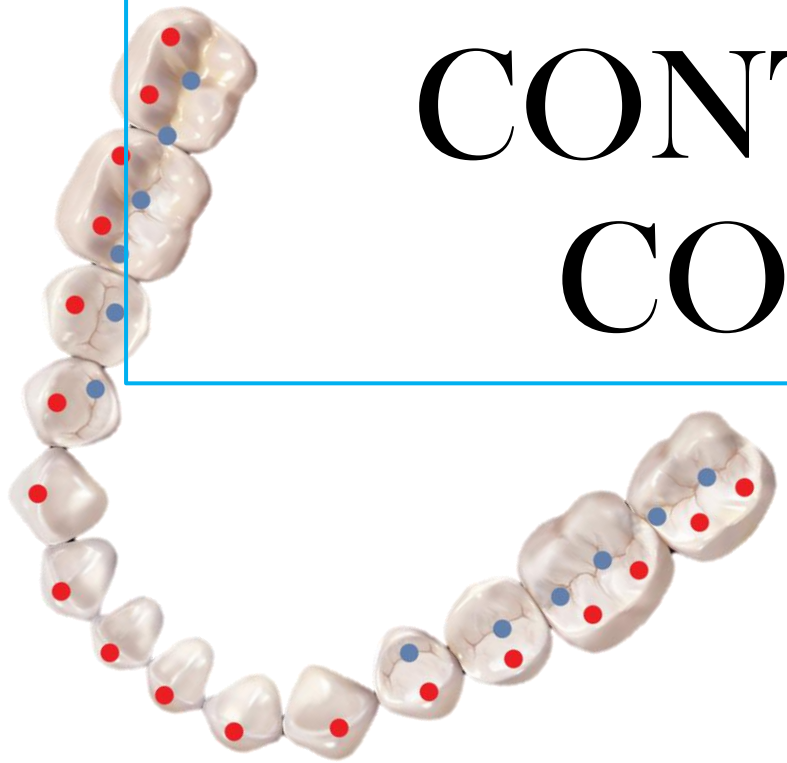
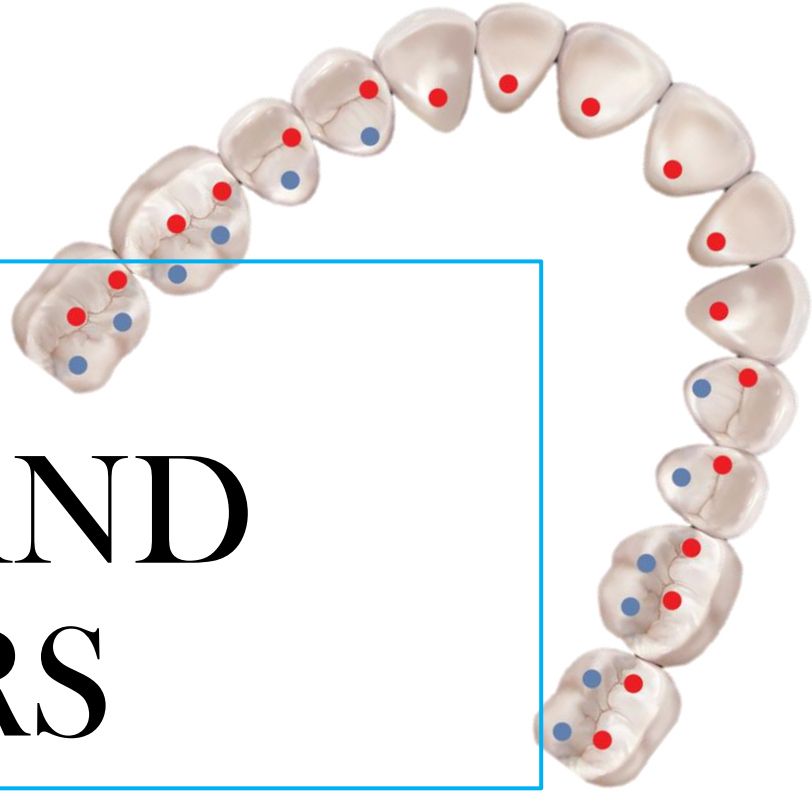




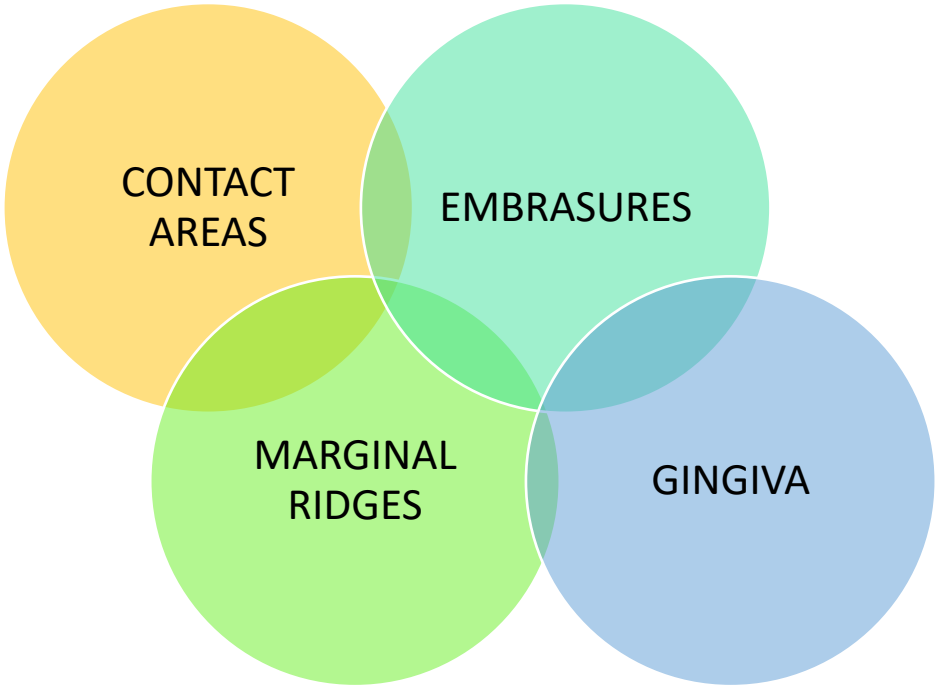
CONTACT AND CONTOURS

CONTENTS

INTRODUCTION

- Occlusal surfaces predisposed to decay by faulty fissures and grooves.
- Decay on proximal surfaces due to -

FAULTY INTER-RELATIONSHIPS OF



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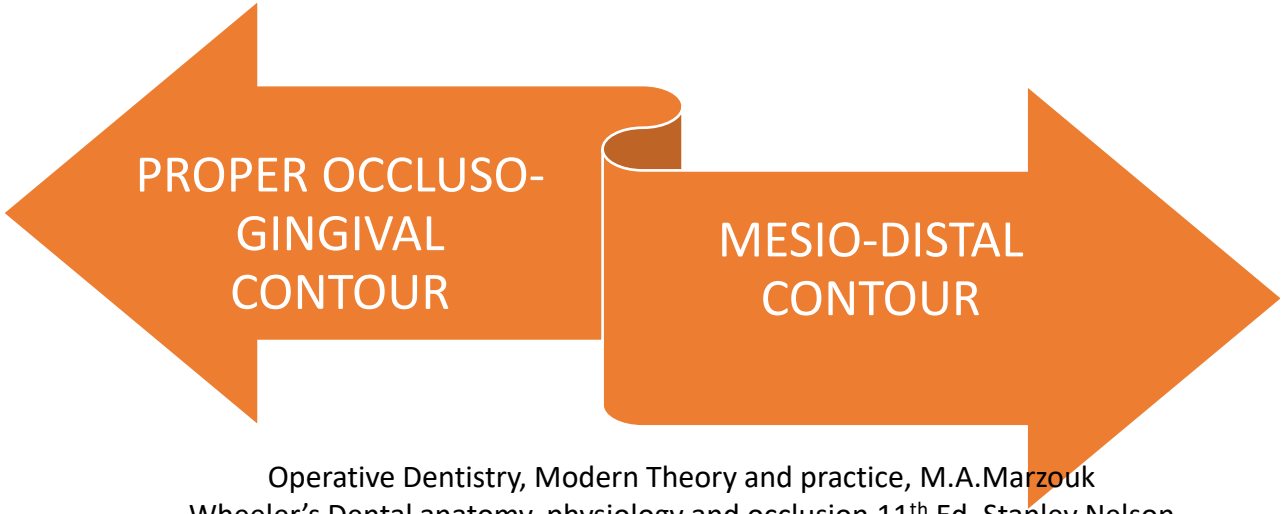
KEY TO PROPER INTER-RELATIONSHIPS PROXIMALLY , IS CONTACT AREA IN PROXIMAL RELATION WITH

KEY TO PROPER CONTOURS FACIALLY AND LINGUALLY



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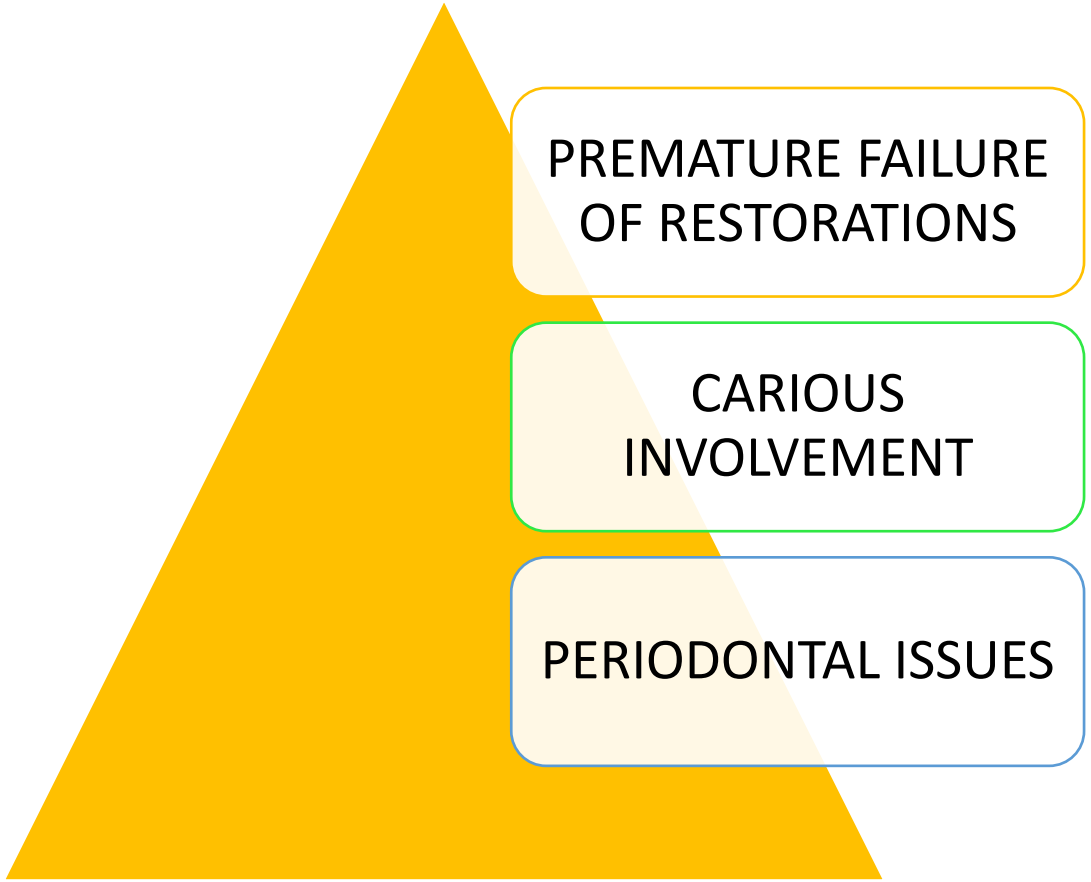
FAILURE TO COMPREHEND THESE CONTACTS AND CONTOURS LEADS TO



CONTACTS AND CONTOURS VARY FROM ONE INDIVIDUAL TO ANOTHER

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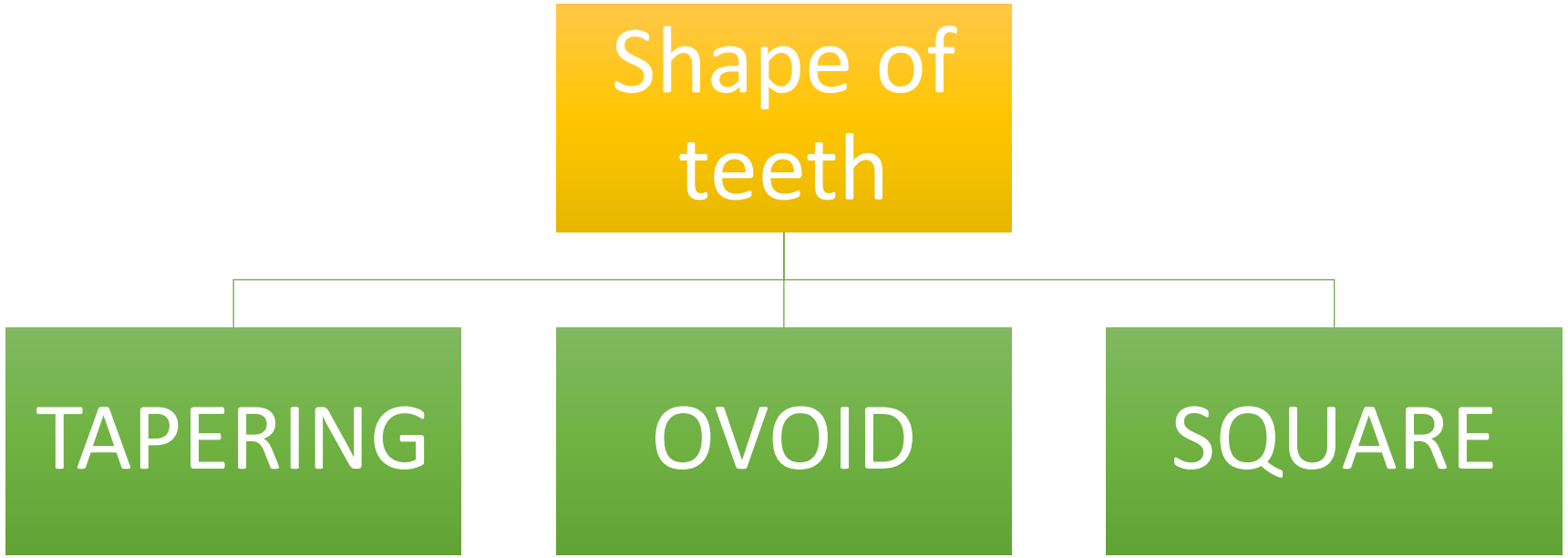
CLASSIFICATION



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PROXIMAL CONTACTS

TAPERING TEETH

1. INCISORS

INCISO-APICALLY

- START NEAR THE INCISAL EDGES

LABIO-LINGUALLY

- START LABIAL TO INCISAL EDGES

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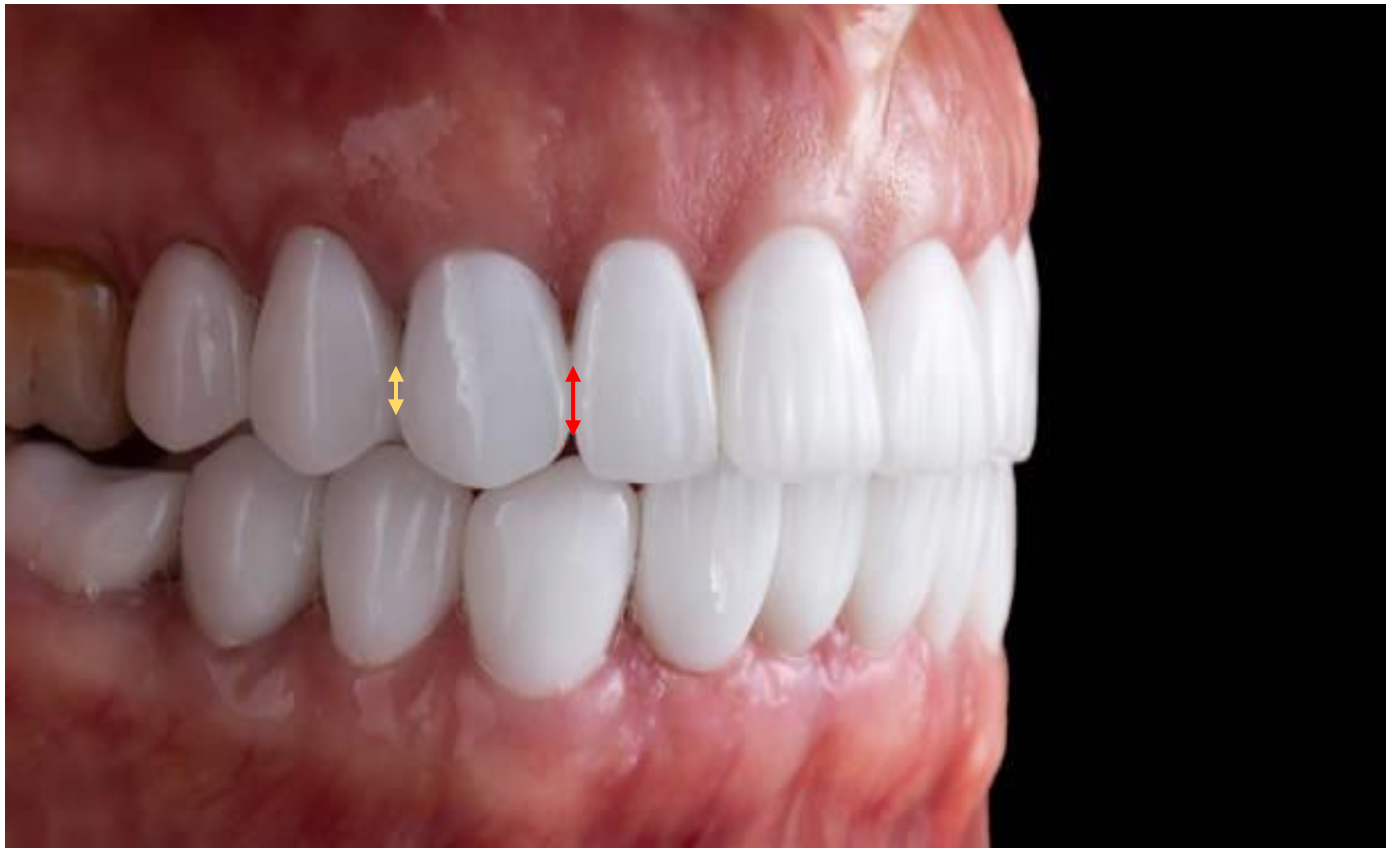
2. CANINES

MESIAL

CLOSE TO INCISAL EDGES



DISTAL

NEAR CENTRE OF DISTAL SURFACE

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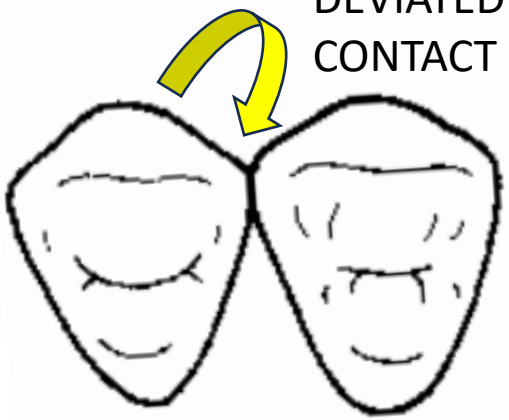
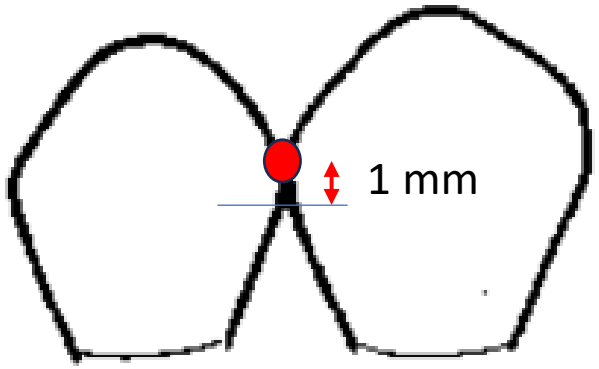
3. PREMOLARS

- ANGULAR TEETH
- CONSTRICTED CERVICALLY
- LONG CUSPS
- CUSPS FORM I/3rd to ½ of TOOTH





- CONTACT IS DEVIATED BUCCALLY
- AT BUCCAL AXIAL ANGLE
- CONTACT BEGIN 1mm GINGIVAL TO MARGINAL RIDGES
- CONTACT SEEN GINGIVALLY TO JUNCTION OF OCCLUSAL AND MIDDLE THIRDS OF TOOTH

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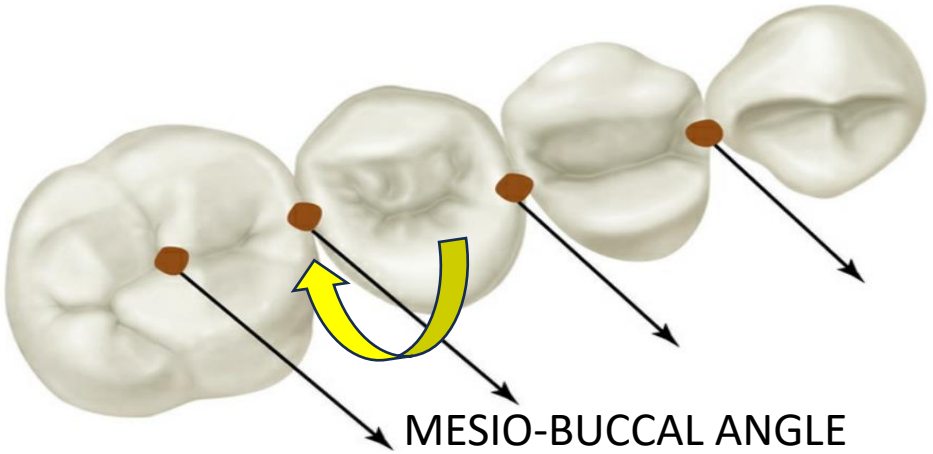
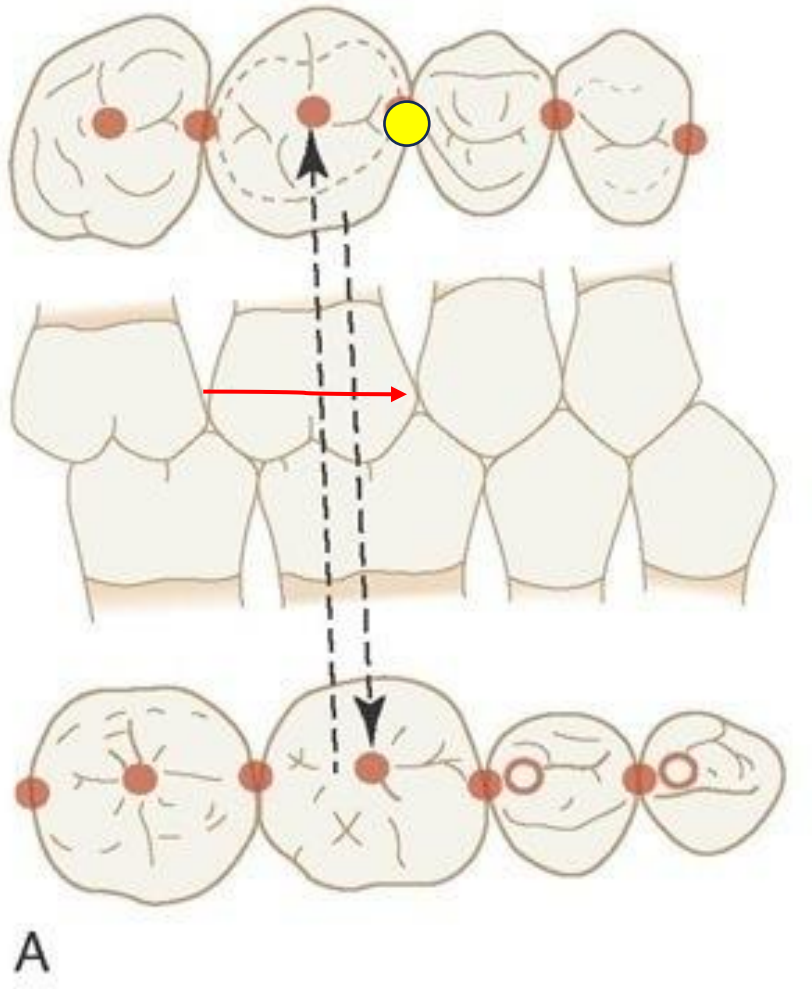
4. MOLARS

MESIAL CONTACT

- START AT MESIO-BUCCAL AXIAL ANGLE
- AT OCCLUSAL AND MIDDLE THIRD JUNCTION





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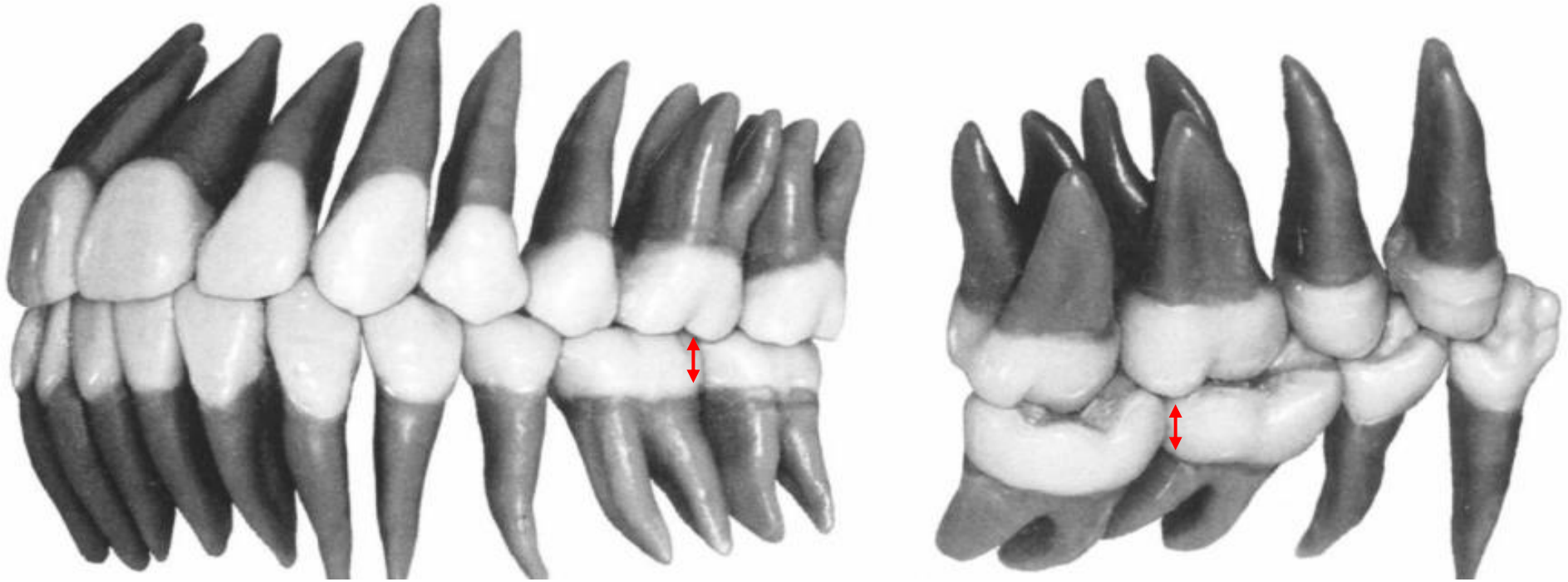
DISTAL CONTACT

- CONTACTS SHIFT LINGUALLY
- SEEN AT MIDDLE THIRD
- LINGUAL SHIFTING OF CONTACTS IS SEEN MORE LINGUALY IN MANDIBULAR MOLARS THAN IN MAXILLARY MOLARS



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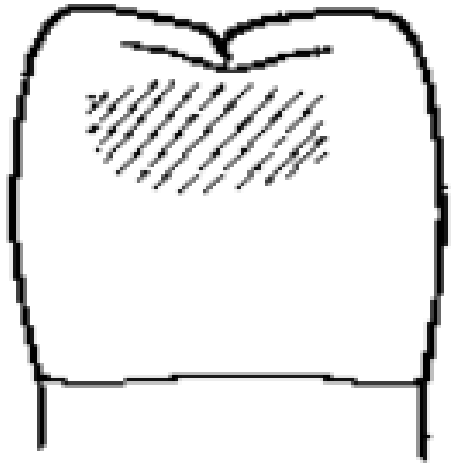
SQUARE TEETH



- BULKY
- ANGULAR
- DEVOID OF PROXIMAL CURVES

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SQUARE TEETH

1. INCISORS

- CONTACTS ARE IN LINE WITH INCISAL EDGES
- SEEN EXTENDING UPTO INCISAL EDGES
- CONTACT AS A PLANE OF 0.5 – 3 mm

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2. CANINES

- CLOSE TO INCISAL EDGES
- IN LINE LABIO-LINGUALLY WITH TEETH

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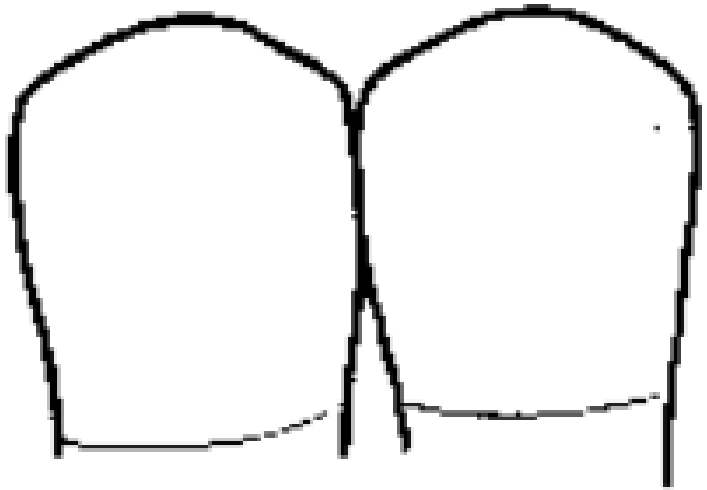
3. PREMOLARS

- CONTACTS ARE BROAD AREAS ON POSTERIORS
- PLACED BUCCALLY

EXTENT OF CONTACT AREAS



BUCCAL – Buccal 1/3 rd

- LINGUAL – Stops in middle 1/3 rd

OCCLUSAL – Occlusal 1/3 rd

- GINGIVAL – Seldom more than 1mm from CEJ

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4. MOLARS

MESIAL CONTACT

- NEAR THE BUCCAL AXIAL ANGLE
- MANDIBULAR MOLARS CAN HAVE CONTACT AREA OF 1-4mm bucco-lingually
- FORM A LINE CONTACT

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DISTAL CONTACT

- PLACED MORE LINGUALLY
- SMALL AREA – SEEN AT MIDDLE 3rd OF CROWN
- LARGE AREA – SEEN AT OCCLUSAL- MIDDLE 3rd of CROWN

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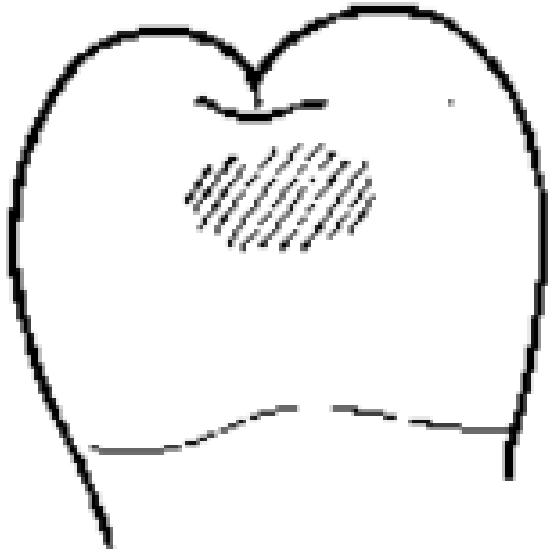
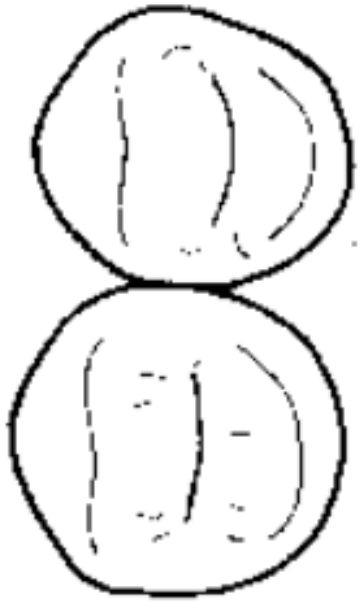
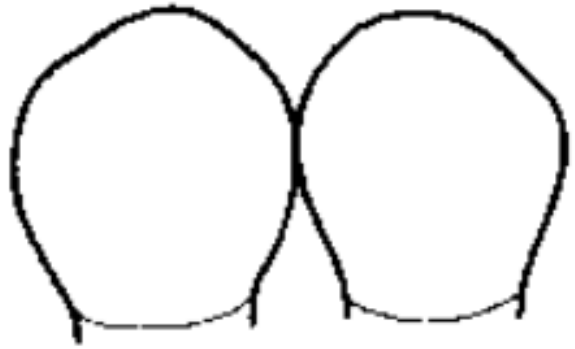
OVOID TEETH

- THEY ARE TRANSITIONAL TYPE TEETH BETWEEN SQUARE AND TAPERING.
- SURFACES ARE CONVEX
- SELDOM CONCAVE SURFACES MAYBE SEEN







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INCISORS

- LINGUAL TO INCISAL RIDGE
- MESIAL – 1/4th of crown inciso-ging ivally
- DISTAL – 1/3rd to ½ of crown inciso-gingivally

CANINES

- CLOSE TO INCISAL RIDGES
- In line with them labio-lingually

PREMOLARS

- CONVEXITY OF MARGINAL RIDGES CARRIES THE CONTACT TILL MIDDLE OF THE CROWN

MOLARS

- Same contact areas as PREMOLARS
- BUCCAL EXTENT OF CONTACT IS IN LINE WITH CENTRAL GROOVE OF TEETH.

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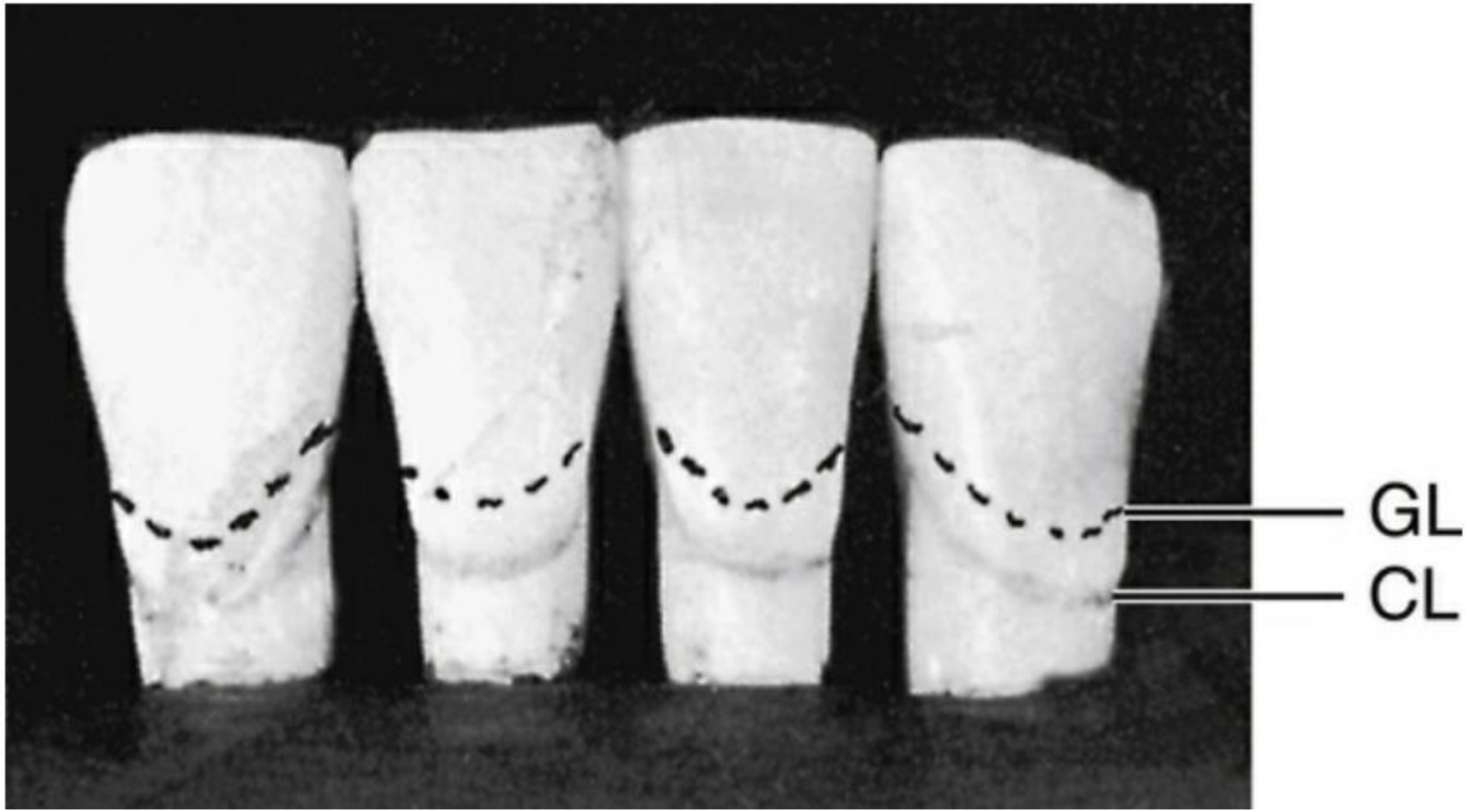

The mandibular centrals and laterals contact each other at the incisal third. The form of each tooth, plus the location of the contact areas, creates narrow pointed spaces between the teeth that differ from other interproximal spaces in other segments of the arches. CL, Cervical line as established by the cementoenamel junction; GL, variable gingival line representing the gingival level

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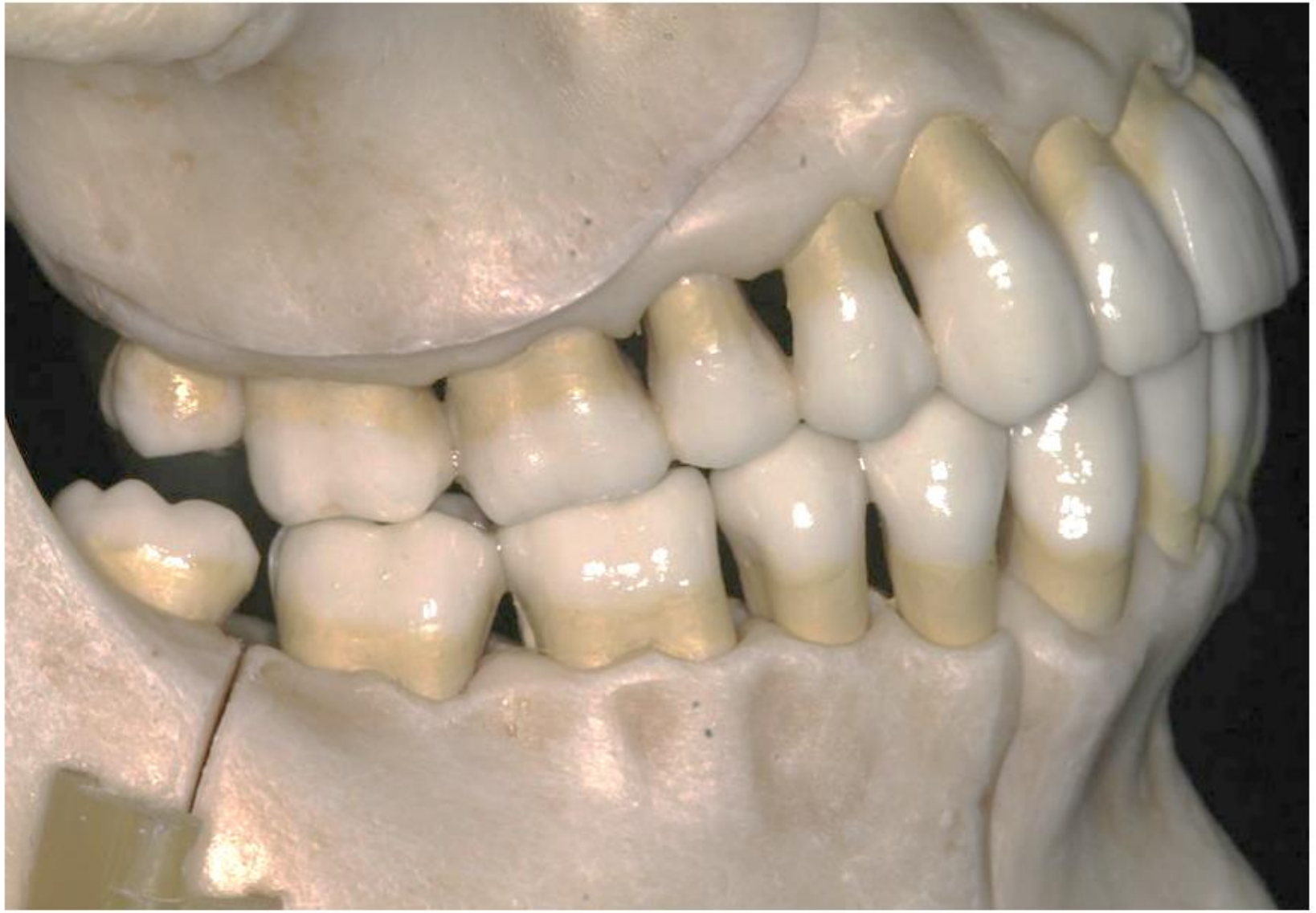

Note flat contacts in molar region compared with absence of flattening in relation to space between mandibular second and third molars. The form of the interproximal spaces is altered by wear of contact areas, extrusion of teeth, or tipping of teeth.

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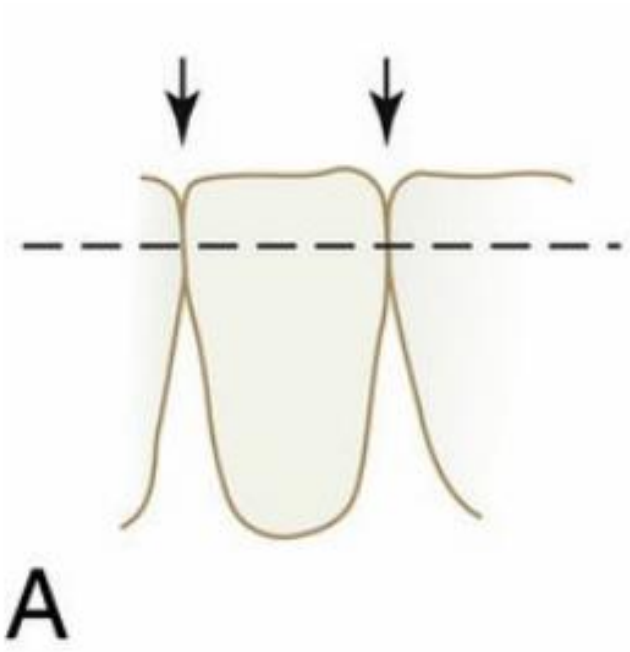
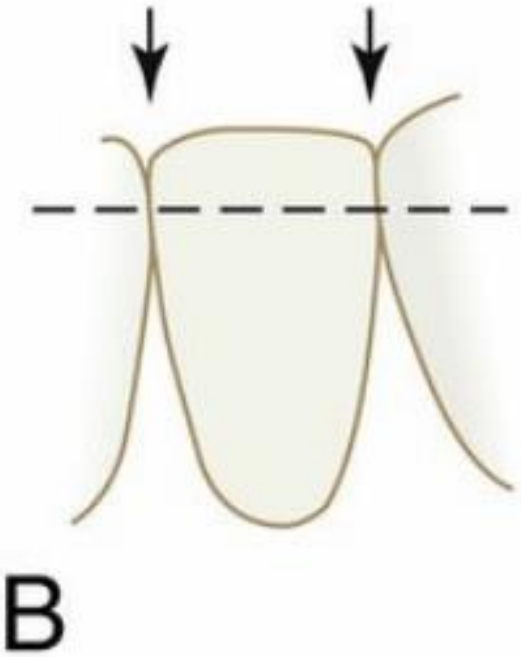
CONTACT LEVELS

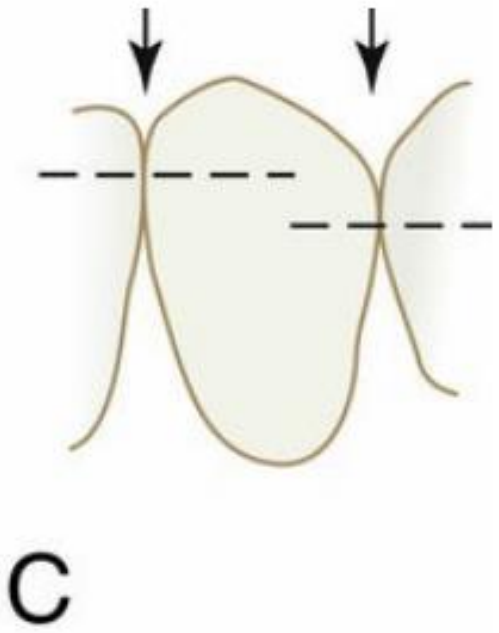
MANDIBULAR TEETH



Central and lateral incisors



CENTRAL , LATERAL , AND CANINE



Lateral incisor, canine, and first premolar.

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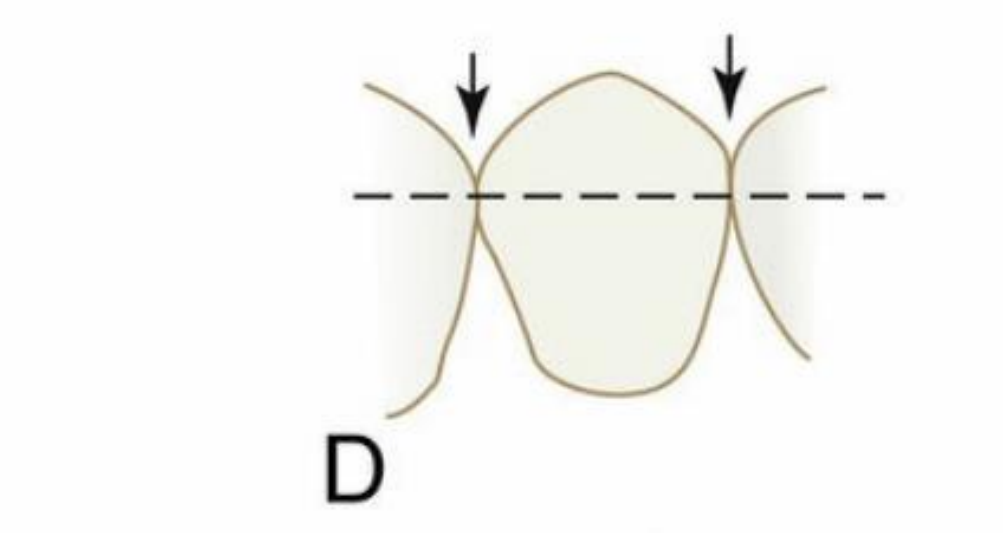
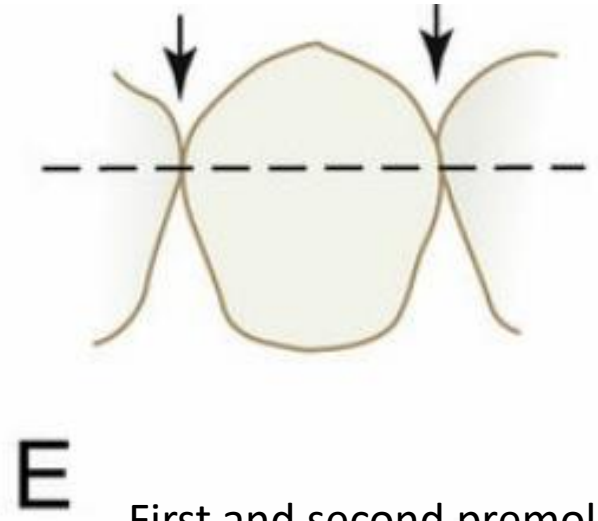
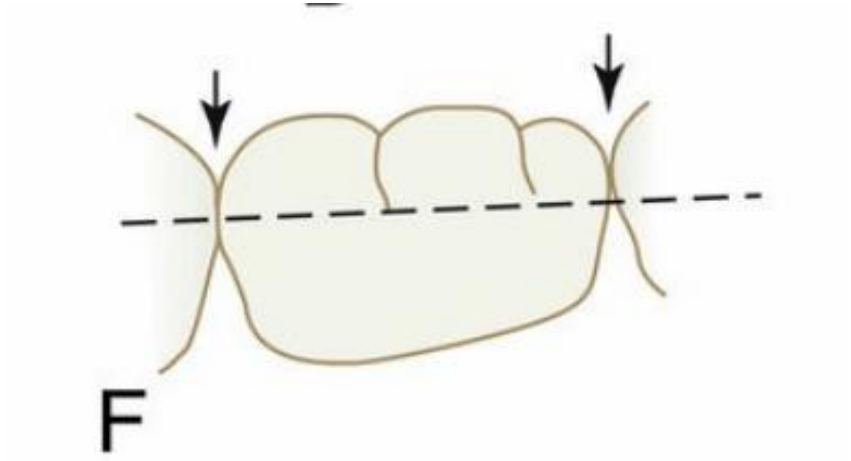


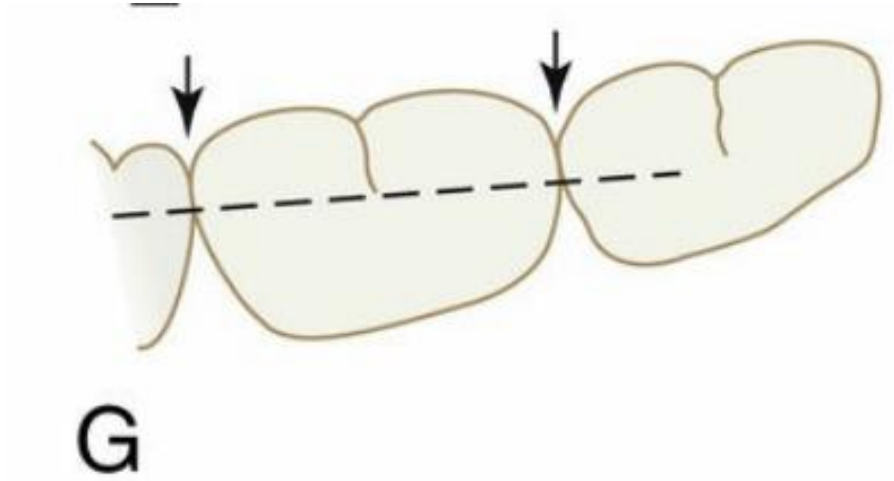
Canine and first and second premolars



First and second premolars and first molar.



Second premolar and first and second molars.



First, second, and third molars.

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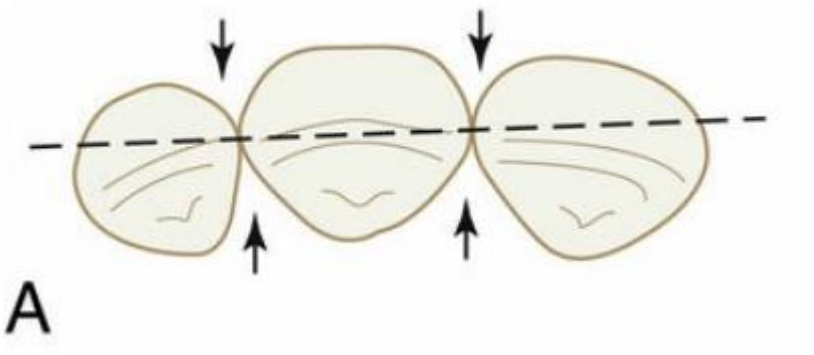
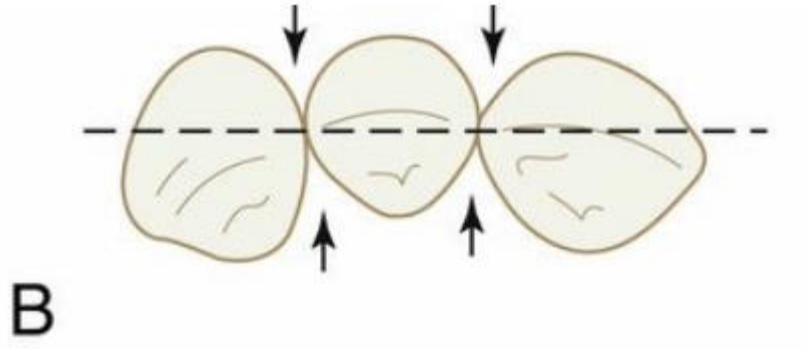
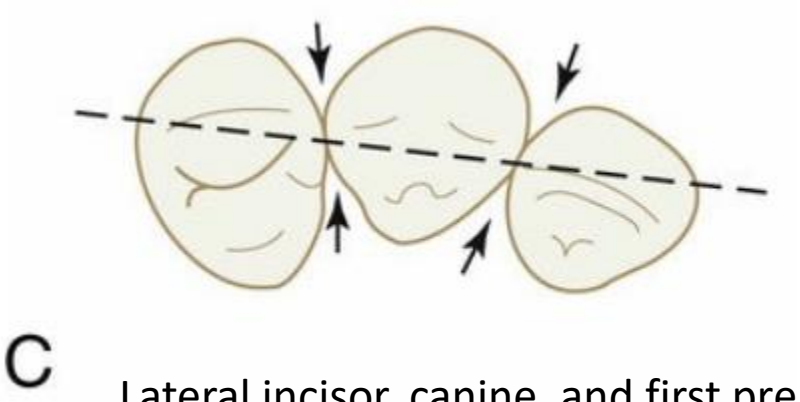
MAXILLARY TEETH



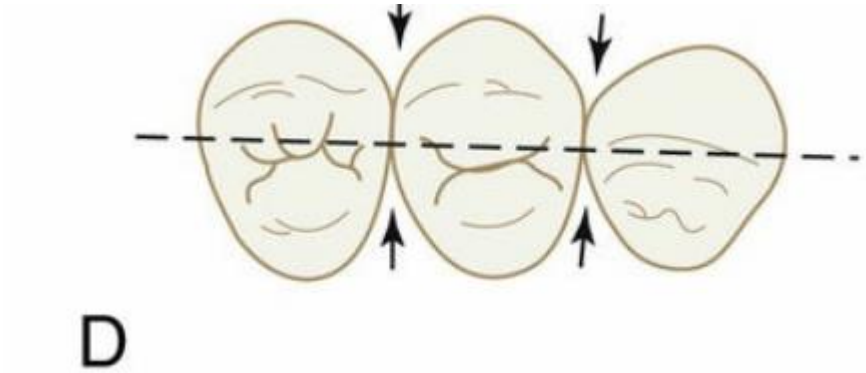
Central incisors and lateral incisor.



Central and lateral incisors and canine.



Lateral incisor, canine, and first premolar.



Canine, first premolar, and second premolar.

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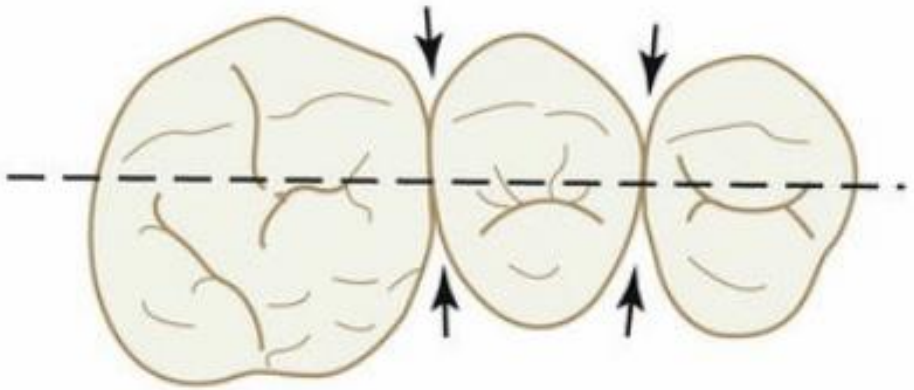
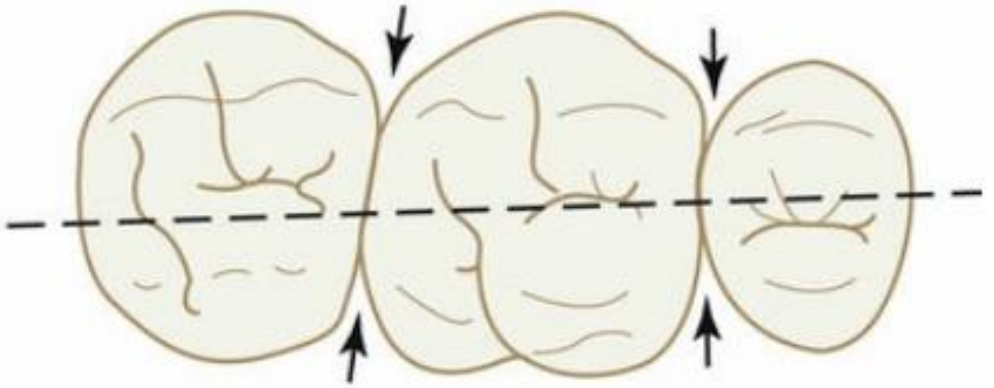
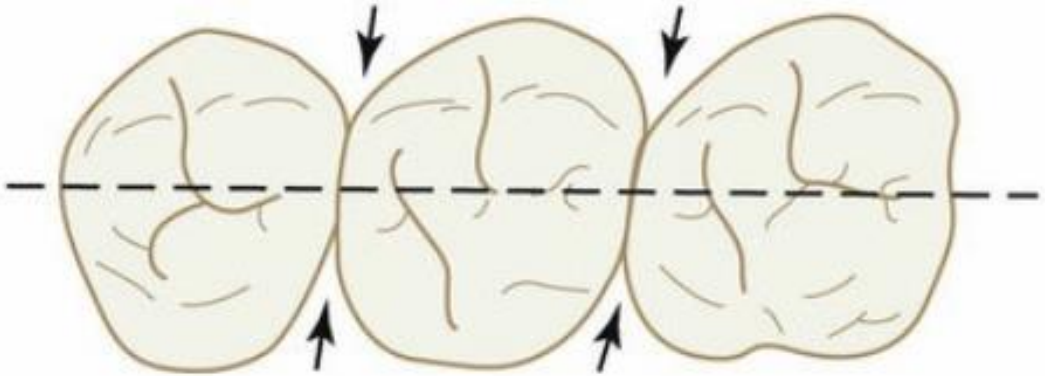


E First molar, second premolar, and first molar.



F Second premolar, first molar, and second molar.



G First, second, and third molars.

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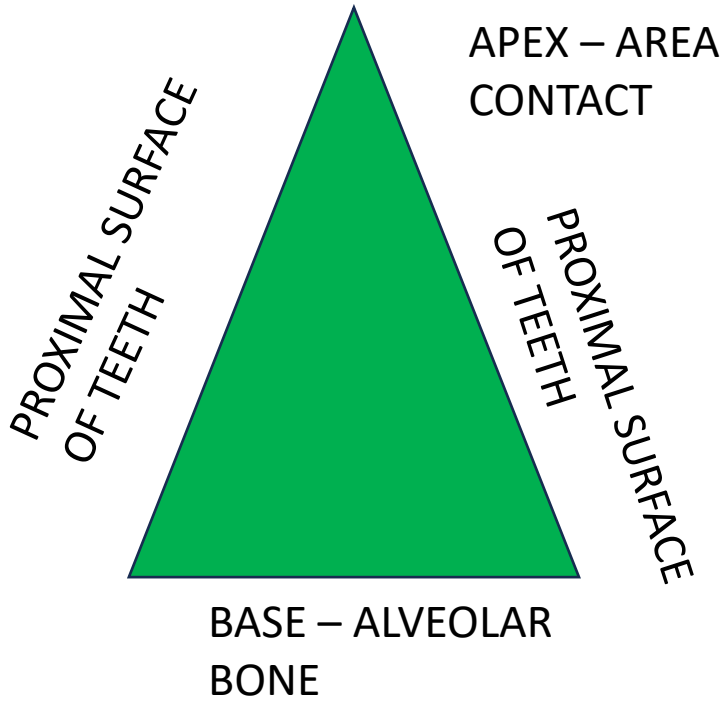
INTERPROXIMAL SPACES FORMED BY PROXIMAL CONTACTS

Triangularly shaped spaces normally filled by gingival tissue (gingival papillae).



Thus the distance from the CEJ (cervical line) to the crest of the alveolar bone is 1.5 mm

ALLOW FOR –

- Normal bulk of gingival tissue
- Help to maintain these tissues against trauma during mastication and invasion by bacteria.
- Anchors the teeth securely in the jaws.
- Simplifies the problem of space for the blood and nerve supply to the surrounding alveolar process and other investing tissues

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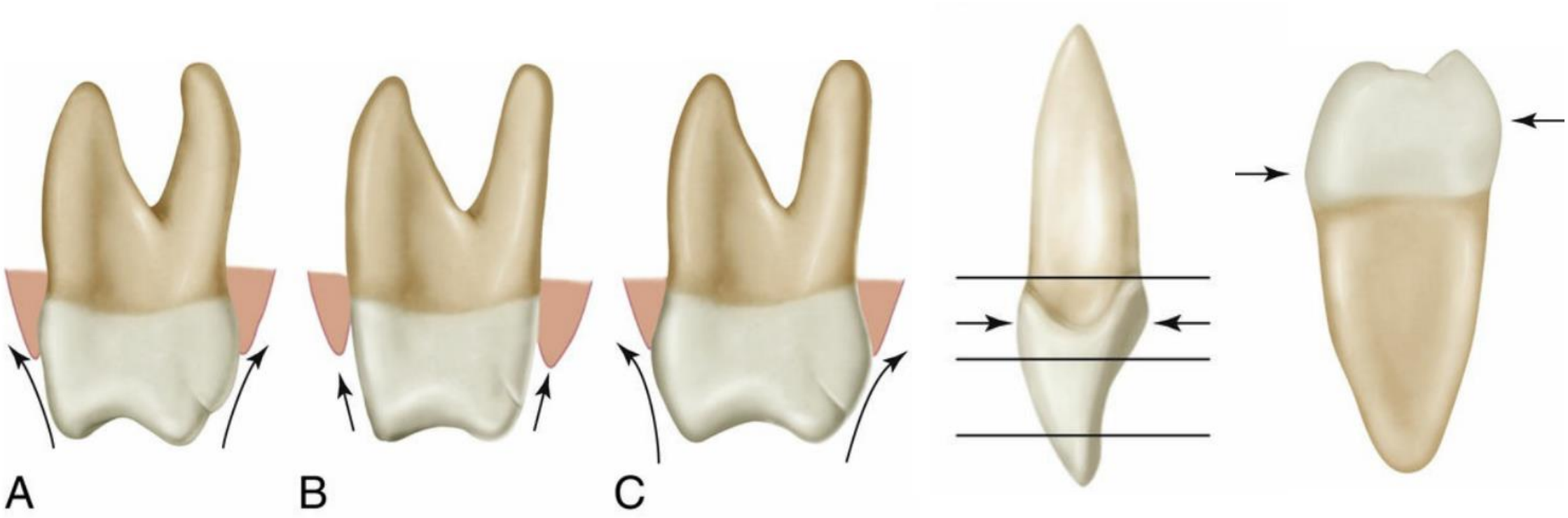
PROXIMAL CONTOURS

- ALL TOOTH EXHIBIT CURVATURE ABOVE CERVICAL LINE
- THIS BULGE AT CERVICAL THIRD IS CALLED – CERVICAL RIDGE
- CURVATURE SHOULDN'T EXTEND 1mm BEYOND CERVICAL LINE, IF SO ITS ABNORMAL
- AVERAGE CURVATURE IS 0.5mm IN GENERAL POPULATION



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CONTOURS IN TAPERING TEETH

- SURFACE PRESENTS A CONCAVITY JUST BELOW CONTACT AREAS .
- SURFACE SHOWS CONVEXITY JUST ABOVE CONTACT AREAS
- CONCAVITY IS MORE PRONOUNCED ON MESIAL SURFACE

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CONTOURS IN SQUARE TEETH

- CONTOURS BECOME PLANES THAN AREAS
- DISTAL SURFACES MAKE FLAT CONTOURS
- OCCASIONALLY CONVEXITY SEEN ON MESIAL SURFACES
- CONVEXITY DISAPPEARS AT CONTACT

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CONTOURS IN OVOID TEETH

- OVOID ANTERIORS – CONVEX CONTOUR INCISAL TILL CERVIX
- PREMOLAR – BELL SHAPED
    - CONVEX FROM CREST OF MARGINAL RIDGES TILL CERVIX
- MOLARS – CONTOURS MOVE LINGUALLY
    - MESIAL SURFACE SHOWS CONVEXITY

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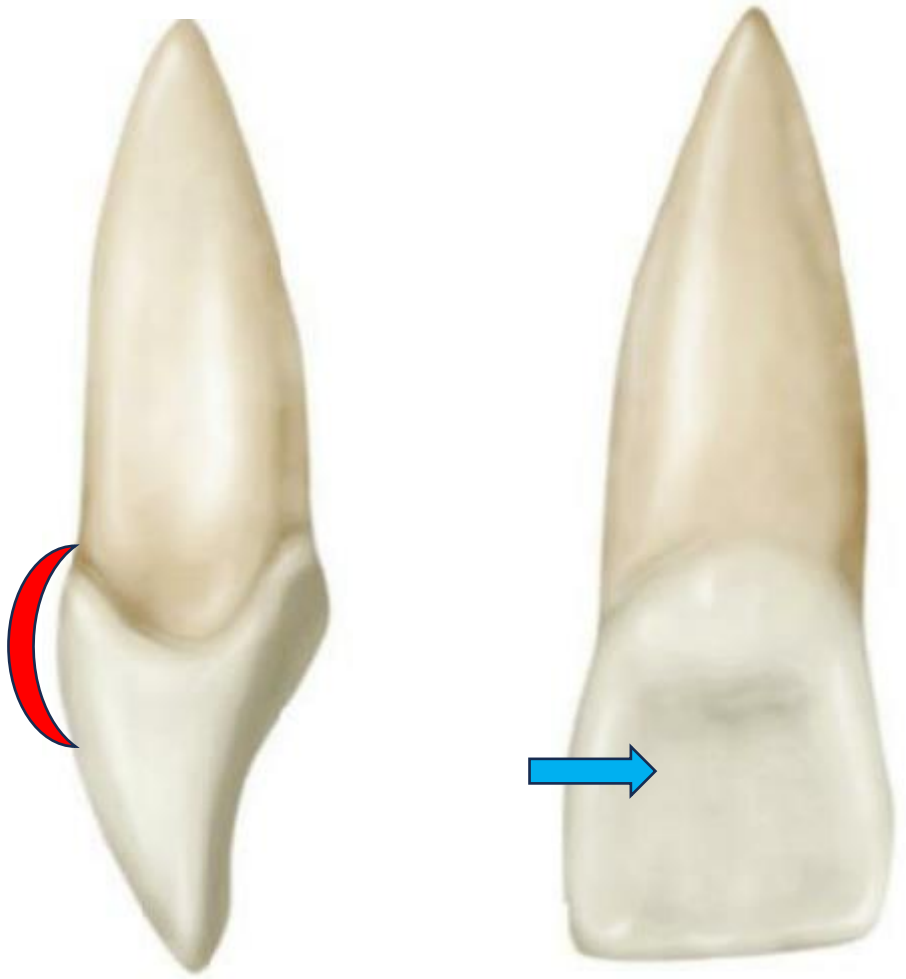
CONTOUR OF INCISORS

- The maxillary central incisor exhibits a curvature of approximately 0.5 mm labially.
- Lingual surface of anteriors show concavity – plays role in mandibular movement.
- Labial surface of anteriors – pronounced convexity mesio-distally
- Each anterior might have one or more concavities that help incisal guidance relationship.
- Mandibular anteriors have less curvature above cervical line as compared to maxillary anteriors.



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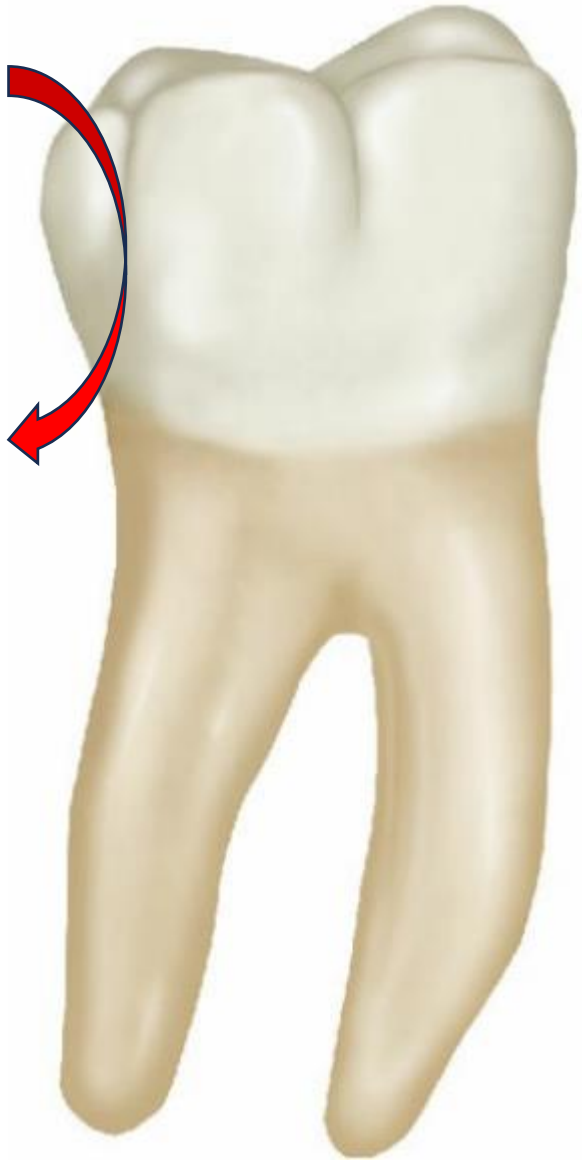
CONTOURS OF POSTERIORS

- Mandibular posteriors have lingually curvature of 1mm
- Posterior teeth show mesio-distal convexity
- Convexity at facial and lingual surface decreases as we approach cervically
- Convexity decreases at CEJ to almost a flat surface.



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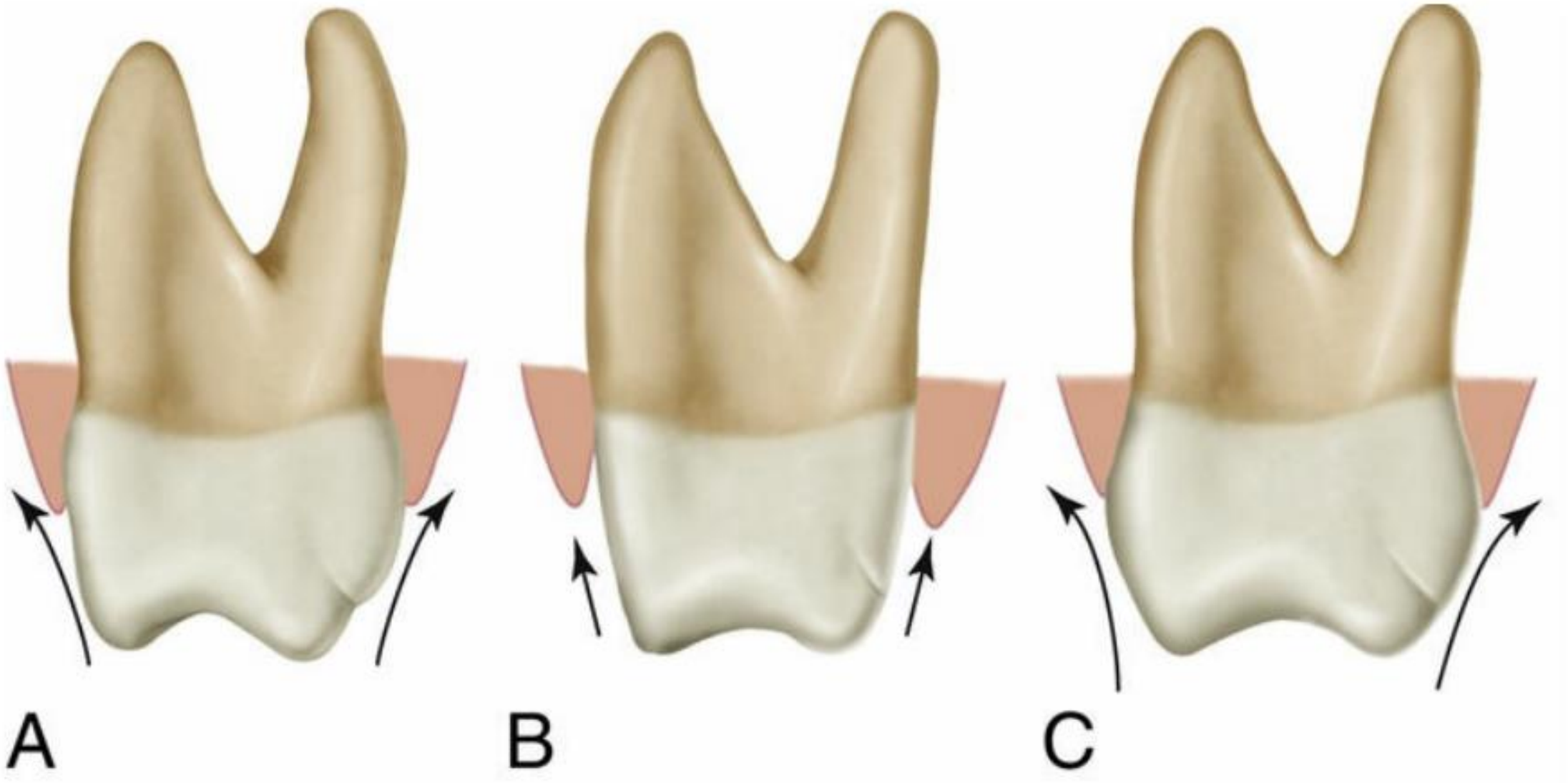
FACIAL AND LINGUAL CONTOURS AT CERVICAL THIRD

LINGUAL CONTOURS AT MIDDLE THIRD OF CROWNS



(A) Normal curvatures as found on maxillary molar. Arrow shows theoretical path of food during mastication. (B) If molar shows little or no curvature, there is possibility for food impaction. (C) Molar with curvature in excess of normal.

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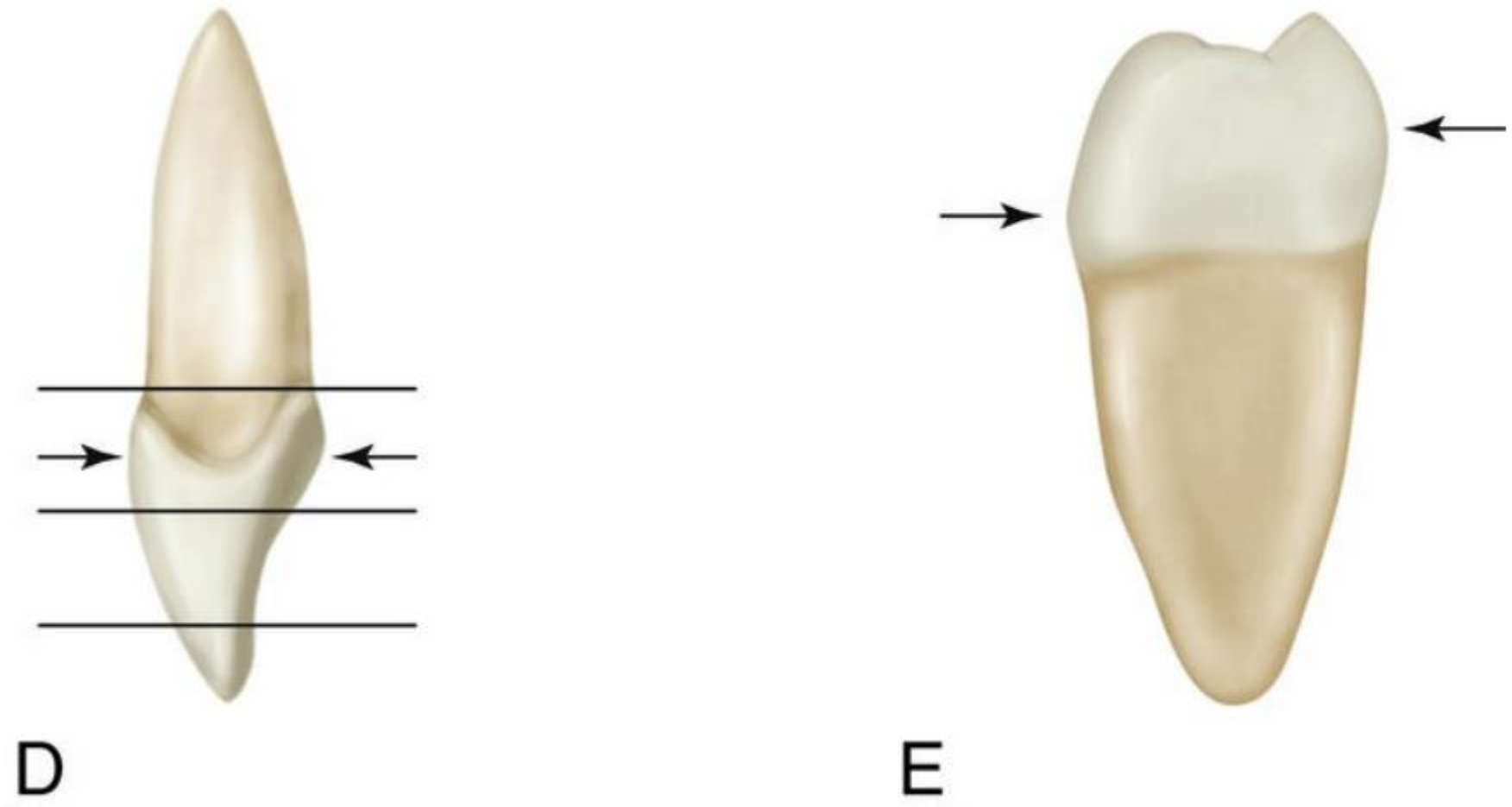

(D) Normal cervical curvatures as found on maxillary incisors. The crests of curvature are opposite each other labiolingually.
(E) Curvatures as found on mandibular posterior teeth.

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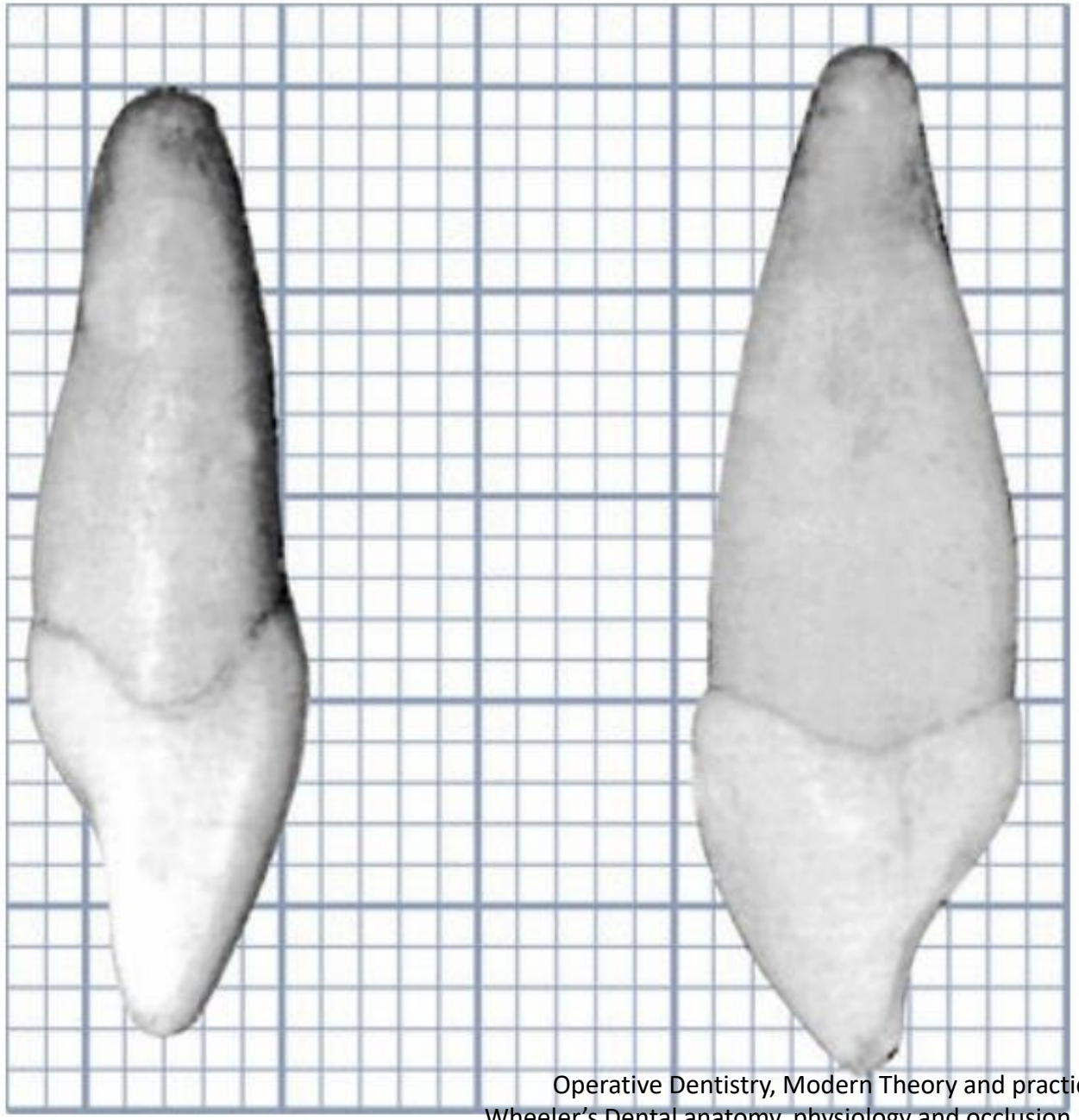

- The maxillary central incisor exhibits a curvature of approximately 0.5 mm labially and somewhat less lingually at the cervical third of the crown. Many specimens show equal curvature on the two sides.

- The maxillary canine exhibits approximately the same curvature. Note the limitation of the curvature at the cingulum area above the cervical line.

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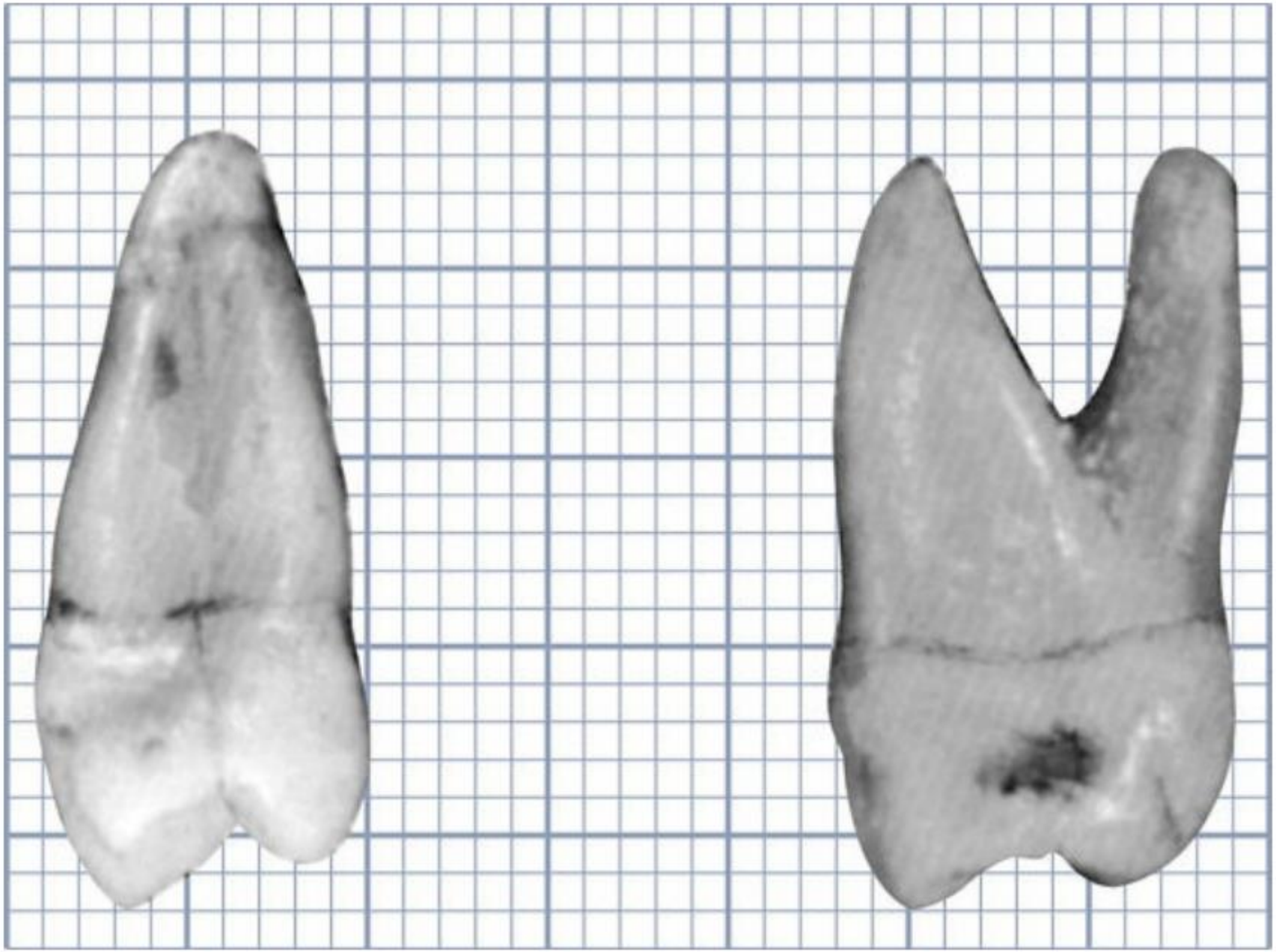

The maxillary first premolar has a curvature of approximately 0.5 mm buccally and lingually. The crest of curvature buccally is located at the cervical third of the crown and lingually at the middle third. The maxillary first molar has curvatures of the same degree at similar points on both sides.

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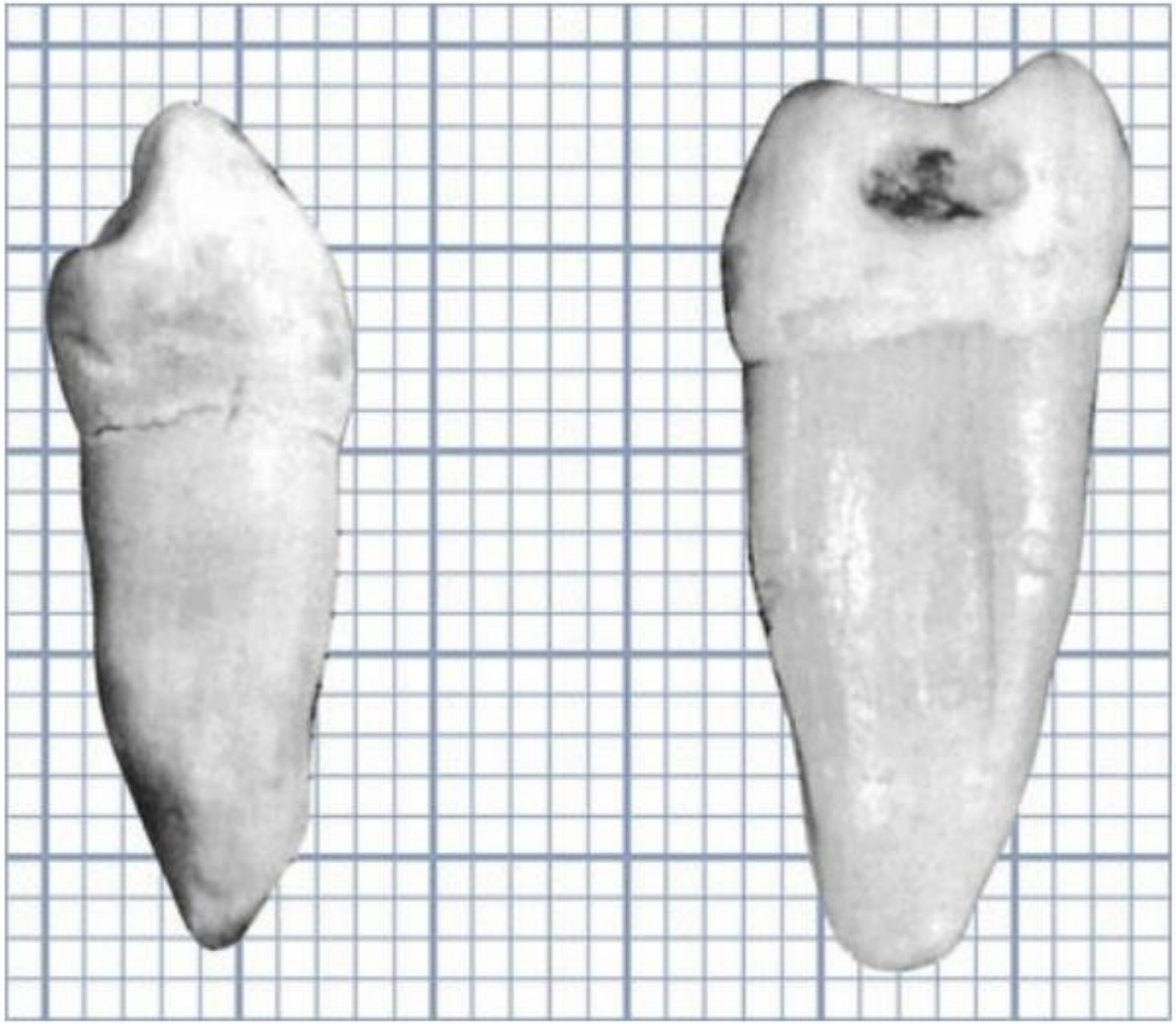

Mandibular first premolar and first molar. Both teeth have a curvature of approximately 0.5 mm buccally at the cervical third of the crown and a curvature of approximately 1 mm lingually, with the crest of curvature at the middle third.

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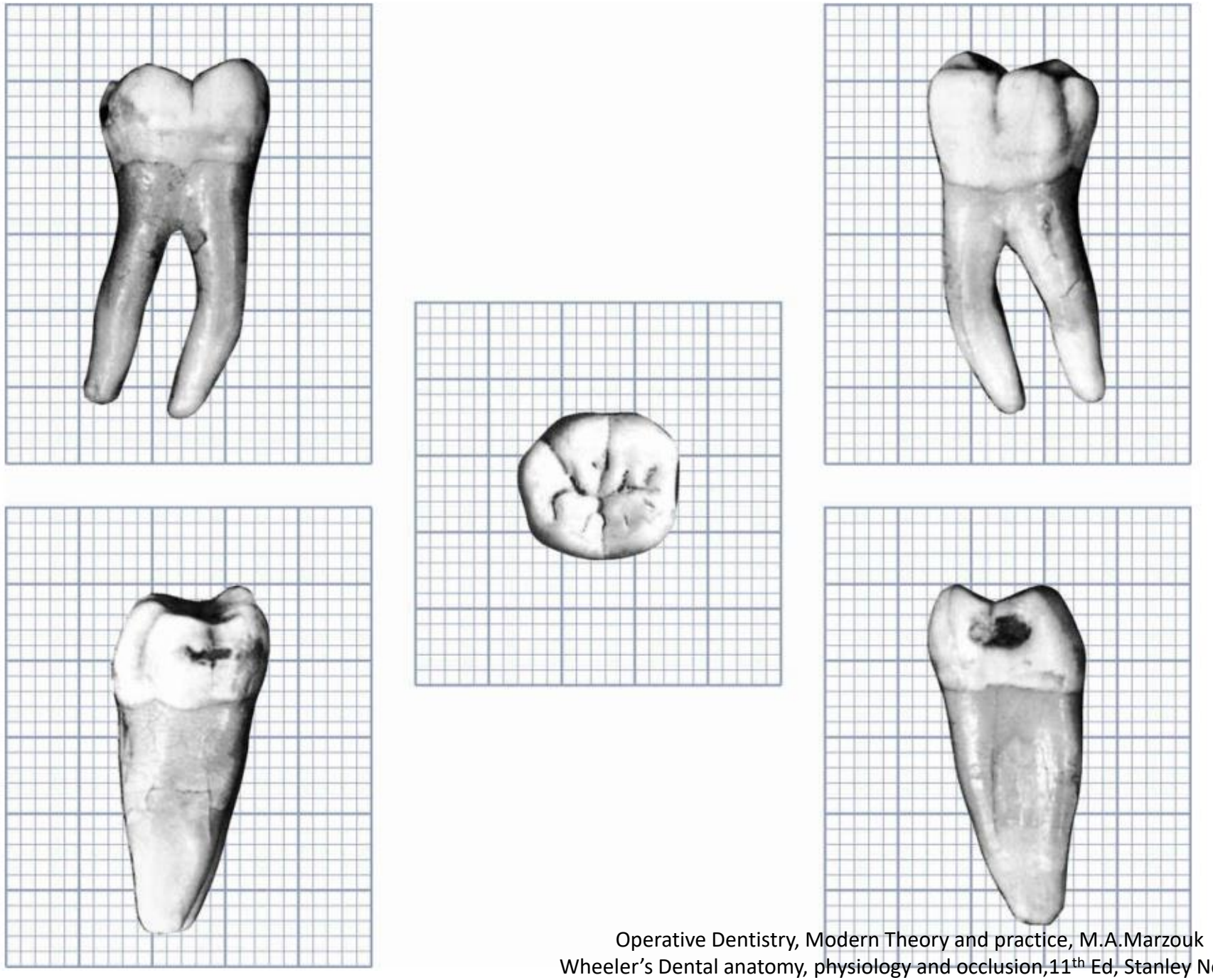

Photographs of a natural specimen of a mandibular first molar, taken with a lens capable of two-diameter registrations.

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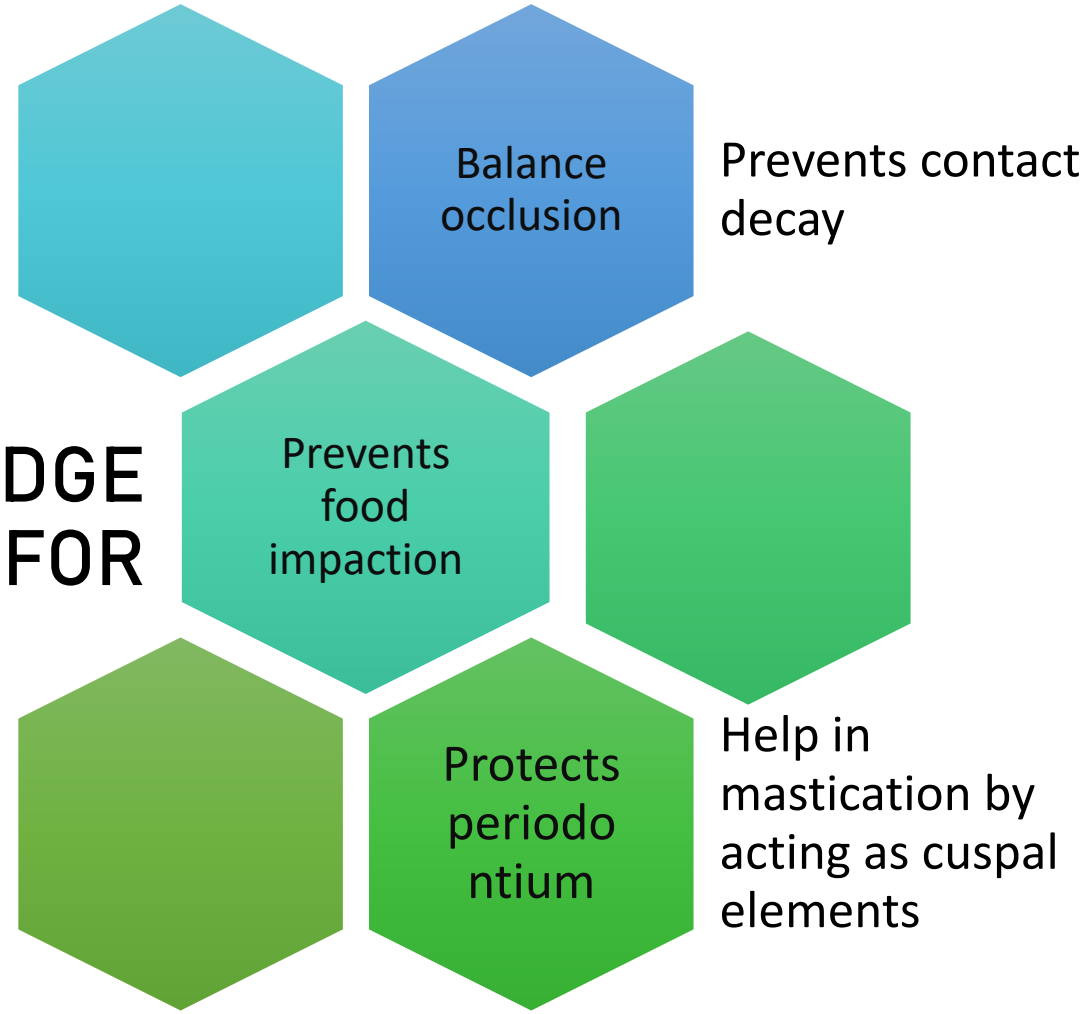
MARGINAL RIDGES

MARGINAL RIDGE IS ESSENTIAL FOR



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REQUIREMENTS FOR PROPER MARGINAL RIDGE

- Compatible with occlusal anatomy
- Should form triangular fossa
- Should form occlusal embrasure
- Should be formed in 2 planes BUCCO-LINGUALLY
- Should meet these two planes at OBTUSE ANGLE

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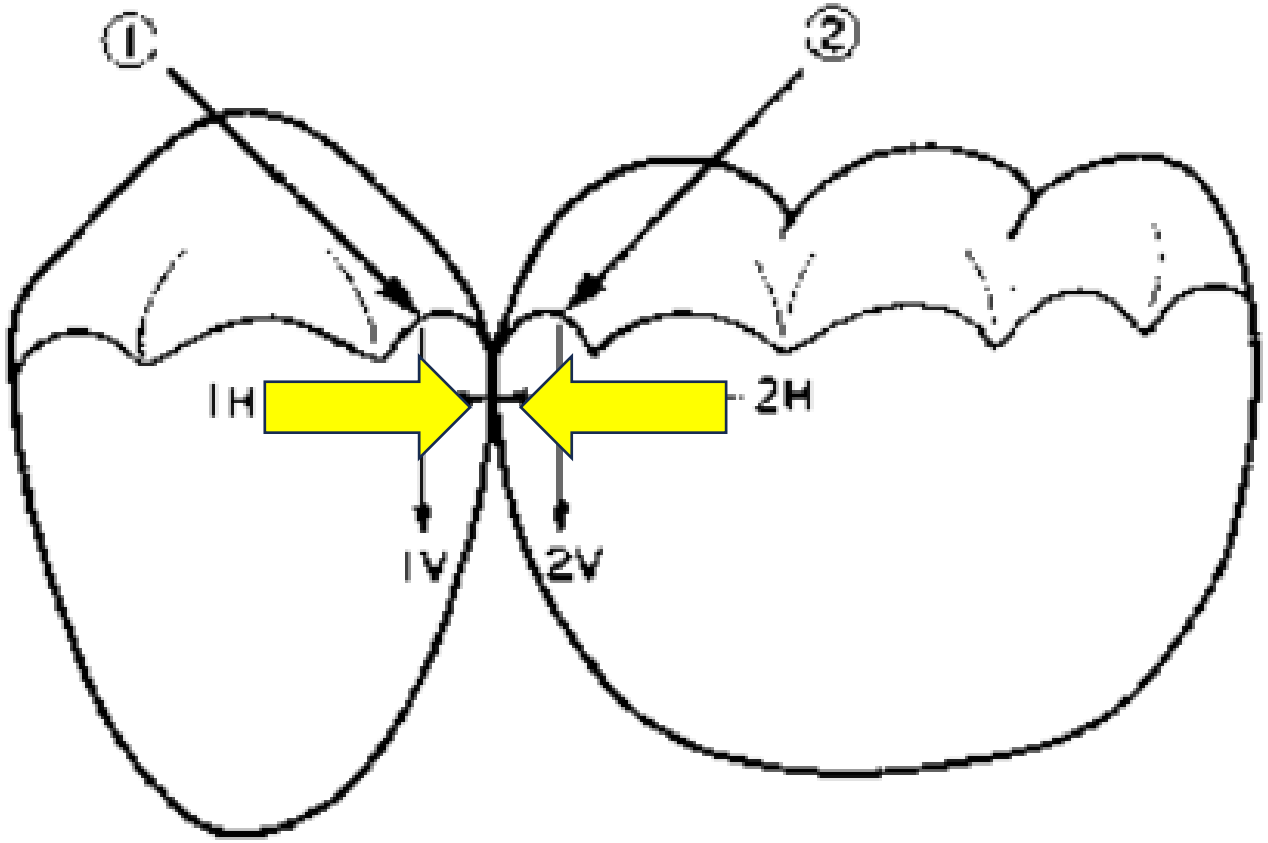
MARGINAL RIDGE PERFORMS ITS FUNCTION



HORIZONTAL FORCES ACTING ON MARGINAL RIDGES 1H AND 2H

MOVE THE TEETH TOWARDS EACH OTHER

AVOID IMPACTION OF FOOD.

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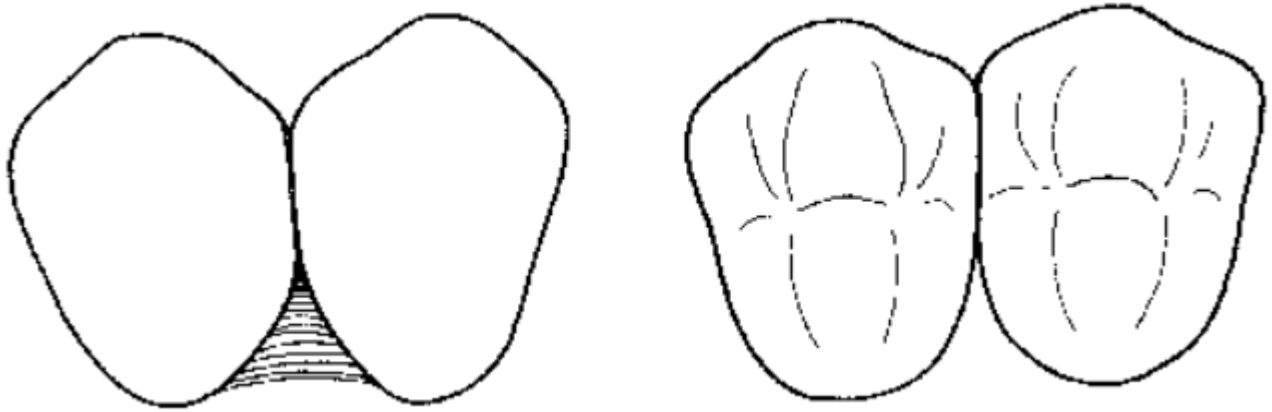
HAZARDS OF FAULTY REPRODUCTION OF PHYSIO-ANATOMICAL FEATURES OF TEETH IN RESTORATION

CONTACT SIZE

BROAD CONTACT



Changes anatomy of interdental col from saddle to broad.

More prone to periodontal disease

Reduces the self-cleansing potential

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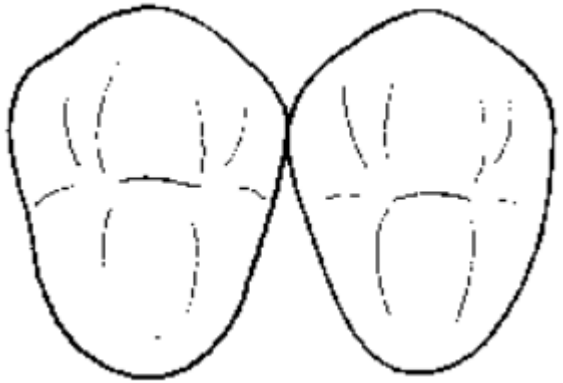
NARROW CONTACT

Changes the anatomy of tooth

More food accumulation in vertical area i.e. interdental col

Periodontal problems , caries .



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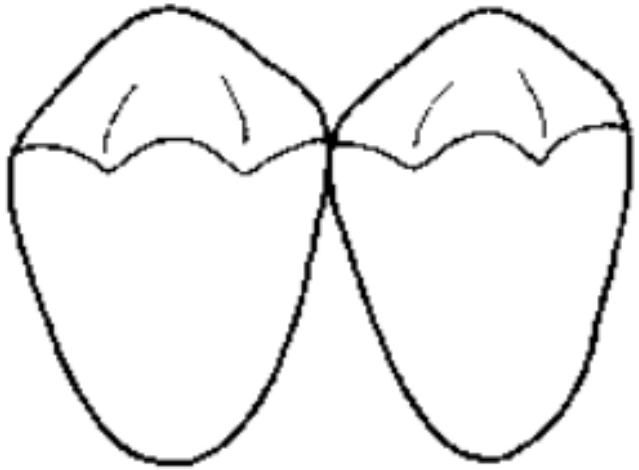
OCCLUSALLY PLACED CONTACT

FLATTENED MARGINAL RIDGES AT EXPENSE OF OCCLUSAL EMBRASURES



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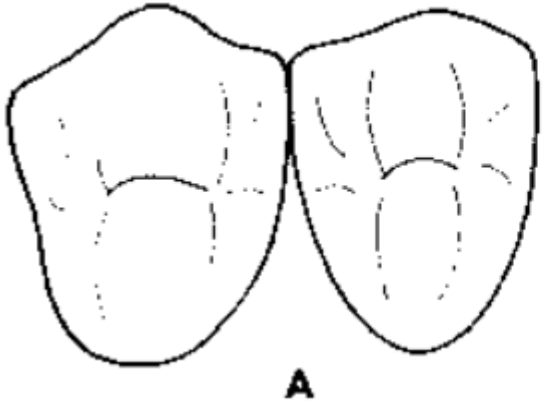
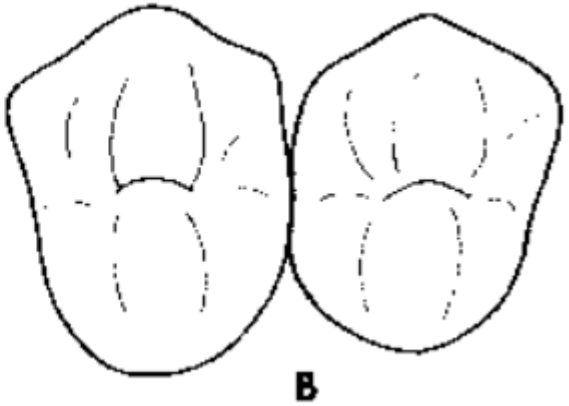
BUCCALLY AND LINGUALLY PLACED CONTACT

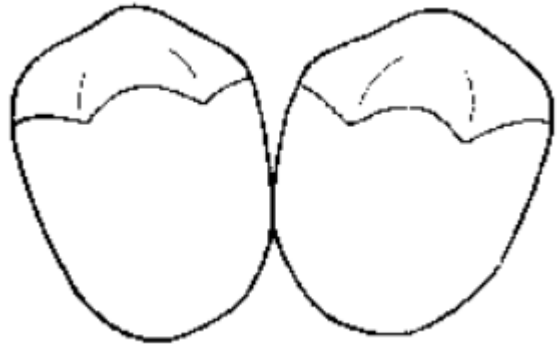
FLATTENED RESTORATION EMBRASURE AT EXPENSE OF BUCCAL AND LINGUAL





GINGIVALLY PLACED CONTACT

INCREASES THE DEPTH OF INTERDENTAL COL



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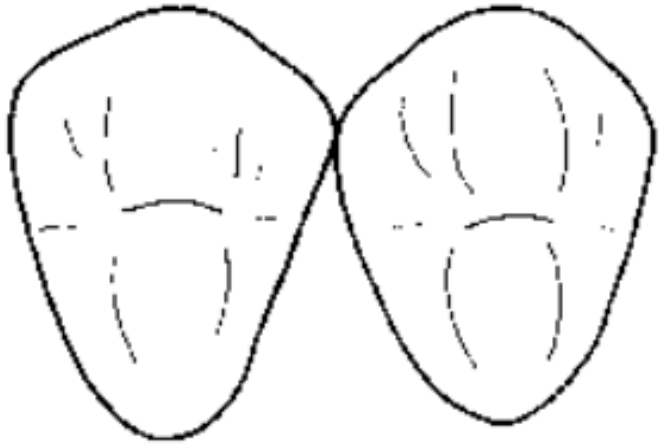
CONTACT CONFIGURATION

FLAT CONTACTS

- BROAD CONTACTS
- DECAY
  PERIODONTAL ISSUES
  PLAQUE ACCUMULATION

TOO CONVEX

- DIMINISHES THE CONTACT AREA
- PRONE TO PERIODONTAL DAMAGE AND DECAY



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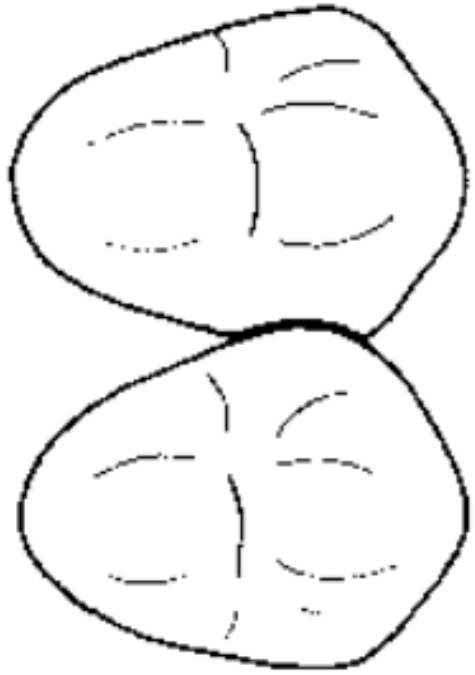
CONCAVE CONTACT

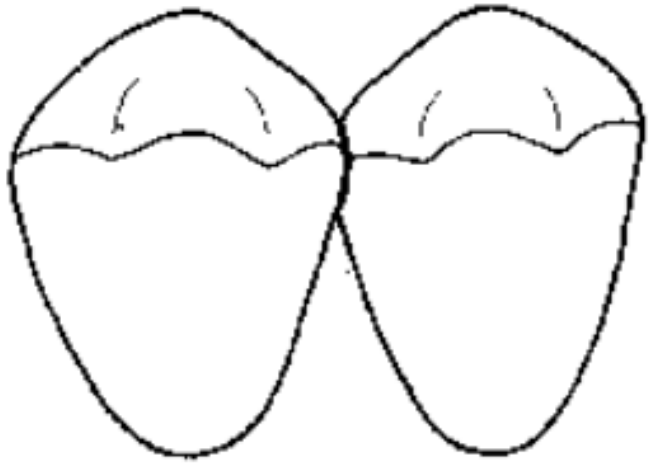
OCCURS WHEN TWO ADJACENT RESTORATIONS ARE DONE AT A TIME AND ONE HAS CONVEX SURFACE

BROADENS AND MISLOCATES THE CONTACT AREA

INTERLOCKS THE CONVEXITY AND CONCAVITY – IMMOBILIZES THE TEETH

CONCAVE SURFACE MAKES IT DIFFICULT TO RESTORE MARGINAL RIDGE





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CONTOUR

- FACIAL AND LINGUAL CONVEXITY

- HISTORICAL THEORY – prevents the accumulation of food in embrasures, avoids frictional tension.
- RECENT STUDIES – More chances of damage via overconvex surfaces rather than underconvex.

- Overconvexity – accumulation of plaque and growth of microbes

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- FACIAL AND LINGUAL CONCAVITIES

- Concavities occlusal to height of contour

  -help in dynamic and static occlusal relations

- DEFICIENT / MISLOCATED CONCAVITIES – premature contacts
- EXCESSIVE CONCAVITIES – extrusion , rotation, tilting
- Concavities apical to height of contour

  -Deficient concavities here can lead to restorative overhangs, plaque accumulation.

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AREAS OF PROXIMAL CONTOUR ADJACENT TO CONTACT AREAS

- Essential to restore the areas in proper contour that are not in contact
- If not restored to proper contour – overhangs and underhangs of restoration.
- Vertical and horizontal impaction of food
- Periodontal issues

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MARGINAL RIDGES

- ABSENCE OF MARGINAL RIDGE IN RESTORATION

FORCE 1

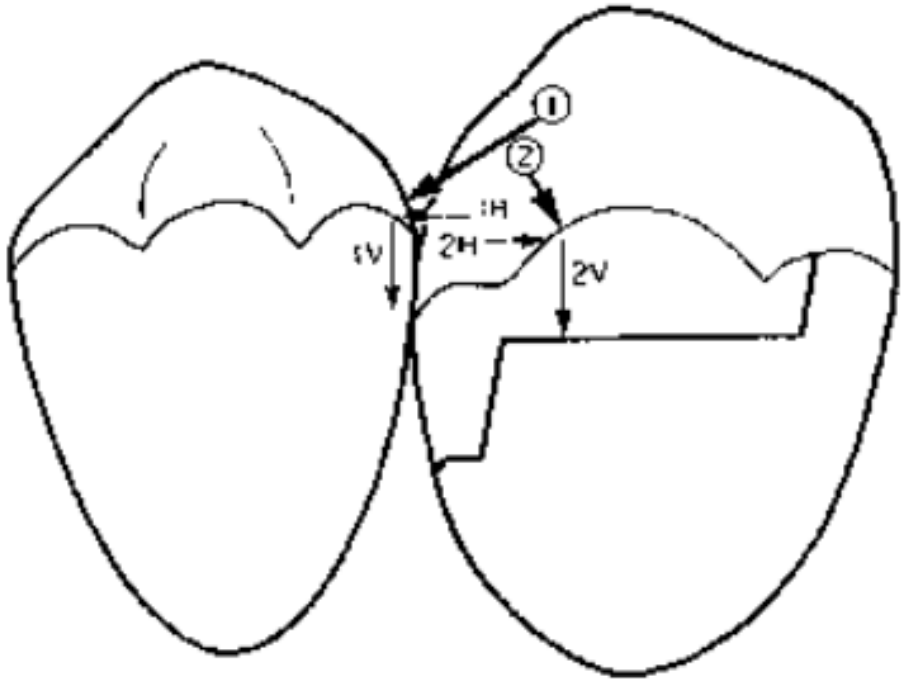
- DIRECTED AT ADJACENT TOOTH

HORIZONTAL FORCES 1H AND 2H

- MOVE TOOTH AWAY FROM ONE ANOTHER

VERTICAL FORCES 1V AND 2V

- IMPACT FOOD INTERPROXIMALLY



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MARGINAL RIDGE WITH EXAGGERATED OCCLUSAL EMBRASURE

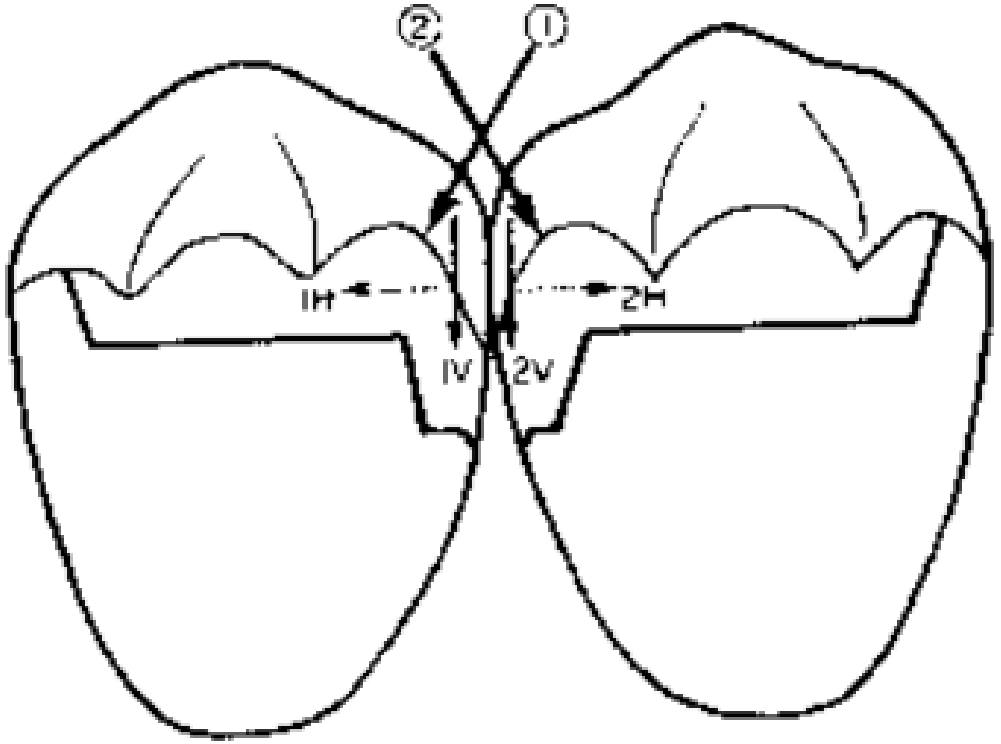
EXAGGERATING OCCLUSAL EMBRASURES DIRECT FORCES 1 AND 2 TOWARDS PROXIMAL SURFACES

HORIZONTAL FORCES 1H AND 2H

- MOVE TEETH AWAY FROM ONE ANOTHER

VERTICAL FORCES 1V AND 2V

- IMPACT THE FOOD INTERPROXIMALLY



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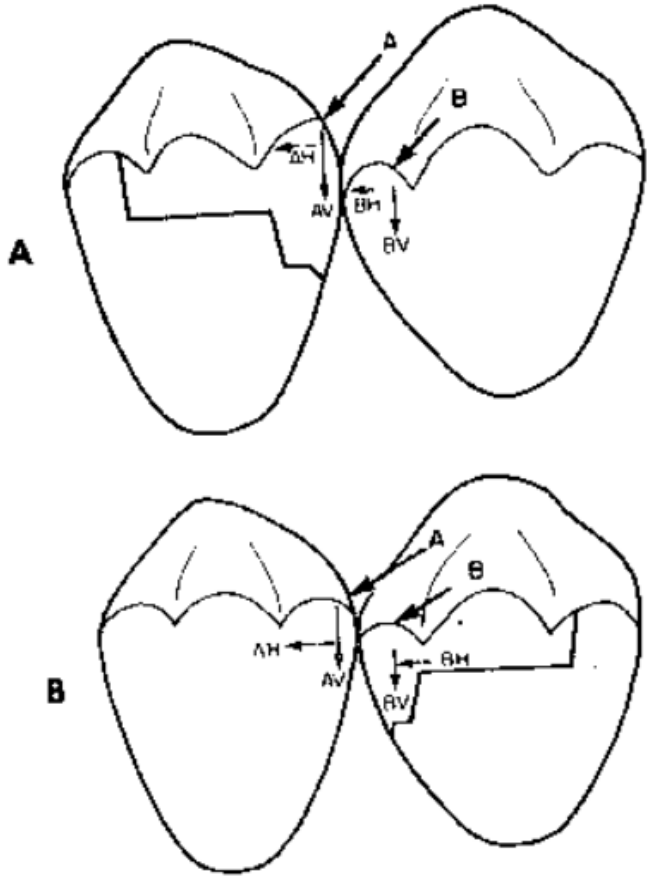
ADJACENT MARGINAL RIDGES NOT COMPATIBLE IN HEIGHT

HIGHER THAN ADJACENT ONE

- DRIVES THE RESTORED TOOTH AWAY FROM ADJACENT NON RESTORED TOOTH
- VERTICAL COMPONENT DRIVES FOOD DEBRIS INTERPROXIMALLY

LOWER THAN ADJACENT ONE

- DRIVES THE NON RESTORED TOOTH AWAY FROM RESTORED TOOTH
- VERTICAL COMPONENT DRIVES FOOD DEBRIS INTERPROXIMALLY



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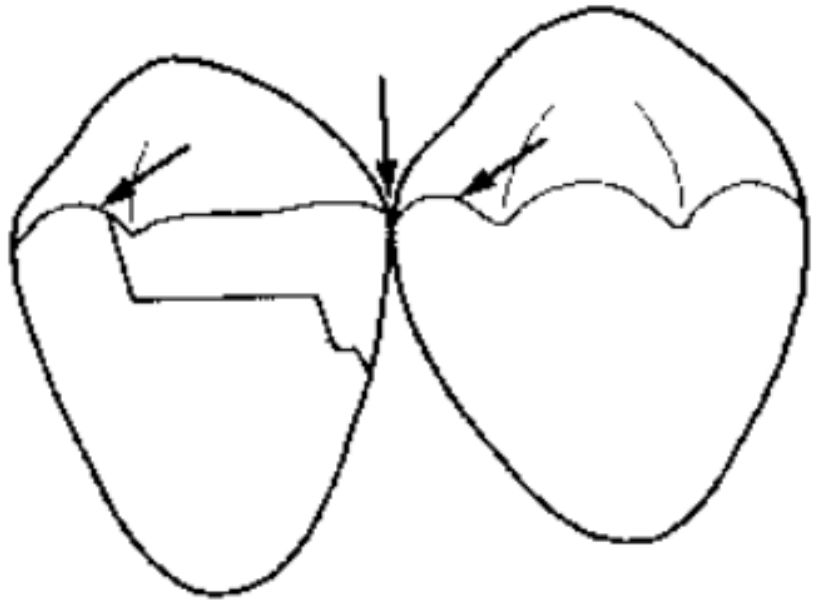
MARGINAL RIDGE WITH NO ADJACENT TRIANGULAR FOSSA

- NO OCCLUSAL PLANE IN MARGINAL RIDGE
- NO HORIZONTAL FORCES THAT MOVE TEETH TOWARDS EACH OTHER
- VERTICAL FORCES IMPACT THE TOOTH INTERPROXIMALLY



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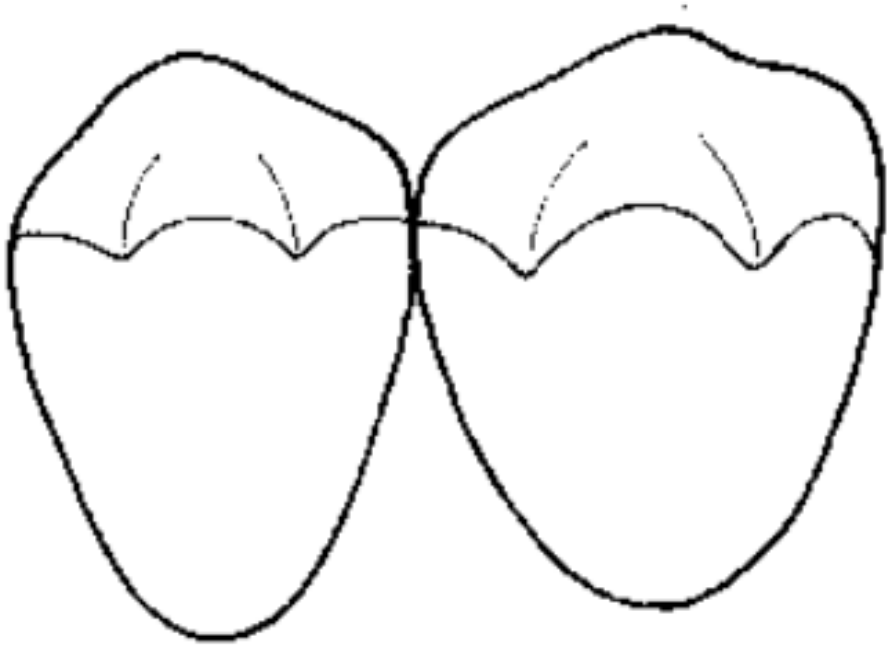
MARGINAL RIDGE WITH NO OCCLUSAL EMBRASURE

BOTH MARGINAL RIDGES ACT AS PAIR OF TWEEZERS AND GRASP FOOD INBETWEEN THEM.



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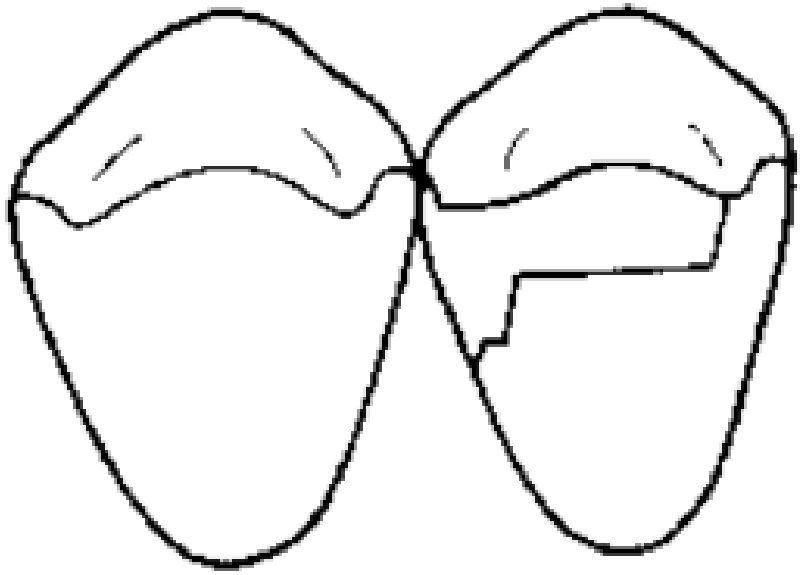
THIN MARGINAL RIDGE IN MESIO-DISTAL BULK

- SUSCEPTIBLE TO FRACTURE OR DEFORMATION.
- CREATES CONCAVITIES THAT IMPACT FOOD DEBRIS
- PERIODONTAL PROBLEMS AND PLAQUE ACCUMULATION.



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Impact of matrix systems on proximal contact tightness and surface geometry in class II direct composite restoration in-vitro

The aim of this study was to evaluate proximal contact tightness and contour established after completing class II direct composite restorations using two pre-contoured matrix systems.

The use of separation ring with sectional matrix provides superior contact tightness compared to circumferential matrix.

Tolba ZO, Oraby E, Abd El Aziz PM. Impact of matrix systems on proximal contact tightness and surface geometry in class II direct composite restoration in-vitro. BMC Oral Health. 2023 Aug 2;23(1):535. doi: 10.1186/s12903-023-03222-5. PMID: 37533048; PMCID: PMC10399026.

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- Sturdevant’s art and science of operative dentistry,4th Ed, Theodore robertson
- Tolba ZO, Oraby E, Abd El Aziz PM. Impact of matrix systems on proximal contact tightness and surface geometry in class II direct composite restoration in-vitro. BMC Oral Health. 2023 Aug 2;23(1):535.