Principle of Occlusion

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Principle of Occlusion
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- Mutually protected occlusion vs Unilaterally/Bilaterally balanced occlusion vs Lingualized occlusion
- Point centric vs Long centric vs Freedom in centric
- Centric relation vs Habitual relation vs Centric occlusion vs Maximum intercuspidation
- Functional movements vs Parafunctional movements
- Normal occlusion vs Pathologic occlusion
- Bennet angle vs Bennet movement
Principle of Occlusion
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Principles of occlusion

Occlusion analysis

Occlusal correction/rehabilitation

Optimal occlusion
Principle of Occlusion

Principles of occlusion
Occlusion analysis
Occlusal correction/rehabilitation
Optimal occlusion

Patient adaptation
People will adapt to deviation in occlusion as long as they are within their adaptation limits
Principle of Occlusion

- Principles of occlusion
- Occlusion analysis
- Occlusal correction/rehabilitation
- Optimal occlusion

Patient adaptation

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Occlusion and Tempromandibular joint dysfunction syndrome (TMD)

There are NO studies proved that the occlusion could cause TMD
Maxillo-Mandibular Relationship
Maxillo-Mandibular Relationship
Maxillo-Mandibular Relationship

Max-Mand relation where; 1- condyles are in their most superior/anterior unstrained position, 2- Mand is most retruded, 3- Mand can do hinge movement, and 4- Mand can do lateral movements.
Maxillo-Mandibular Relationship

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Centric Relation

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Centric Occlusion

Teeth contact (not intercuspation) in CR. Rarely MI coincides with CR.
Maxillo-Mandibular Relationship

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Maximum Intercuspation
Max-Mand relation where the opposing teeth cusps are in maximum integrations. Regardless the condyles position.
Maxillo-Mandibular Relationship

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**Centric Occlusion**
Teeth contact (**not intercuspation**) in CR. Rarely MI coincides with CR.

**Maximum Intercuspation**
Max-Mand relation where the opposing teeth cusps are in maximum integrations. Regardless the condyles position.

**Habitual Relation**
Max-Mand relation where the patient is used to occlude. Most often coincide with CR (muscular-driven).
Mandibular Movement
Mandibular Movement

Laterotrusive (working side)
Bennet movement (mand. side shift)

Mediotrusive (nonworking side)
Bennet angle
Mandibular Movement
Mandibular Movement

Rotation (hinge)  Translation
Mandibular Movement

Rotation (hinge)  Translation

Condylar angle
Mandibular Movement
Mandibular Movement

1- Mandibular incisors track along the lingual concavity of the maxillary incisors.
2- Edge-to-edge position.
3- Incisors move superiorly until posterior tooth contact recurs.
4- Protrusive path.
5- Most protrusive mandibular position.
Anatomic Determinants of Mandibular Movement
Anatomic Determinants of Mandibular Movement

Anterior determinants of occlusion
Anatomic Determinants of Mandibular Movement

Principles of occlusion

Anterior determinants of occlusion

Posterior determinants of occlusion
Concepts of Occlusion
Concepts of Occlusion

Natural dentition

Artificial dentition
Concepts of Occlusion

Natural dentition

- Mutually protected occlusion (canine guided occlusion)
- Unilaterally balanced occlusion (group function occlusion)

Artificial dentition

- Bilaterally balanced occlusion
- Lingualized occlusion
Concepts of Occlusion

Natural dentition

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Concepts of Occlusion

Natural dentition

Mutually protected occlusion (canine guided occlusion)

- Uniform contact of all teeth around the arch when the mandibular condylar processes are in their most superior position.
- Centric relation coincident with maximum intercuspsation (intercuspal position).
- Stable posterior tooth contacts with vertically directed resultant forces.
- No contact of posterior teeth in lateral or protrusive movements. Lateral contact only between canines & protrusive contacts only between anteriors.
- Anterior tooth contacts harmonizing with functional jaw movements.

CONDITIONS:
1- Full set of teeth exists. 2- Healthy PDL. 3- No cross-bite. 4- Angle Class I occlusion.
Concepts of Occlusion

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Concepts of Occlusion

Natural dentition
**Concepts of Occlusion**

Unilaterally balanced occlusion (group function occlusion)

- In case canine PDL is compromised.

- Laterotrusive (working side): contact between all posterior teeth

- Mediotrusive (nonworking side): No contacts.

- Protrusive: No contacts between posterior teeth.
Concepts of Occlusion

Artificial dentition
Bilaterally balanced occlusion

- Maximum number of teeth in contact in maximum intercuspation and all excursive positions.

- Works best with complete dentures to maximize stability.

- DOES NOT work with natural dentition.
Bilaterally balanced occlusion

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- Works best with complete dentures to maximize stability.

- DOES NOT work with natural dentition.
Concepts of Occlusion

Artificial dentition
Concepts of Occlusion

Lingualized occlusion

- Only contacts are between maxillary molars palatal cusps and mandibular molar CENTRAL fossae in ALL maxillo-mandibular positions.
Lingualized occlusion

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Concepts of Occlusion

Centric contacts
Concepts of Occlusion

Centric contacts
Concepts of Occlusion

Centric contacts
Concepts of Occlusion

Centric contacts

Principles of occlusion
Concepts of Occlusion

Centric contacts

CUSP

Marginal ridge

Fossa
Concepts of Occlusion

Centric contacts

CUSP

Marginal ridge

Fossa

Cusp tip
Concepts of Occlusion

Centric contacts

Cusp
down
Marginal ridge
Fossa
Cusp tip
Cusp slope
Concepts of Occlusion

Centric contacts

CUSP

Marginal ridge

Fossa

Cusp tip

Too much horizontal force

Principles of occlusion
Concepts of Occlusion

Centric contacts
Concepts of Occlusion

Centric contacts
Concepts of Occlusion

Centric contacts

Point centric

CR = MI
Concepts of Occlusion

Centric contacts

Point centric
CR = MI

Long centric
Anteroposterior
CR 0.5-1.5mm MI
Concepts of Occlusion

Centric contacts

Point centric
CR = MI

Long centric
Anteroposterior
CR 0.5-1.5mm MI

Freedom in centric
Anteroposterior
0.5-1.5
+
Buccolinguial 0.5-1

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Parafunctional Movements
Parafunctional Movements

- Parafunctional movements of the mandible may be described as sustained activities that occur beyond the normal functions of mastication, swallowing, and speech.

- E.g. Bruxism, clenching, nail biting and pencil chewing.

- Long periods of increased muscle contraction and hyperactivity.

- Excessive occlusal pressure and prolonged tooth contact, which is inconsistent with normal chewing cycle.

- Over time this can result in excessive wear, widening of the periodontal ligament, mobility, migration or fracture of the tooth.

- In some cases muscle dysfunction such as myospasms, myostitis, myalgia and referred pain (headaches) from trigger point tenderness may also occur. MOST common cause for seeking professional help.

- Increased radiographic bone density and wear facets are often seen in patients with sustained parafunctional activity.
Parafunctional Movements
Bruxism

- Bruxism is defined as the oral habits consisting of involuntary rhythmic or spasmodic nonfunctional gnashing, grinding, or clenching of teeth that may lead to occlusal trauma. It occurs at the subconscious level during day (diurnal) or at sleep (nocturnal).

- Altered mastication has been observed in subjects who brux and may result from an attempt to avoid premature occlusal contacts (occlusal interferences). There may also be a neuromuscular attempts to “rub out” an interfering cusp.

- Bruxism can exert considerable lateral forces on the posterior teeth, leading to widening of the PDL and mobility.

- The causes of bruxism are difficult to determine. One theory states that bruxism is performed on a subconscious reflex-controlled level and is related to emotional responses and occlusal interferences.

- The relationship, if any, between bruxism and temporomandibular disorders is still unclear.
Parafunctional Movements

Principles of occlusion

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Parafunctional Movements

Clenching

- Clenching is defined as the pressing and clamping of the jaws and teeth together frequently associated with acute nervous tension or physical effort.

- The pressure created can be maintained over a long time with short periods of relaxation.

- The pressure is concentrated more through the long axis of the posterior teeth without lateral forces (UNLIKE bruxism).

- Abfractions, cervical defects at the cementoenamel junction, may result from sustained clenching.
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Pathologic Occlusion
Pathologic Occlusion

Definition: It is the occlusal relationship that is capable of producing pathologic changes in the stomatognathic system. Also known as “traumatic occlusion”.

Signs & symptoms:
1. Teeth: Wear, mobility, migration or fracture of the tooth/teeth.

2. Periodontium: Widening of the periodontal ligament, isolated or circumferential periodontal pockets.


4. TMJ: Pain, clicking, popping.
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Centric relation
Vs
Habitual relation
Vs
Centric occlusion
Vs
Maximum intercuspation
Overview

Principle of Occlusion

Centric relation
Vs
Habitual relation
Vs
Centric occlusion
Vs
Maximum intercuspation

Bennet angle
Vs
Bennet movement

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Overview

Principle of Occlusion

Point centric Vs
Long centric Vs
Freedom in centric

Centric relation Vs
Habitual relation Vs
Centric occlusion Vs
Maximum intercuspsation

Bennet angle Vs
Bennet movement

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Principle of Occlusion

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Overview
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  vs
  Unilaterally/Bilaterally balanced occlusion
  vs
  Lingualized occlusion

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  vs
  Long centric
  vs
  Freedom in centric

- Centric relation
  vs
  Habitual relation
  vs
  Centric occlusion
  vs
  Maximum intercuspatation

- Normal occlusion
  vs
  Pathologic occlusion

- Functional movements
  vs
  Parafunctional movements

- Bennet angle
  vs
  Bennet movement
The End
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References