Balanced occlusion

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مرکز تخصصی پروتزهای دندانی

های دنت

طراحی و ساخت انواع پروتزهای دندانی بویژه ایمپلنت

برگزار کننده دوره های آموزشی تخصصی وجامع دندانسازی و...

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Introduction

•Occlusion in complete denture must be developed to function efficiently and with the least amount of trauma to the supporting tissues.

•All dentures move in function and prime aim in construction of complete dentures to ensure that this movement is reduced to the minimum. When forces act on a body in such a way that no motion results there is BALANCE or equilibrium. Stable denture is ultimate goal

Definitions:

Occlusion:

Is defined as static contact between the incising or masticating surfaces of the maxillary and mandibular teeth.-GPT

According to *Heartwell* this is a static position and the jaws can be in either centric or eccentric relation.

Articulation: the dynamic contact relationship between the occlusal surfaces of the teeth during function.

Excursive movement: movement occuring when mandible moves away from maximum intercuspation.

Balancing side/non-working side: that side of mandible which moves towards median line in lateral excursion.

Balanced occlusion: the bilateral, simultaneous, anterior, and posterior occlusal contact of teeth in centric and eccentric positions.

Centric occlusion:

The occlusion of opposing teeth when the mandible is in centric relation. This may or may not coincide with the maximal intercuspal position.(GPT 8) .Centric occlusion the tooth-to-tooth relation whereas centric relation is a static position and a bone-to-bone relation.

Eccentric occlusion

Eccentric occlusion refers to contact of teeth that occurs during movement of the mandible.

It is of two types:-

1. Functional occlusion
2. Non fucntional occlusion

1.Functional occlusion

Functional occlusion (also called working side occlusion) refers to tooth contacts that occur in the segment of the arch towards which the mandible moves.

- Functional occlusion can be of two types :
  a. *Lateral functional occlusion*
  b. *Protrusive functional occlusion*

a) LATERAL FUNCTIONAL OCCLUSION:

It includes tooth contacts that occur on canines and posterior teeth on the side towards which the mandible moves.

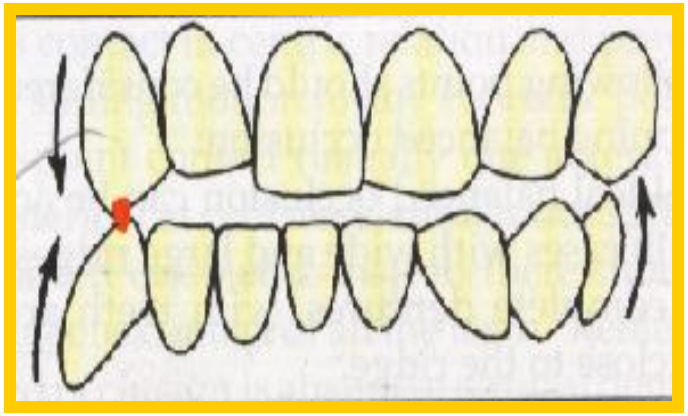
- The lateral functional occlusion can be of two types :

1. Canine guided occlusion:
2. Grouped lateral occlusion

i) Canine guided occlusion:

During lateral mandibular movement, the opposing upper & lower canines of the working side contact thereby causing disclusion of all posterior teeth on the working &, balancing sides.

Canine guided occlusion is usually seen in young individuals with unworn dentition.



ii) Grouped lateral occlusion :

In addition to canine guidance, certain other posterior teeth on the working side also contact during lateral movement of the mandible.

Such a type of contact during lateral movement is called grouped lateral occlusion.

B) PROTRUSIVE FUNCTIONAL OCCLUSION:

It includes eccentric contacts that occur when the mandible moves forward.

Ideally the six mandibular anterior teeth contact along the lingual inclines of the maxillary anterior teeth while the posteriors disocclude.

Difference Between Natural and Artificial teeth

NATURAL TEETH	ARTIFICIAL TEETH
-Periodontal ligament supports teeth.	-No periodontal ligament.
-Function independently.	-Function as group.
-Malocclusion non problematic over years.	-Malocclusion causes drastic problems.
-Non vertical forces well tolerated.	-Non vertical forces are damaging to supporting tissues.

-Incising doesn't affect posterior teeth.	-Incising affects all teeth on the base.
-Second molar is favoured position for mastication.	-Heavy pressures of mastication in second molar region tilts base & shifts it on inclined surface.
-Bilateral balance is rarely found & if present is considered as interference.	-Bilateral balance necessary for base stability.
-Proprioceptive impulses give feed back to avoid prematurities & interferences-so a habitual occlusion away from centric is established.	-No feed back of proprioceptive impulses & denture base rests in centric relation-any prematurities in this position will shift denture base.

Requirement of Complete Denture Occlusion (Winkler)

1. Stability of occlusion in centric relation and in areas forward and lateral to it.

2. Balanced for all eccentric contacts bilaterally for all eccentric mandibular movements.

3. Unlocking the cusp mesiodistally to allow for gradual but inevitable settling of the bases due to tissue deformation and bone resorption.

4. Control of horizontal forces by buccoligual cusp height reduction according to the residual ridge resistance and interridge space.

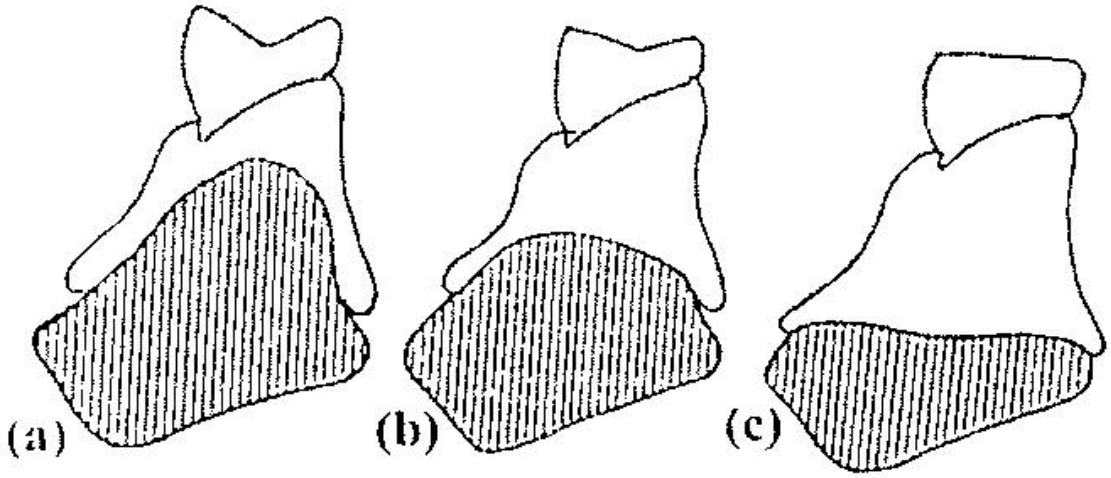
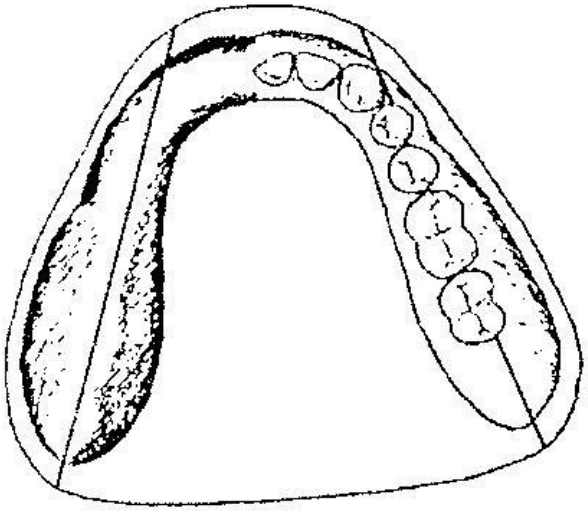


Fig. (8.2)

Reduction of cusp height according to the ridge height
(a) Well formed ridge can resist horizontal forces of cusped teeth
(b) The use of reduced cusp height with resorbed ridge
(c) The use of flat non antomic teeth with flat ridge

5. Functional lever balance by favorable tooth-to-ridge crest position

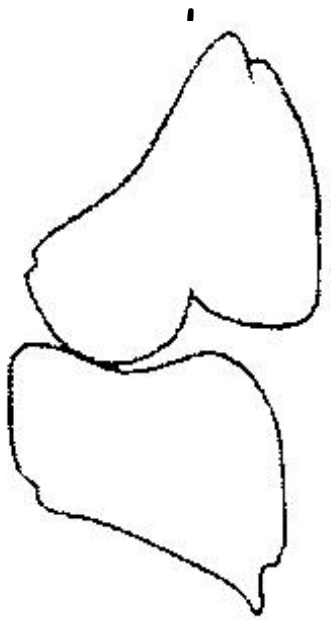


Posterior teeth over the center of the ridge

6. Cutting, penetrating and shearing efficiency of the occlusal surface (sharp cusps or ridges)

7. Anterior clearance of teeth during mastication.

8. Minimum occlusal contact between the up lower teeth to reduce pressure during function.(lingual occlusion)



Requirements of Incising units

These units:

1. Should be sharp in order to cut efficiently
2. Should not contact during mastication
3. Should contact only during protrusive incising function
4. Should have as flat an incisal guidance as possible considering esthetics and phonetics
5. Should have horizontal overlap to allow for base settling without interference

Requirements of Working occlusal units

1. Should be efficient in cutting and grinding
2. Should have less bucco-lingual width – to minimize the worklaod
3. Should function as a group with simultaneous harmonious contacts at end of the chewing cycle and eccentric excursions.
4. Should be over the ridge crest in the masticating area for lever balance
5. Should have surface to receive and transmit force of occlusion essentially vertically.
6. Should center the work load near the anteroposterior center of the denture
7. Present plane of occlusion as parallel as possible to mean foundation plane

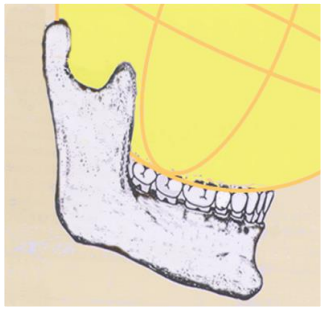
Requirements of Balancing occlusal units

1. Should contact on the second molars when the incising units contact in function
2. Should contact at end of the chewing cycle when the working units contact
3. Should have smooth gliding contacts for lateral and protrusive excursions

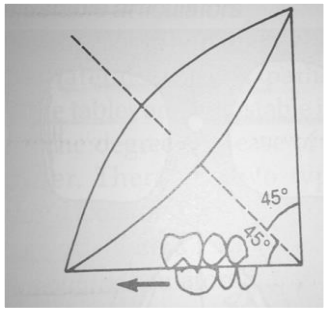
AXIOMS FOR ARTIFICIAL OCCLUSION -SEARS (1952)

1. The smaller the area of occlusal surface acting on food, smaller will be the crushing force on food transmitted to the supporting structures.
2. Vertical force applied to an inclined occlusal surface causes non-vertical forces on the denture base.
3. Vertical force applied to an inclined supporting tissue causes non-vertical force on the denture base.
4. Vertical forces applied to a denture base supported by yielding tissue causes the base to teeter when the force is not centered on the base.
5. Vertical force applied outside (lateral) to the ridge crest creates tipping forces on the base.

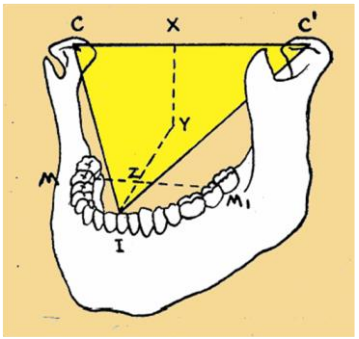
Theories of complete denture occlusion



- **Bonwill's theory(1858)**
- theory of equilateral triangle.
- This theory proposed that teeth move in relation to each other as guided by the condylar controls and the incisal point



- **Conical Theory(1915)**
- the lower teeth move over the surfaces of the upper teeth as over the surfaces of a cone and with a central axis of the cone tipped at a 45 degree angle to the occlusal plane.



- **Spherical theory (1918)**
- Proposed by G.S. Monson
- was based on the observations of natural teeth and skulls made by **Von Spee.**

Various concepts of occlusion

In pertinence to occlusion the concept of occlusion for complete denture falls in to two broad disciplines

1) Balanced occlusion. (Heartwell 5th ed)

2) Non-balanced occlusion.

Concepts of occlusion acc. to **Boucher (13th ed)**

- **Balanced**
- **Monoplane**
- **Lingualized**

Balanced Occlusion:

- Reported by Brewer.
- Definition : " The simultaneous contacting of maxillary and mandibular teeth on right and left and in the posterior and anterior occlusal areas in centric and eccentric positions."- Heartwell
- "Stable simultaneous contact of the opposing upper and lower teeth in centric relation position and a continuous smooth bilateral gliding from this position to any eccentric position within normal range of mandibular function."- Winkler

OBJECTIVES OF BALANCED OCCLUSION

- To improve the stability of denture.
- To reduce resorption of the residual ridge and soreness.
- To improve oral comfort & well being of the patient.

CHARACTERISTIC REQUIREMENTS OF BALANCED OCCLUSION

- All the teeth of working side should glide evenly against opposing teeth
- No single tooth should produce any interference or disocclusion of other teeth
- There should be contacts in balancing side but they shouldn't interfere with smooth gliding movements of working side
- There should be simultaneous contact during protrusion


Working
Balancing
Protrusive

GENERAL CONSIDERATIONS FOR BALANCED OCCLUSION:

- The wider and larger the ridge & the teeth closer to the ridge, the greater the lever balance.
- Wider the ridge & narrower the teeth buccolingually, greater the balance.
- The more lingual the teeth are placed in relation to the ridge crest, the greater the balance.
- The more centered the force of occlusion anterioposteriorly, the greater the stability of the base.

TYPES OF BALANCED OCCLUSION:

Balance may be: Unilateral, bilateral, or protrusive.

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UNILATERAL LEVER BALANCE

This is present when there is balance of the base on its supporting structures, when bolus food is interposed between the teeth on one side and a space exits between the teeth on the opposite side. Following points encourages the lever balance-

a) Teeth placement should be such that to direct the resultant force on the functioning side over the ridge or slightly lingual to it.

b) Having the denture base cover as wide an area on the ridge as possible.

c) Placing the teeth as close to the ridge as other factors will permit.

d) Using as narrow a buccolingual width occlusal food table as practical.

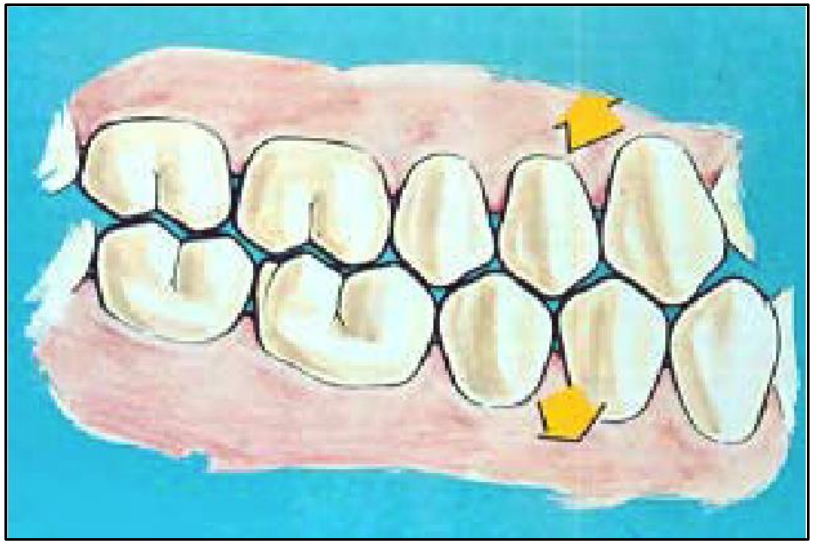
1 .Unilateral ooclusal balance:

It is present when occlusal surface of teeth on one side articulate simultaneously, as a group, with smooth uninterupted glide.

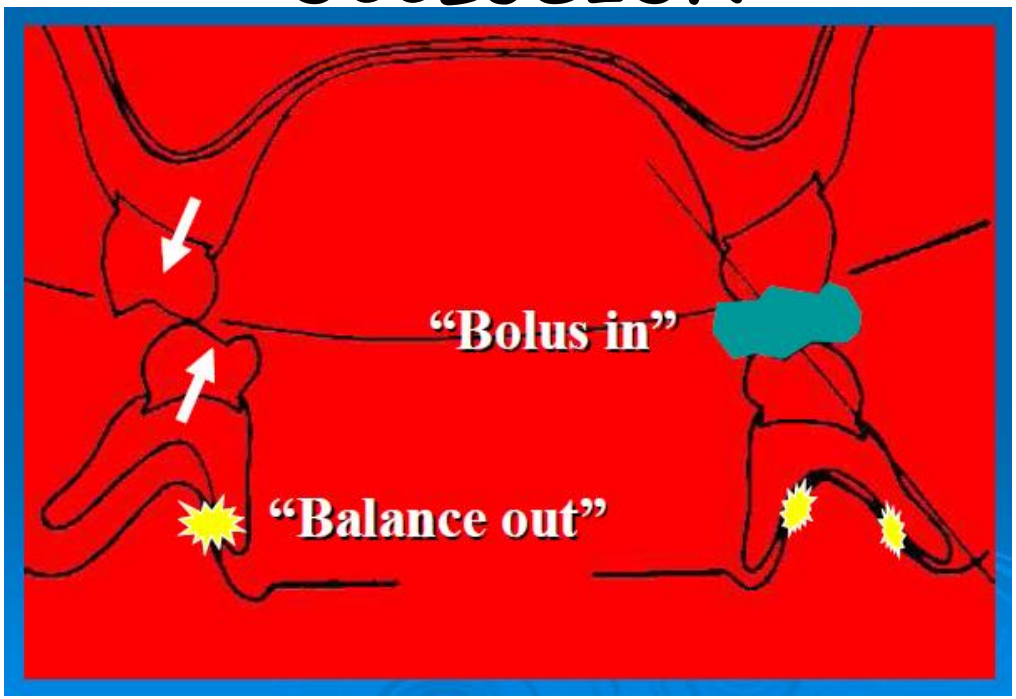
2.Bilateral occlusal balance:

-This is present when there is equilibrium on both sides of denture due to simultaneous contact of teeth in centric and eccentric occlusion.

-It requires a minimum of three contacts. The more the contacts the more assured the balance.



ADVANTAGES OF BILATERALLY BALANCED OCCLUSION



Prime gave the concept of " **ENTER BOLUS EXIT BALANCE**" which implies that introduction of food on one side will prevent the teeth of opposite side from contacting and hence occlusal balance is impossible during mastication.

However **Sheppard** (1964) later gave the concept of **ENTER BOLUS ENTER BALANCE** according to which even while chewing, the teeth cut through the bolus and come in contact with each other, for few fractions of a second. Hence the stability of the denture is maintained during various movements of mandible during chewing.

Brewer and hudson (1963) found in a 24 hour test that:

Normal individual makes masticatory tooth contact only for 10 mins in one day compared to 4hrs of total tooth contact during other functions. So, for these 4hrs of tooth contact, balanced occlusion is important to maintain denture stability

It improves the stability of denture, reduce resorption of the residual ridge and soreness and improve oral comfort & well-being of the patient

Pros (as stated in winkler)

1. If this contact is interruptive and deflective; and not bilateral, the denture base will not be stable. Hence, bilateral balanced contacts during the terminal arc of closure help to seat the denture in a stable position.

2. Also bilateral balanced occlusion is important during activities such as swallowing saliva, closing to reseat the dentures and bruxism of teeth during times of stress.

3.Patient with a balanced design do not upset the normal static, stable and retentive position of their dentures.

4.In bilateral balance the bases are stable during bruxing activity and they are tight when the patient separate the teeth.

Cons:

There are some possible disadvantages of bilateral balanced articulation:

1.It may tend to encourage lateral and protrusive grinding, although this habit may be confined to those people who are subjected to irrelevant muscle activity.

2..It is difficult to achieve in mouths where an increased vertical incisor overlap is indicated, and is better to retain the vertical overlap, than to sacrifice it in order to achieve articular balance.

3.A semi-adjustable or fully adjustable articulator is required.

3.Protrusive occlusal balance:

-This is present when the mandible moves essentially forward and occlusal contacts are smooth and simultaneously in posterior region both on right and left sides as well as anterior teeth.

-It is slightly differebt from bilateral balanced occlusion as it requires a minimum of three contacts, one on each side posteriorly and one anteriorly.

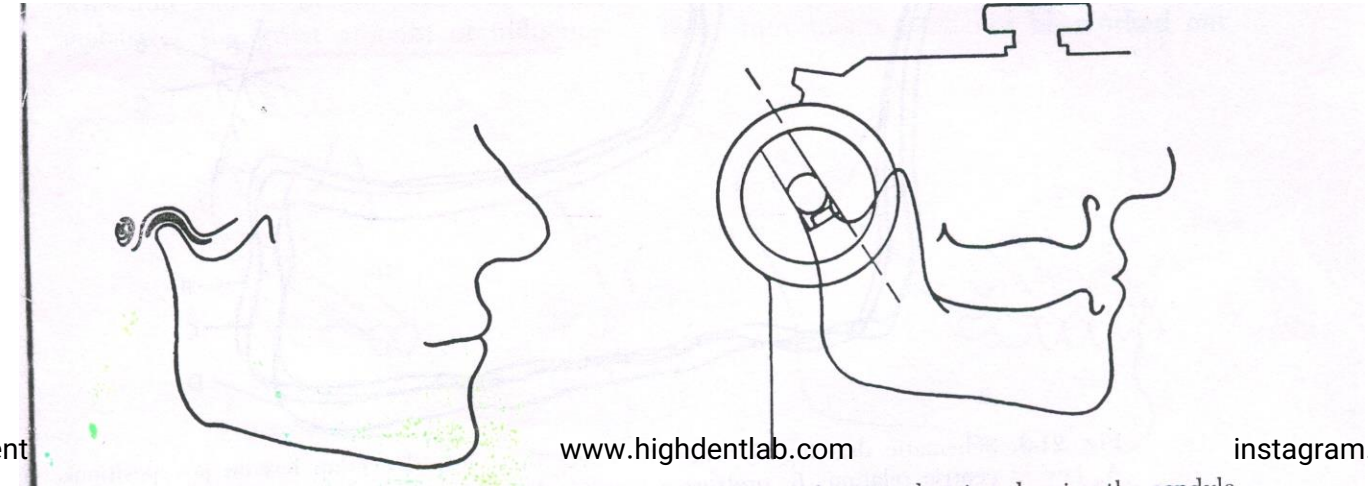
Factors influencing balanced occlusion

(1) Inclination of the condylar path
(2) Incisal guidance
(3) Orientation of the plane of occlusion
(4) Cuspal angulation
(5) Compensating curve

1. CONDYLAR GUIDANCE

- Mandibular guidance generated by condyle and articular disc traversing contour of glenoid fossa

- Condylar guidance is due to path followed by condyle in temporomandibular joint
- Obtained by protrusive registration record



- HANAU states that inclination of condylar guidance is definite anatomical conception.

- This path is precise & constant and it guides mandible so precisely that it is primary dictator of occlusion

- KURTH claims that condylar path is not same for varying incisal guidances.

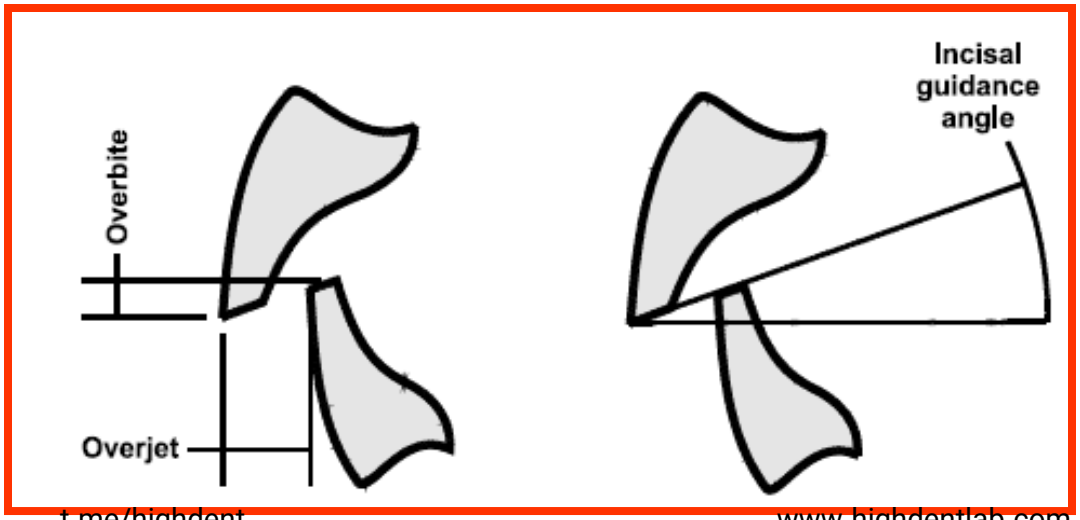
- WEINBERG showed that condylar path varies owing to variable pressures of function.

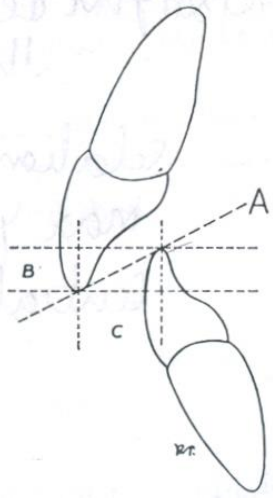
Significance

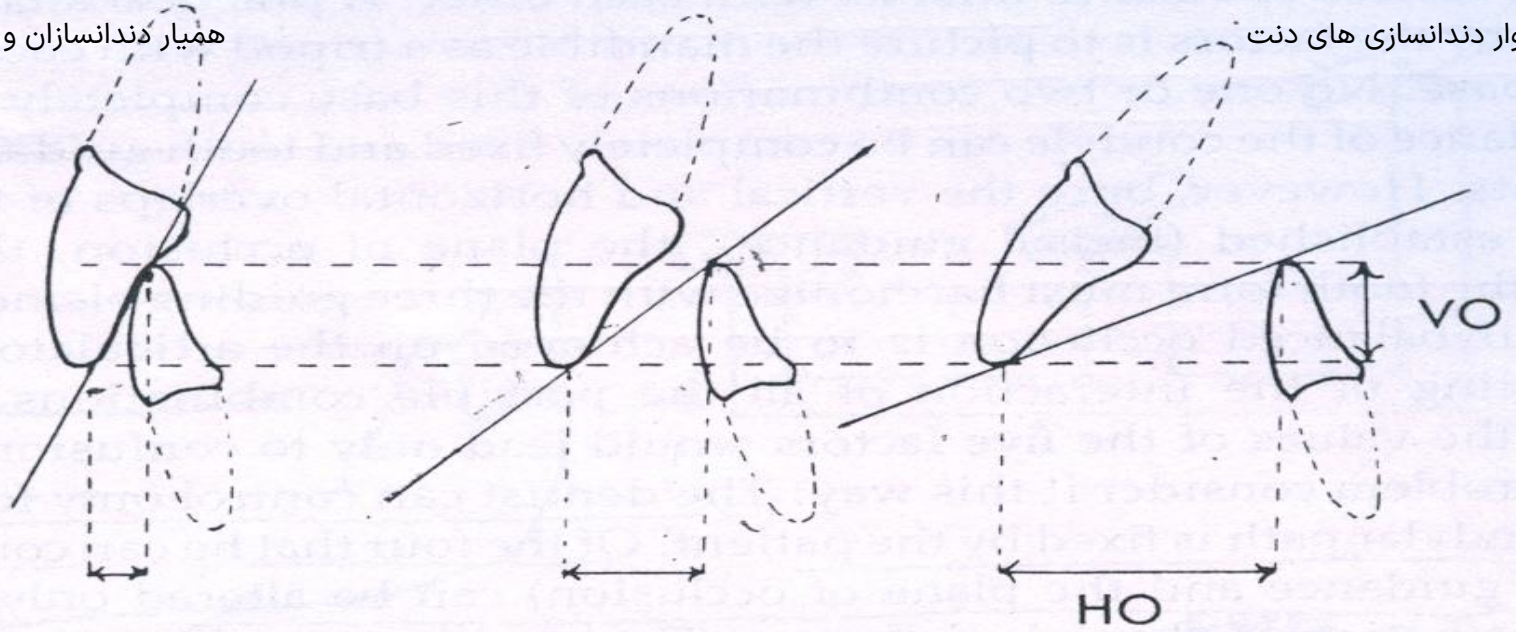
- Increase in condylar guidance will increase jaw separation during protrusion.
- In patients with steep condylar guidance, incisal guidance should be decreased to reduce amount of jaw separation produced during protrusion
- As this factor cannot be modified, all other 4 factors should be modified to compensate effects of this factor

2. INCISAL GUIDANCE

- INCISAL GUIDE ANGLE: angle formed by intersection of plane of occlusion and line with in sagittal plane determined by incisal edges of maxillary& mandibular central incisors when teeth are in maximum intercuspation (GPT-8)







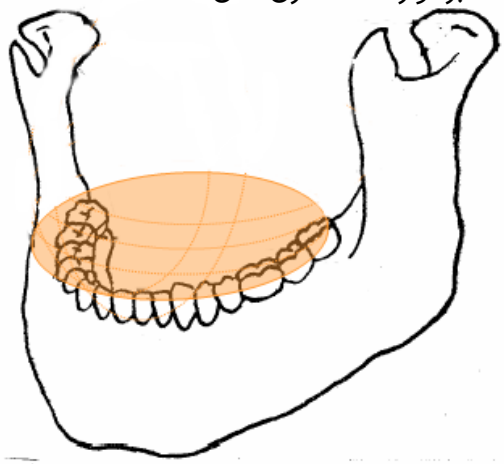
- Angle of incisal guidance is largely under influence of dentist
- This factor is influenced by amount of horizontal, vertical overlap
- Greater horizontal overlap = lesser angle of inclination
- Lesser the vertical overlap = lesser angle of inclination

•During protrusive movements mandibular teeth move downward & forward as per incisal guidance.

•For complete dentures the incisal guidance should be as flat as esthetics and phonetics will permit.

•If the incisal guidance is steep, steep cusps or occlusal plane or steep compensatory curve is needed to balance occlusion.

•When the arrangement of the anterior teeth necessitates vertical overlap, a compensating horizontal overlap should be set to prevent dominant incisal guidance, from upsetting the occlusal balance on the posterior teeth

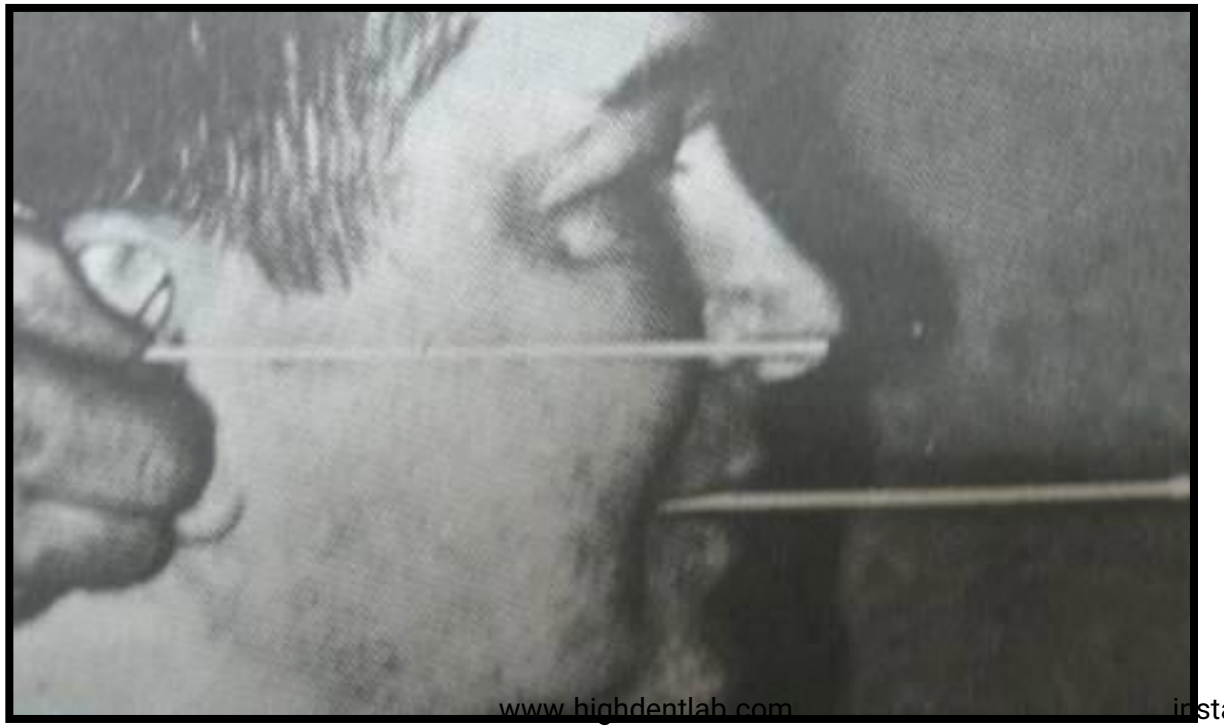


3.PLANE OF OCCLUSION OR OCCLUSAL PLANE

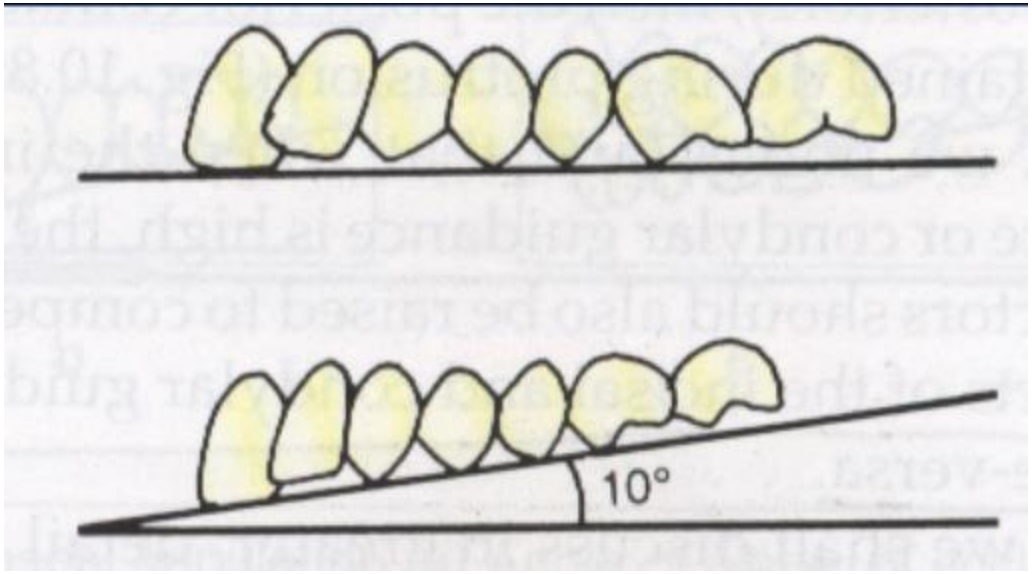
- Defined as "An imaginary surface which is related anatomically to the cranium and which theoretically touches the incisal edges of the incisors & the tips of the occluding surfaces of posterior teeth.

- It represents the mean curvature of the surface. Established anteriorly by height of lower canine and posteriorly by height of retromolar pad. (winkler)

- These landmarks also provide a physiologically and functionally acceptable anteroposterior inclination of the occlusal plane that is nearly parallel to the lower mean foundation plane.
- These landmarks also creates an occlusal plane essentially parallel to the ala-tragus line(Camper`s plane).



- The plane of occlusion can be altered to a maximum of 10°

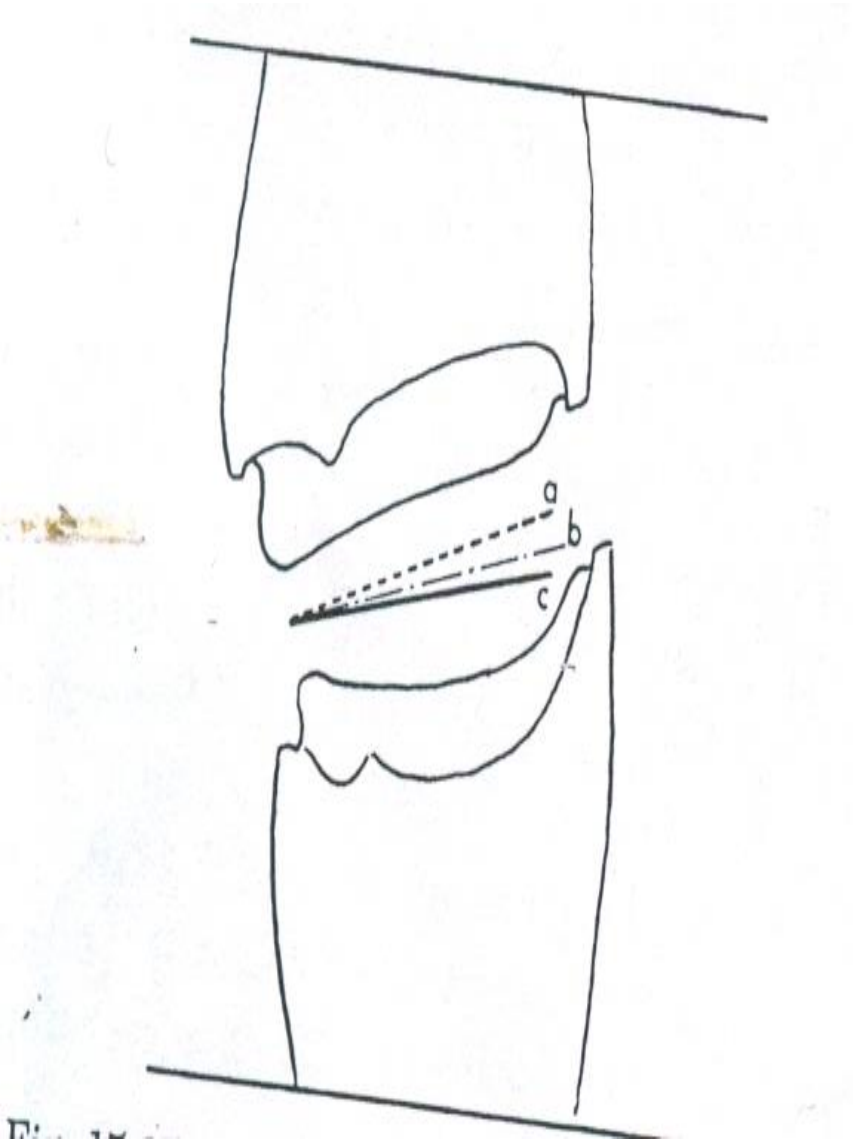


- ✓ HANAU states plane of orientation is purely geometrical factor and pass through central incisal point & summits of mesiobuccal cusps of molars.

- ✓ Hanau used this plane for signifying general direction of masticatory surfaces in denture space available & for characterization of compensating curve.

- According to Sharry, plane of orientation established intially can be altered subsequently to serve purposes.

- Its existence is temporary as it is lost in establishing compensating curves.



- ✓ According to Boucher, locating occlusal plane high/low to favour weaker of two ridges can cause both esthetic, mechanical trouble.

- ✓ If soft tissues surrounding dentures are to work around them as they did around natural teeth, occlusal plane should be oriented exactly as it was when natural teeth are present.

- ✓ By positioning anterior teeth correctly for esthetic appearance & locating posterior end of occlusal plane approximately level with top of retromolar pad-factor of orientation of occlusal plane is fixed.

- ✓ Any necessary alterations for balancing occlusion must be made on other factors.

4.COMPENSATING CURVE

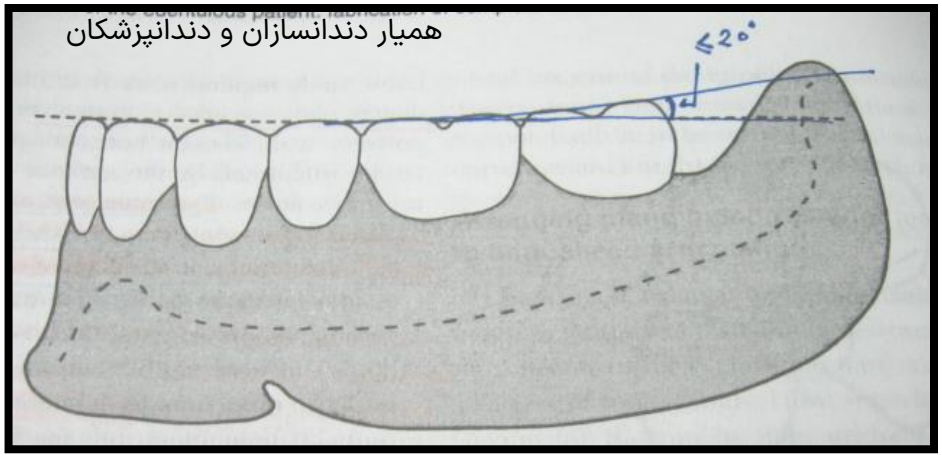
- "The anterioposterior and lateral curvatures in the alignment of the occluding surfaces and incisal edges of artificial teeth which are used to develop balanced occlusion"(GPT -8)

- Determined by inclination of posterior teeth and their vertical relationship to occlusal plane.

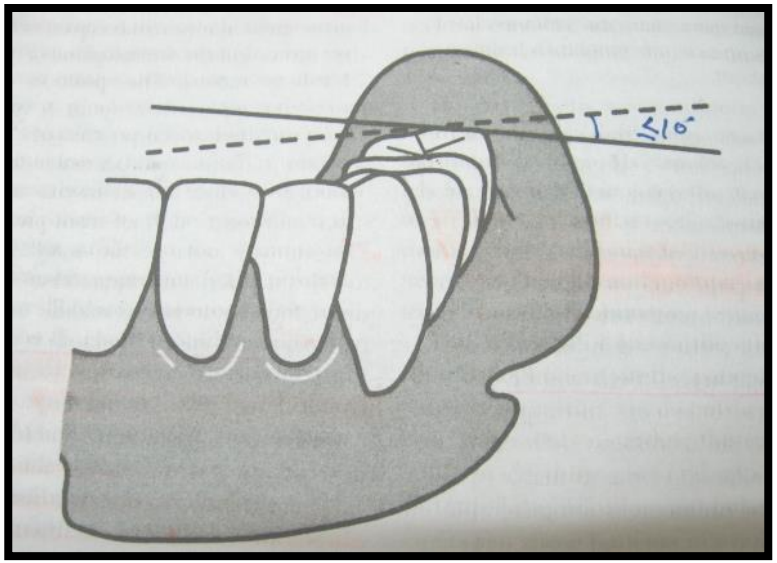
- The primary function thus of compensating curve is to provide balancing contacts for protrusive mandibular movements. Without this curve it would be necessary to incline the entire occlusal plane at an angle.

- Steep condylar path requires steep compensating curve to produce balanced occlusion

- Lesser compensating curve for the same condylar guidance → steeper incisal guidance (anterior interference) → causing loss of molar balancing contact



Anteroposterior compensating curves



Mediolateral compensating curve

With compensating curve it is possible to produce eccentric balance in monoplane occlusal scheme, which is otherwise said to be deficient in this.

The compensating curve incorporated in a properly oriented plane of occlusion starts with the first replacemental tooth by raising it at distal and continuing this initiated curve with further rise in the 2nd molar with distal surface located at or above the top of retromolar pad.

Anteroposteriorly it should not exceed 20 degree and mediolateraly it should not exceed 10 degree

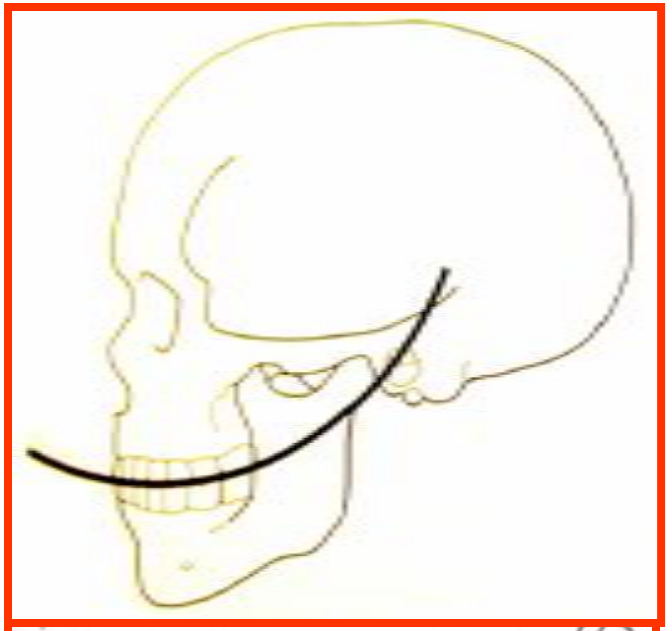
TYPES OF COMPENSATING CURVES

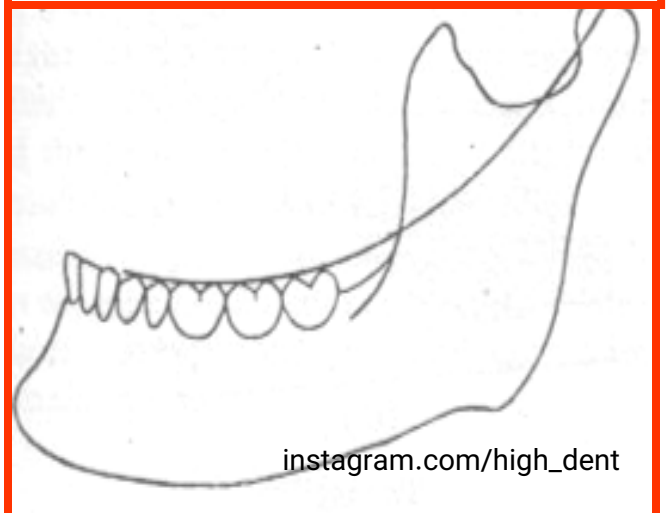
- ANTERIOPOSTERIOR:
  Curve of spee

- MEDIOLATERAL:
  Monson's curve
  Wilson's curve

Curve of spee

The anatomic curve established by the occlusal alignment of the teeth, as projected onto the median plane, beginning with the cusp tip of the mandibular canine and following the buccal cusp tips of the premolar and molar teeth, continuing through the anterior border of mandibular ramus, ending with the anterior most portion of the mandibular condyle.(GPT8)



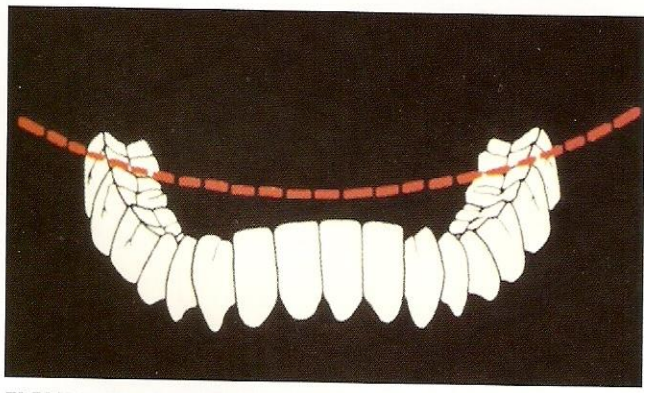


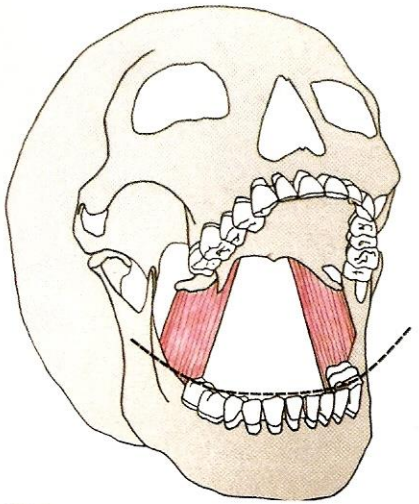
- Compensating curve for curve of spee in artificial dentition is anteroposterior curve

- Posterior teeth set on this curve will continue to remain in contact during protrusion

Curve of wilson

- GEORGE.H.WILSON
- eponym for mediolateral curve
- contacts buccal and lingual cusp tips of molars on each side of arch





IGURE 20-8 Alignment of the posterior teeth to parallel the d

In mandibular arch -results from inward inclination of lower posterior teeth-making lingual cusps lower than buccal cusps – curve being concave

In maxillary arch-results from outward inclination of posterior teeth-making buccal cusp higher than lingual cusps-curve being convex

Teeth set on this curve will have lateral balance of occlusion

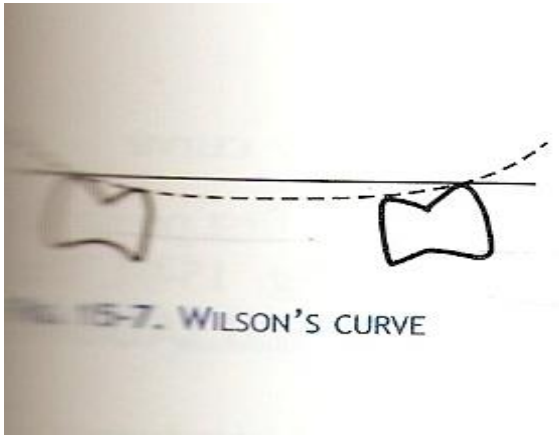
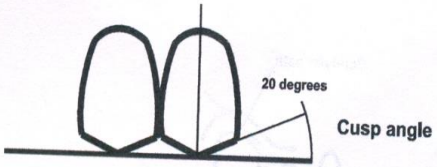


FIG. 15-8. MEDIOLATERAL CURVE (WILSON'S CURVE).

CURVE OF MONSON:

- GEORGE S. MONSON
- eponym for proposed ideal curve of occlusion in which each cusp and incisal edge touches or conforms to segment of surface of sphere 8 inches in diameter with its center in region of glabella.



5.Cuspal Inclination

- angle made by average slope of cusp with cusp plane measured mesiodistally or bucco lingually
- It is an important factor that modify the effect of plane of occlusion & the compensating curves.
- The angulation of the cusp is more important than the height of the cusps.
- The mesiodistal cusp heights that interdigitate lock the occlusion so that reposition of the teeth due to setting of the base cannot take place. To prevent this problem, it is advocated that all mesiodistal cusp heights be eliminated in anatomic type teeth. With the teeth so modified, only the buccolingual inclines need be considered as determinants of balanced occlusion.

In shallow bite cases - cuspal angle should be reduced to balance the incisal guidance.

Deep bite cases with steep incisal guidance , the jaw separation is more during protrusion .Teeth with high cuspal inclines are required

Interaction of the five factor

- Of the four that we can control two of them.
- The incisal guidance and the plane of occlusion can be altered only a slight amount because of esthetic and physiologic factors.
- The important working factors for the dentist to manipulate are the compensating curve and the inclinations of cusp on the occlusal surfaces of the teeth.

CHARACTERISTICS OF BALANCED OCCLUSION IN COMPLETE DENTURES

In centric relation

- **Anterior teeth** - no contact
- **Posterior teeth** - multiple, uniform occlusal contacts.

In protrusive

- ***Anterior teeth-*** maxillary & mandibular teeth contact
- ***Posterior teeth-***
  - semi-anatomic/ anatomic-
    - Multiple posterior buccal cusp to buccal cusp & lingual cusp to lingual cusp contacts between maxillary & mandibular teeth.
  - Flat plane, neutrocentric, monoplane-
    - 2nd molar contact if increased compensating curve.
    - Balancing ramp contacts if maintain true flat plane.
    - If no curve or ramp & have incisal vertical overlap, can't balance in protrusive.

In lateral excursion: working side

- ***Anterior teeth-*** the maxillary & mandibular anterior teeth contact on the working side.

- ***Posterior teeth-*** the buccal & lingual cusps of the maxillary & mandibular posterior teeth are in contact. If lingualized occlusion, the maxillary lingual cusp will be in contact with the mandibular lingual cusp.

In lateral excursion: balancing side

- ***Anterior teeth-*** the maxillary & mandibular anterior teeth may contact on the balancing side.

- ***Posterior teeth-*** the lingual cusps of the maxillary teeth will be in contact with the buccal cusps of the mandibular teeth. With monoplane balanced occlusion, usually only the second molars are in contact or the balancing ramp. If monoplane but not balanced, may get contacts on balancing side but may lose the contact the further the mandible moves towards the working side. With cusped teeth multiple contacts of the posterior teeth are possible.

CONTACTS IN BALANCED OCCLUSION

- **Working side:**

  The mandibular buccal cusp ridges makes articular contact with the maxillary buccal cusp ridges as the mandibular lingual cusp ridges are making contacts with the maxillary lingual cusp ridges.
- **Balancing side:**

  The mandibular buccal cusps & their occlusal facing ridge, contacts maxillary lingual cusps & ridge.
- **Protrusion:**

  Incisal edges of the mandibular anterior teeth contact with the lingual surface of the maxillary anterior teeth. The mesiobuccal & lingual cusp ridges of the mandibular teeth contact the distobuccal & lingual cusp ridges of the maxillary teeth.

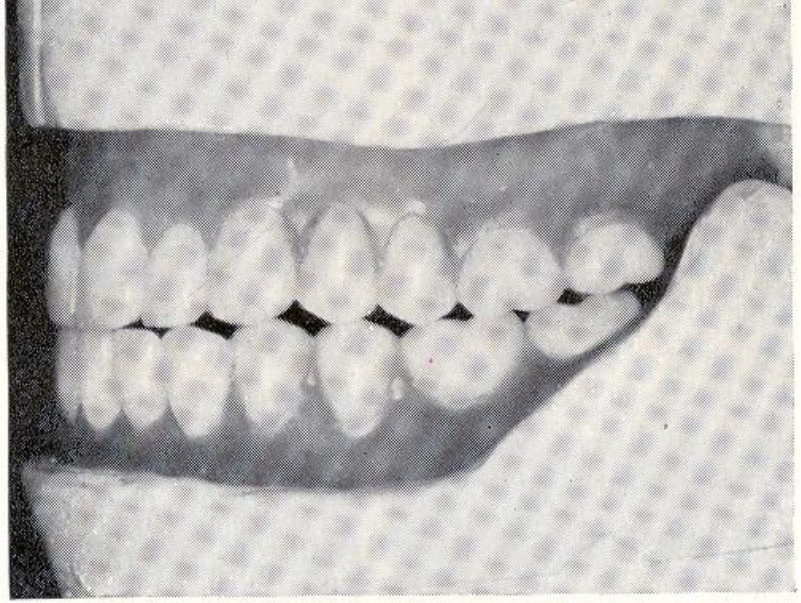


Fig. 162.—A balanced protrusive occlusion. Anterior teeth are edge-to-edge and there are posterior contacts.

A **B**

Fig. 163.—**A**, The working side of a balanced lateral occlusion. **B**, The balancing side of a balanced lateral occlusion.

SELECTIVE GRINDING

- Selective gliding is defined as the, "intentional alteration of the occlusal surfaces of the teeth to change their form" – GPT 8
- Teeth are altered by selective grinding to make simultaneous cusp tip to cusp tip contact on both sides of the arch when the jaws are in left or a right lateral position
- Avoiding remounting the dentures on articulator and selective grinding leads to,

1) A deformation of underlying soft tissues,
2) Discomfort, and
3) Destruction of the underlying supporting bone. Later occlusal errors may be concealed and impossible to locate and correct because of distorted and swollen tissues.

Methods of detecting occlusal errors:

a) Articulating paper:

- *it is a paper impregnated with blue dye*
- *It 's placed bilaterally and teeth are tapped together*
- *High points will show a dark staining or a dough nut shape blue circles*
- *High points are trimmed with carborumdum stone, till all contacts show an equal distribution of force*

Eg:- 40μ micro special color coating with liquid colors consists of many color-filled microcapsules.

Colors available are :- blue, green and red

(60μ) which is thin and tear resistant and is coated with liquid colours on both sides. The paper is also available in the horseshoe-shape. This paper is useful for marking dentures; the two colours can be used for centric and excursion markings. The horseshoe-shaped articulating papers are also especially useful for patients who tend to bite unilaterally during the occlusion test due to diminished resilience.

b)Wax template:

a softened wax is place between both dentures, areas of heavy contact will show thinning of wax or even a hole.

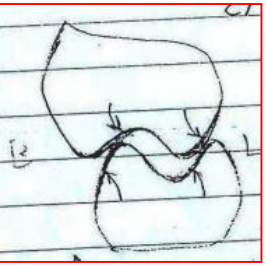
c) Abrasive pastes

its use has many disadvantanges. Shifting of base as a result of premature contact may result in altering the occlusion so that centric occlusion doesnot correspond to centric relation. Cusps that maintain the occlusal vertical dimension may be destroyed.

How to do a selective grinding:

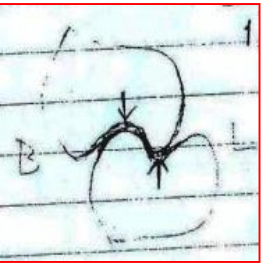
1) Lock the articulator condyles to allow for hinge movement only.
2) Use a blue articulating paper to mark teeth with high contacts in centric relation.
3) Loosen the condyles allow for eccentric movemnts.
4) Use a red articulating paper to mark teeth with high contacts at eccentric movements.
5) High points are evaluated and centric prematurities are removed.

a) Centric position errors:



1) pair of opposing teeth hold other teeth out of contact:

- deepen the fossae corresponding to cusps till other teeth came in contact.

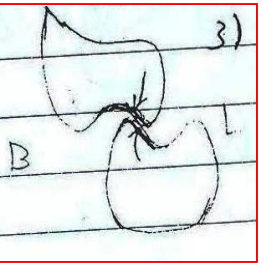


2) upper & lower teeth are nearly end to end:

- grind the inner inclines of upper buccal & lower lingual cusps.

- grind lingual of upper lingual cusps.

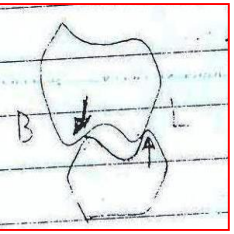
- grind buccal of lower buccal cusps.



3) upper teeth are far buccal to lower ones:

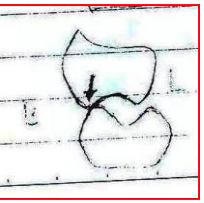
- grind the inner inclines of upper lingual cusps & lower buccal cusps.

b) Working side errors:



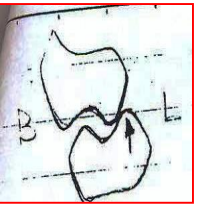
1) both upper buccal & lower lingual cusps are long:

- *grind the high cusp tips of non functional*



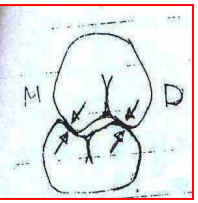
2) buccal cusps make contact but lingual don't:

- *grind the buccal cusp tips & alter their inclines (in) non functional cusps).*



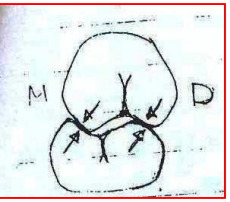
3) lingual cusps make contact but buccal don't:

- *grind lingual cusps & alter their inclines (of non functional cusp only).*



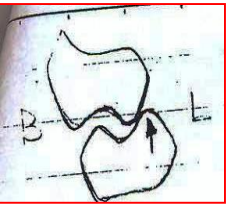
4) upper buccal & / or lingual cusps are mesial to intercuspation position:

- *reduce upper mesial inclines & lower distal inclines*



5) upper buccal & / or lingual cusps are distal to intercuspation position:

- *reduce upper distal inclines & lower mesial inclines*

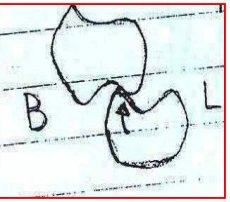


6) teeth on working side are out of contact:

-*selective grinding to balancing side*

c) balancing side errors:

1) balancing side show heavy contact, and working side show no contact:



- grind the inner incline of lower buccal cusp.

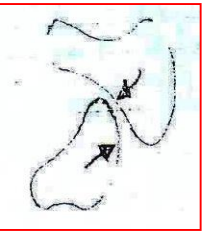
2) no contact on balancing side:

- grind the buccal upper cusps on lower lingual cusps of cusps on working side.

d) protrusive position errors:

1) anterior teeth show heavy contacts with no posterior contact:

- *reduce palatal surface of upper anteriors & labial surface of lower anteriors.*



2) posteriors show heavy contact with no anterior contact:

- *grind distal inclines of upper cusps & mesial inclines of lower cusps.*

"BULL Principle"

- In anterior teeth, lingual of upper & labial surface of lower teeth is grinded to eliminate any interference.

- Final result should be smooth gliding lateral excursion with working & balancing contacts.

- The multiple contacts should be smooth, uniform & in harmony with the TMJs & the neuro-muscular activity.

Those opposing

- In a study by **Heydecke et al** it was found that patient ratings of the prosthesis were not significantly different for a lingualised scheme as compared to a simple scheme with anatomic teeth.

- In a study by **Rehmann et al** it was concluded that a bilateral balanced occlusion primarily influences patient satisfaction with complete denture prosthesis.

- However on the contrary it was found in a study by **Kimoto** et al that among patient's provided with complete dentures with lingualised occlusion and bilateral balanced occlusion that those with lingualised occlusion displayed greater satisfaction with their denture retention.

➢In another study by **Heydecke et al**, they found that comprehensive methods used for fabrication of complete dentures including semi-anatomical lingualised teeth and a full registration did not greatly influence patients perceived chewing ability , when compared with more simple procedures. Anatomical teeth showed better patient satisfaction with chewing ability for tough foods.

➢ In a study by **Matsmaru** , he evaluated the influence of mandibular residual ridge resorption on masticatory measures of lingualized and fully bilateral balanced denture articulation. And he found that Lingualised Occlusion is the preferred occlusal scheme for patients with severe RRR.

- In a study by **Ohguri** to estimate which occlusion scheme shows best conditions of pressure distribution on supporting structures in a complete denture prosthesis it was found that in a lingualized occlusion and fully balanced occlusion a great occlusal force was not required for crushing hard food, and the stress to the supporting tissues is smaller than with monoplane occlusion.

- In a study by **Clough et al** it was found that majority of people preferred a lingualized occlusal scheme over monoplane scheme because of improved masticatory ability, comfort, and esthetics.

DIFFERENT CONCEPTS ABOUT BALANCED OCCLUSION

- GYSI'S CONCEPT
- FRENCH'S CONCEPT
- SEARS'S CONCEPT
- PLEASURE'S CONCEPT
- FRUSH'S CONCEPT
- HANAU'S QUINT
- TRAPAZZANO'S CONCEPT
- LOTT'S CONCEPT
- BOUCHER'S CONCEPT
- LEVIN'S CONCEPT

GYSI'S CONCEPT

- He proposed the *1st concept* towards balanced occlusion in *1914.*

- He suggested arranging *33⁰ anatomic teeth* could be used under various movements of the articulator to enhance the stability of the denture.

FRENCH'S CONCEPT

- In *1954* he proposed *lowering the lower occlusal plane* to increase the stability of the dentures along with balanced occlusion.
- He arranged upper first premolar with 5 degree of lingual occlusal incline, upper second premolar with 10 degree incline, upper molars with 15 degree incline. These cuspal inclines were arranged in curved occlusal plane and permitted occlusal balance laterally as well as anteroposteriorly

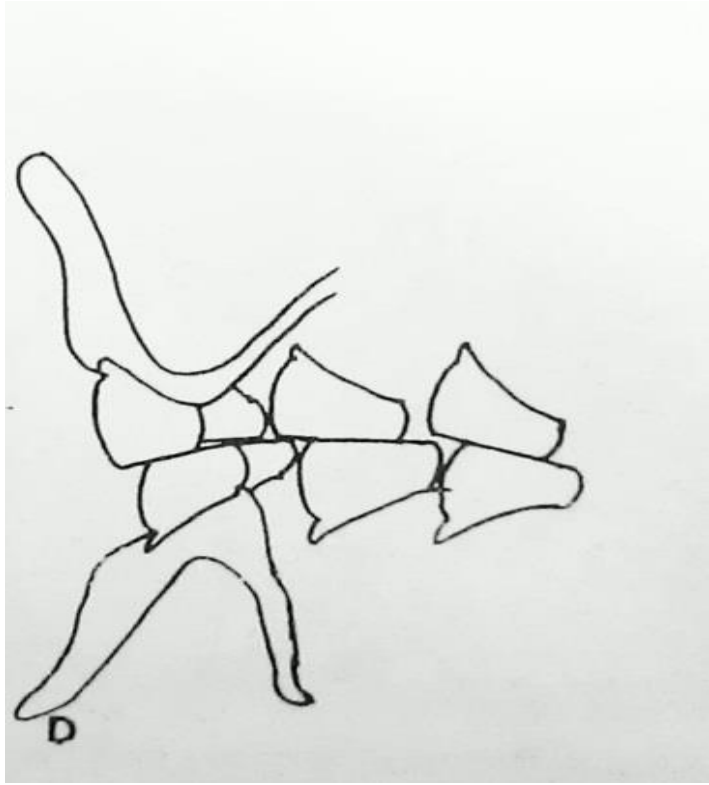
- He used *modified French teeth* to obtain balanced occlusion.

SEARS'S CONCEPT(1920)

- He proposed the balanced occlusion for *non-anatomic teeth* using *posterior balancing ramps* or an occlusal plane which curves anteroposteriorly & laterally.

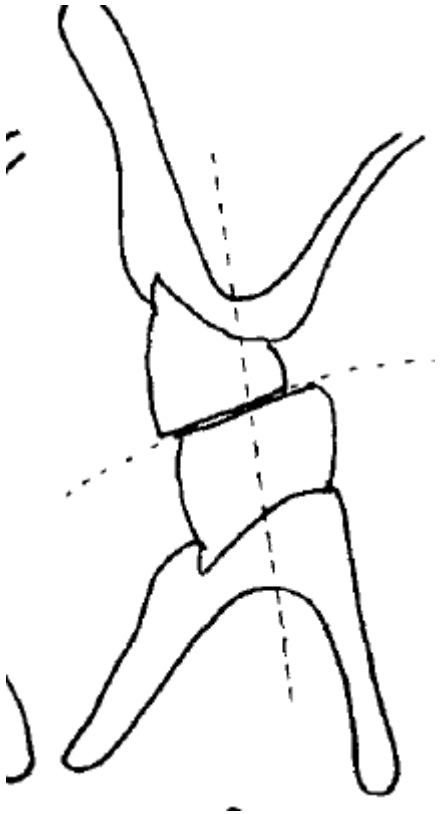
PLEASURE'S CONCEPT

In 1937, Dr. Max Pleasure described a reverse occlusal scheme in which the posterior teeth are set with buccal tilt providing total lever balance during function.



- Buccal tilt (reverse curve) is given at the premolars , no tilt or flat occlusal surface at first molars and a lingual tilt (Monson curve) to second molars.

- This scheme is especially beneficial for patients with class II jaw relation.
- The lever balance obtained in the premolar area is nearly at the anterio-posterior center of the denture foundation coinciding with the zone where class II patient functions during light to heavy intermediate chewing..

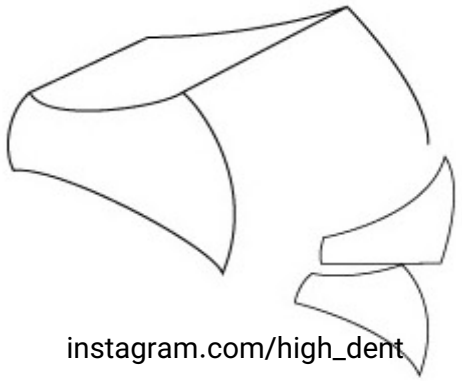


- The reverse curve is created to direct forces of occlusion lingually to favor stability of lower denture. Lingual tilt of the second molar provides a buccal rise to provide for a lateral balancing contact. A compensating curve is developed in the first and second molar area to provide for protrusive balance.

FRUSH'S CONCEPT(1966)

He advised arranging teeth in a *one – dimensional contact relationship*, which should be reshaped during *try – in* to obtain balanced occlusion. Intent of this occlusion was to remove occlusal deflective contacts and provides greater stabilization of dentures.

- buccal blades of the lower posterior teeth should form a perfect straight blade. This blade should be perfectly straight to support one-dimensional contact against the opposing occlusion.



" Hanau's Laws of articulation "
RUDOLPH L. HANAU

Nine factors governing the articulation are-

- Horizontal condylar guidance
- Compensating curve
- Protrusive incisal guidance
- Plane of orientation
- Buccolingual inclination of the tooth axis
- Sagittal condylar pathway
- Sagittal incisal guidance
- Tooth alignment
- Relative cusp height

TRAPOZZANO CONCEPT

According him –only 3 factors necessary for determining plane of occlusion

1.Condylar guidance
2.Incisal guidance
3.Cuspal angle

-He stated occlusal plane could be located at various heights to favour weaker ridge

-He also stated that by arranging cusped teeth-these curves are produced automatically

BOUCHER'S CONCEPT

- Boucher's concept is that

1. There are 3 fixed factors
   - -orientation of occlusal plane
   - -incisal guidance
   - -condylar guidance

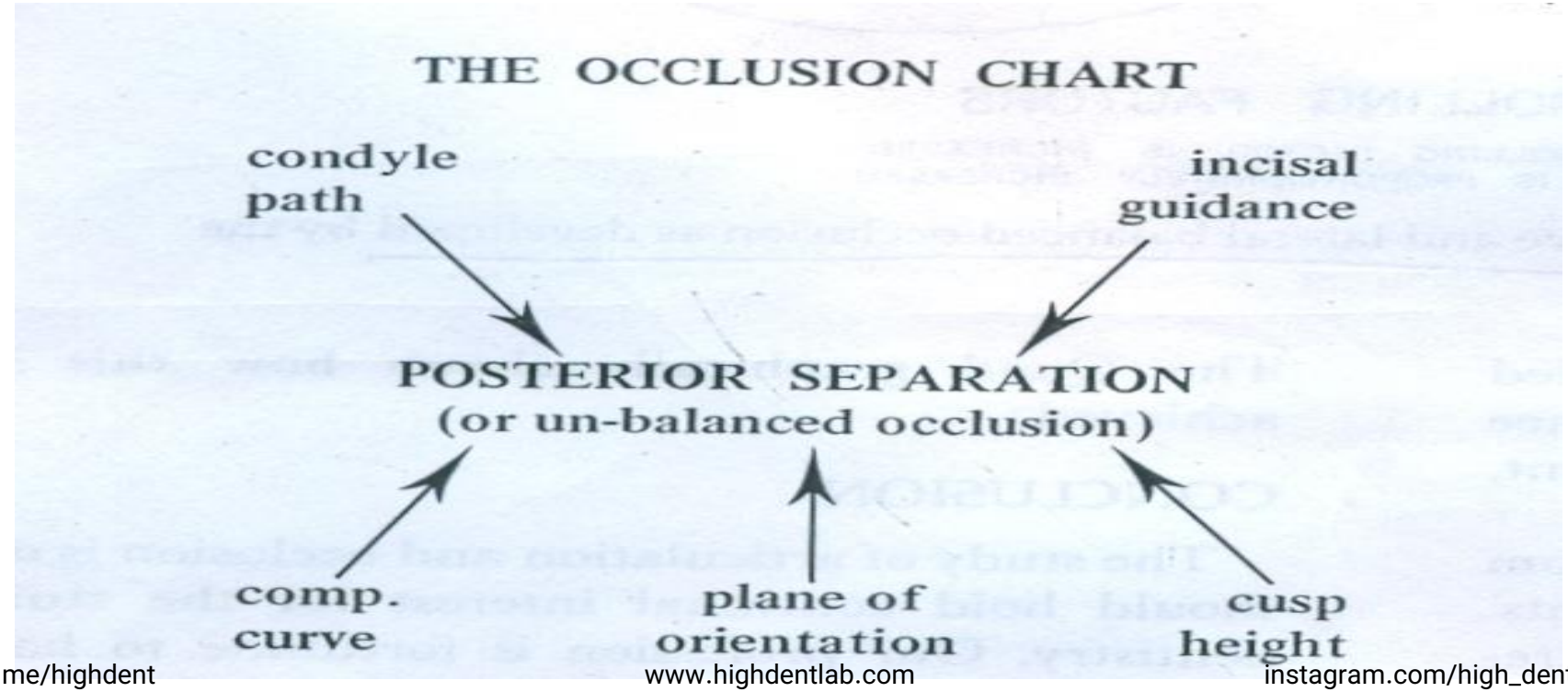
2. Angulation of cusp is more important than height of cusp

- Boucher felt that the compensatory curve is important since it helps in increasing the effective height of the cusps without changing the form.

- Boucher's disagreed with Trapazzano that the occlusal plane could be located at various heights to favour a weaker ridge and recommended that the plane be orientated exactly as when natural teeth were present.

The Lott concept :

- He clarified the laws of occlusion by relating them to the posterior separation that is the resultant of the guiding factor.



Levin's concept:

- Levin's concepts are similar to that of Lott's, but he eliminates the plane of occlusion.
- Levin has put forth the four factors in the form of a Quad.

The essentials of a Quad are:-

- The condylar guidance is fixed & is recorded from the patient.
- The incisal guidance is usually obtained from patient's esthetic & phonetic requirements. However it can be modified for special requirements.

E.g., the incisal guidance is decreased for flat ridges.

- The compensating curve is the most important factor in obtaining occlusal balance. Monoplane or low cusp teeth must employ the use of compensating curve.

- Cusp teeth have the inclines necessary for balanced occlusion but nearly always are used with a compensating curve.

Selection of posterior teeth:

- Selection of posterior teeth: Artificial teeth are the important part of the denture to establish occlusion.

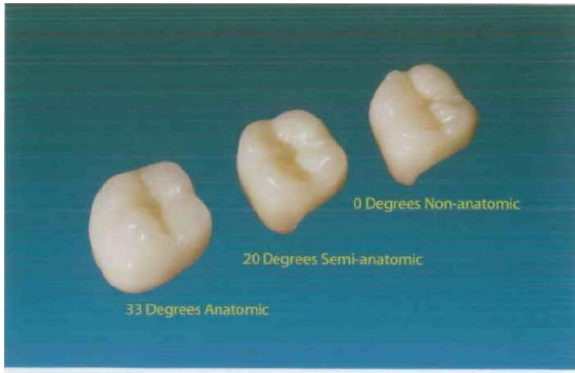
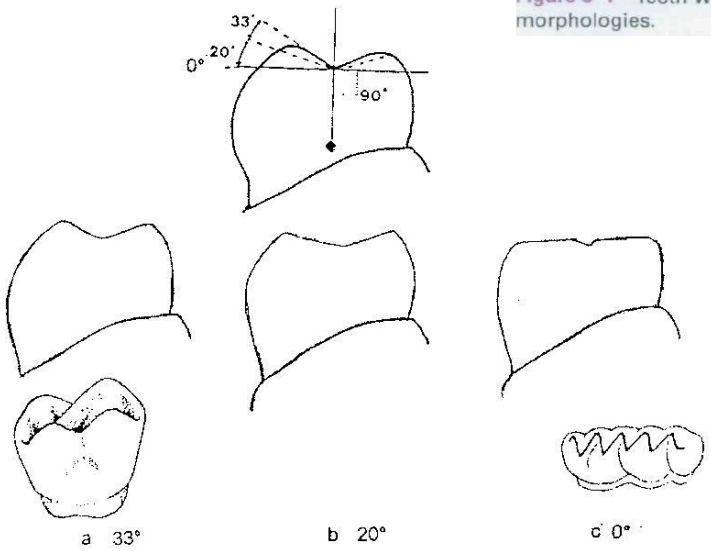


Figure 9–1 Teeth with 33°, 20°, and 0° tooth morphologies.

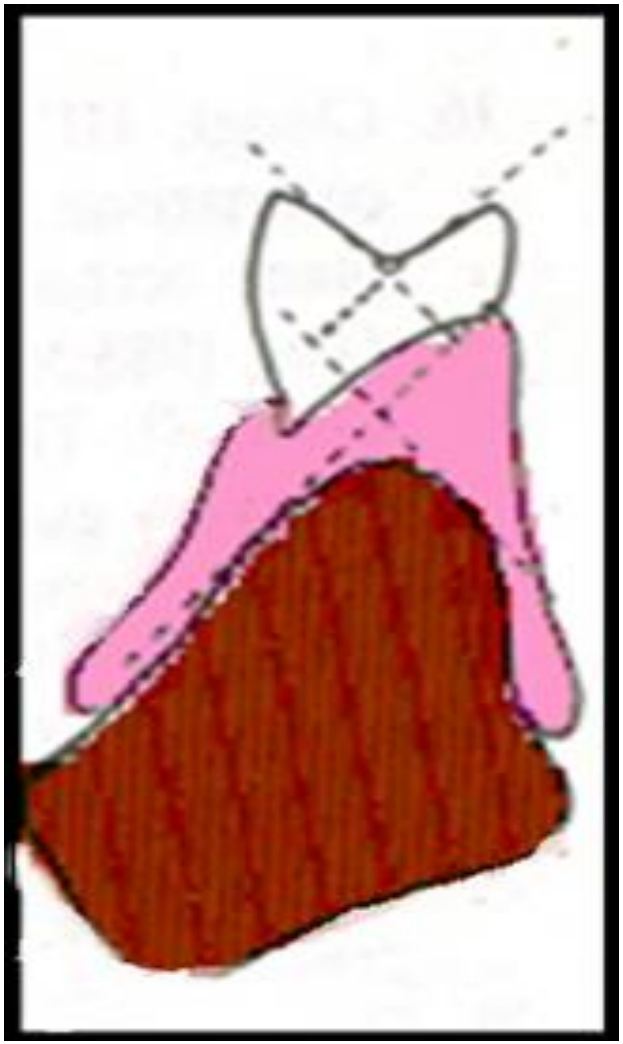
- These teeth can be divided into 3 main groups-
- Anatomic teeth
- Semi - anatomic
- Non-anatomic teeth.



Posterior teeth forms

Anatomic teeth:

- An anatomic tooth is one that is designed to simulate the natural tooth form.
- It has cusp heights of varying degrees of inclination that will intercuspate with an opposing tooth of anatomic form.
- The standard anatomic tooth has inclines of approximately 33 degrees or more and somewhat resembles natural teeth



CUSPAL ANGLE ≥ 30°

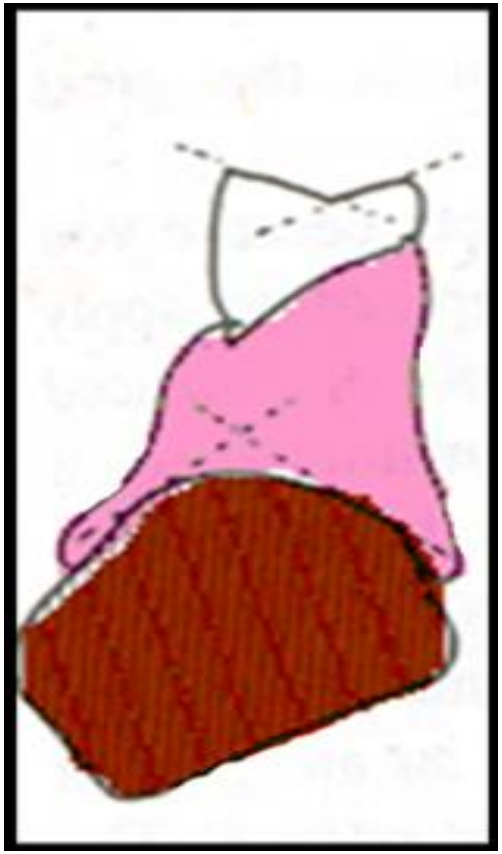
(CUSPED TEETH)

GOOD RIDGE

Advantages	Disadvantages
Ease in developing bilateral balanced articulation	The use of an adjustable articulator is mandatory.
Excellent esthetics	Mesiodistal interlocking will not permit settling of the base without horizontal forces developing. Harmonious balanced occlusion is lost when settling occurs.
More efficient in cutting food thereby reducing the forces directed on the ridge.	The bases need prompt and frequent refitting to keep the occlusion stable and balanced.
The contours are more like natural teeth; therefore, they will be more compatible with the surrounding oral environment	The presence of cusps generates more horizontal force during function.
Cusp teeth provide a resistance to denture rotation in relation to each other and to their bases, which is lacking in zero-degree teeth.	

Semianatomic teeth

- When the cusp incline is less steep than the conventional anatomic tooth form of 33 degree, it can be classified as a modified or semi-anatomic tooth.



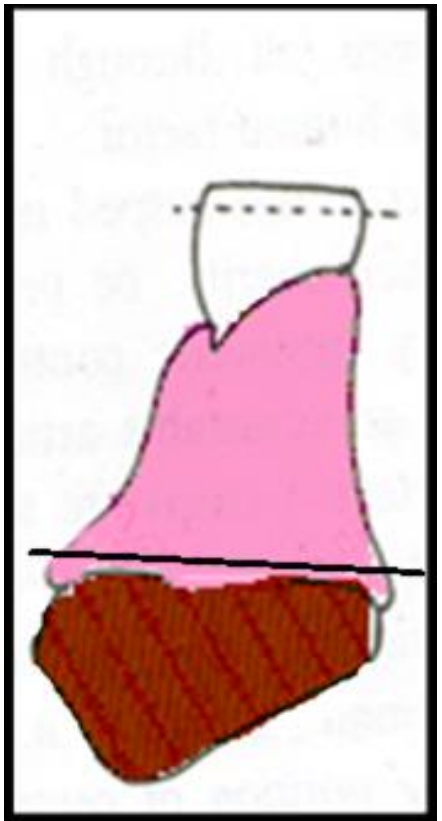
CUSPAL ANGLE
≤ 30°
(SEMI-ANATOMIC TEETH)

MODERATE RIDGE

Non-anatomic teeth:

- A nonanatomic tooth is essentially flat and has no cusp heights to interdigitate with an opposing tooth.

- Non anatomic teeth articulate on an essentially flat surface in only two dimensions.



CUSPAL ANGLE 0°- 5°

(FLAT TEETH)

POOR RIDGE

Advantages	Disadvantages
Versatility of use in class II and class III jaw relationships.	Bilateral and protrusive balance is not possible with a purely flat occlusion.
Creation of minimal horizontal pressures.	The flat teeth do not function efficiently unless the occlusion surface provides cutting ridges and generous spillways.
Cusp less teeth eliminate the possibility of deflective occlusal contacts	They cannot be corrected by much occlusal grinding without impairing their efficiency.
useful for cases with neuromuscular incordination	appear dull and unnatural to some patients and may create psychological problem concerning function.
In highly resorbed residual ridges or poor ridge, there is no support present to resist dislodgement by horizontal forces. Monoplane teeth offer less resistance to these forces.	They probably require the application of force in nearly horizontal direction of jaw movement to shear food and this results in lateral forces against the residual ridges.

Non balanced occlusion

- When requirements for balanced centric and eccentric occlusion and balanced sliding occlusion are accepted as requisites for balanced occlusion, it follows that all other occlusal arrangements are non-balanced occlusion.
- Non balanced occlusion is an arrangement of teeth with form or purpose.

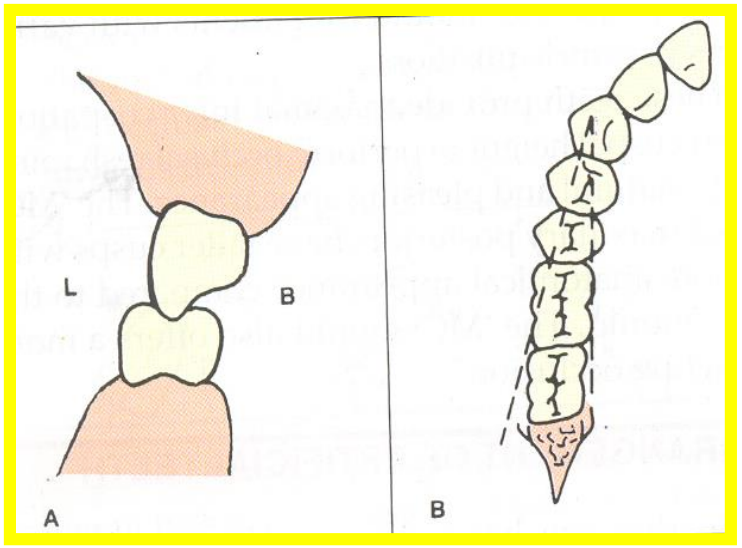
Types:-

- Spherical theory
- Organic occlusion
- Occlusal balancing ramps for protrusive balance
- transographics

Concepts of non balanced occlusion

- **Pound's concept** :monoplane occlusion stresses the importance of phonetics and esthetics. He basically proposed lingualized occlusion , wide lower fossa sharp upper lingual cusps. The buccal cusp of lower posterior teeth were reduced to avoid non vertical forces.

No buccal contact of upper and lower teeth Occlusal surface is reduced such that they lie between triangle formed between mesial end of canine and two sides of retromolar pad.



- **Gold surface occlusal concept**-33 degree teeth with full occlusal gold surface are used to attain non balanced concept. Extreme vertical overlaps producing cuspid guidance are frequently used resulting in disocclusion of posterior teeth away from maximum intercuspation position.

- **Hardys concept-** A straight horizontal occlusal plane using non anatomical teeth is used to establish non balanced occlusion.

- **Occlusal pivots by Sears**- The pivots were used to place the mandible in equilibrium by concentrating the load in the molar regions. This scheme reduced the injury to the temporomandibular joint and also reduced the stress in the anterior region.

- **Kurth's concept-** refers to balanced occlusion when mandible is in centric relation to the maxillae. He disregarded incisal and condylar guidance, eccentric balance and sets noncuspal teeth with reverse compensatory curve

MONOPLANE OCCLUSION

Acc. To G.P.T -8 it is defined as an occlusal arrangement wherein the posterior teeth have masticatory surfaces that lack cuspal height .

Hall (1929) is credited for the introduction of Zero degree teeth calling them inverted cusp tooth, but these teeth have the problem of clogging of food in the depressions onto the occlusal surfaces.

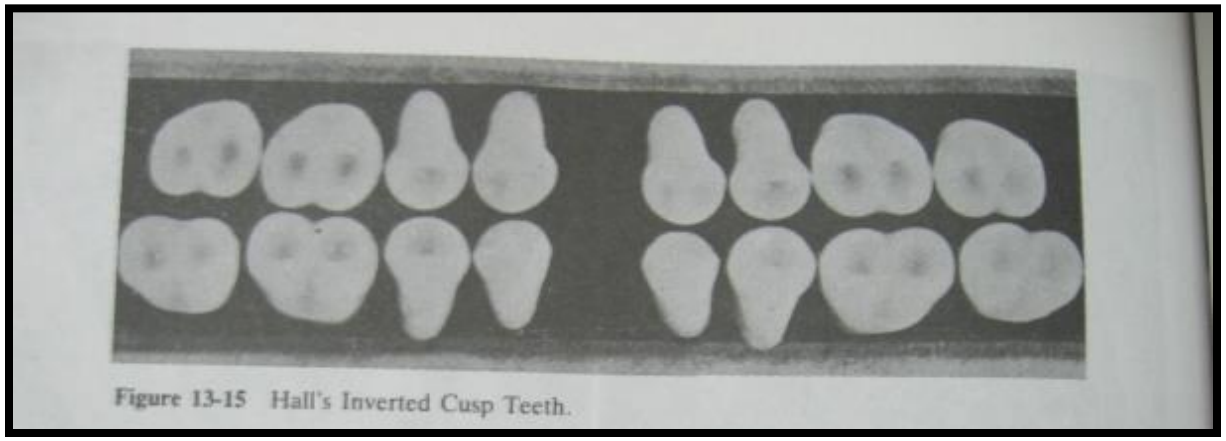
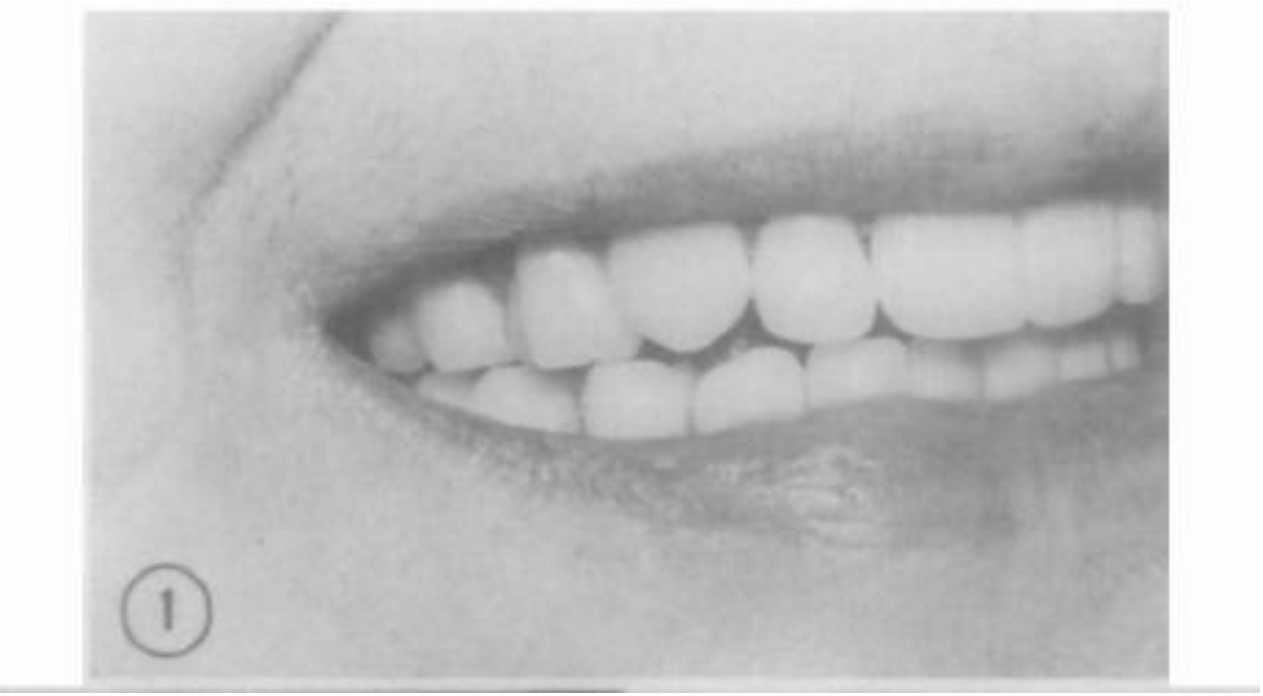


Figure 13-15 Hall's Inverted Cusp Teeth.

Advantages of monoplane occlusion / zero degree teeth

- They are more adaptable to unusual jaw relations such as Class II and Class III malocclusions cross bite set up.
- Zero degree teeth impart to the patient a sense of freedom because they do not lock the mandible in one position only.
- Centric occlusion is more of an area and less of a precise point in these teeth hence they allow closure of jaws over a broad contact area.
- Minimal horizontal pressures are created because of elimination of incline plane.
- simplified and less time consuming technique and offer greater comfort and efficiency for longer duration.
- They accommodate better to the inevitable negative changes in the ridge that occur with aging.

- Disadvantages



1. Poor esthetics
2. Decreased masticatory efficiency
3. More difficult to obtain balanced occlusion

As far as balanced occlusion is concerned in monoplane occlusion two important concepts prevail-

A) **Non Balanced occlusion (in centric relation only)** E.g Neutrocentric concept.

B) **Balanced occlusion in centric relation and lateral excursions**

This can be achieved with the use of compensating curve, balancing ramps, Tripodization by tilting the 2nd maxillary and mandibular molars, and using monoplane with zero overbite (but this will compromise phonetics and esthetics.)

Neutrocentric concept

Devan in 1954 suggested the concept of neutrocentric occlusion

- This concept of occlusion assumes that the anterior-posterior plane of occlusion should be parallel to the denture foundation area and not dictated by condylar inclination.
- There is no compensating curves involved
- There is no vertical overlap of anterior teeth

Acc. to DeVan the main objectives of neutrocentric concept are-

I – Neutralization of the inclines and,

II – Centralization of the occlusal forces acting on the denture foundations.

In order to attain these objectives, it is necessary to reduce the size and number of teeth and to abandon attempts to secure balancing contacts in eccentric positions beyond the range of masticatory stroke.

When using this concept of occlusion the patient is instructed not to incise the bolus. With this tooth arrangement DeVan noted that "the patient will become a chopper, not a chewer or a grinder."

According to DeVan, the five factors involved in the relation of the teeth to dental foundation are:

(a) POSITION

There is probably no single tooth factor as important as position.

- ✓ posteriors should be positioned in as lingually on the foundation as allowed by the tongue so that forces would be parallel to support areas

1. denture will be more stable due to enhanced lever balance
2. more of the osseous foundation will be saved from the harmful tensile and shearing forces acting on bone and the overlying mucosa.

B) PROPORTION

- ✓ DeVan recommends reduction in the proportion of the artificial teeth as compared to size of natural teeth.
- ✓ Reduction in proportion is necessary to develop centralization of forces, Reduction of frictional forces developing on occlusal surfaces which will transfer to the underlying mucosa and bone.

- ✓ Reduction by 40% in width is possible without serious diminution of the food table.

C PITCH

Pitch is synonymous with inclinations or tilt .

- In neutrocentric concept the plane of occlusion should be oriented so that it is midway and parallel to mean foundation planes of the maxilla and the mandible.

- The compensating curve should be neutralized so that posteriors are placed on a plane rather than on spherical surface.

D) FORM

- Artificial posterior teeth should be devoid of projecting cusps.
- Contacting occlusal lines should be on a single plane. This arrangement will avoid interference from TMJ and their inclines.

E) NUMBER OF TEETH

- DeVan recommends reduction in no. of teeth from 8 per denture to 6 per denture. This will aid in stability by freeing the lower ridge molar incline of occlusion.
- Elimination of 2^{nd} molar will result in establishment of centralization and reduction in occlusal area.

Monoplane Occlusion (Neutrocentric Concept)

B) Balanced occlusion in centric relation and lateral excursions

The 2nd category in monoplane occlusion involves bilateral balance in centric and eccentric relations

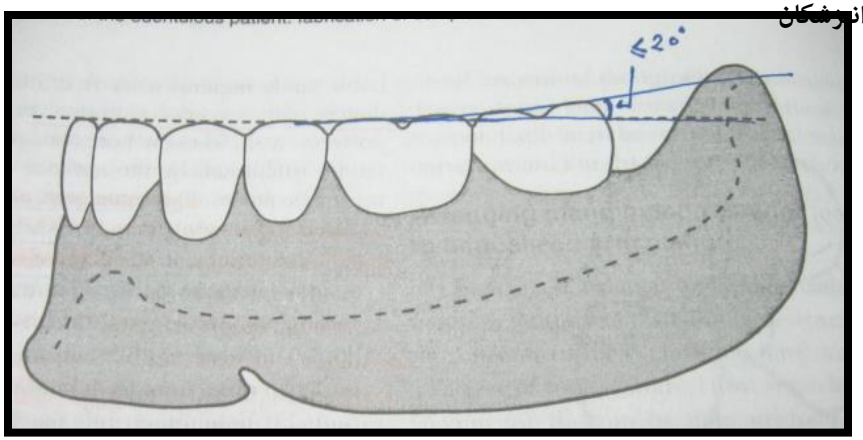
A) With Compensating Curve

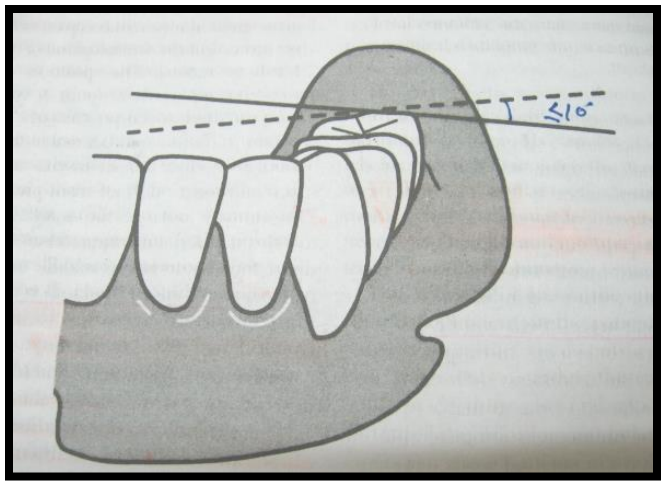
Acc. to this concept –

A) No. of posterior teeth should be 3, i.e. mandibular 1st premolar should be omitted.

B) Antero-posterior comp. curve begins at the DMR of the 2nd premolar and continues till 2nd molar.

- The amount of this curve is dependent on steepness of the condylar guidance, but is rarely more than more than 20 degree from horizontal. This curve is used to provide the needed tooth structure for protrusive balancing contacts





C) Mediolateral compensating curve is also needed to achieve lateral balanced contacts. This curve is initiated from first replacement tooth and continued till the second molar. The degree to which the facial cusps are elevated to establish this curve will vary with the condylar and incisal guidances. The curve usually does not exceed 5-10 degree.

B) With Balancing Ramps (NEPOLA 1958)

- Balancing ramps provide a tripodization of the denture base.
- As the patient moves the mandible from centric relation to protrusive or lateral positions, there is smooth contact anteriorly on the teeth and posteriorly on the ramps.

The balancing contact give improved horizontal stability to the dentures. Esthetics and phonetics are greatly enhanced because there is more freedom in placing anterior teeth.

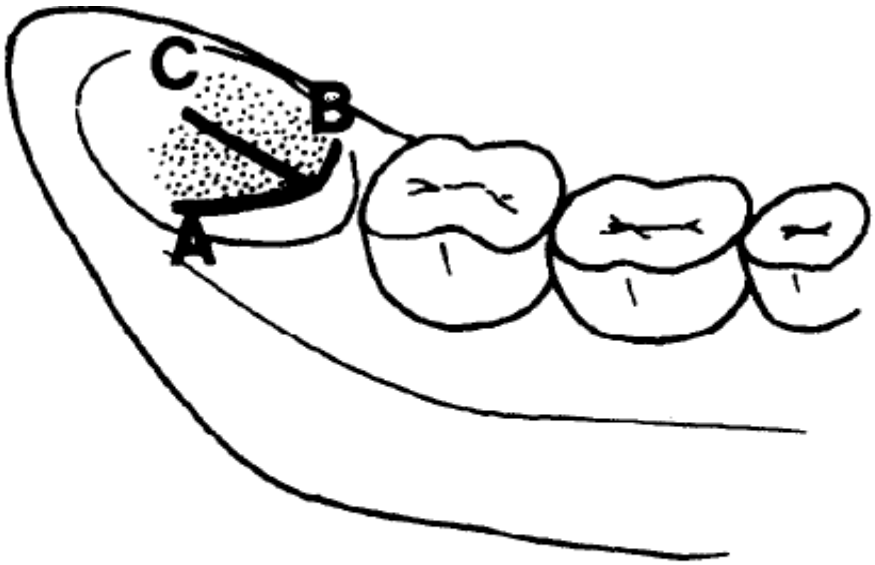


Fig. 2. Contact area on balancing ramp. Border positions are balancing contact *(A)*, working contact *(B)*, and protrusive contact *(C)*. Contact should be established for intermediate excursions *(shaded area)*.

- The ramps can be developed after the try-in of the waxed dentures or at the time of clinically remounting the dentures at the insertion appointment
- The procedure is performed on a properly adjusted articulator.
- This technique can be applied to existing dentures by clinical remount.

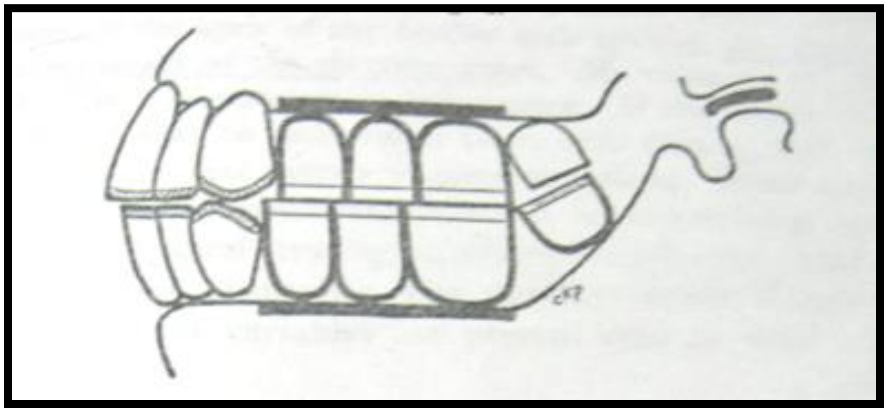
Monoplane with Balancing Ramps

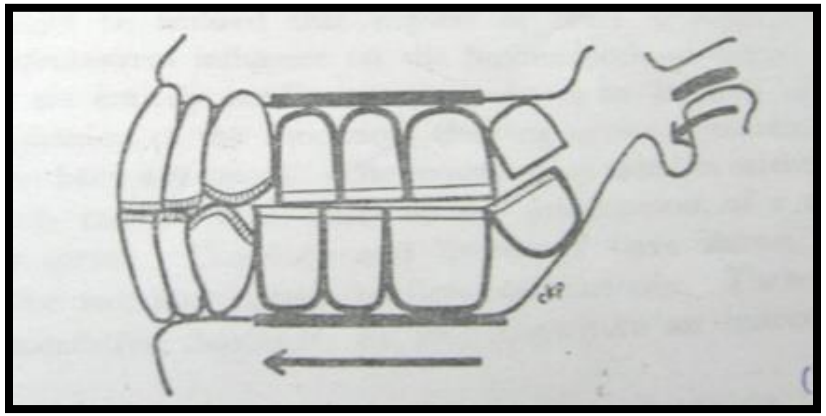
Bilateral balanced occlusion can also be obtained with nonanatomic posterior teeth if balancing ramps are employed. In all lateral excursions you should observe at least three points of contact bilaterally if bilateral balance is to be achieved.

C) With Tilting The Second Molars

Acc to C G Porter, mandibular second molar is inclined to provide contact with maxillary dentures in all excursions.

The maxillary molars are also inclined but left out of centric contact.

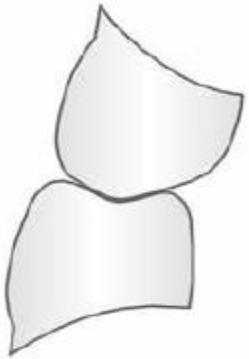




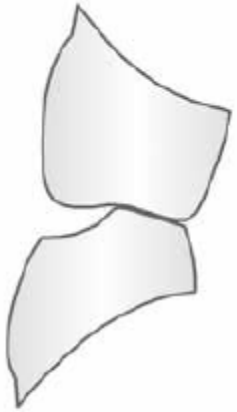
Lingualized occlusion

- Acc. to GPT-8, lingualized occlusion is defined as the form of denture occlusion in which the maxillary lingual cusps articulate with the mandibular occlusal surfaces in centric, working and balancing mandibular positions.

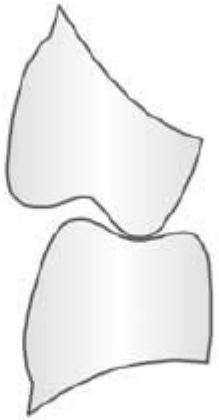
- Although S. H. Payne(1941) has being credited for being the first one to describe, it was Gysi (1927) who used this scheme approximately 20 years earlier(1927).



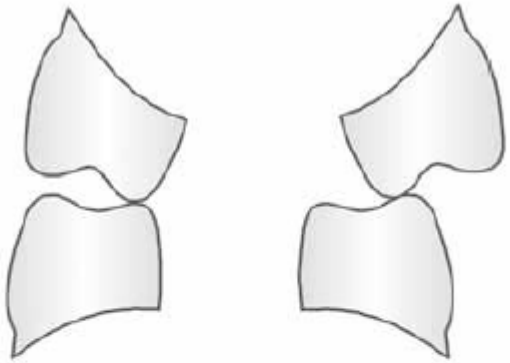
1 Gysi's Cross-Bite Posterior Teeth were introduced in 1927.[5] Maxillary posterior teeth featured single, linear cusps that fit into shallow mandibular depressions.



2 French's Modified Posterior Teeth were introduced during the 1930s.[6] Mandibular posterior teeth displayed relatively flat, narrow occlusal surfaces that fit into shallow maxillary fossae.



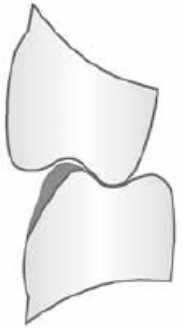
3 Payne recontoured existing 30-degree tooth forms to produce readily attainable form of lingualized occlusion.[7]



4 According to Payne, maxillary lingual cusps were to maintain contact with mandibular teeth in centric and eccentric positions, while maxillary buccal cusps were never to contact opposing surfaces in any maxillomandibular relationship.[7]

In 1941, Payne reported on Farmer's posterior setup that used 30(cusp teeth that were selectively reshaped to fulfill the concept of lingualized articulation and meet the individual requirements of edentulous patients.

- During the ensuing years, Pound 1970 also championed lingualized occlusion.. He carefully reshaped mandibular fossae to produce cross-arch balance. Like his predecessors, Pound ensured that maxillary buccal cusps did not contact mandibular teeth during eccentric mandibular movements.
- He accomplished this by reducing the facial surfaces of the mandibular posterior teeth rather than elevating the buccal cusps of the maxillary teeth



5 Pound created lingualized arrangements using combination of steep maxillary cusp angles (>30 degrees) and moderate-to-shallow mandibular cusp angles (<20 degrees).[8,9]

MYERSON'S LINGUALIZED INTEGRATION

- Myerson proposed specialized tooth Molds for arranging teeth in lingualized occlusion.
- Two different molds for the maxillary posterior namely

✓ Maximum contact (Mc) mold. - accurate centric position , more anatomical appearance ,more exacting occlusion

- control contact (cc) mold -variation in centric position.

✓ The remaining teeth are common for both these molds.

Organic concept of occlusion

- Mutually protected occlusion is also known as canine protected occlusion or ''organic" occlusion. It had its origin in the work **of D'Amico, Stallard and Stuard. (1963)**
- According to this concept of occlusion, the anterior teeth bear the entire load and the posterior teeth are disoccluded in any excursive position of the mandible.
- In organic or organized occlusion the arrangement of teeth should be in harmony with the muscles& joints in function. The muscles & joints should determine the mandibular position of occlusion without tooth guidance.

- Organic occlusion has three phases of mutually interdependent protection
  1. *The posterior teeth should protect the anterior teeth in centric occlusal position*
  2. *The maxillary incisor should have vertical overlap sufficient to provide separation of the posterior teeth when the incisors are in end-to-end contact.*
  3. *In lateral mandibular position outside the masticatory cyclic movement the cuspid should prevent contact of all other teeth.*
- An articulator capable of receiving and reproducing pantograms in 3 planes is recommended to develop the organic concept of occlusion.
- This type of occlusion is more applicable in natural dentition and fixed partial denture, than in complete dentures

During crossover, guidance is from anterior teeth.

Table I. Advantages of various cusp forms suggested in the literature

Cusp form	*Advantages*
Anatomic occlusion	1. Penetrates food more easily 2. Resists the rotation of denture bases through cusp interdigitation 3. Provides better esthetics 4. Acts as a guide for proper jaw closure
Nonanatomic occlusion	1. Does not lock the mandible in one position 2. Permits the use of less time-consuming techniques 3. Minimizes horizontal stress because of the absence of inclined planes 4. Adapts easily to Classes II and III jaw relations 5. More easily adjusted after changes in vertical and horizontal relations 6. Easier to arrange in crossbite

Table II. Disadvantages of various cusp forms suggested in the literature

Cusp form	*Disadvantages*
Anatomic occlusion	1. More occlusal disharmony during settling and difficult to correct by adjustment 2. Precise jaw closure and base stability required for interdigitation 3. Increased horizontal forces 4. Difficult to adapt to abnormal jaw relationships
Nonanatomic occlusion	1. Poor esthetics 2. Decreased masticatory efficiency 3. More difficult to obtain balanced occlusion 4. Psychological

Review of literature

Vincent R. Trappozano(1960) carried out tests to check the efficiency of balanced and non-balanced occlusion.

-He selected few patients depending on inter-ridge space, intelligence and experience of wearing dentures and on basis of type of residual ridge. Patients were from 55 years to 70 years.

-All had worn dentures with 23degrees posterior teeth in balanced occlusion.

- Comparative chewing tests of occlusal efficiency were made with carrots and freshly roasted peanuts.

-These were selected as test foods because they don't readily disintegrate into fine particles.

Trappozano V.R.: An experimental study of the testing of occlusal patterns on the same denture bases. JPD.;1952; 440-457.

-The number of strokes made upto time of deglutition were counted and averaged.
-The average was noted for each patient and this was the number of strokes permitted.

-A 100 mesh screen was used as sieve to study the size of remaining particles and weight changes in test materials after mastication by the patient.

-Out of 12 patients examined, 9 patients had greater efficiency of chewing with balanced occlusion.

- In 3, efficiency was greater with non balanced occlusion when carrots were chewed. When peanuts were chewed no difference was noticed.

Trappozano V.R.: An experimental study of the testing of occlusal patterns on the same denture bases. JPD.;1952; 440-457.

H.O. Beck (1973) grouped the balanced and non-balanced occlusions into five categories each.

Non-balanced occlusions are:

a. Modified cusp teeth with upper lingual cusps opposing widened lower fossa and a reduction of buccal cusps of lower posterior teeth.

b. Cusp teeth arranged in typical occlusion with disocclusion by cuspid guidance in eccentric positions.

c. Non-anatomic teeth arranged in flat occlusal plane anteroposteriorly and laterally.

d. Non-anatomic teeth arranged high in second and first molar regions.

e. Non-anatomic teeth arranged in flat plane anteriorly but with reverse lateral curve.

Beck H.O.: Occlusion as related to complete removable prosthodontics. JPD,1972;27:246-256.

Five balanced occlusions are:

a. Anatomic and semi-anatomic teeth arranged in classic interdigitations.

b. Semi anatomic teeth with buccal reduction of lower posterior teeth.

c. Non-anatomic teeth arranged on curves anteroposteriorly and laterally.

d. Non-anatomic teeth arranged reverse curve laterally but with second molar ramps for balancing contacts.

e. Semi-anatomic teeth with only a linear contact of lower posterior teeth with upper occlusal surfaces balanced anteroposteriorly and laterally.

Summary

The nature of the supporting structures for the complete dentures and the forces directed to them by the occlusion creates a special biomechanical problem.

Balanced occlusion is one of the most important factors which will favor the stability of the base; and help in preservation of the supporting structures by reducing the lateral forces.

" Thereby signifying its importance in complete denture fabrication."

Conclusion

"Regardless of ones belief about the superiority of a particular form of occlusion; the anatomical, mechanical, physiologic and esthetic limits presented by the patient should determine the choice of the occlusal scheme".

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