Integrating Physical Therapy and Dentistry for Optimal Patient Care and Outcome for the Temporomandibular Patient

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Dentistry Education in TMD
4 to 8 hours

Primary Weapons

TMD Number
5000 - 7000
Since 1981

TMJ
“Costen’s Syndrome”

- In 1934 Costen “ENT” stated it’s a dental problem
- The medical field gave a huge sigh of relief
- In 2014 it’s still looked at primarily as a problems with the teeth “occlusion”
Education in Oregon Physical Therapy Programs

- Send them to a physical therapist?
  - Minimal to no training in facial or TMD pain
  - 8 hours at Pacific and George Fox Universities
  - As far as PTs are concerned our patient’s don’t have teeth!
  - To Treat a Condition that 10% of the population seeks treatment for!

State of the Union

- Dentist know about the teeth
- PTs may know about the head and neck but in most case little about how the head and neck work in the masticatory system
- Both are virtually unaware of how factors on both sides of the TMJ effect each other

Manage All Three

- Balanced head on neck
  - Sagittal
  - Frontal
  - Coronal
  - Pain free and not referring pain to the face confusing the diagnosis
- Pain free masticatory muscles
- Pain free TMJ
  - Full ROM
  - Quiet
  - Take compression for function

LPTMJ – Format

The Start of The Exam Process

- L Look
- P Palpate
- T Total ROM
- M Muscle Testing
- J Joint testing
Two Primary Views

<table>
<thead>
<tr>
<th>Sagittal</th>
<th>Frontal</th>
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Biological Ideal?

- Head is at rest front to back
- Length and work of the anterior and posterior musculature of the neck are balanced
- Minimal trespass on nerves supplying the head and facial area – cephalometric graphing
- Balanced muscle of the stomatognathic system making closure efficient and easy
- Minimizes translation forces on the TMJ for closure

A Graph in Every Room

- A line dropped from the malar bone should related to the manubrial sternal notch:
  - Normal 1.5 – 3 cm
  - Mild 4 – 5 cm
  - Moderate 6 – 7 cm
  - Marked > 7 cm
- Also measure from the back of the wall to the mid cervical area
  - Normal 5 – 7 cm
  - Mild 8 – 9 cm
  - Moderate 10 – 11
  - Marked > 11 cm

Normal vs. Abnormal

Neurology of the Suboccipital Area

- Greater Occipital Nerve comes out between C1 and C2
- Lesser Occipital nerve exits between C2 and C3
- Both refer over the back of the skull
Cervical Input – to the Trigeminal Nerve

• C1 – C3 nerves have direct input into the trigeminal nucleus
  – Orchestrates fine tuning occurring between the mandible, cranium, and the cervical spin
• Trigeminal – upper cervical feedback loop
• Upper cervical compression and 2ndary nerve irritation in forward head posture feeds directly into the trigeminal system

Changes in the Position of the Mandible

“At Rest”

Forward head posture (FHP) is significantly associated with Class II skeletal pattern
Subjects with Type II malocclusion are associated with FHP
FHP increases tension in the supra & infrahyoid musculature
FHP distalizes the mandible at rest by 1 – 2 mm

Integrated Masticatory and Upper Cervical Function

A Contributor to Disc Displacement?

Does Posture Affect Occlusion

Or

Why Should a Dentist Work With A PT?

What does the research say about the effect of posture on occlusion?

Changes in the Arc of Closure

“The Path”

• FHP has an immediate effect on mandibular closure path in the normal population
• FHP influences the mandibular closure path causing abnormal tooth contact
• FHP causes increased suprahoid tension resulting in a downward pull on the mandible

Changes in EMG Activity for Closure
“The Work Load”

- FHP was the most common head position that could affect the neuromuscular system
- Head and neck dorsiflexion (back bending) increases temporalis activity
- Head and neck dorsiflexion increases activity in the masseter muscles with closure


Synopsis - Sagittal Posture on Occlusion

- Forward Head Posture “FHP” appears to have an effect on growth and development – tight hyoid complex
- Tight supra and infrahyoid distalize the condylar head promoting disc displacement anteriorly
- FHP affects the arc of closure – decreased spin more translation!
- FHP increases muscle activity “EMG” activity to accomplish closure
- FHP results in trigger point development and neural compromise which can be major contributors to facial pain
- Trigger points and neural compromise add to confusion of diagnosis and treatment

Look - Convergence Right

- Injury of the right TMJ with decreased condylar growth on that side
- Can be an acute change
- Often the side of TMJ complaints
- Check mandibular and maxillary frenulum

A Journey Into the Frontal Plane

- Rocabado: High lip line and a high eye on the same side – Atlas is rotated
- “Esser’s Rule” of the eye and lip: The atlas is rotated to the side of the high eye
- In this case the atlas is rotated to the left
- A left rotated atlas elevates the occlusal plane on the right

What About From the Front

Biomechanics of Occlusal Elevation Secondary to Atlas Rotation on Axis - LAB

Atlas/axis

Fig 2
X-ray and CT Scan:
Right Rotated Atlas

Assessing Atlas Movement Restriction

- Flex head with chin onto the chest
- Gently lock occiput onto atlas
- Turn the head to the right and the left
- The patient should be able to look at their axilla
  - About 40 degrees of movement

Case Study

10/6/10
Left joint pain with atlas rotation to the right = elevated left occlusion plane

11/1/10
Left joint pain absent. Atlas correction and stabilization exercises

Enter Tom Dumont, DDS

- Tom: “It’s about occlusion – teeth are the driving force behind TMJ dysfunction”
- Bill: “Cranial position effect the occlusion and is driving force behind TMJ dysfunction”
Right Posterior Prematurity

- Left rotated atlas position
- Occlusion elevated on the right
- Patient moves mandible forward on the left - Neuromuscular Avoidance Pattern (NMAP)
- Occlusal wear pattern predicted by head position

Presentation of a Predictable Pattern Occurs with Occlusion

Treatment - Manage All Three

Upper Cervical Dysfunction - 3 Levels of Compression/on the TMJ

- Fossa compression from above as side bend of the occiput occurs
  - down on the right
- Compression from below
  - as the occlusion is elevated on the (R)
- Compression/Shear on the TMJ
  - As upper cervical atlas/axis changes occur they move where the maxillary teeth are in space
  - Distraction and compression of the TMJs occur
  - Fascial and muscle tractions onto the mandible occur from the body

Head and Neck Sagittal

- It's what we do as PTs
- From the side
  - Balance the head on the neck
  - Decompress the S/O area
  - Restore rest position of the mandible
  - Decrease work of closure


- Early contact results in increased activity of the masseter and temporalis balanced behind by the suboccipital, SCM, Splenius Capitus and Trapezius
- Increased SCM activity results in side bend of the cranium to the early contact side and conjunct rotation of the cranium on the atlas
  - SB left and cranial rotation right
  - Atlas/Axis dynamics result in further atlas rotation to the right

Are early interference contacts the driver for upper cervical dysfunction?
Get the Head On Straight!
Frontal and Coronal

Off Their Stomach!
- Compresses the upper TMJ
- Distracts the lower TMJ
- Place a racquet ball in a pocket on the sternum

If It hurts you can not eat it!

Practical
- Don't lean on the jaw
- Stop gum chewing
  - Frank Spears – 50% increase in TMJ in gum chewers
  - Teeth together only 15 minutes/day
- Quit chewing the nails
- Quit chewing the lips
- Quit chewing on pencils
- If it hurts to eat it “Don’t”
- Cut it up – the apple has ruined every woman since EVE
- Little Kisses!

RTTPB Program
- I. Awareness
  - Relax – self monitor stress level
  - Teeth apart – establish an unclenched mandible at rest “float the boat”
  - Tongue Position – on the roof of the mouth “Minnnnnnnnne”
  - Posture – establish an orthostatic neutral position of the head and neck
  - Breathing - establish a diaphragmatic breathing pattern

Self Soft Tissue Work
- Cross friction for 1 – 2 minutes
- Circles clockwise 1 – 2 minutes
- Circles counter clockwise for 1 – 2 minutes
- Mobilization with movement
Soft Tissue Work
Additional Benefits
• Decreases the upward compression of the mandible against the disc
• Makes it easier to get the condyle under the disc
• Soft tissue is always a good place to start

Staging Dysfunction
• Where’s the Disc?
• From disc displacement with reduction
• Disc Displacement without reduction

Temporalis Stretch

Disc Displacement with Reduction - ddwr

What About the Joint Itself?

Disc Displacements are Multidirectional
• There are 9 positions the disc may be in
• 90% by MRI are combinations of frontal plane with a variation of medial or lateral
Normal Joint

Disc Displacement Without Reduction – ddwr

- Problem
  - Patient is no longer able to bring the condyle under the disc “Reduce the joint subluxation”
  - Loss of superior inferior dimension of the joint occurs
  - The joint capsule shrinks
  - Static compression onto the retrodisclal tissue occurs and dependent upon the acute status of the event mild to severe pain results

Disc Displacement with Reduction - ddwr

- Problem
  - disc is off the top but repositions with opening
  - Ligament structures have become loose allowing disc to displace
  - A rock is in front of a trailer wheel
  - The condylar head is compressing the nerves and vascular supply of the joint

Disc Displacement Without Reduction - ddwor

Macro Trauma – Acute Disc Displacement Without Reduction

- History is clear and common
  - Kids with falls on the face
  - Teens with skateboards and bikes
  - Adults in airbag impacts
- Traumatic displacement of the disc off the condylar head
- Collateral and posterior ligament structures are intact and not over stretched
- Look for displacement opposite the side of the blow
**Treatment – Macro Trauma**

- Unlock through mobilization techniques
- Splint immediately
- See within 72 hours
- Set up an acute management program through the emergency rooms in your area

**Oral Opening**

- Condyle must move inferiorly
- Condyle moves laterally
- Condyle moves anterior—inferiorly along the face of the eminence
- Mobilization restores these components

**Treatment**

- Unlock the joint
- Stabilize with a splint
- Coordinate care for final splint with their dentist

**Caudal Glide**

- Utilize a pistol grip
  - Thumb on back teeth and rolled slightly onto the inside of the back teeth
  - Hand cupped under chin
- Mobilization 1 – push down on the back teeth and pull gently up under the chin
- Mobilization 2 – push gently outward on the back teeth while pulling the jaw slightly to the opposite side
- Mobilization 3 – pull the jaw slightly down and forward
- Gently take up the slack each direction
- Repeat 6 times for a 6 second hold and repeat ________ times/day

**Manual Mobilization of TMJ**

**Mobilization Of TMJ 3 Dimensional with Thumb**

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Call the Dentist
“I Can’s Stabilize this Patient Without Your Help!”

Questions?