

Advanced Restorative Care

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Centric Occlusion (MIP)

The relationship of the mandible to the maxilla when the teeth are in maximum occlusal contact irrespective of the position or alignment of the condyle-disk assemblies. This is also known as the acquired position of the mandible or the maximum interocclusal position.

Centric Relation

The relationship of the mandible to the maxilla when the properly aligned condyle-disk assemblies are in the most superior position against the eminentia, irrespective of the tooth position or vertical dimension.

We must diagnosis and treatment plan the case before we may begin comprehensive care. Going in blind can just get us in trouble.

Our teeth touch when we:

- Swallow
- Speak
- Parafunctional movement
 - *Clenching
 - *Bruxing

The force can be up to 6 times as great during sleep

The goal is to design occlusion that does not induce problems.

A through exam should always include a full mouth radiographic series, mounted study models using a face bow and an intraoral exam. Questioning the patient about soreness and tightness will also be helpful.

Mounted models should include a wax bite of centric relation that can be achieved that day. Centric Relation De Jour.

SAM Estimated Facebow, Inter-arch Registration and Mounting

Bite Fork Preparation

- Soften a sheet of Delar blue wax in a water bath set at 140^o F. Fold the sheet about ½ inch from one end to double it's thickness and cut this piece off with scissors. Form this double thickness strip of wax into a horseshoe shape and adapt it to the top side of the bite fork using it's holes and edges for retention. Warm the bite fork in the water bath so that the wax is dead soft.

Estimated Face Bow

- Position the bite fork in the patient's mouth and make a cusp tip impression of the maxillary teeth. After the wax has cooled and hardened remove the bite fork from the mouth and add three or four thickness roll of Delar wax to the underside of the bite fork. Reposition the bite fork in the patient's mouth (on the maxillary arch) and gently close the patient into the wax, in centric relation if possible. Be careful not to close the patient all the way through the wax. If you let the lower posterior teeth hit metal you will probably dislodge the bite fork from the upper anterior teeth.
- Tell the patient how the face bow will be placed. Mention that the plastic ear pieces in the auditory canals will greatly amplify noises caused by the adjustments and that the ear pieces will feel tight. Instruct the patient not to open during the procedure.
- Gently guide the plastic ear pieces into each external auditory meatus and hold them in place with firm pressure forward while the assistant tightens the main face bow thumb screw. It also works very well to have the patient position and hold the face bow while you tighten the screws. Center the plastic nose piece on the nasion and tighten it's thumb screw.

- Position the double “toggle” on the shaft of the bite fork which is protruding from the patient’s mouth with the horizontal bar perpendicular to the vertical bar and tighten both toggles firmly. Use your free hand to steady the whole assembly and take extreme care not to torque or tilt the face bow during tightening.
- Loosen the plastic nasion relater thumb screw and the main thumb screw on the under side of the face-bow as the patient opens his mouth and remove the entire assembly from the patients head and mouth.

Wax Inter-Arch Registration

- Delar wax tabs (ready made tabs with an aluminum foil core or two thickness tabs made from Delar sheet wax) are heated in a controlled water bath at 140° F. until they are dead soft.
- Recline the patient.
- Have the assistant hold a cheek retractor on the left side of the mouth, while you retract the patient's right cheek with your forefinger.
- Remove the tabs from the water bath one at a time and press them against the upper teeth.
- Manipulate the mandible into centric relation and slowly close the patient down until they just touch wax. Ask the patient to “hold.” When most of the cusp tips of the lower teeth have contacted the wax and made shallow cusp tip impressions in the wax, ask the patient to “stop and very carefully hold that position.” Instruct the patient to hold very still and not to open or close at all.
- Quickly chill the wax with the air/water syringe while the patient holds very still.
- After the wax has been cooled sufficiently, tap the patient's teeth into the hard wax. If a reasonably good centric relation record has been obtained, the patient will offer little or no resistance to closure and the teeth will make a loud, solid, “wooden” sound in centric closure. If

- the patient offers resistance or the sound is not consistent and loud, the centric relation record is probably not accurate and should be retaken.

Preparation of the SAM Articulator and Mounting Stand for Mounting Casts

- Set the condylar eminence angle to 30° on each side of the articulator in preparation for attaching the face-bow assembly. Firmly secure clean mounting plates to the upper and lower frames of the articulator.
- Next, secure the face bow to the upper member of the articulator. Place the yellow plastic incisal guide table on the upper member of the articulator. Hold the face bow in one hand and the upper member of the articulator in the other. There is a pin on the outer flange of each (yellow plastic) condylar guide. Guide first one pin, then the other, into the holes on the medial sides of the plastic ear pieces of the face bow. Note that the face bow is designed so that neither side arm can be moved laterally without moving the other arm a corresponding distance. Allow the incisal guide table on the upper frame of the articulator to rest on the cross bar of the face bow and tighten the thumb screw.
- Secure the face bow in the mounting stand and use the provided acrylic block and a little snow white #2 plaster to support the bite fork before mounting the upper model.

Mounting the Casts

- Trim the wax impression of the maxillary teeth with a sharp Bard Parker #15 blade so that only impressions of cusp tips remain.
- Carefully place the trimmed casts of the maxillary teeth into the impression on the bite fork. Make sure that no bubbles or soft tissue
- areas of the model prevent the model from seating fully into the cusp tip impressions on the bite fork. Lift the front end of the

maxillary member of the articulator and place a minimal amount of mounting plaster or stone on the cast and the mounting plate. Lower the maxillary frame so that the incisal guide table rests on the cross bar of the face bow.

- After the plaster has set, remove the maxillary member of the articulator and the face bow from the mounting stand. Remove the face bow from the upper member of the articulator.
- Adjust the incisal guide pin to $+3^{\circ}$ to accommodate for the thickness of the bite registration material.
- Loosen the spring loaded thumb screws on the upper member of the articulator which are used to lock the “condyles” of the articulator in “centric relation.”
- Set the Bennett elements at 5° and the horizontal condylar path inclination at 30° . These settings (a fairly steep eminence with minimal side shift) will help stabilize the “condyles” in the “fossae” of the articulator for mounting the lower model.
- Turn the upper member of the articulator “upside down” and place the centric registration records on the teeth of the mounted maxillary model.
- Insert the “condyles” of the lower member of the articulator into the “fossae” of the upper member and close the articulator to make sure there is adequate clearance and enough room for plaster between the lower mounting plate and the lower model (with the incisal pin touching the incisal table).
- Attach the lower model to the mounting plate with mounting plaster of a thin creamy consistency.
- Add plaster between the models and mounting plates as necessary to improve the strength and appearance of the mounted models.
- Once all plaster has set completely, use the split cast to verify the mounting. If necessary, separate lower model from the mounting plate and remount it.

The Repositioner Splint

- To test the patient's response to a change in the occlusion.
- To determine if occlusal change will resolve TMD symptoms.

- To determine if the craniomandibular relationship can be stabilized.
- To allow comprehensive diagnosis and treatment planning.

Rationale

Relief of symptoms alone is not the major purpose or the end point of treatment with the repositioner splint in our mode of therapy as it is with many other approaches. The splint will relieve symptoms, but almost anything that is placed between the teeth to disengage the occlusion will relieve symptoms temporarily.

Occlusal therapy may be divided into three stages:

1. Symptomatic relief and differential diagnosis.
2. Transitional care – mandibular stabilization, diagnosis and treatment planning.
3. Definitive treatment.

The foremost rationale for making a repositioner splint is to provide an artificial functional occlusion that eliminates occlusal interferences, allows the joint to heal and allows the mandible to seek its most stable position.

Indications

Splint therapy is indicated anytime that:

1. TMD symptoms are present.
 2. Mandibular manipulation is difficult.
 3. A patient is to be treated to the centric relation position (restorative, orthodontic or surgical treatment.)
- In addition to a centric relation closure, the repositioner splint provides an anterior guidance ramp, which serves to disclude the posterior teeth during any movement out of centric. The anterior ramp is adjusted to the gentlest possible slope that will immediately

disclude all posterior teeth. As many of the lower four incisors as possible should contact the ramp in straight protrusive. The cuspids should not contact at all during protrusive but should be the main guiding inclines (and should disclude the posterior teeth immediately) in lateral movements. The lower anterior teeth should only have .0005" clearance from the ramp in centric closure.

The repositioner should be adjusted when a change in mandibular position becomes evident. The adjustment is usually done by relining the occlusal surface of the splint with self-curing acrylic resin.

Three significant factors cause change in mandibular position during splint therapy:

- Relaxation of the muscles that posture the mandible. This tightness is often due to parafunctional habits or muscle spasms.

- Elimination of intracapsular inflammatory fluid.

- Repositioning, remodelling or recontouring of the bony and/or cartilaginous parts of the joints (condyles, disc or fossae).

The repositioner splint is a device that can be used to test the patient's response to a change in the occlusion without doing something irreversible.

Splint therapy, in symptomatic patients, must be continued until there has been no change in mandibular position and the patient is comfortable. This will take 3 months or more in most patients.

If comfort and stability cannot be achieved with the splint, there is no reason to believe that it can be obtained by altering the occlusion permanently. If symptoms cannot be relieved or stability

attained with the splint, we will usually not proceed with definitive treatment.

Indirect Repositioner Splint Construction.

- Upper and lower alginate impressions with good anatomical detail and no bubbles.

- Estimated face bow and wax centric relation records.

- Mount upper model on the articulator with the face bow and a split cast device.

- Mount lower using the wax bites. Less office adjustment will be needed if the wax bites are taken at the exact vertical. Do not allow the lab to move the pin unless necessary for clearance.

- Send mounted models to a lab asking for a superior repositioning appliance.

- At delivery date, the splint should fit the maxillary arch with no movement. It should be adjusted as follows:

- *Simultaneous contact of all posterior teeth with the condyle seated as much as possible.

- *All anterior teeth have 5/10,000 inch clearance with the condyle seated.

- *In lateral movement, right and left cuspids will contact and separate all posterior teeth. No other anterior teeth should contact.

- *In protrusive, the lower incisors will function against the ramp to disclude all posterior teeth including the cuspids.

The above should always be achieved by using the reline technique as shown in the presentation. Do not try to use marking paper and grind in the occlusion. This will not work in most patients and be frustrating to you. Just do not do it!

TMD treatment

- Symptomatic relief

- Get patient out of pain

Wet heat (8 minutes heat – 1 minute cold – 2 minutes heat)

Both sides at the same time

Drugs (NSAID)

Night time splint therapy

Sleep on back

-Transitional care

Full time splint therapy

Diet changes (caffeine)

Mandibular stabilization

Diagnosis and treatment plan

-Definitive treatment

Equilibration

Restorative work

Ortho or combined ortho with surgery

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