OCCLUSION AND MALOCCLUSION

1

OKLUSI GIGI GELIGI ANAK

- SUATU KEADAAN GIGI GELIGI PD MAKSILA DAN MANDIBULA BERADU APABILA MULUT TERKATUP → BUKAN KEADAAN HUBUNGAN YG STATIS TAPI DINAMIS DARI TONJOLAN GIGI GELIGI DENGAN SEGALA POSISI (OCCLUSAL INCLINED PLANE - CENTRIC AND EXCENTRIC) → UTK MENDPTKAN FUNGSI NORMAL (HUB KOMPLEK ANTARA GIGI GELIGI, OTOT, DAN TL ALVEOLUS/TL RAHANG)

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OKLUSI NORMAL

- MERUPAKAN SIFAT YG KOMPLEKS MELIPUTI:
- 1. INTERDIGITASI NORMAL GIGI GELIGI
- 2. FUNGSI NORMAL DARI OTOT RONGGA MULUT.
- 3. HUBUNGAN NORMAL ATAU HARMONIS SENDI RAHANG

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DEFINITION

The deviation from the accepted normal occlusion is malocclusion.

Malocclusion is a condition that reflects an expression of normal biologic variability in the way the maxillary & the mandibular teeth occlude.   (BISHARA)

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An occlusion in which there is a malrelationship between the arches in any of the planes of the space or in which there are anomalies in tooth position beyond the limit of the normal (WALTHER & HOUSTON)

CLASSIFICATION

Depending upon which part of the oral & maxillofacial unit is at fault :

1. Individual tooth malpositions (DENTAL DYSPLASIA)

2. Malrelations of the dental arches or dento alveolar segments. (SKELETODENTAL DYSPLASIA)

3. Skeletal malrelationship (SKELETAL DYSPLASIA)

1) INDIVIDUAL TOOTH MALPOSITION

• These are malocclusions of individual teeth in relation to adjacent teeth with in same dental arch.

• They also called **intra arch malocclusions**.

• Also includes condition like spacing or crowding with in dental arches.

    They are of following -

1. MESIAL INCLINATION OR TIPPING

2. DISTAL INCLINATION OR TIPPING

3. LINGUAL INCLINATION OR TIPPING

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4. LABIAL/BUCCAL INCLINATION OR TIPPING

5. INFRA OCCLUSION

6. SUPRAOCCLUSION

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7. ROTATIONS :-

a. Mesiolingual or distolabial

b. Distolingual or mesiolabial

8. TRANSPOSITION

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2) MALRELATION OF DENTAL ARCHES

- These characterized by an abnormal relationship between teeth or groups of teeth of one dental arch to another arch.

- These occur in all the three planes of space, namely –

  sagittal plane

  vertical plane

  transverse plane

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SAGITTAL PLANE MALOCCLUSION

A. Pre normal occlusion

Where the mandibular dental arch is placed more posteriorly when the teeth meet in centric occlusion.

b. <u>Post normal occlusion</u>

Where the mandibular dental arch is place more distally when the teeth meet in centric occlusion.

VERTICAL PLANE MALOCCLUSION

<u>A. Deep bite or increase over bite</u>

<u>B. Open bite</u>

TRANSVERS PLANE MALOCCLUSION

• These includes various types of <u>cross bites</u> due to constriction of the dental arches or some other reason the r e l a t i o n s h i p i s disturbed.

3) SKELETAL MALOCCLUSIONS

• These malocclusions are caused due to the defect in the underlying skeletal structure itself.

• The defect can be in size position or relationship b/w the jaw bones.

VARIOUS SYSTEM OF MALOCCLUSION

- Angle's classification.
- Dewey's modifications.
- Lisher's modifications.
- Bennette's classification
- Simon's classification
- Skeletal classification
- Ackerman-Proffit system

ANGLE'S CLASSIFICATION OF MALOCCLUSION

- In 1899 EDWARD H. ANGLE classified malocclusion based on the mesio-distal relation of the teeth,dental arches & jaws.

- He considered maxillary first permanent molar as fixed anatomical point & as key to occlusion.

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- He classified three categaries designated as classes & represented by ROMAN numerals I, II and III.

ANGLE'S CLASS I

- The mesiobuccal cusp of the maxillary first molar occluding in the buccal groove of the mandibular first permanent molar.
- The pt. show some dental irregularities like crowding, spacing, rotation missing tooth etc.

- The mandibular dental arch is in normal mesiodistal relationship of the maxillary arch.

- Another category of malocclusion is classified as class I is Bimaxillary Protrsion.(both jaws forwardly placed)

ANGLE'S CLASS II

- The mesiobuccal cusp of maxillary first permanent molar occlude in the space b/w the mesiobuccal cusp of the mandibular first permanent molar & the distal aspect of the mandibular second premolar.

- Also,the mesiolingual cusp of the maxillary first permanent molar occludes mesial to the mesiolingual cusp of the mandibular first permanent molar.

Based on the labiolingual angulation of the maxillary incisors angle divided the class II malocclusion into two division-

class II division 1

class II division 2

CLASS II DIVISION 1

➢ The maxillary incisor teeth are proclained or labioversion.

➢ Frequently the lower anterior segment shows supraversion or over eruption of the incisor teeth,a tendency towards "flattening" & some irregularities.

➢ The maxillary arch shape become "V" instead of U but seldom normal.

- Due to proclination of upper anterior there is increase in overjet.

- Lower lip cushion to the lingual aspect of the upper teeth

- this class associated with abnormal muscle function compare to angle's class I

During swallowing abnormal mentalis activity & abberent buccinator activity, together with compensatory muscle function & changed tongue position tend to accentuate the narrowing of the maxillary arch,the protrusion, labial inclination & spacing of the maxillary incisors, the curve of spee &the flattening of the mandibular anterior segment.

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CLASS II DIVISION 2

Along with the typical class II molar relationship the maxillary central incisor are near normal anterioposteriorly or slightly in linguo version,whereas the maxillary lateral incisor are tipped labially and/or mesially.

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In some cases variation occurs-Both central and lateral incisors may be lingually inclinedand the canines labially inclined.

In contrast with classII div 1 perioral muscle function is usually normal but certain function problems involving temporalis,masseter & lateral pterygoid muscle activity are common.

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The combination of the lingually inclined maxillary incisors & infraocclusion of the posterior teeth often results in the creation of an abnormal path of closure. (mandible can be forced into a retruded position by tooth guidence.)

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CLASS II SUBDIVISION

When a class II molar relationship exist on one side of dental arch & class I on other side it is reffered to subdivision.

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DIFFERENCE B/W DIV1 & DIV2

|		DIV 1	DIV2
1.	Profile	Convex	Convexity/straight
2.	Lips	Incompetent	Competent
3.	Mentalis muscles	Hyperavtive	Normal
4.	Lower facial height	Increase/normal	Decreased
5.	Arch form	V shaped	Square/U shaped
6.	Palate	Deep	Normal
7.	Incisors	Proclined	CI retroclined & LI proclined
8.	Overjet	Increased	Decreased
9.	Overbite	Deep	Closed
10.	Path of closure	normal	Backward

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ANGLE'S CLASS III

The mandibular dental arch & body is in mesial relationship to the maxillary arch; with the mesiobuccal cusp of the maxillary first molar occlusion in the interdental space b/w the dental aspect of the distal cusps of the mandibular first molar & the mesial aspect of mesial cusps of the mandibular second molar

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- In most cases the incisors are inclined excessively to the lingual aspect,despite the crossbite

- individual tooth irregularities are frequent.

- The space provided for the tongue appears to be greater & the tongue lies on the floor of the mouth most of the time.

- The pt can present with a normal overjet, an edge to edge incisor relation on an anterior cross bite
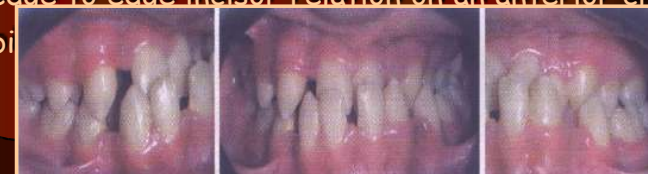
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PSEUDO CLASS III

- This is not a true class III malocclusion but the presentation is similar.

- Here the mandible shifts anteriorly in the glenoid fossa due to premature contact of the teeth or some other reason when the jaws are brought together in centric occlusion.

- Incidence is low

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DIFFERENCE B/W TRUE & PSEUDO CLASS III

Concave	Straight
Heriditary	Habitual
Absent	disturbance Present
Forward	
	Deviated
Not possible	
	Possible
Orthopedic appliance,surgical correction	Elimination of prematurities & replacement of lost teeth

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DRAWBACKS OF ANGLE'S CLASSIFICATION

1) Angle presumed the first permanent molars as fixed points within the jaws, which definitely is not so

2) Angle depended exclusively on the first molars. Hence, the classification is not possible if the first molars are missing or in the deciduous dentition

3) malocclusion are considered only in the anteroposterior plane. Malocclusion in the transverse & vertical planes are not considered

4) individual tooth malocclusion have not been considered

5) there is no differentiation b/w skeletal & dental malocclusion

6) etiology of malocclusion has not been eleborated upon.

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DEWEY'S MODIFICATION OF ANGLE'S CLASSIFICATION

Dewey in 1915 modified angle's class I & class III by segregating malposition of anterior and posterior segments as:-

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MODIFICATION OF ANGLE'S CLASS I

TYPE 1:- Angle's classI with crowded maxillary anterior teeth.

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TYPE 2:- Angle's class I with maxillary incisor in labio-version (proclined)

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TYPE 3:- Angle's class I with maxillary incisor teeth on linguo-version to mandibular incisor teeth.(anterior in cross bite)

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TYPE 4:- Molar and/or premolars are in bucco or linguo-version,but incsors & canines are in normal alignment. (posterior in crossbite)

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TYPE 5:- Molars are in mesioversion due to early loss of teeth mesial to them.(Early loss of deciduous molars or second premolar)

TYPE 1:- Individual arches when viewed individually are in normal alignment, but when in occlusion the anterior are in edge to edge bite.

TYPE 2:- The mandibular incisors are crowed & lingual to the maxillary incisors.

TYPE 3:- Maxillary arch is underdeveloped,in cross bite with maxillary incisors crowded & the mandibular arch is well developed & well aligned.

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LISCHER'S MODIFICATIONS OF ANGLE'S CLASSIFICATION

- Lischer in 1933 further modified angle's classification by substitute names for angle"s class I, II& III malocclusion

- he also proposed terms to designate individual tooth malpositions

  1) Neutroocclusion
  2) Distoocclusion
  3) Mesioocclusion

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LISCHER'S NOMENCLATURE FOR INDIVIDUAL TOOTH MALPOSITIONS:-

Lischer add the suffix **"version"** to a word to indicate the deviation from normal position

1)MESIOVERSION

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2) DISTOVERSION

3) LINGUOVERSION

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4) LABIOVERSION

5)INFRAVERSION

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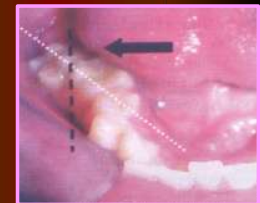
6) SUPRAVERSION

7) AXIVERSION

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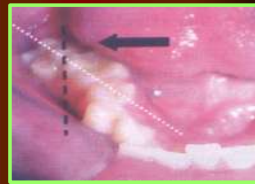
8) TORSIVERSION

9) TRANSVERSION

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BENNETT'S CLASSIFICATION

Based on their etiology

✓   CLASS I:- Abnormal location of one or more teeth due to local disturbance

✓   CLASS II:- Abnormal formation of a part or a whole of either arch due to developmental defects of bone

✓   CLASS III:-Abnormal relationship b/w the upper & lower archs and b/w either arch & the facial contour,due to developmental defects of bone.

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SIMON'S CLASSIFICATION

Simon in 1930 was the first to relate the dental arches to the face & cranium in the three planes of space-

i.e. .Frankfort horizontal plane

    .Orbital plane

    .Raphe or Median Sagital plane

FRANKFORT HORIZONTAL PLANE (VERTICALLY)

F-H plane is determined by drawing a straight line through the margins of the bony orbit directly under the pupil of the eye to the upper margins of the external auditory meatus.
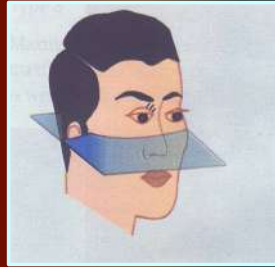
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This plane is used to classify malocclusion and vertical deviation with respect to the plane are:-

1.ATTRACTIONS:-When the dental archor part of this is closer to the F-H plane is reffered to attraction.

2.ABSTRACTION:- When a dental arch or part of it is further away from the F-H plane it is reffered to as abstruction.

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ORBITAL PLANE (ANTEROPOSTERIORLY)

This plane is perpendicular to the F-H plane at the margins of bony orbit directly under the pupil of the eye.
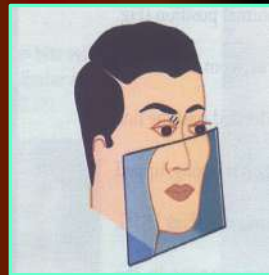
This plane should pass through the distal third of the upper canine.(simon's law of canine)

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1. PROTRACTION:- the teeth one or both dental arches and/or jaws are too far forward i.e. placed forward or anterior to the plane.

2. RETRACTION:- the teeth one or both dental arches and/or jaws are too far backward, i.e. placed posterior to the plane than normal

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MEDIAN SAGITAL PLANE (TRANSVERSE)

The plane is determined by the approximately 1.5 cm. apart on the median raphe of the palate.
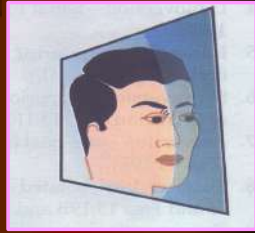
Malocclusion classified according to transverse deviation as:

1. CONTRACTION:- A part or all of the dental arch is contracted towards the median sagittal plane.

2. DISTRACTION:- A part or all of the dental arch is wider or placed at a distance which is more than normal.

SKELETAL CLASSIFICATION

SALZMANN in 1950 was the first to classify malocclusion on skeletal structure basis.

Skeletal class 1

Skeletal class 2

Skeletal class 3

SKELETAL CLASS 1

These malocclusion were purely dental with the bones of the face & jaws being in harmony with one another & with the rest of the head.

The profile is orthognathic

further divided

DIV 1

DIV 2

DIV 3

DIVISION 1:- Local malrelations of incisors, canine and premolars.

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DIVISION 2:- Maxillary incisors protrusion

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DIVISION 3:- Maxillary incisors in linguoversion

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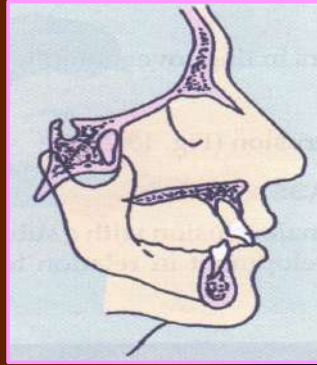**DIVISION 4:-** Bimaxillary protrusion.

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SKELETAL CLASS 2

These include malocclusion with a subnormal distal mandibular development in relation to the maxilla.

It further divided into two division based on features with a retrudedly placed mandible.

DIV 1
DIV 2

DIVISION 1:- the maxillary dental arch is narrower with crowding in the canine region, cross bite may be present and the vertical face height is decreased.
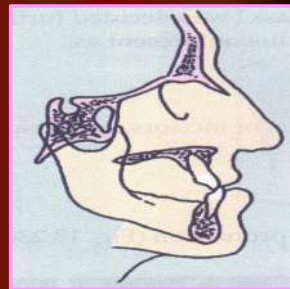
The profile is retrognathic.

DIVISION 2:- the maxillary incisors are lingually inclined,the lateral incisors may be normal or in labioversion.

SKELETAL CLASS 3

Here there is an overgrowth of the mandible with an obtuse angle.

The profile is prognathic.

ACKERMAN-PROFITT SYSTEM OF CLASSIFICATION

Proposed a very comprehensive system of classification which includes malocclusions in three planes of space tended to give an indication towards the severity of malocclusion.
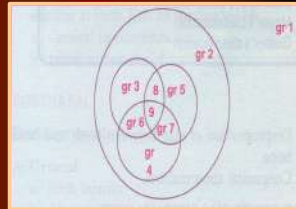
The system based on a set theory,where a set is defined on the basis of morphologic deviations from the ideal.

The classification was illustrated using the VENN SYMBOLIC LOGIC diagram.
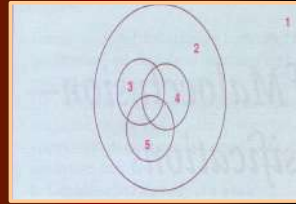
The classification consists 9 groups and 5 characteristics or steps with in.

The steps are:-

 CHARACTERSTIC 1 (ALIGNMENT)

Intraarch alignment and symmetry are assessed as when seen in the occlusal view.

Classified as ideal/crowded/spaced.

 CHARACTERSTIC 2 (PROFILE)

Profile can be convex/straight/concave

it also includes the facial divergence anterior or posterior divergence.

 CHARACTERSTIC 3:- (TRANSVERSE RELATIONSHIPS/TYPE)

Buccal or palatal cross bites are noted

further subclassified as unilateral/bilateral

skeletal/dental cross bites

 CHARACTERSTICS 4:- (CLASS)

here sagittal relationships of the teeth is assessed using the angle's class I/class II/ class III.
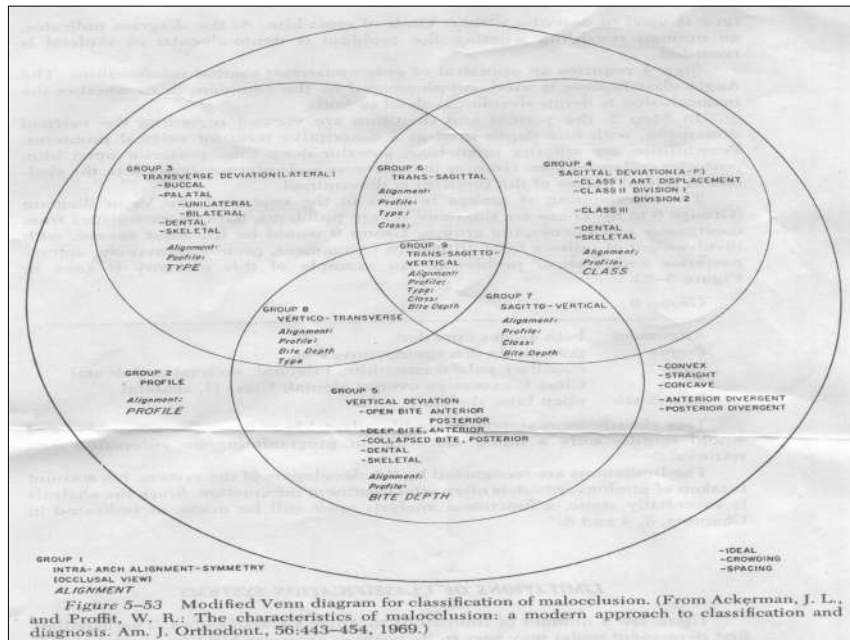Distinction b/w skeletal/dental

 CHARACTERSTICS 5:-(OVERBITE)

here malocclusion are assessed in the vertical plane.
They are described as anterior openbite/posterior openbite/anterior deepbite/posterior collapsed bite.
Skeletal or dental.

Figure 5-53 Modified Venn diagram for classification of malocclusion. (From Ackerman, J. L., and Proffit, W. R.: The characteristics of malocclusion: a modern approach to classification and diagnosis. Am. J. Orthodont., 56:443–454, 1969.)

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GROUP 1:- Repersented as the outer envelop or universe.since the degree of alignment & symmetry are common to all dentitions.

GROUP 2:- the profile is affected by many malocclusions so it becomes a major set with in the universe.

GROUP 3-9:- Deviations in three planes of space are represented by group 3-9 which includes the overlapping or interlocking subsets,all with in the profile.

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Group 9:- would be more severe with involvement of criteria from all groups.

ALIGNMENT : both arches crowed

PROFILE   : posteriorly
              divergent,convex

TYPE   : maxillary palatal crossbite,
              bilateral skeletal & dental

CLASS   : class I,excessive overjet,
              class II dental & skeletal

BITE DEPTH : open bite skeletal

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INDIVIDUAL TOOTH CLASSIFICATIONS
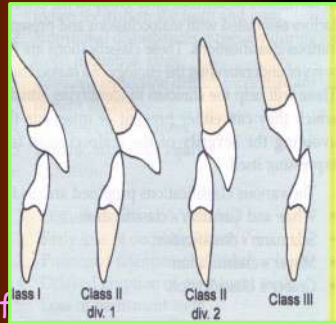
INCISOR CLASSIFICATION

CANINE CLASSIFICATION

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INCISOR CLASSIFICATION

Simple & more relevent than Angle's classification.

Adopted by british standard institute in 1983

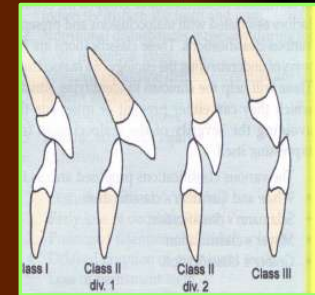based upon the lower incisal edges & the cingulam plateu of the maxillary central incisors.

 CLASS I:- The lower incisor edges occlude with or lie immediately below the cingulam plateu of the max.central incisors.

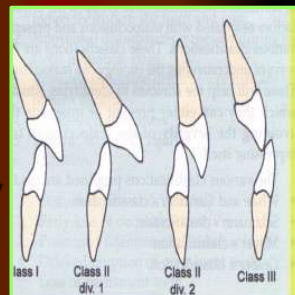 CLASS 2:- The lower incisor edges lie posterior to thecingulam plateu of the max.central incisors.
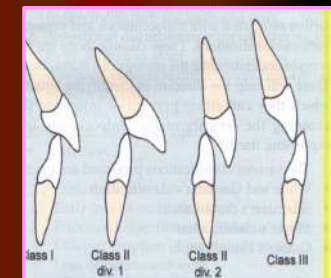   DIV 1
   DIV 2

 DIVISION 1:- The maxillary CI are proclaimed or of average inclination & there is increase over jet.

 DIVISION 2:- The maxillary CI are retroclained, the overbite is normally minimum but may be increased.

 CLASS 3:- The man. incisor edge lie anterior to the cingulam plateu of the upper CI the over jet is reduced or reversed

CANINE CLASSIFICATION

CLASS I :- mesial incline of the upper canine
overlaps the distal slope of the lower canine.

CLASS II:- Distal slope of the max.canine occludes
or contact the mesial slope of the lower canine.

CLASS III:- The lower canine is displaced anterior
to the upper canine with no overlapping of the
upper & lower canine.

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