

ORTHODONTICS

WHAT IS ORTHODONTICS?

Orthodontics has been defined as that branch of dental science concerned with the genetic variation, development and growth of facial form. It is also concerned with the manner in which these factors affect the occlusion of the teeth and the function of the associated organs.

Thus, whilst orthodontic techniques are concerned with the treatment of irregularities of the teeth, the study of orthodontics, as a whole, includes the growth, development and function of the total oro-facial complex.



Occlusion:

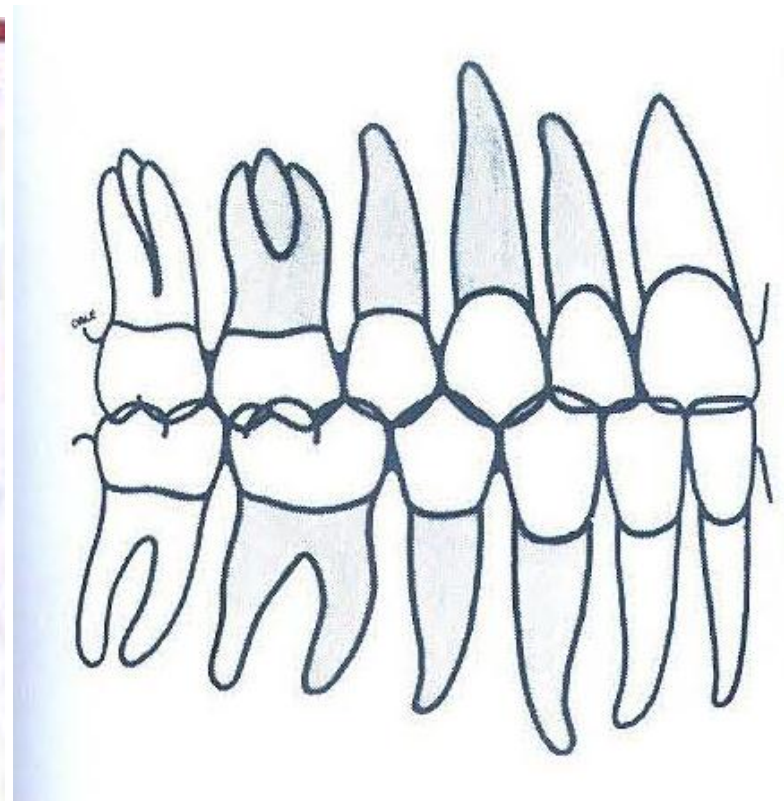
- Is the way the maxillary & mandibular teeth articulate.
- Is defined as "every contact of teeth of the maxilla with those of the mandible"

Types

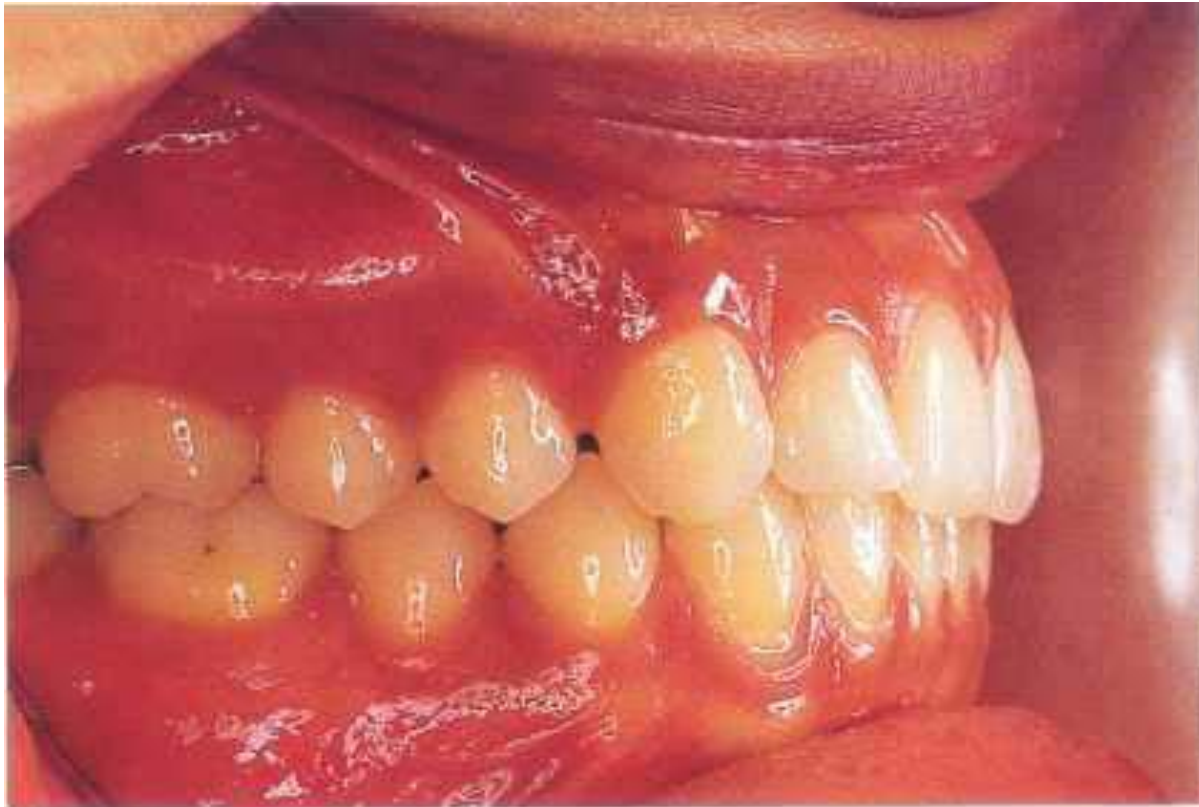
- Ideal occlusion -
- Normal occlusion
- Malocclusion



-Ideal occlusion is a hypothetical concept based on the anatomy of the teeth. It is rarely, if ever, found in nature. However, it provides a standard by which all other occlusions may be judged.



-Normal occlusion is commonly described as 'An occlusion within the accepted deviation of the ideal'. This vague definition means that there are no clear limits to the range of normal occlusion. However, in general, minor variations in the alignment of the teeth which are not of aesthetic or functional importance might be considered as being consistent with a normal occlusion.



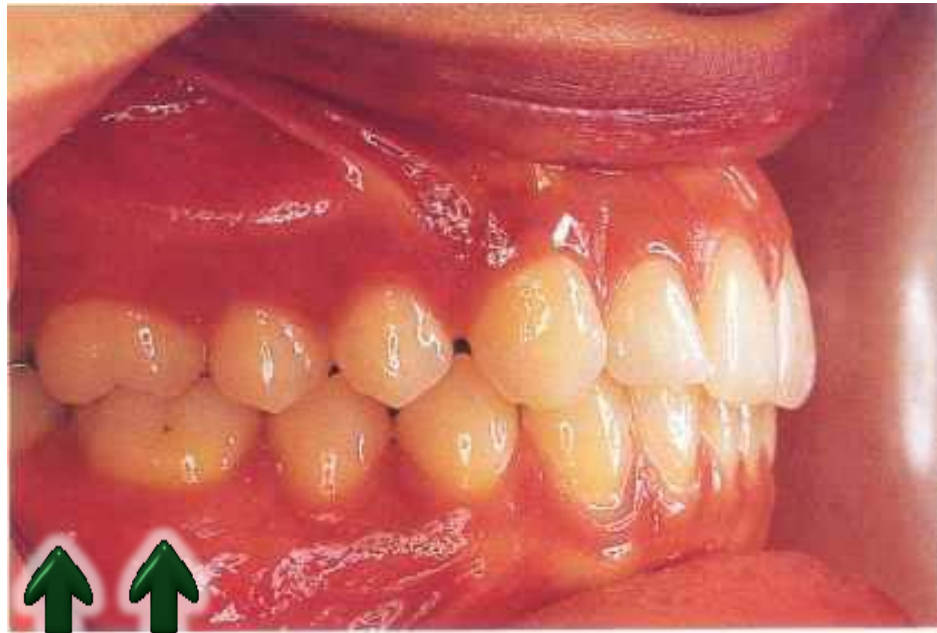
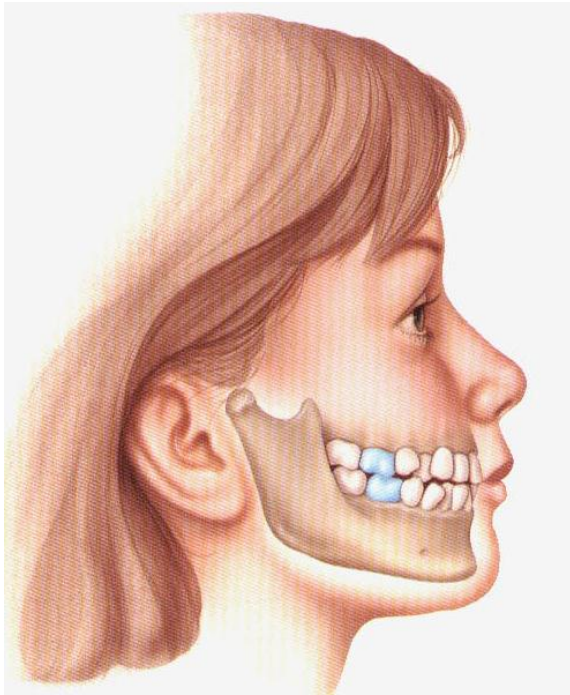
-Malocclusion is an irregularity in the occlusion beyond the accepted range of normal.

The fact that an individual has a malocclusion is not in itself a justification for treatment. Only if it is possible to say with certainty that the patient will benefit aesthetically or functionally, and only if they are suitable and willing to undergo treatment should orthodontic intervention be considered.

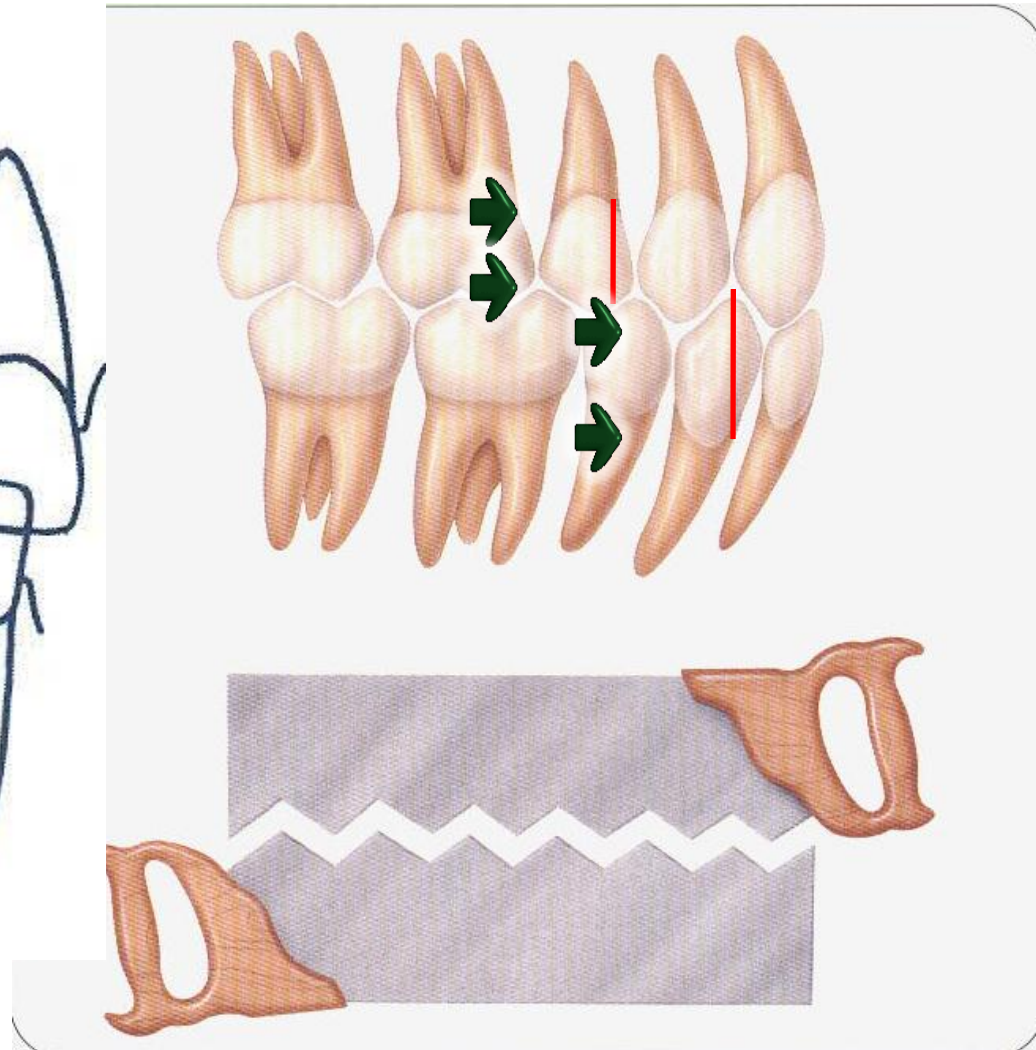
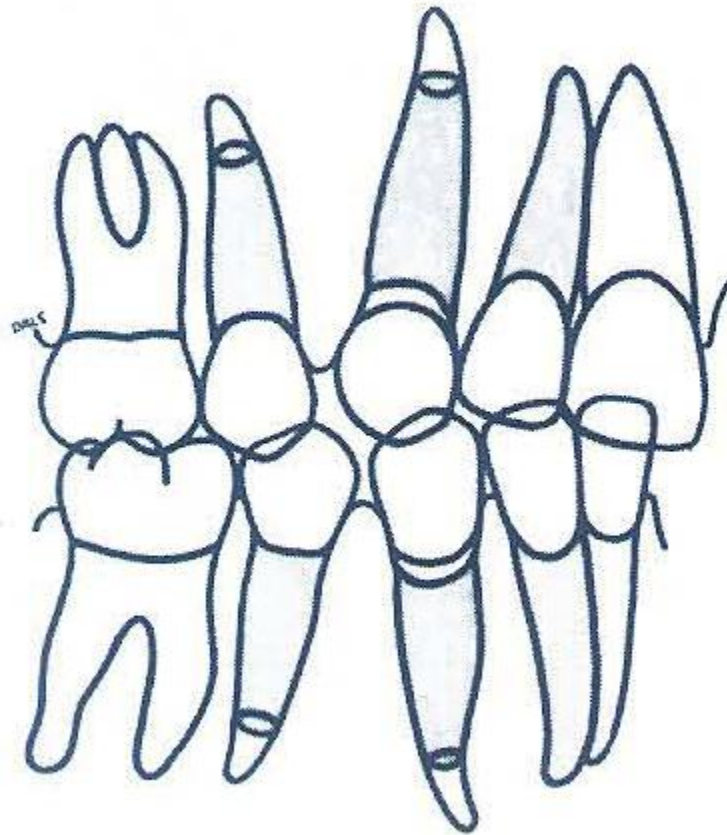


Normal permanent occlusion (Six Keys of Occlusion)

1. Molar relationship ; Distal surface of the disto-buccal cusp of 6 contacts and occludes with the mesial surface of the mesiobuccal cusp of lower 2nd molar.
The mesiobuccal cusp of 6 lies in the groove between the mesial and middle cusps of lower 1st molar.
The mesiolingual cusp of 6 seats in the central fossa of lower 1st molar.



2. Crown angulation; Gingival aspect of the long axis of each crown lies distal to its incisal or occlusal portion. The degree of mesial tip depends of the type of the tooth.

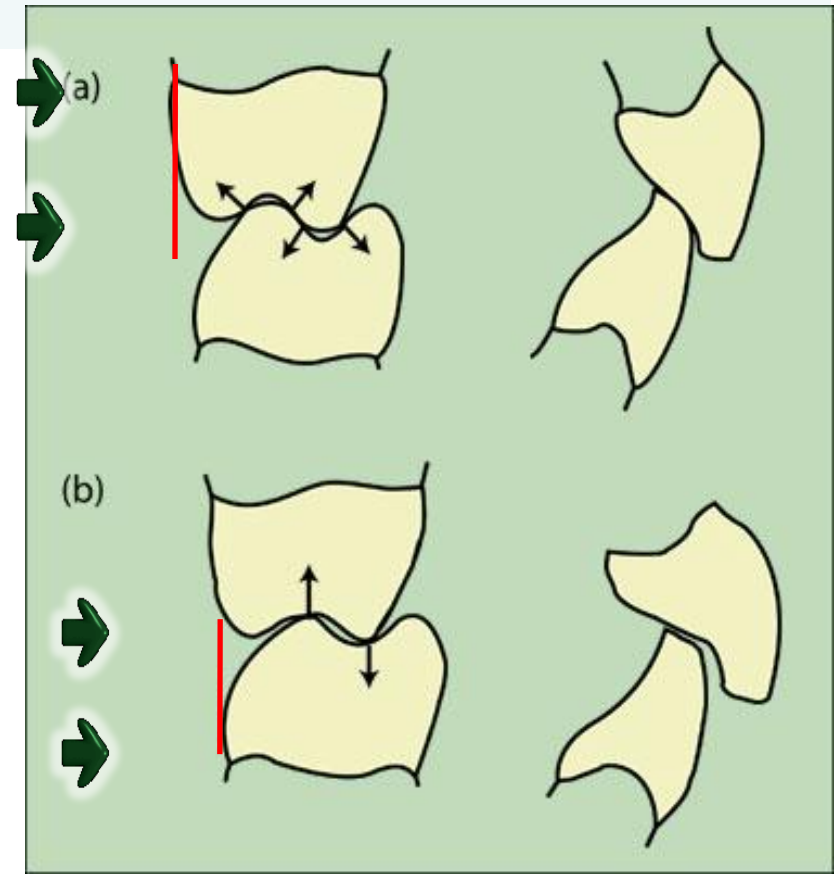
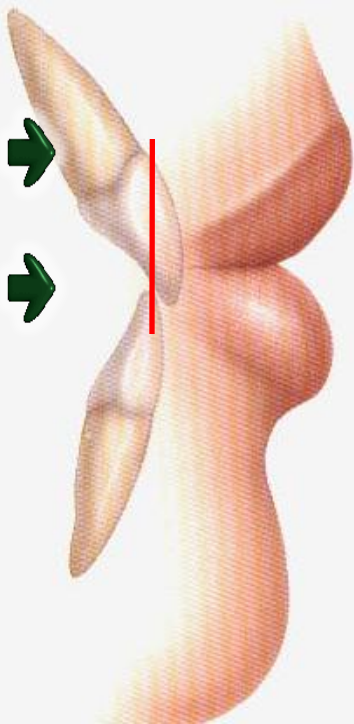


3. Crown inclination (labio-lingual or bucco-lingual);

The gingival aspect of the labial surface of the crown of incisors lies palatal to the incisal aspect.

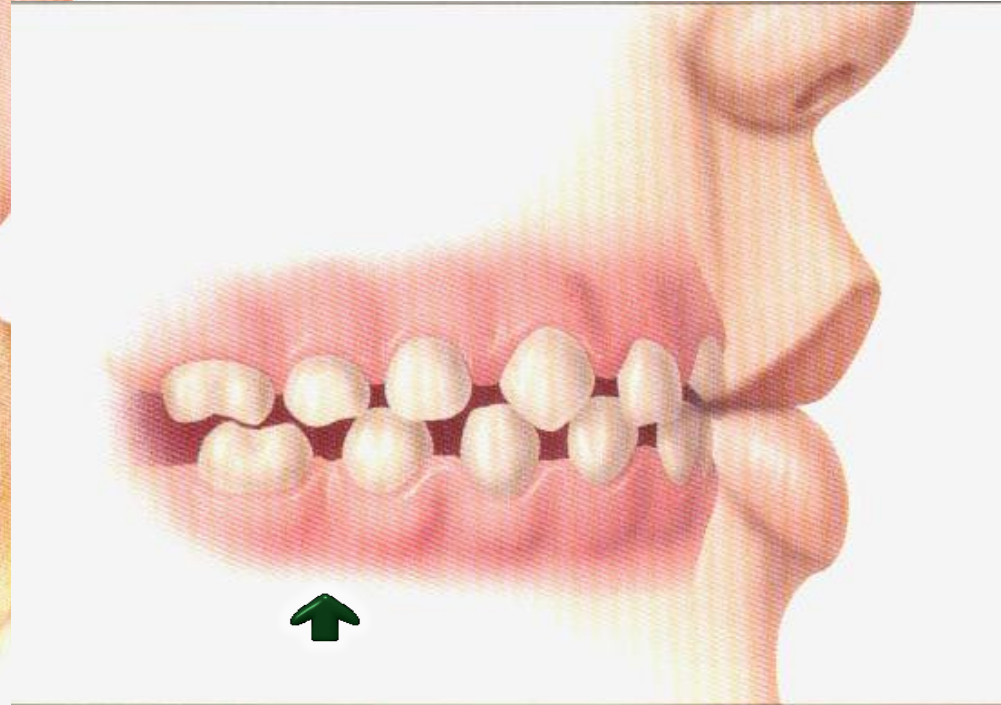
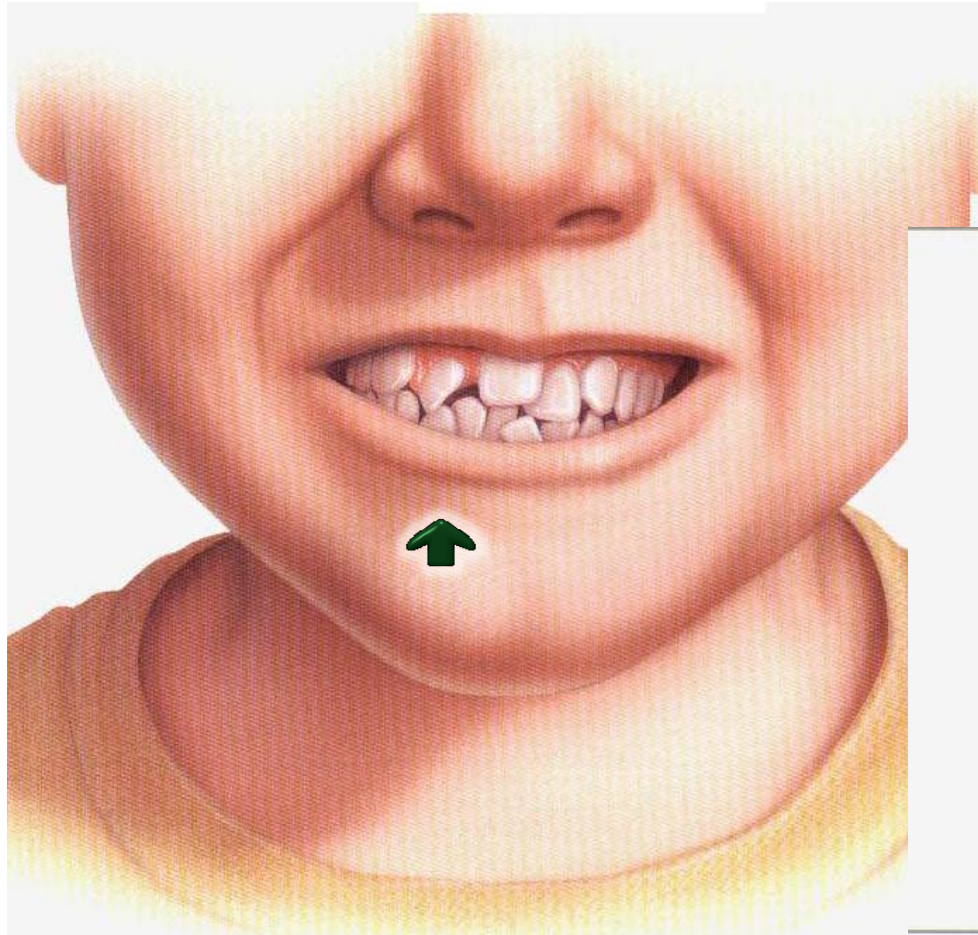
-The gingival aspect of the labial or buccal surface of the crowns of upper posterior teeth lies labial or buccal to the incisal occlusal aspect (molar teeth inclined slightly more than premolars).

The lower posterior teeth inclined lingually progressively more from canine to molar.

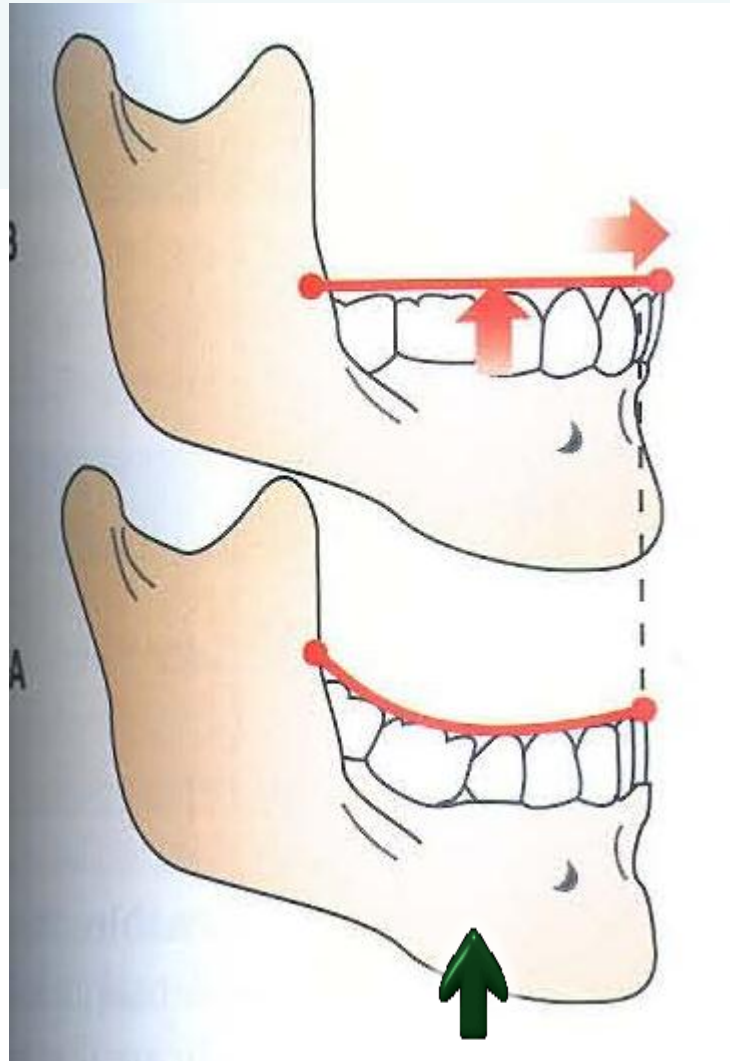


4. No rotations.

5. No spaces between the teeth.



6. Occlusal plane; Flat or slightly increased (<_1.5mm) curve of Spee.



The scope and aims of orthodontic treatment

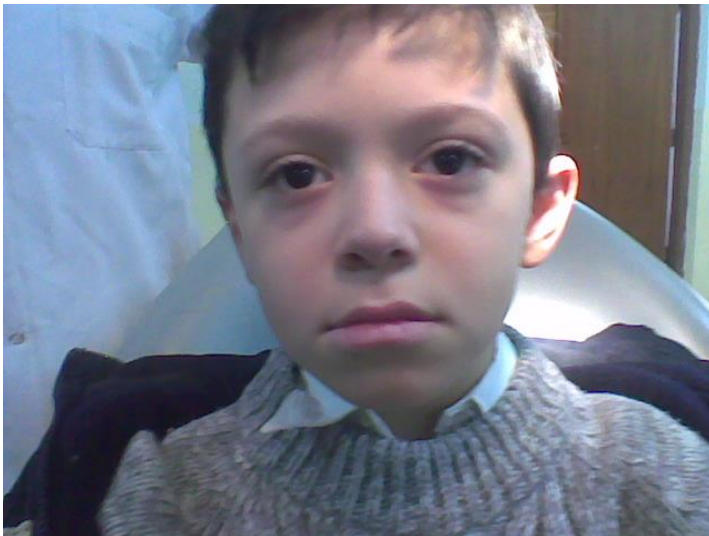
These might be best summarized as follows:

- 1. The improvement of facial and dental aesthetics.**
- 2. The alignment of the teeth to eliminate stagnation areas.**
- 3. The elimination of premature contacts which give rise to mandibular displacements and may contribute to later muscle or joint pain.**
- 4. The elimination of traumatic irregularities of the teeth .**
- 5. The alignment of prominent teeth which are liable to be damaged.**
- 6. The alignment of irregular teeth prior to bridgework, crowns or partial dentures.**
- 7. The alignment of periodontally involved teeth prior to splinting.**
- 8. The alignment and planned positioning of teeth in the jaws prior to orthognathic surgery.**
- 9. To assist the eruption and alignment of displaced teeth.**

The timing of orthodontic treatment

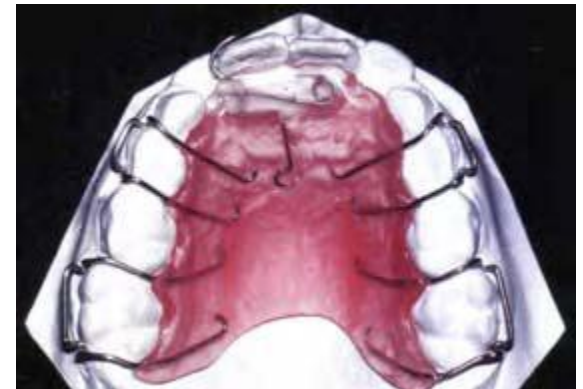
The deciduous dentition

Treatment at this stage is hardly ever indicated. Examples of possible exceptions when there is a malposed tooth give rise to marked mandibular displacement, or where a supernumerary tooth is creating a localized problem. However, it is important to identify and make an early referral for those patients where significant jaw discrepancy or facial asymmetry are apparent during these early stages of growth.



The early mixed dentition

The planned extraction of extensively carious first permanent molars, balancing extractions of deciduous teeth, and serial extractions may be undertaken during this stage . Space maintainers may be fitted and simple orthodontic treatment to correct an instanding incisor or alternatively to eliminate a mandibular displacement may be indicated . Only treatment which can be completed rapidly and which will be stable should be attempted. Prolonged appliance wear at this stage is to be avoided and is unlikely, in any event, to be longer than between three and six months. The types of treatment that are employed in the early mixed dentition are intended to either eliminate or, at a minimum, reduce the severity of a developing malocclusion. A term often applied to this type of occlusal management is 'interceptive orthodontics'. It is at this time that such measures are most often employed .



The late mixed and early permanent dentition

At this stage, the greater part of orthodontic treatment is carried out. Most of the permanent teeth have erupted and there is little further growth in arch width, thus crowding can be reliably estimated. In the majority of children the jaw relationship changes only to a limited extent after the age of ten years and so it is possible to plan and carry out orthodontic treatment with the confidence that major growth changes are not likely to affect the treatment adversely. It is at this stage that most definitive active treatment to correct malocclusion will be performed, and it has been suggested that children in this age group are often more willing to wear appliances than are older adolescents and adults.



The late permanent dentition

It is important to recognize that orthodontic treatment may be undertaken at almost any age. However, treatment planning and mechanics will usually require modification from that which is appropriate in the growing child . Whatever the age of the patient, when treatment is being considered, a careful assessment of need, taking into account the balance of benefit and cost



Angles classification

Class I (neuro-occlusion) The mesiobuccal cusp of 6 lies in the groove between the mesial and middle cusps of lower 1st molar.

Class II Malocclusion (Disto-occlusion): Malocclusion in which the buccal groove of the mandibular first permanent molar occlude posterior (distal) to the mesiobuccal cusp of the maxillary first permanent molar.

Class III Malocclusion (mesio-occlusion): a malocclusion in which the mesiobuccal cusp of upper first molar occlude distal to buccal groove of lower first molar.

CL II malocclusion can be divided into:

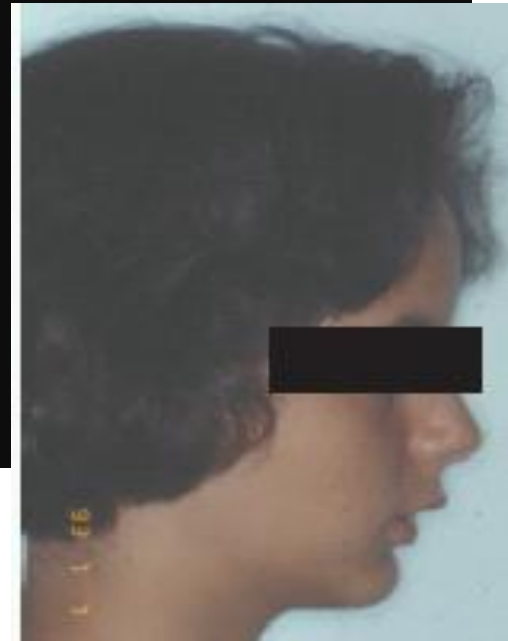
1- Dental CL-II malocclusions.

2- Skeletal CL-II malocclusions.



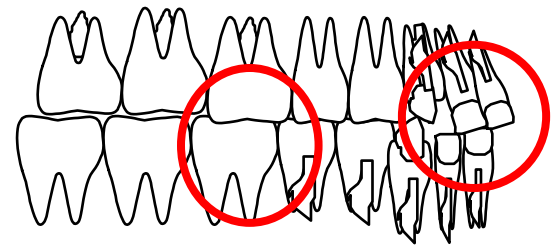
Skeletal CL-II Malocclusion: can be subdivided;

- 1- CL II malocclusions; caused by mandibular deficiency, the mandible is retrognathic and maxilla orthognathic.
- 2- CL II malocclusions; caused by maxillary excess, the maxilla is prognathic and the mandible orthognathic.
- 3- CL II malocclusion; caused by combination of mandibular deficiency and maxillary excess.

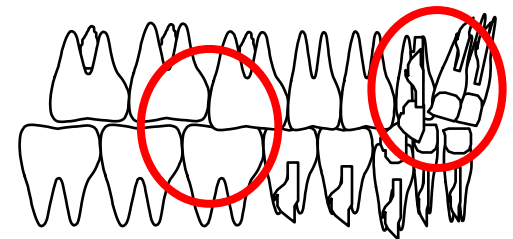


“Divisions” are used in class II malocclusion based on the inclination of the maxillary incisors:

Division 1 A class II malocclusion with proclined maxillary incisors, resulting in an increased overjet .



Division 2 A class II malocclusion typically with the maxillary central incisors tipped palatally .



Three types of class II division 2

Type A: The four maxillary permanent incisors are tipped palatally, without the occurrence of crowding. •

Type B: The maxillary central incisors are tipped palatally and the maxillary laterals are tipped labially. •

Type C: The four maxillary permanent incisors are tipped palatally with the canines labially positioned. •



Fig. 53 Typical Class II Division 2 malocclusion.

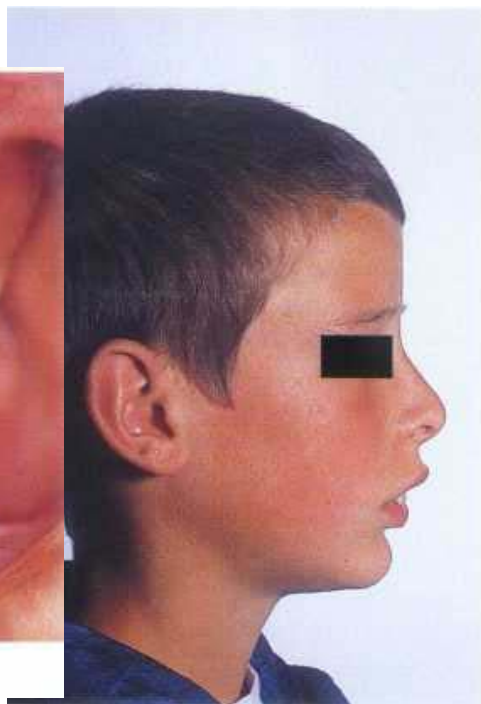


Fig. 51c Associated Class II Division 1 malocclusion; trauma to 1.

Class III malocclusion

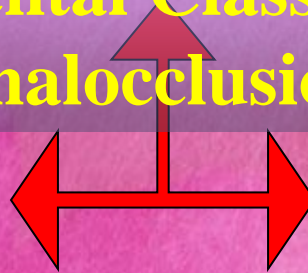
True Class III
malocclusion



Pseudo Class III
malocclusion

Dental Class III
malocclusion

Skeletal Class III
malocclusion

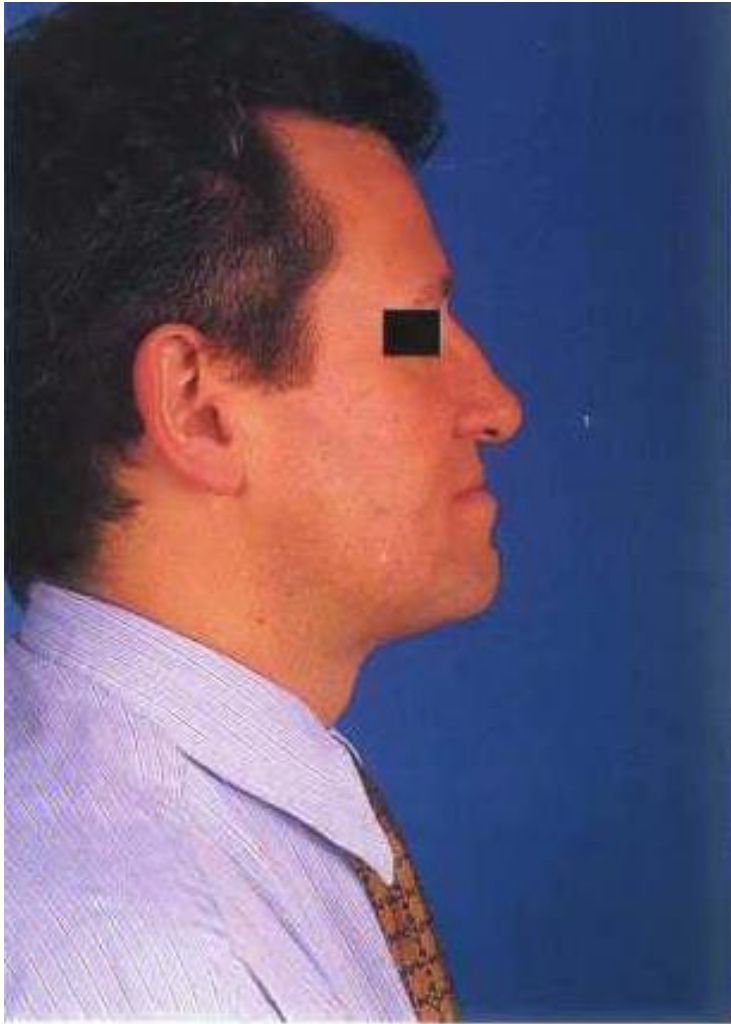


Dental Class III
malocclusion

Maxillary retrognathism

Mandibular prognathism

Combination of both



Overbite is defined as vertical overlap of the incisors. Normally, the lower incisal edges contact the lingual surface of the upper incisors at or above the cingulum (i.e., normally there is 1 to 2mm overbite). In open bite, there is no vertical overlap, and the vertical separation of the incisors is measured to quantify its severity.

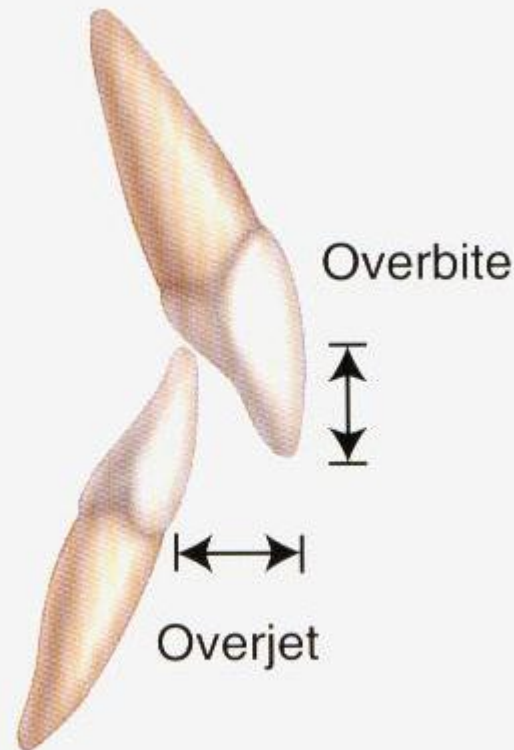
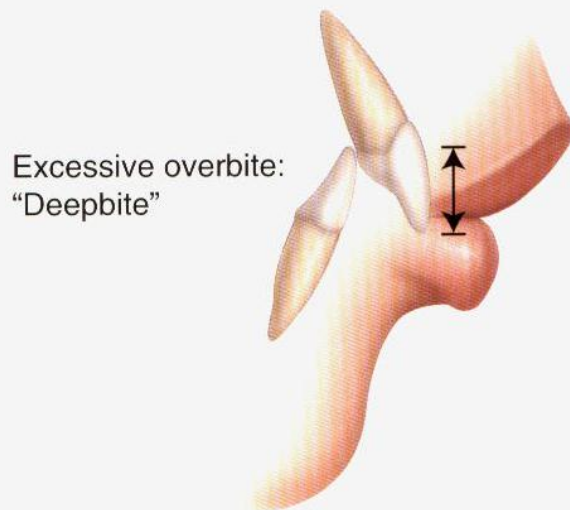
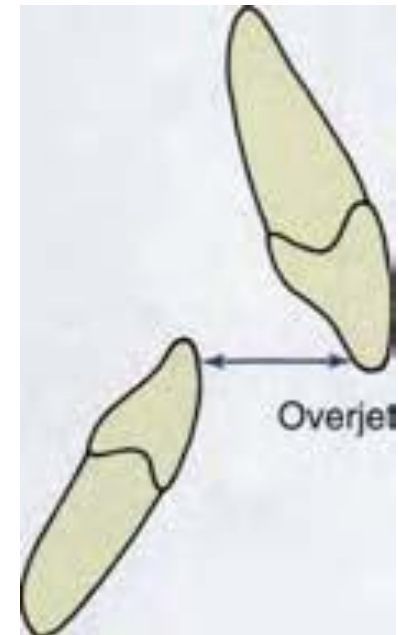
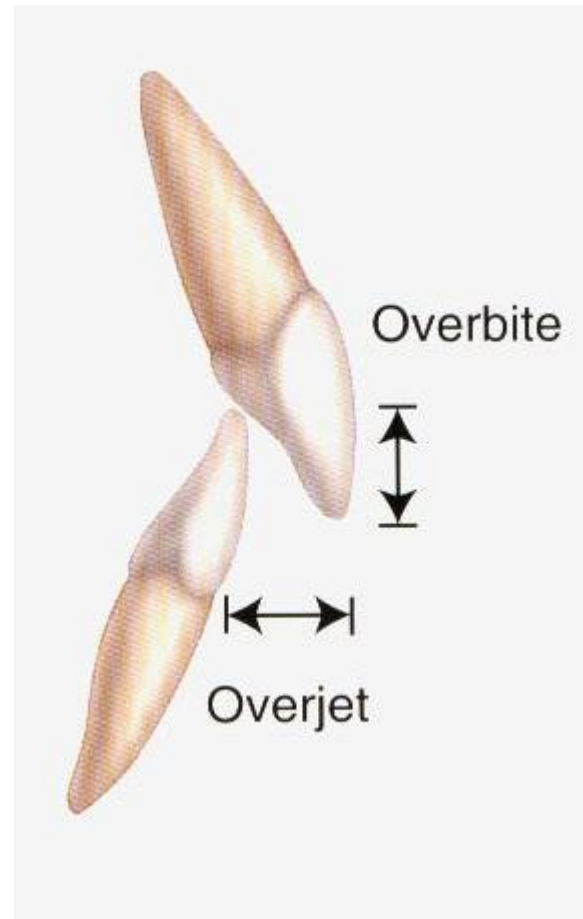
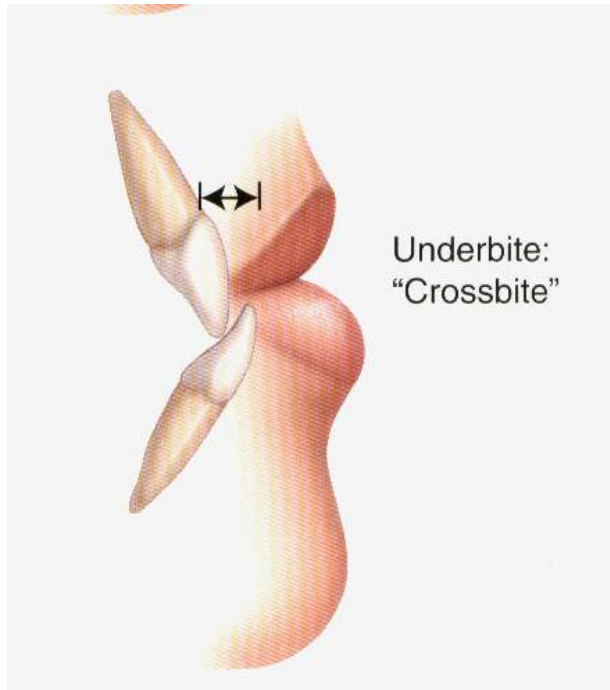
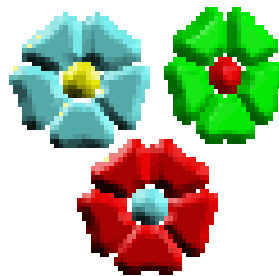


Fig. 69 Anterior open bite due to increased FMIPA.

Overjet is defined as horizontal overlap of the incisors. Normally, the incisors are in contact, with the upper incisors ahead of the lower by only the thickness of their incisal edges (i.e., 2-3 mm overjet is the normal relationship). If the lower incisors are in front of the upper incisors, the condition is called reverse overjet or anterior crossbite.

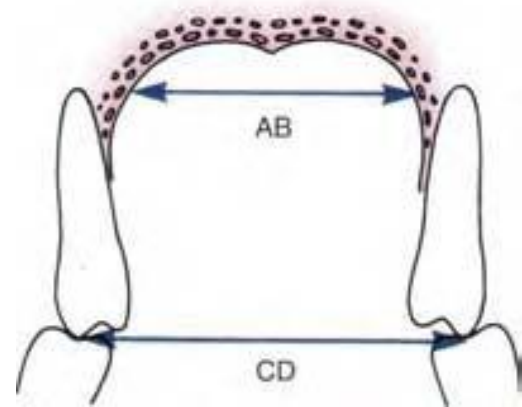
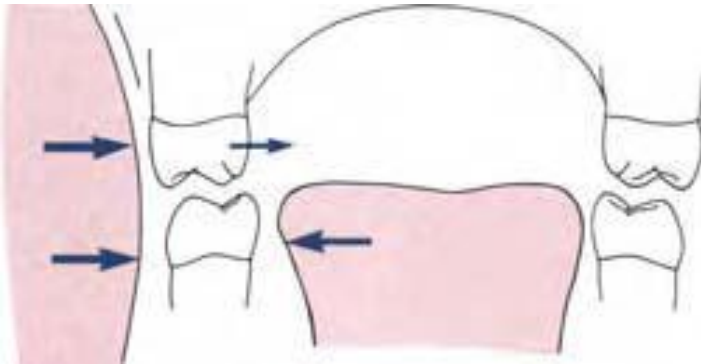


CROSS-BITE



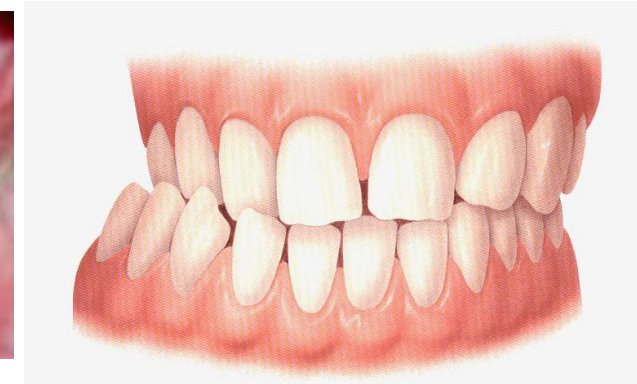
What is the cross-bite?

An abnormal relationship of a tooth or teeth to the opposing teeth, in which normal bucco-lingual or labio-lingual relationships are reversed.

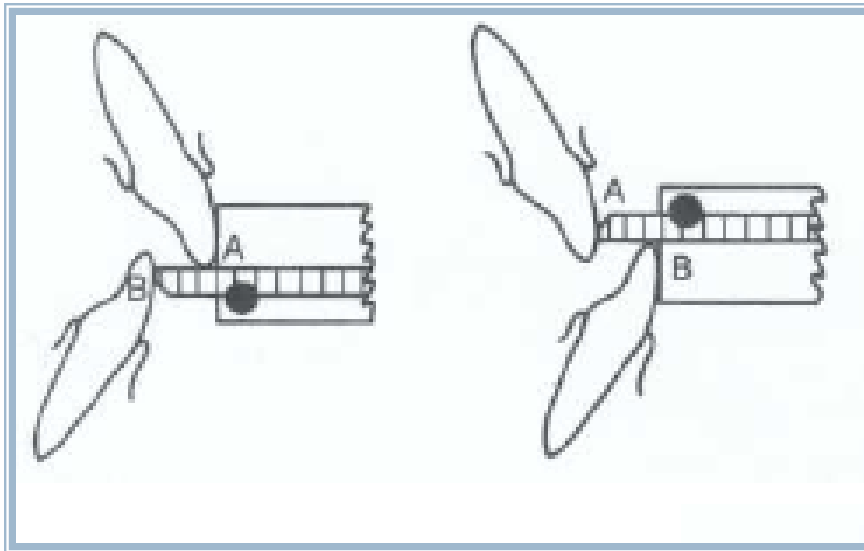


Classification

- Anterior or posterior.
- Single tooth or groups of teeth.
- Dental or skeletal.
- Unilateral or bilateral.



Anterior Cross-bite: defined as the malocclusion in which the labial surfaces of the maxillary incisors occlude posterior to the lingual surface of the mandibular incisors; may involve two or all of the anterior teeth.



B - Posterior Crossbite

Buccal crossbite. Lower teeth occlude buccal to corresponding upper teeth .



Lingual crossbite (scissors bite). Lower teeth occlude lingual to palatal cusps of upper teeth .



Fig. 64 Bilateral lingual crossbite; Class II Division 1 malocclusion.

open bite

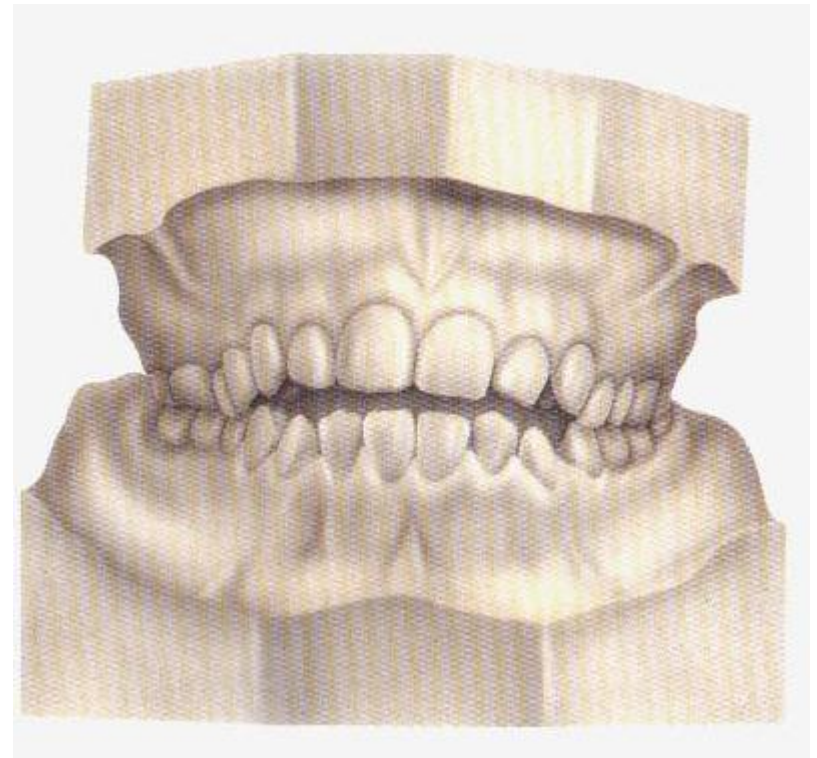
Types of open bite

1-Anterior open bite The lower incisors are not overlapped in the vertical plane by the upper incisors and do not occlude with them.

2- posterior open bite: no contact between upper and lower posterior teeth.



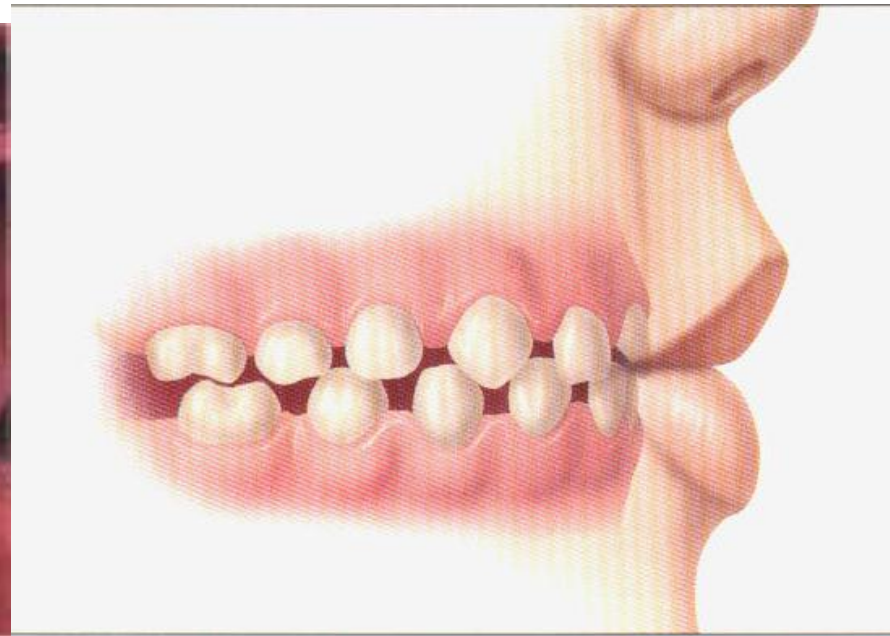
Fig. 69 Anterior open bite due to increased FMIPA.



Space discrepancy : it is the difference between the space needed in dental arch and the available space in that arch.

Spacing ;its best accepted unless it gives an unsightly appearance in the upper labial segment.

It is either localized and concentrated in the midline as a median diastema or it is more generalized



Crowding: loss of dental arch perimeter, which is manifested as space loss, teeth slipping over their contact area with the resultant rotation and or displacement.

So crowding can be described as expression of an altered tooth/ tissue ratio.



The common site of crowding

A; in the upper arch

1; lateral incisors which crowded labially or palatally

2; canines which crowded buccally or palatally

3; second premolars crowded palatally

4; second and third molars crowded buccally



Fig. 21 Severe crowding due to early loss of q_1 .

B;in the lower arch

1;incisors crowded lingually

2;canines buccally crowded

3;second premolars crowded lingually

4;second and third molars mesioangular or impaction



Fig. 47 Class I malocclusion with crowding.

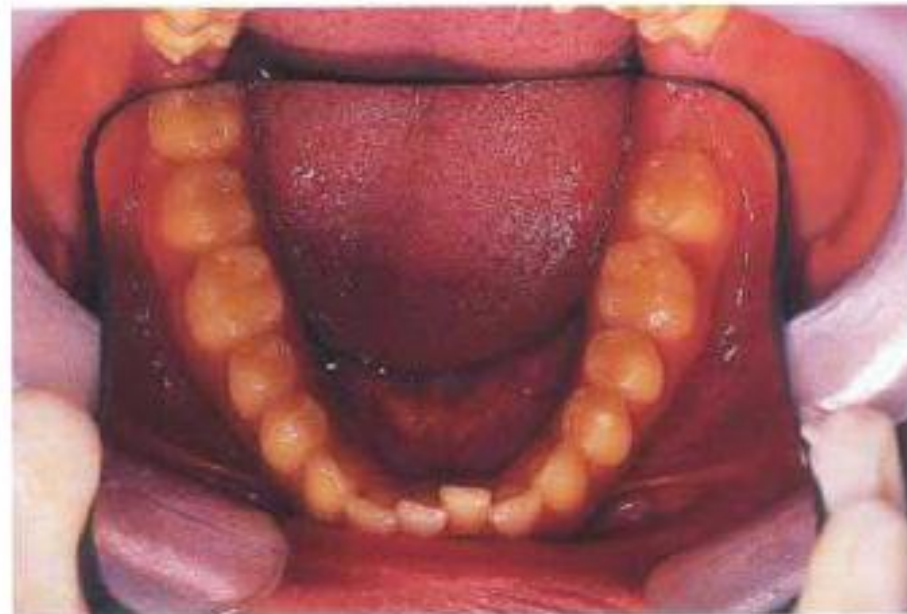


Fig. 6 Late lower incisor crowding.

THANK YOU

