Normal Occlusion and Its Characteristics

INTRODUCTION :

- The study and practice of most branches of dentistry should be based on a strong foundation of knowledge of occlusion.
- The orthodontist should know what constitutes normal occlusion in order to be able to recognize abnormal occlusion.
- Normal in physiology is always a range, never a point.
- A balanced, stable, healthy and aesthetically attractive occlusion is also conceivable normal even if minor rotations are present.
- And yet, what may be abnormal for one age may be normal for another.
- The curve of space, compensatory curve, cusp height and facial relation of each tooth to its antagonist and other characteristics of occlusion may all vary within a broad range and still be normal.
- It may be equally normal for one child to have a marked overbite and overjet and procumbent incisors and for another to have little overbite or overjet.
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INTRODUCTION HISTORY:

The alignment and occlusion of the dentition areThe alignment and occlusion of the dentition are extremely important in masticatory function. The basics are extremely important in masticatory function. The basic activities of chewing, swallowing, and speaking depend activities of chewing, swallowing, and speaking depend greatly not only on the position of teeth in the dental greatly not only on the position of teeth in the dental arches but also on the relationship of opposing teeth searches but also on the relationship of opposing teeth as they are brought into occlusion.they are brought into occlusion.

What is occlusion?

Occlusion has been rightly defined as the medium thatOcclusion has been rightly defined as the medium that brings all branches of dentistry together (Ramford and brings all branches of dentistry together (Ramford and Ash).Ash).

Occlusion is a Latin word

Clusion - closing-

Occ – up

- In simpler terms it is the act of closure or being closed in simpler terms it is the act of closure or being closed.
- It may be defined as contact relationship of the teeth inIt may be defined as contact relationship of the teeth in function or parafunction. (G.P.T.)
- Occlusion can also be referred to the relationship of the maxillary and mandibular teeth when they are in maxillary and mandibular teeth when they are in functional contact during activity of the mandible. (G.P.T.)
- Shaw defined dental occlusion as the static, closed contacting position of the upper teeth to lower teeth.
- The most comprehensive definition of occlusion given by Jablonski 1982-
  It is the relationship between all components of the masticatory system in normal function, parafunction and dysfunction including the morphology and features of the contacting surface of the opposing teeth and restoration.

  History:
  - Fictional Period
  - Hypothetical period
  - Factual Period
  - **Fictional Period**
    In fictional periods, pioneers like Fuller, Clark and Imrie talked of antagonism, meeting or gliding of teeth. Others relied on anatomic descriptions of morphology of the teeth as individual units. But the creation of a normal standard, a typical relationship, a basis on which to compare departures from the normal, was lacking.

    - **Hypothetical Period**
      The first description of the occlusal relationship of the teeth which stood the test of time was made by E.H. Angle 1897.
      He defined occlusion as the normal relation of the occlusal inclined planes of the teeth when the jaws are closed.

Class I

The normal anteroposterior relationship of the mandible to the maxillae. The mesiobuccal cusp of the permanent maxillary first molar occludes in the buccal groove of the permanent mandibular first molar.

Class II

A malocclusion where the molar relationship shows the buccal groove of the mandibular first molar distally positioned when in occlusion with the mesiobuccal cusp of the maxillary first molar.

Division 1

The maxillary anterior teeth are proclined and a large overjet is present

Division 2,

the maxillary anterior teeth are retroclined and a deep overbite exists

.

Class III

A malocclusion where the molar relationship shows the buccal groove of the mandibular first molar mesially positioned to the mesiobuccal cusp of the maxillary first molar when the teeth are in occlusion.

☐ **Factual Period**

1930 as the dividing line between the hypothetical and factual periods.

Broadbent introduced roentgenographic cephalometry which enabled to follow longitudinally the orofacial developmental pattern and the intricacies of tooth formation, eruption and adjustment.

Intra Arch Tooth Alignment
Intra arch tooth alignment refers to the relationship of the teeth to each other.

Plane of Occlusion:
Refers to an imaginary surface that theoretically rouches the incisal edges of the incisors and the tips of the occluding surfaces of the posterior teeth.

Significance:
Mandibular movements are determined by the two temporomandibular joints, which rarely function with identical simultaneous movements. Since most jaw movements are complex, with the centres of rotation constantly shifting, a flat occlusal plane will not permit simultaneous functional contact in more than one area of the dental arch. Therefore the occlusal planes of the dental arch are curved in a manner that permits maximum utilisation of tooth contacts during function.

## Mesiodistal Axial Inclination
Inclination of teeth in mandibular arch

☐ In the mandibular arch both the anterior teeth and the posterior teeth are mesially inclined. The second and third molars are more inclined than the premolars.
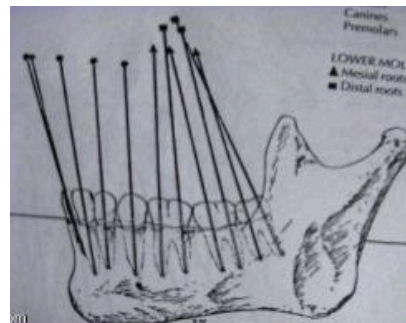
### Inclination of teeth in maxillary arch

☐ In maxillary arch the anterior teeth are generally mesially inclined, with the most posterior molars being distally inclined.
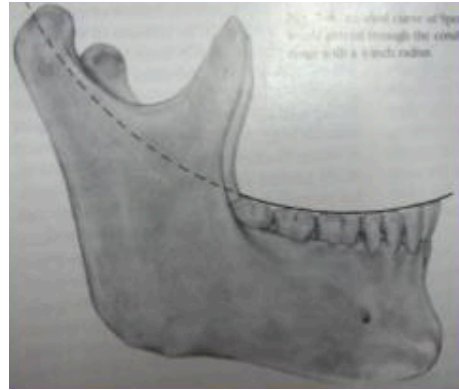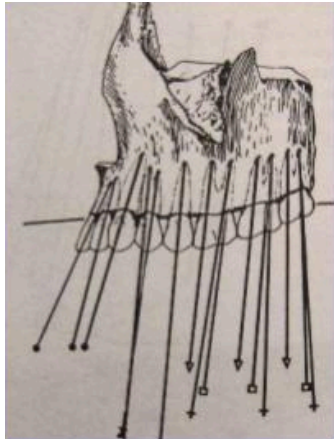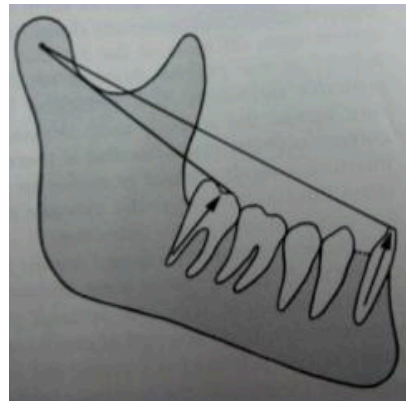
Curve of spee:

The curve of spee refers to the antero posterior curvature of the occlusal surfaces, beginning at the tip of the lower cuspid and following the buccal cusp tips of the bicuspid and molars and continuing to the anterior border of the ramus.

If the curved line continued further back, it would follow an arc through the condyle. The curvature of the arc would relae, on average, to part of a circle with a 4-inch radius.
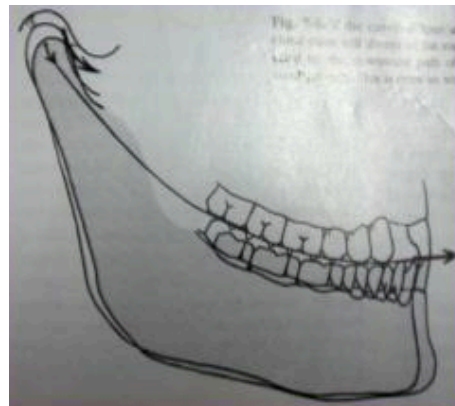

Significance:

- The curve of spee results in alignment of each tooth for maximum resistance to the functional loading, the long axis of each lower tooth is aligned nearly parallel to its individual arc of closure around the condylar axis. This progression positions the cusp tips on a curve that is directly related to the condylar axis by a progressive series of tangents.

- The relationship of the curve of spee to the condylar axis also relates to condylar path of protrusion. If the occlusal plane is on the arc that passes through the condyle, the posterior part of the occlusal plane will always be flat enough to be discluded by the normal condylar path on its steeper eminentia. Thus even with a flat zero degree anterior guidance the occlusal

plane on the lower will be dismayed by the forward movement of the condyle that is directed downward at an angle that is steeper than the posterior part of the occlusal plane.
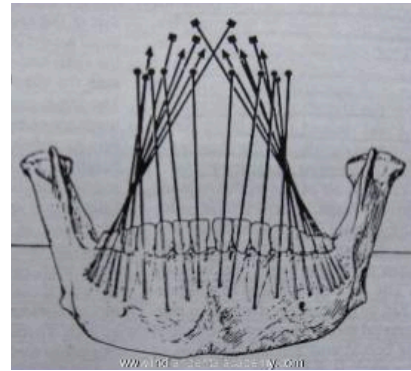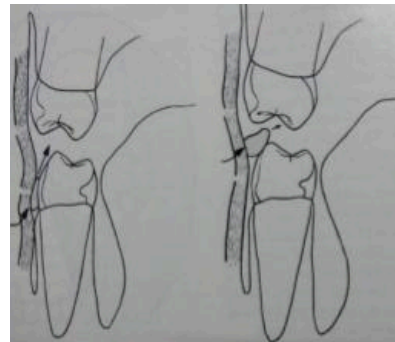

Buccolingual Axial Inclination

When observing the dental arches from the frontal view, it is possible to see the B-L axial relationship.

Inclination of teeth maxillary arch:

☐ In the maxillary arch the posterior teeth have a slightly buccal inclination.

Inclination of teeth in mandibular arch

In the mandibular arch the posterior teeth have slightly lingual inclination.

Curve of Wilson

The curve of Wilson is the mediolateral curve that contacts the buccal and lingual cusp tips on each side of the arch. It results from inward inclination of the lower posterior teeth, making the lingual cusps lower than the buccal cusps on the mandibular arch.

Significance

Resistance to loading:

The axial inclination of posterior teeth is nearly parallel with the strong inward pull of the internal pterygoid muscle. Aligning both upper and lower posterior teeth with the principal direction of muscle contraction produces the greatest resistance to masticatory forces and creates the inclination that forms the curve of Wilson.
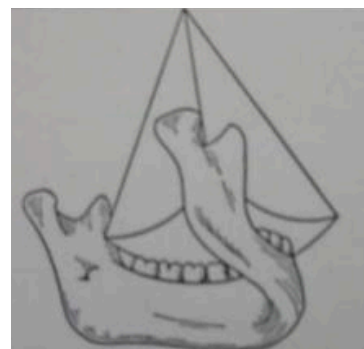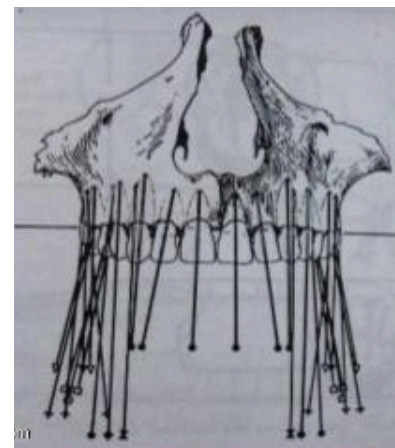
Masticatory Function:

☐ The inward inclination of the lower occlusal table is designed for direct access of food from the lingual, with no blockage by lower cusp by the action of tongue.

☐ The outward inclination of the upper occlusal table provides access from the buccal for the food to be tossed directly onto the occlusal table by the action of buccinators muscle.

Bonwill triangle

Bonwill was the first to describe the dental arches, noting that an equilateral triangle of 4 inch sides existed between the centres of the condyles and the mesial contact areas of the mandibular central incisor.
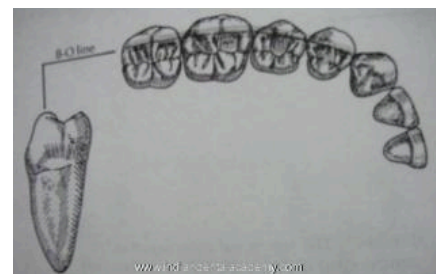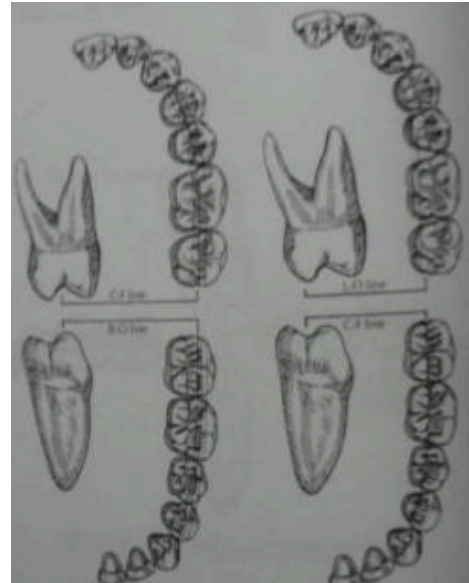

Buccolingual Occlusal Contact Relation:

☐ If an imaginary line is extended through all the buccal cusp tips of the mandibular posterior teeth, the buccocclusal (B-O) line is established. In a normal arch this line

flows smoothly and continuously, revealing the general arch form.
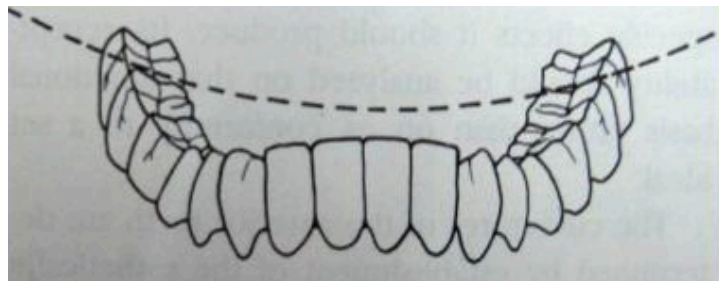
☐ In the maxillary arch, if an imaginary line is extended through the lingual cusps of maxillary posterior teeth, the linguocclusal (L-O) line is observed. This line reveals general arch form.
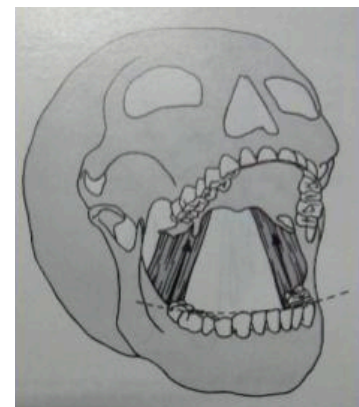
☐ If a third imaginary line is extended through the central development grooves of the maxillary and mandibular posterior teeth, the central fossa

(C-F) line is established. The proximal contact areas are placed slightly buccal to C-f line.

☐ In normal buccocclusal relationships of posterior teeth in occlusion, the B-O line of the mandibular teeth occludes with the C-F line of the maxillary teeth. Simultaneously the L-O line of the maxillary teeth occludes with the C-F line of the mandibular teeth.