ABSTRACTS
There are several schools of thoughts on occlusal schemes in complete denture and some clinician believe there should be cusps on the teeth and must be in complete harmony with the stomatognathic system. Some believe that cuspleless teeth create minimum horizontal force to unseat denture. Monoplane occlusion imparts a sense of freedom to the patient and do not lock the mandible in one position. It eliminates horizontal force, which is more damaging than vertical forces. In the present case, the patient was rehabilitated with a complete denture using cuspleless teeth since the patient had a deviated mouth opening. Monoplane occlusal scheme seems to be more adaptable to the unusual jaw relation.

Key words: Cuspleless teeth, Monoplane occlusion, Balancing ramps.

INTRODUCTION
Numerous concepts, techniques and philosophies have been documented concerning about complete denture occlusal schemes.

Some believe that cuspleless teeth create minimum horizontal force to unseat denture. Many investigations on a scientific level have not been able to prove, which occlusal scheme is superior in function or which best meets the requirements of biologic and physiologic concerns for each patient.

OCCUSION is defined as “The static relationship between the incising or masticating surfaces of the maxillary or mandibular teeth or tooth analogues”.GPT 9

Occlusal scheme is defined as the form and the arrangement of the occlusal contacts in natural and artificial dentition. The pattern of occlusal contacts between opposing teeth during centric relation and functional movement of the mandible will be determined by the occlusal schemes. The quantity and the intensity of these contacts determine the amount and the direction of the forces that are transmitted through the bases of the denture to the residual ridges. That is why the occlusal scheme is an important factor in the design of complete denture prosthesis.

Occlusal schemes have been classified into:
1. Neutrocentric occlusion
2. Lingualized occlusion
3. Non anatomic occlusion (Monoplane occlusion)
4. Linear occlusion
5. Balanced occlusion

Neutrocentric occlusion is at the far right of the occlusal spectrum and the exact opposite of the anatomic occlusion. It was developed by De van.
De Van coined the term neutrocentric to embody the two key objectives of his occlusal scheme,

A. The neutralization of inclines.

B. The centralization of forces which act on the basal seat when the mandible is in centric relation to the maxillae.

2. Lingualized occlusion

Concept was introduced by Alfred Gysi in 1927 and described by S.H. Payne (1941)

Lingualized occlusion can be defined as, the form of denture occlusion where the maxillary lingual cusps articulate with the mandibular occlusal surfaces in centric working and non-working mandibular positions

3. Monoplane occlusion:

Sear introduced monoplane occlusion with balancing ramps. According to this concept, teeth which are flat mesiodistally and buccolingually are used, and oriented as close as possible parallel to the maxillary and mandibular mean foundation plane.

4. Linear occlusion:

According to this concept, teeth which are flat mesiodistally and buccolingually are used, and oriented as close as possible parallel to the maxillary and mandibular mean foundation plane.

Linear occlusion is a one dimensional contact between two opposing posterior teeth. The contact occurs only in one dimension which is the length of the contacting blade (not surface). This blade, being always in the form of a straight line, geometrically constitutes “length” without either “width” or “depth” of occlusal contacts.

5. Balanced occlusion:

It is the bilateral, simultaneous, anterior and posterior occlusal contact of teeth in the eccentric and centric positions. It is not seen in natural dentition.

**CASE REPORT**

A male patient named Ravinder Singh (figure 1), age 36 years reported to the department of prosthodontics and crown and bridge in Sri Guru Ram Das Institute Of Dental Sciences And Research, Amritsar, with the chief complaint of missing teeth in upper and lower jaw and wanted their replacement. Patient got extractions done 10 years back due to loose and broken teeth and had not used a complete denture before. Patient had an accident 11 years back causing trauma to the head, temporomandibular joint and jaw bones. Facial form of the patient was tapering with straight facial profile. Lip support was inadequate and lips were thin. On examination of temporomandibular joint clicking on the left side and deviated mouth opening towards right side was observed.

Maxillary and mandibular Arch form was ovoid whereas ridge form was rounded in case of maxilla and low well rounded for mandible. Ridges were parallel with class II ridge relation.

Conventional impression technique was used to make the primary impressions for maxillary and mandibular arches with the help of impression compound. Custom special trays were fabricated with autopolymerising resin, border molding with low fusing green stick compound was done and final impressions were made with zinc oxide eugenol impression paste. Final casts were poured with dental stone. Occlusal rims were made, checked in patients mouth, jaw relations were made to record horizontal and vertical dimensions.

Teeth arrangement was done in a conventional way following the monoplane occlusion concept using non-anatomical teeth, and trial was done in the patients mouth (figure 2).

Denture was processed in a conventional manner and after finishing and polishing denture insertion was done (figure 3), and post-insertion instructions were given to the patient.

Follow-up was done at 1 week, 1 month and 3 months. Patient was satisfied with the denture.

**DISCUSSION**

Monoplane occlusion:

According to this concept, teeth which are flat mesiodistally and buccolingually are used, and oriented as close as possible parallel to the maxillary and mandibular mean foundation plane.

**Indication:**

1. Abnormal closure imbalance, trauma, neuromuscular disturbances.
2. Posterior displaceable mucosa.
3. Mutilated, tortuous ridges with an excessive denture space.
4. If ridges are flat or knife edge, rendering dentures more susceptible to horizontal force.
5. When chewing pattern is milling type with broad excursions.
6. If maximum of vertical force and a minimum of horizontal stress is desired.

Monoplane occlusion can be balanced by following methods: Incline the mandibular second molar to provide contact with the maxillary denture in all excursions, the maxillary second molars are similarly inclined but left out of centric contact. The use of customized balancing ramp placed distal to the mandibular second molar. Ramp provides tripodal effect of contacts of denture bases. In eccentric relation, there is smooth contact anteriorly on teeth and posteriorly on the balancing ramp. Balancing ramp improves horizontal stability of the denture.
Advantages:

1. They are more adaptable to the unusual jaw relation such as class II and class III relations, used easily in cases of variations in the width of maxillary and mandibular jaws, cross bite.
2. These impart a sense of freedom to the patients, do not lock mandible in one position.
3. They eliminate horizontal forces, which are more damaging than vertical forces.
4. Because the monoplane teeth occlude in more than one relationship, so centric relation is developed to an area instead of a point.
5. Monoplane teeth permit the use of a simplified and less time consuming technique and offer greater comfort and efficiency for a longer period.
6. They accommodate better to the negative changes in the ridge height that occur with aging.

Disadvantages:

1. No vertical component to aid in shearing during mastication.
2. Patients may complain of lack of positive intercuspation position.
3. Esthetically limited.
4. Occlude only in two dimensions, but the mandible has a three dimensional movement due to its condylar behaviour.

OTHER OCCLUSION SCHEMES

1. Neutrocentric occlusion: There are five elements in this occlusal scheme:

   I. Position:
   The posterior teeth are positioned over the posterior residual ridge as far lingually as the tongue would allow, so that forces would be perpendicular to the support areas.

   II. Proportion:
   Reduction of tooth width upto 40%. Reduced vertical stress on the ridge by narrowing the occlusal table. Forces are centralized without encroachment on the tongue space.

III. Pitch:

   Pitch or inclination or tilt There is no compensating curve and no incisal guidance. This positioning directs the forces perpendicular to the mean osseous foundation plane.

IV. Form:

   Flat teeth with no deflecting inclines. Reduced destructive lateral forces and keeps masticatory forces perpendicular to the support.

V. Number:

   The posterior teeth are reduced in number from eight to six. This decreases the magnitude of the occlusal force and centralize it to the second premolar and first molar area.

Advantages:

1) Technique is simple and requires less precise records.
2) Ideal for a patient who has resorbed friable ridges.
3) By removing inclines, the lateral forces, which are very destructive to the residual ridges, are reduced.
4) Because the neutrocentric technique provides an area of closure and does not lock the mandible into a single position. Thus ideal for Geriatric patients with limited oral dexterity.
5) It is especially good for Class II (retrogнатic), Class III (prognathic) and crossbite cases

Disadvantages:

1) It is the least esthetic of the five basic occlusal schemes.
2) Moving the teeth lingually and altering their vertical position may not be compatible with the tongue, lip and cheek function.
3) Impairs mastication because of poor bolus penetration.

This type of occlusion cannot be balanced. When using this concept of occlusion the patient is instructed not to incise the bolus, with this tooth arrangement, De van noted that “the patient will become a chopper, not a chewer or a grinder.”

2. Lingualized occlusion

Lingualized occlusion can be defined as, the form of denture occlusion in which the maxillary lingual cusps articulate with the mandibular occlusal surfaces in centric working and non-working mandibular positions.
Lingualized occlusion should not be confused with placement of the mandibular teeth lingual to the ridge crest.

**Indications:**
1) When patient places high priority on esthetics but oral conditions indicate a non-anatomic occlusal scheme.
2) When a complete denture opposes a removable partial denture.
3) When a more favorable stress distribution is desired in patients with parafunctional habits

**Advantages:**
1) Lingualized occlusal concept is a simple technique requiring less precise records than fully balanced occlusion and is similar in requirements to nonanatomic teeth set on a curve.
2) Most of the advantages attributed to both anatomic & non-anatomic forms are retained.
3) Cusp form is more natural in appearance compared to non-anatomic tooth form.
4) Good penetration of food bolus is possible. This may reduce the lateral chewing component.
5) Vertical forces are centralized on mandibular teeth & it provides an area of closure, allowing easier accommodation to unpredictable basal seat changes.
6) With lingualized occlusion, additional stability is imparted to the denture during parafunctional movements than when balanced occlusion is used.

**Disadvantages:**
Wear of maxillary lingual cusp or mandibular fossa rapidly results in buccal and lingual contact of equal intensity results in negotiation of centralization of forces on the mandibular posterior teeth and increase the likely hood of lateral displacement

**3 Linear occlusion:**
This concept advocates a straight line of points or knife edge contacts on artificial teeth in one arch occluding with flat non-anatomic teeth in the opposing arch, thereby reducing unfavourable occlusal forces.
Linear occlusion is a one dimensional contact between two opposing posterior teeth. The contact occurs only in one dimension which is the length of the contacting blade.

**4 Balanced occlusion:**
The bilateral, simultaneous, anterior and posterior occlusal contact of teeth in centric and eccentric positions.
It is not seen in natural dentition.
Characteristics of balanced occlusion:
All the teeth of the working side (central incisor to second molar) should glide evenly against the opposing teeth.
No single tooth should produce any interference or disocclusion of the other teeth.

There should be contacts in the balancing side, but they should not interfere with the smooth gliding movements of the working side.

**CONCLUSION:**
Differing ideas about occlusion, relative to centrics, gnathology, occlusal adjustment have led to controversies in the literature.
In resorbed ridges, the chances for arch relationship discrepancies are increased due to greater horizontal overlap and lack of specific interdigitation making neuromicroocclusal scheme ideal.

With Lingualized occlusal scheme, additional stability is imparted to the denture during parafunctional movements than, when balanced occlusion is used.

Monoplane occlusal scheme are more adaptable to the unusual jaw relation such as class II and class III malocclusions and cross bite cases.

Linear occlusal scheme stabilizes the denture bases by minimizing lateral occlusal forces.

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