

PROSTHESIS

COMPLETE DENTURE



Lec. 8

MaxilloMandibular
relationships

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Jaw relation

Defintions

- ☒ **Jaw relation** → any relation between mandible (movable) to maxilla (fixed) in centric and eccentric (lateral and protrusive)
- ☒ **Occlusion** → static contact between opposing teeth at any mandibular position so there is centric occlusion position, protrusive occlusion position, lateral occlusion position
- ☒ **Articulation** → dynamic contact between opposing teeth during movement
- ☒ **Centric occlusion** → maximum intercuspal position, teeth to teeth relation, condyle in center of glenoid fossa
- ☒ **Maximum intercuspation** → complete intercuspation between teeth regardless condylar position
- ☒ **Centric relation** → the most retruded unstrained position of condyle in glenoid fossa in 3d dimension (vertical, anteroposterior, lateral) at a given V.D, can move to all position from it, Bone to bone contact

N.B

- ✓ In dentulous patient → has centric occlusion anterior to centric relation by 1:2mm
- ✓ In edentulous patient not have centric occlusion, but has centric relation so construct denture on centric relation so occlusion of artificial teeth will be on centric relation which is called **centric occluding relation**
- ✓ Hinge axis imaginary horizontal line pass between 2 condyles where mandible open and close in the first 20:25 mm around it and 2 condyles are in centric relation and rotate without translation also called terminal hinge axis

*Steps

1. Orientation relation

a-occlusal plane orientation (adjustment of occlusion rim)

b-cranio maxillary orientation (face bow transfer)

2. Vertical relation

V.D.O vertical dimension of occlusion, V.D.R → vertical dimension of rest

Occlusal plane in upper labial inclined and in lower is nearly vertical or slight labial inclined (if excess bone resorption in lower) so difference between them ammm labial inclination of upper which is overjet

Buccal section of occlusal rims

- ✓ there is overjet posteriorly mean upper overlap lower



In upper jaw

wax rims at buccal slanted slight palataly to create space between it and cheeks Adjust buccal corridor area (space between inner surface of cheeks, and buccal surface of natural teeth)

If excess contour no buccal corridor ,it is anesthetic as when patient smile, mouth appear to be full with teeth .

If under contour cause food stagnation in this area , bad esthetic

In lower jaw

Adjusted to give buccal corridor area, posterior to cuspid area occlusion rim will be over crest of the ridge

2. Establish vertical height of occlusal plane

Maxillary occlusal plane

1. anterior occlusal plane

a-esthetic (lip line) method

- ✓ occlusal plan extend below relaxed upper lip by 2mm "standard"
- ✓ if excess resorbed ridge or long lip so occlusal plane behind upper lip as if increase height so make lever action and cause instability of denture
- ✓ if excess short lip so occlusion rim below upper lip more than 2mm(2.4mm)



b-phonetic method (physiologic method)

- ✓ set upper anterior teeth and ask patient to say F,V to be sure it is correct as teeth touch lower lip(make valve seal)

- if say F,V correct--so it is good height
- if not well so adjust teeth till be correct in height

2.posterior occlusal plane

- ✓ 1/4 inch below stenson's duct papilla of parotid gland opposite to upper 6

Mandibular occlusal plane



1. Anteriorly

with level of lower lip and corner of mouth as canine were at level of angle of mouth, not exceed, but may be decreased in case of well-developed ridge where decrease inter arch space and this increase stability of denture

2. posteriorly

(height play important role for stability of denture)

a-functional relation to tongue (most accurate method)

Adjust height to be just below greatest convexity of the tongue so become more near to crest of the ridge so increase stability od denture

So

1-during speech tongue make seal with denture at sides of teeth to give better pronunciation

2-during chewing food always on occlusal surface of teeth

- ✓ If occlusal plane higher than maximum convexity of tongue → so food will stagnate in floor of mouth, stain of tongue and cause instability of denture by forces of tongue
- ✓ if occlusal plane more below maximum convexity of tongue + cause tongue biting

b-principles of physics and mechanics

leverage action :The nearer occlusal plane to basal bone, the less leverage action and better stability occlusal plane of lower not exceed 2/3retromolar pad so near to ridge so decrease leverage and increase stability of denture

parallelism (not accurate) if 2 ridges are parallel(not present) so measure distance between two ridges and divide it into 2 equal parts, it will be the height of occlusal plane so force are directed vertically to ridge " no tendency to horizontal displacement"

3-Establish orientation of occlusal plane

❖ **anatomical method:** patient is upright and looking straight forward

A-ala tragus line

- ✓ Posterior occlusal plane in maxillary rim is parallel to it
- ✓ Horizontal line from lower part of the nose and orifice of the ear



b-Inter pupillary line

- ✓ anterior occlusal plane in maxillary occlusion rim is parallel to it
- ✓ imaginary line pass between 2 pupils when patient looking straight forward



C-Retromolar pad

- ✓ anatomical land mark represent reference for placement of posterior teeth in three dimension vertically, laterally, anteroposterior
- ✓ vertically, height of occlusal plane lie in the middle of pad (not exceed 2/3 retro molar pad)



functional method

a-buccinator groove

Apply alginate or tissue conditioner on polished surface of record block labially ,ask patient to make lip protrusion so buccinator groove will be recorded , hole is made in the bottom of the groove which is in the same orientation with



occlusal plane (called neutral zone impression technique)

N.B

Fibers of Buccinator muscle arranged horizontally so its contraction not displace denture but fibers of masseter muscle arranged vertically so its contraction cause displacement of denture if denture border not extended equally

b-lateral border of the tongue

apply green compound lingually at polished surface of occlusion rim then ask patient to swallow, tongue will make groove in compound in the same orientation with occlusal plane

Biomechanical method (not accurate)

measure distance between 2 ridges anterior and posterior and divide it, occlusal plan pass at the midway between 2 ridges and parallel to the ridges so forces are directed at right angle to ridge and enhance stability of denture

b-craniomaxillary orientation /foundation or registration of maxilla in relation to cranium by face bow

Aim:

- ✓ transfer relation between established occlusal plane (maxilla)and t.m.j (hinge axis) to fixed anatomical landmark at cranium(infraorbital notch) from patient to articulator (adjustable articulator)
 - ✓ 3D registration of maxilla (2 at t.m.j and other one at infraorbital notch)from patient to articulator done by face bow
 - ✓ or by other way orient maxillary cast in articulator in the same direction where maxilla to cranium in patient
 - ✓ Or by other way orient relation of maxillary cast to condylar compartment/guidance and to hinge axis on articulator as relation of maxilla to TMJ and hing axis in patient
- ✓ the first in all steps of orientation relation to condylar elements on articulator (base) so must be accurate to make other steps accurate

logic reasons for usage face bow(importance)

1-Locate maxilla , TMJ and their relation differ from one to the other(vary between patients)

2- accurate reproduction of mandibular movement with wearing denture

3-all distances to condyles transferred to articulator

4-relate maxillary cast to terminal hing axis then mandibular cast related to maxillary cast

5-relate maxillary cast to exact location in horizontal plane also to opening axis on articulator , this allow technician to view maxillary arch in patient.

Indications of face bow

- 1) when balanced occlusion is desired on adjustable articulator
- 2) used with single denture oppose to natural teeth
- 3) when cusped teeth /anatomic are used
- 4) for occlusal rehabilitation
- 5) mount cast in clinical remount
- 6) mount cast or diagnosis and treatment plan

Advantages of face bow

- 1) decrease occlusal errors in occlusion
- 2) more accurate programmed articulator
- 3) support cast when mount on articulator
- 4) locate/assist occlusal plane on articulator correctly

Face bow not essential when use

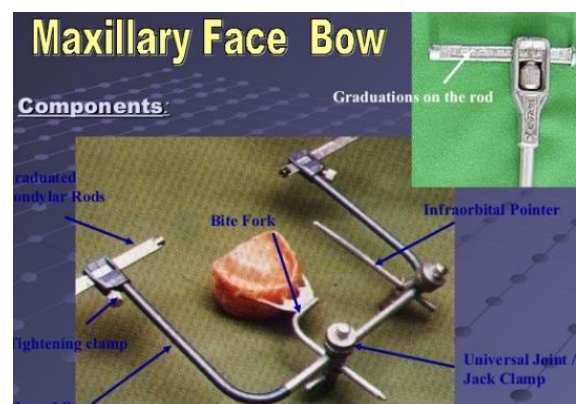
- A. flat teeth
- B. non balanced occlusion
- C. articulator not accept face bow

Types of face bow

1. maxillary face bow arbitrary

- Consist of U-shaped caliper like device

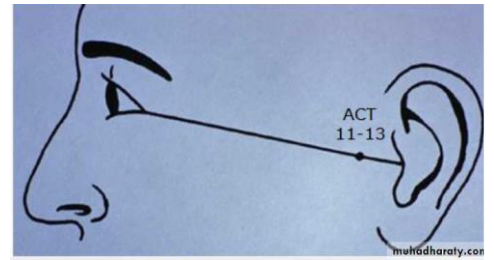
✓ U-shaped bite fork placed on labial surface of occlusion rim 1mm above occlusal plane



✓ 2 condylar rods has degrees, can be moved right and left, placed on condyle (found at 10 -13 mm anterior to tragus of ear along Frankfort horizontal plane "canthus tragus line"), must have equal reading in both sides

✓ Infraorbital pointer placed at infraorbital notch

✓ Frankfort horizontal plane → imaginary line passes between superior border of tragus of ear and outer canthus of the eye



✓ Called arbitrary as detect position of condyle arbitrary

☒ Types

1- fascia face bow → place condylar rods on skin over condyle where detect its position arbitrary as before, but in accurate as fascia of skin is movable

2- ear piece face bow → place 2 ear rods (ear piece) placed in ear at external auditory meatus which relate to position of condyle

Advantage: easy and accurate

3- spring face bow

4- slidmatic face bow

☒ Steps

1. bite fork is heated and inserted into labial surface of occlusion rim 2 mm away from occlusal plane parallel to occlusal plane and fixed joint of bite fork

2. Condylar rods are placed at its position (mentioned before) without over pressure to mucosa and move rods from side to side till reading be equal in both sides

3. place infra orbital pointer to infraorbital notch and tighten its screw

4. Transfer face bow to articulator and condylar rods attached to shaft of articulator and mount upper cast

2-mandibular face bow (kinematic!)

☒ Aim

Detect position of condyle kinematically or used to detect actual terminal hinge axis and centric relation by tracing

☒ Steps

- 1) bite fork is heated and attach to lower occlusion rim
- 2) place 2 condylar rods on condyle arbitrary
- 3) ask patient to open and close within 20:25mm and decrease opening so condylar rods draw curves till be point which is position of condyle at centric relation (line pass between 2 points is terminal hinge axis)
- 4) So make tracing and record centric relation

Notes

- ✓ on adjustable articulator

Mount upper cast by maxillary face bow ,,mount lower cast by inter occlusal record or mandibular face bow

- ✓ maxillary face bow - detect arbitrary hinge axis

Mandibular face bow detect kinematic/ actual hinge axis

- ✓ mandibular face bow make tracing (drawing),,it is way to record centric relation
- ✓ Static method mean operator do it
Dynamic method /physiologic/functional → mean patient do it by him self
- ✓ eccentric relation any relation between mandible and maxilla other than centric "protrusive and lateral"
- ✓ stability obtained from occlusal balance ..and lever balance

beyron's point???

Occlusal plane is tilted anteriorly for esthetic and phonetic ,also affected by mastication and stability of denture so prefer not to be too high, nor too low and not too buccal not too lingual (in correct occlusal plane so affect esthetic ,phonetic mastication ,stability of denture