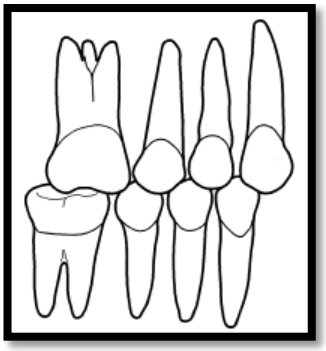
Treatment of class II malocclusion

According to the incisors' inclination, class II can be divided to two types:

A. ***Class II div.1 (cl II1)***
B. ***Class II div.2 (cl II2)***

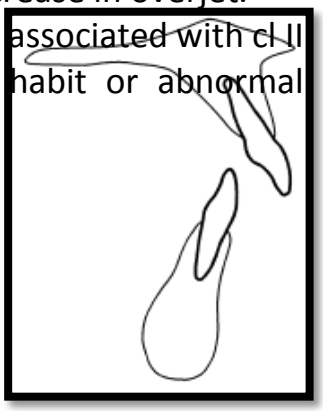
Class II: it can be defined according to the angles' classification that the mesiobuccal cusp of the upper permanent 1st molar pass 1/2 or complete cusp width to the buccal developmental groove of the corresponding lower molars, there will be increase in the (OB and OJ). On the other hand, the upper canine is either 1/2 or complete cusp width mesial to the lower canine (in the mesial slope of the lower canine).



However, patient with class II sometimes is seems to have the molar classification class I but there is a proclination of anterior teeth (increase OJ) or we can see the canine classification is class I and the molar classification class II. The incidence about 15-20% for caucasians, the cl II occlusal relationship mostly provides the major load of orthodontic appliance treatment in many communities.

Class II Division 1, according to British Standards incisor classification, the lower incisors' edges lie posterior to the cingulum plateau of the upper incisors. The upper central incisors are proclined or of average inclination and there is an increase in overjet.

Etiologically, sometimes a skeletal cl I or cl III can be associated with cl II dental pattern especially in the presence of bad habit or abnormal breathing.



Etiological factors of class II div1

a. Skeletal factor. (mostly cl II)
b. Soft tissue factor. (unfavourable)
c. Dental factor.

- The skeletal relatioship responsible for the degree of antero-posterior discrepancy.
- The vertical relationship of cl II malocclusion can be present with vertical problems either increased or decreased lower facial height and this should be dealt by a specialist.

- In association with skeletal relationship the muscles of the lips and the tongue govern the inclination and degree of vertical development of the incisors, and thus govern the incisal OB and OJ.

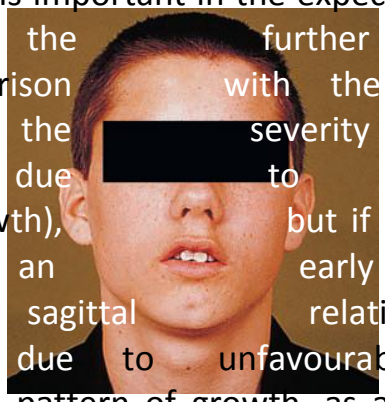
Treatment objectives:

- Relief of crowding and local irregularities.
- Reduction of incisal overbite.
- Reduction of incisal overjet.
- Correction of buccal segment relation.

Treatment of cl II div1:

There are many factors that must be considered during treatment:

A.Age of the patient. *B. Severity of the case.*
C. Patient cooperation *D. Facial profile.*



The early treatment is important in the expected growth whether it is favourable or not, the further forward growth in the mandible in comparison with the maxilla has an advantage in reducing the severity of class II in a condition that it is mainly due to antero-posterior discrepancy (forward growth), but if it is associated with vertical discrepancy at an early years (backward growth), the expected sagittal relation will be worse with further growth due to unfavourable growth rotation of the mandible. Also this pattern of growth, as a result, will lead to incompetent lips and this again will worse the problem, as the latter is very important for good prognosis of treated class II div1.

Types of treatment:

1) young growing patient: by growth modification using functional appliances like horizontal or vertical activators or frankle appliances. By attempting restraint of maxillary growth, encouraging mandibular growth or by a combination of both. However, fixed appliances can be used later to achieve alignment and to detail the occlusion.

2)) Adult patient: either by removable or fixed orthodontic *(Orthodontic camouflage)* appliances depending on the degree of (crowding; skeletal discrepancy; incisal inclination; patient cooperation).

3))) Orthognathic surgery: in adult patient with sever Class II skeletal pattern, particularly where the lower facial height is significantly increased or reduced, a combination of orthodontic and surgical correction may be required to produce an aesthetic and stable correction of the malocclusion.

Treatment by means of removable appliances:

When the features of class II div1 malocclusion are based on a skeletal class I or class II in its mild degree provided that the canine is .....angulated; a removable orthodontic appliance can be used.

The extraction can be done in the upper but not in the lower arch and it need a cooperative patient. However, the amount of crowding or spacing in the arches; buccal segment relation; facial profile are very important considerations when planning for dental extraction. In cl II1, always correct the OB before the OJ.

Stage 1: *(canine retraction, 5-6 months duration)*

Creation of space of space by extraction of both upper 1st premolars.

Design of the upper applianse:

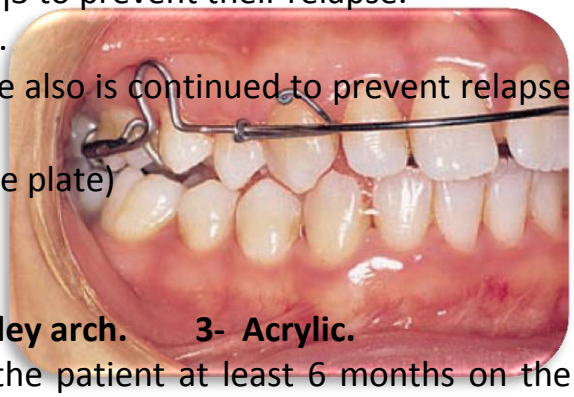
- Simple or guarded finger spring on the upper canine 3|3 for its distal movement provided that the tooth is within the dental arch; otherwise a buccal canine retractor can be indicated.
- Double adam clasp on 65|56 for the retention of appliance and.....
- Fitted labial arch on the upper incisors.
- Acrylic base plate to collect the springs and clasps.
- Anterior bite plane to reduce the deep overbite either flat or inclined depending on the axial relation of the lower incisors to the mandibular plane, if their long axis is perpendicular on the mandibular plane, a flat bite plane will be indicated; otherwise the inclined one will be the best choice.

At the end of this stage the canine will be retracted and the deep OB also will be corrected.

Stage 2: *(Incisors retraction, 4 months duration)*

- Robert retractor is used to retract the upper 4 incisors, the activation done by closing the active coil about 2mm for each 3 weeks interval aimed to reduce the overjet. At each activation visit, trimming of palatal acrylic just behind the upper incisors is required.

- Stoppers mesial to canines 3|3 to prevent their relapse.
- Double adam clasp on 65|56.
- The use of anterior bite plate also is continued to prevent relapse of the deepbite.
- Major connector (acrylic base plate)



Stage 3: (retention of teeth)

1- Adam clasp on 6|6. 2- Hawley arch. 3- Acrylic.

The retainer sould be weared by the patient at least 6 months on the basis of full-time (day and night) wearing at the initial 3 months followed by part-time (at night) wearing for the last 3 months.

Treatment with fixed appliance

The fixed orthodontic appliances are indicated in the following situations:

a. Bodily not tipping tooth movement (canine is vertical or distally angulated).
b. Upper incisors are not proclined.
c. Presence of rotation more than 90°.
d. Moderate or sever class II.
e. Residual space after OJ correction.
f. Increased OB in adults.
g. Vertical and/or transverse discrepancies associated with class II.

Treatment of such cases required more skill and well trained orthodontist.

Surgical correction:

Surgery is indicated in adult patient for impact the maxilla, when the growth is seased especially in presence of vertical maxillary excess. It is mainly indicated in cases of gummy smiles adult patients associated with increased vertical skeletal proportions or with short upper lip.

Prognosis

To aid stability, full reduction of the overjet and the achievement of lip competence are advisable.