Jaw Relation Record

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JAW RELATION
IT IS THE RELATION BETWEEN MANDIBLE (LOWER JAW) AND MAXILLA (UPPER JAW) IN VARIOUS POSITIONS OF THE MANDIBLE
**OCCLUSION**

**static contact** relationship that exist after the jaw movement has stopped and the tooth contact are identified
CENTRIC RELATION

• Bone to bone contact.

• The most retruded relation of the mandible to the maxilla when the condyles are in the most posterior unrestrained position in the glenoid fossa from which lateral movements can be made, at any given degree of jaw separation.

• Maxillo-mandibular relationship when the condyle is in the rear most upper most midmost (RUM position)
**CENTRIC RELATION**
This position is clinically discernable when the mandible is directed superiorly and anteriorly and **restricted to a purely rotary movement** about a transverse horizontal axis.

**CENTRIC OCCLUSION**
The occlusion of opposing teeth when the mandible is in centric relation.
POUR MASTER CASTS
RECORD BASES AND OCCLUSION RIMS
FOR MAKING JAW RELATIONSHIP RECORDS
Significance of jaw relation
1. Function and esthetics
2. Stability
3. Health
4. Establishing maxillo-mandibular relation in several directions
5. Building up occlusion of denture
RECORDING JAW RELATIONSHIPS

1. Check denture foundation.
2. Establish facial contour.
3. Establish occlusal plane.
5. Determination of vertical dimension of centric occluding relation.
6. Equalize pressure of occluding forces.
7. Determine centric relation at the accepted vertical dimension.
8. Locking device (recording the C.O.R.)
I- CHECK DENTURE FOUNDATIONS.

- Extension
- Retention
- Stability
II-ESTABLISH FACIAL CONTOUR
Cutting a post-dam

If the impression procedure has not involved the selective displacement of the palate in the post-dam region, it will be necessary to trim the cast to produce a seal around the denture in this area. This procedure is required if a mucostatic impression material such as plaster is used.

203 The position of the posterior border of the denture should be marked on the palate with an indelible pencil. The trial denture base should then be trimmed to this line.

204 The trial denture is replaced on the master cast, and the posterior border of the palate used as a template for marking the post-dam.

205 If the base is underextended a periodontal pocket-measuring probe may be used to measure the deficiency.

206 This information is transferred to the master cast.
207 The palate is then felt with a ball-ended burnisher to assess the amount of potential tissue displacement in the post-dam region, and to delineate its extent.

208 This area usually has the shape of a cupid's bow.

209 A line is scribed into the cast to the depth of the posterior part of the post-dam.

210 The cast is then gently scraped so as to bevel its surface from the anterior limit of the post-dam to the depth of the scribed line.
III- Determination of the occlusal plane

OCCLUSAL PLANE = PLANE OF OCCLUSION

A common plane established by the incisal edges and occlusal surfaces of the teeth.

[This is usually curved and is therefore not strictly a plane]

- Camper’s line
3- DETERMINATION OF THE OCCLUSAL PLANE

Anatomical determinants of the orientation of occlusal plane:

1- The lip line.
2- The interpupillary line.
3- The ala-tragus line.
4- The Retromolar Pad.
5- The Linea Alba.
Ala-tragal line (Camper’s line):
A line passing through the inferior border of the ala of the nose and the superior border of the tragus of the ear. [This line is approximately parallel to the occlusal plane of the natural teeth]
By the use of FOX occlusal guide

It is advisable to use an occlusal plane indicator (fox plane) for obtaining the correct anterior and anteroposterior planes.
DETERMINATION OF THE OCCLUSAL PLANE

- Posteriorly starting from the canine backwards, parallel to the naso-auricular line (ala-tragus or Camper's line).
- The posterior teeth are set to a slight anteroposterior curve.
3- **DETERMINATION OF THE OCCLUSAL PLANE**

Factors must be considered:

1- Aesthetic base

2- Functional base (chewing and speech)

3- Physical and mechanical (leverage action and parallelism)
DETERMINATION OF THE OCCLUSAL PLANE

• Aesthetic base.

The Height Of Occlusal Plane Should Be 1-2 Mm. Below The Upper Lip.

Anteriorly Is Influenced By:

▶ The Length Of The Lip,
▶ Ridge Fullness,
▶ Ridge Height,
▶ The Amount Of The Maxillomandibular Space And
▶ The Incisal Guide Angle.
Chewing

- The tongue works in coordination with the buccinator muscle to keep the food on the occlusal surface of the teeth. When the teeth meet during the chewing cycle, they mash the food. The food is pushed away from the occlusal table to the cheek and tongue side. Then the tongue and cheek put the food again on the occlusal surface of the teeth and another masticatory cycle starts.
1) Chewing

- The height of occlusal plane should be convenient and at a level familiar to the tongue to perform its action easily and stop food escaping to the floor of the mouth.

The occlusal surface of the teeth should be below the greatest convexity of the tongue.

- This also improves the stability of lower denture.
2) Speech:

- During speech, the tongue pushes against the sides of the teeth to produce a seal for better pronunciation of words.
3- Principle of Physics and Mechanics

1) Leverage action
2) Parallelism
3) Arch form

The amount of leverage or torque exerted on the occlusal plane is a function of the height of the plane above the ridge. Torque X = force (f) x Distance from fulcrum (R).
3- Principle of physics and mechanics

1) Leverage action:
   - The nearer the occlusal plane to the basal bone of the jaws, the less the leverage action and the better the stability.
2) Parallellism:

- The occlusal plane should be parallel to both supporting ridges. In this way the biting forces are vertical on the ridges and there is no tendency for horizontal displacement of the dentures.
3- Principle of physics and mechanics

3) Arch form

Both the width of the occluding surfaces and the contour of the arch form of the occlusion rims should be individually established to simulate the desired arch form of artificial teeth.
SIMULATE THE DESIRED ARCH FORM OF ARTIFICIAL TEETH
TO ACHIEVE THE CONCEPT OF A NEUTRAL ZONE APPEARANCE
LEVER BALANCE
Too high occlusal rim, hard to position food on occlusal surface.
The central line.
The high lip line.
The corner lines.
IV- DETERMINATION OF VERTICAL DIMENSION OF CENTRIC OCCLUDING RELATION
Vertical Dimension

V D O

The vertical dimension of the face when the teeth are in contact in centric occlusion.
Occlusal Vertical Dimension

- The distance measured between two points when occluding members are in contact in centric occlusion.
Vertical Dimension

V D R

The vertical dimension of the face when the mandible is in rest position.
The postural relation of the mandible to the maxilla when the patient is resting comfortably in an upright position and the condyles are in a neutral unstrained position in the glenoid fossa.
PHYSIOLOGIC REST POSITION IS:

- The postural position of the mandible when an individual is resting comfortably in an *upright position* and the associated muscles are in a state of *minimal contractile* activity. and the condyles are in a *neutral unstrained* position in the glenoid fossa.
The space between the maxillary and mandibular occlusal surfaces when the mandible is in the rest position.
Vertical Dimension

Inter Occlusal Distance
(Free Way Space) = 2 to 4 mm.
(FWS) (0 to 10 mm.)

VDR - FWS = VDO
Variables Affecting V D R :

Short Term Variables:

1. Position of the patient's head.
2. Respiration.

Long Term Variables:

1. Loss of the proprioceptors impulses from the periodontal ligament.
2. Age.
Only maxillary record base and occlusion rim inserted to provide lip support.
Willis gauge
VALUE OF VERTICAL DIMENSION

Biological importance of correct registration of the occlusal vertical dimension; the patient can

1 - Masticate his food efficiently.

2 - Speak without impediment.

3 - Present a normal facial appearance.

4 - Experience a minimum amount of discomfort in using his dentures.
Sequelae Of Improper Registration Of V.D.0.

A. High Vertical Dimension Of Occlusion:

1- inharmonious facial proportions (Appearance).

2- Flexor muscles are in constant strain.

3- The lips are unnaturally separated and have a strained appearance.

4- The free-way space will be obliterated, inability to find comfortable resting position.

5- Clicking of teeth may occur during speech and mastication.
A. High Vertical Dimension Of Occlusion:

7. Difficulty in swallowing and gagging sensation (Discomfort).
8. Loss of biting power and muscular fatigue.
9. Interference with speech.
10. Pain under the basal seat and trauma to the supporting structures.
11. Accelerate bone resorption.
High Vertical Dimension

Flabby Tissue
High Vertical Dimension

Obliterated free-way space

High Plane of Occlusion
B. LOW VERTICAL DIMENSION OF OCCLUSION:

1- Extensor muscles are strained.
2- Facial appearance is distorted.
3- Corners of the mouth may be inflamed (angular cheilitis).
4- Pain in tempromandibular joint (Custon’s syndrome).
5- Cheek biting.
6- Inefficiency: reduces biting force
TROUBLE IN THE T.M.J.
The symptoms of the joint due to reduced V.D. are manifested by

- Obscure pains and discomfort,
- Clicking sounds,
- Headaches and neuralgia running in the ear.

These symptoms may be resulted from pressure on the tympanic nerve.
Cheek Biting

Monoplane
Heavy Bite
No Horizontal Overlap
Angular Cheilitis

Corner of Mouth
MOUNTING OF THE CASTS ON THE ARTICULATOR FACEBOW:
SCORING (INDEXING) OF THE CASTS
A) MOUNTING OF MAXILLARY CAST
Using facebow record
Using bonwill triangle
MOUNT MAXILLARY CAST
SAME RELATIONSHIP TO TRANSVERSE HINGE AXIS
Mounting the upper cast

1. By face bow record.
2. By Bonwill triangle.
METHODS OF DETERMINATION OF CENTRIC RELATION

1- Wax registration method (check bites).

2- Terminal hinge axis determination method (mandibular face bow).

3- Graphic tracing or excursive method.

4- Chew in or functional record method.
CHECK BITE METHOD

Notch Preparation

Thin Layer of Material
Equalizing occluding forces can be done on two steps:

1- Maintain even contact throughout all occluding surfaces of the hard occlusion blocks at the predetermined vertical dimension of centric occluding relation.
CHECK BITE METHOD

Guiding the mandible into centric position (Wax wafer method)
METHODS TO GUIDE THE MANDIBLE IN CENTRIC RELATION

1- Tongue retrusion.
2- Swallowing.
3- Biting operator’s fingers.
4- Relaxation.
5- Fatigue.
6- Head position.
7- The temporalis muscle check.
CHECK BITE METHOD

Locking device
Wax Registration Method
2- TERMINAL HINGE AXIS METHOD

Kinematic Face Bow
(Mandibular Face Bow)
TYPES OF TRACERS

A - Intraoral tracer

B - Extraoral tracer
ECCENTRIC JAW RELATIONSHIPS

Any jaw relation other than centric relation.

Protrusive Record
Right Lateral Record
Left Lateral Record
ECCENTRIC JAW RELATIONS

Methods of Registration

1. Wax registration method.
2. Graphic tracing method.
3. Chew-in or Functional method.
**Protrusive Record**

**Christensen Phenomena**

When the mandible moves to edge to edge position, separation occurs distally between the natural dentition or occlusion rims.
THE PROTRUSIVE RELATIONSHIP DETERMINES THE ANGLE OF THE HORIZONTAL CONDYLAR PATH
LATERAL RELATIONS:

Right Lateral movement

Left Lateral movement
Gothic Arch Tracing Method
Gothic Arch Tracing Method
Gothic Arch Tracing Method
Graphic Tracing Method
THANK YOU