بسم الله الرحمن الرحيم
وما أوتيتم من العلم إلا قليلاً
Classification of Malocclusion

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**Introduction**

- Orthodontics can be traced to the old Greek and Etruscan materials.

- During the 18\(^{th}\) and 19\(^{th}\) centuries, there were few attempts to develop orthodontic appliances.

- In US, Norman Kingsley (1850):
  - First to develop extraoral appliances
  - Pioneer in the treatment of Cleft patients
  - Main emphasis was on aligning teeth and correction of facial proportions
  - Extraction of teeth was frequent
  - Little attention was paid to dental occlusion
The changing goals of Orthodontic Treatment
Edward Hartley Angle

- American dentist
- Born June 1, 1855, Herrick, Bradford County, Pennsylvania
- Died August 11, 1930, Pasadena
- Originally was a prosthodontic
Angle Concept

- In order to know the abnormal, we should know the normal.
- Angle was the pioneer in orthodontics who first classified occlusion (1890).
- His main interest was in prosthodontic.
- He was specifically interested in dental occlusion and how to transfer and apply prosthetic occlusion into natural dentition.
Angle established the concept of normal occlusion.

Angle postulate was that the upper first molars were the key to occlusion and that the U/L 6s should be related so that the mesiobuccal cups of the upper molar occlude in the buccal groove of the lower molar. If the teeth were arranged on a smoothly curving line of occlusion and this molar relationship existed then normal occlusion would result. This requires the presence of full complement of teeth.

So malocclusion was then defined as any deviation from the normal occlusion described by Angle.
Normal occlusion
Angle Classification

Based on this concept, Angle described four Classes of occlusion, normal occlusion and three (3) classes of malocclusion (the occlusal relationship of the dental arches) based on the first molars relation.
• **Class I occlusion**: Mesobuccal cups of the upper first molar occlude on the buccal groove of the lower first molar with normal line of occlusion.

• **Class I malocclusion**: Normal relationship of the molars but line of occlusion is incorrect.

• **Class II malocclusion**: Lower molar distally positioned relative to the upper molar, line of occlusion not specified.

• **Class III malocclusion**: Lower molar mesially positioned relative to the upper molar, line of occlusion not specified.
Angle Classification

Class II, division 1 malocclusion

- Molars are Class II.
- Overjet and overbite are both increased.
- Crowding, spacing, or malposed teeth may or may not be present.
Angle Classification

Class II, division 2 malocclusion

- Molars are Class II.
- Maxillary central incisors are retrusive, and exhibit a deep bite in relation to lowers.
- Maxillary lateral incisors are flared labially.
Angle Classification

Class II, subdivision left malocclusion

- Same individual, but molar relation is Class I on the right and Class II on the left.
Class II division 1
100% deep impinging bite
Increased overjet
Class II division 1, Subdivision left
Deep bite 75%
Weaknesses of Angle’s Classification
1- Did not address facial and skeletal problems

2- Malocclusion includes different other characteristics, which were not addressed in Angle’s Classification, such as vertical and transverse problems

3- Should not be used in the Mixed/primary dentition (Terminal plane relationships)
Terminal plane relationship should be used in the primary and mixed dentition.
Inter-Arch Relationships

- Over jet
- Over bite
- Deep bite
- Open bite
- Cross bite
- Midline
- Molar relationships
- Canine relationships
Overbite

- Vertical relationships of upper and lower incisal edges, when they are overlapping
- Measured in percentage of how much of the upper incisors cover the lower incisors
- Normal is 10-20%
Deep bite

Deep impinging bite
INCISOR INTRUSION
DEEP OVERBITE

PRETREATMENT
DEEP OVERBITE

EFFECTS OF
INTRUSION ARCH WIRES
Open bite

- Vertical relationship of upper and lower incisors when they are apart
- Measured in millimeters
Overjet

- The anteroposterior relationship of incisal edges of upper and lower incisors
- Measured in millimeters from the palatal of the upper incisors to the buccal of lower incisors
- Normal is 1-2 mm
Anterior crossbite

- **Crossbite**: A crossbite occurs when any or all of the upper teeth fit into the lingual side of the lower teeth.
Crossbite
Posterior transverse relationship

Normal Relationship

Cross bite Relationship Palatal
Posterior transverse relationship

Buccal crossbite
Scissor Bite
Scissors-bite

- Situation in which several adjacent posterior teeth overlap vertically in habitual occlusion with their antagonists, without contact of their occlusal surfaces. The deviation of the affected teeth from their ideal position could occur either in a buccal or a lingual direction.
Telescoping bite

- A term denoting either a complete mandibular lingual, or a complete maxillary buccal crossbite. The opposite (i.e. a complete maxillary palatal or a complete mandibular buccal crossbite) sometimes is called a reverse telescoping bite.
Dental Midline Relationships

- Upper midline is measured relative to upper filtrum
- Lower midline is measured relative to the upper midline
Example

- Upper midline is centered (Relative to ?)
- Lower is deviated to the ? of the upper
Canine Relationships

- **Class I** canine relationship: Upper canine occlude between lower canine and first premolar
- **Class II**: Lower canine occlude distal to the normal relationship
- **Class III**: Lower canine occlude mesial to the normal relationship
Intra-arch problems

- Crowding
- Spacing
- Rotation
- Arch form problems
- Lingually positioned
- Buccally positioned
- Impacted
- Delayed eruption
- Over eruption
Intra-arch problems
As the time passed, it became clear that Angle classification was unsatisfactory or inadequate because the objectives of treatment have become different.

After the introduction of cephalometry until now, skeletal, esthetics and facial appearance were given more attention and not only dental relationship.

So in addition to dental relationship, jaw and profile relationships were addressed as **Class I, II, and III skeletal and profile relationships**.

Goals of treatment have also changed
GROWTH MODIFICATION
CLASS II (EARLY TREATMENT)

PRE-TREATMENT
CEPHALOMETRIC
RADIOGRAPH

CRANIAL BASE
SUPERIMPOSITION
END OF PHASE I RX
### Cepalometric Analysis

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
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<tbody>
<tr>
<td>Npg/FH</td>
<td>87.5</td>
</tr>
<tr>
<td>NPG/SN</td>
<td>70 (80)</td>
</tr>
<tr>
<td>SNA</td>
<td>70 (80)</td>
</tr>
<tr>
<td>SNB</td>
<td>70 (80)</td>
</tr>
<tr>
<td>ANB</td>
<td>0</td>
</tr>
<tr>
<td>NA/APG</td>
<td>0</td>
</tr>
<tr>
<td>M.P/FH</td>
<td>29</td>
</tr>
<tr>
<td>M.P/SN</td>
<td>52 (42)</td>
</tr>
<tr>
<td>U.T to SN</td>
<td>86 (96)</td>
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<tr>
<td>U.T to NA</td>
<td>16.5</td>
</tr>
<tr>
<td>U.T to NA (mm)</td>
<td>4</td>
</tr>
<tr>
<td>U.T to L.T</td>
<td>144</td>
</tr>
<tr>
<td>L.T to M.P</td>
<td>76</td>
</tr>
<tr>
<td>L.T to NB</td>
<td>19</td>
</tr>
<tr>
<td>L.T to NB (mm)</td>
<td>1</td>
</tr>
<tr>
<td>Lower Face (%)</td>
<td>59</td>
</tr>
<tr>
<td>WIT</td>
<td>-5</td>
</tr>
</tbody>
</table>
Class I
Molar and jaw relationship

Class II
Molar and jaw relationship

Class III
Molar and jaw relationship

Growth pattern

Dental malocclusion (crowding, etc.)

Skeletal and/or dental malocclusion

Skeletal and/or dental malocclusion
Due to the weaknesses of Angle’s Classification and to fulfill the new objectives of orthodontic treatment, new classifications came into surface and have been used successfully to describe occlusal, skeletal and facial relationships in three dimensions.
Ackerman- Profit Classification (1960) (Five Characteristics Classification)

- It incorporated all malocclusions in the three dimensions and their interrelationships.

- It also incorporated the dental, skeletal and facial profile descriptions and their interrelationships.
Ackerman- Profit Classification (1960) (Five Characteristics Classification)
Two additional things add more significance to this classification:

1. Esthetic line of the dentition: it characterizes the appearance of dentition, labial and buccal aspect of the teeth, it incorporates tooth-lip relationships.

2. Rotation of the three planes of space.
<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dentofacial Appearance</strong></td>
<td>Frontal and oblique facial proportions, anterior tooth display, orientation of the esthetic line of occlusion, profile</td>
</tr>
<tr>
<td><strong>Alignment</strong></td>
<td>Crowding/spacing, arch form, symmetry, orientation of the functional line of occlusion</td>
</tr>
<tr>
<td><strong>Anteroposterior</strong></td>
<td>Angle classification, skeletal and dental</td>
</tr>
<tr>
<td><strong>Transverse</strong></td>
<td>Crossbites, skeletal and dental</td>
</tr>
<tr>
<td><strong>Vertical</strong></td>
<td>Bite depth, skeletal and dental</td>
</tr>
</tbody>
</table>
Classification by the characteristics of Malocclusion

1- Facial proportion and Esthetics
2- Alignment and asymmetry within the arches
3- Transverse relationships
4- Anteroposterior Relationships
5- Vertical relationships
6- Imaginary Plane: Growth
Conclusion

The idea is to provide a convenient way of organizing the diagnostic information and not to overlook important points of relevance.