developmental pits**, mesial and distal developmental pits respectively.

• 8-the **buccal cusp is sharper and more pointed than the lingual cusp**.
Occlusal aspect

- **Right and Left:** two distinctive traits that help are distinguishing right and left. The mesial developmental depression and the mesially displaced lingual cups tips are consistent clues for determining right and left. The mesial marginal ridge, when well-defined, is also a clue to right and left.

- **Root:** About 80 percent of upper premolars have two roots; the next most common variant is a single root.

- **Variation:** Most upper first premolars of people in our society have two roots. However, a single root is found in about 20 percent of teeth. Three rooted premolars are found occasionally.
Permanent maxillary 2\textsuperscript{nd} premolar
Principle identifying features

1- the buccal and lingual cusps are equal in height.
2- the mesial slope of the buccal cusp is shorter than the distal slope.
3- the mesial surface has no developmental depression.
4- has a single root.
Principle identifying features

- 5-the **occlusal surface is more rounded or oval**.
- 6-the **central developmental groove is shorter and more irregular with more supplemental grooves** on the occlusal surface.
- 7-there is **no mesial marginal developmental groove crossing** the mesial marginal ridge.
Buccal aspect

- This tooth closely resembles the maxillary first premolar, but is a less defined copy.
- The buccal cusp is shorter, less pointed and more rounded than the first.
Lingual aspect

- Again, this tooth resembles the first. The lingual cusp, however, is more nearly as large as the buccal cusp.

Maxillary left second premolar, lingual aspect.
Mesial and distal surfaces are rounded. The mesial developmental depression and mesial developmental groove crossing the marginal ridge are not present on the second premolar.
Occlusal aspect

- The crown outline is rounded, ovoid and less clearly defined than the first premolar.

Maxillary left second premolar, occlusal aspect.
Permanent maxillary 2\textsuperscript{nd} premolar

- **Contact points and height of curvature:** When viewed from the facial, the contact areas of this tooth are nearly at the same level, the distal contact area is located more cervically than the mesial contact area.

- **Right and Left:** The one consistent clue to right and left is the lingual cusp tip, which is shifted mesially.

- **Root:** The maxillary second premolar has a single root.

- **Variation:** The occlusal anatomy is more variable in the second than in the first. There is wide variability in root size, curvature and form.
Great Thanks