Advanced Principles of TMJ, Rib & Shoulder Girdle Adjusting

What You Should Know About Extremity Adjusting
Agenda

• The Laws of Healing
• T.M.J. What is the Syndrome?
• Superior Lateral T.M.J.
• Anterior Inferior T.M.J.
• RIBS - The Seven Areas of Subluxations.

LAWS OF HEALING

• PIEZOELECTRIC EFFECT.
• WOLFF’S LAW.
• DAVIS LAW.
• SHERRINGTON’S LAW.
• IF IT’S FIXATED MOBILIZE IT.
• IF IT’S HYPERMOBILE STABILIZE IT.
• ENERGY GOES WHERE ENERGY FLOWS.
• ENERGY STOPS WHERE ENERGY FLOPS.
• MECHANORECEPTOR RESPONSE.
Whiplash May Produce Delayed Jaw Pain

*Science Daily* — One in three people exposed to whiplash trauma is at risk of developing delayed TMJ symptoms that may require treatment, according to research published in the August 2007 issue of The Journal of the American Dental Association.

Researchers at Urea University, Sweden, studied short- and long-term temporomandibular joint (TMJ) pain and dysfunction in 60 patients in hospital emergency rooms directly after they were involved in a rear-end car collision and evaluated them again one year later. According to the study, the incidence of new symptoms of TMJ pain, dysfunction or both between the initial examination and follow-up was five times higher in subjects than in uninjured control subjects. In the year between the two examinations, 7 percent of control subjects developed symptoms in the TMJ versus 34 percent of study subjects.
According to the American Dental Association, the TM joint is one of the most complex joints in the body. Located on each side of the head, these joints work together and can make many different movements, including a combination of rotating and translocational (gliding) action, used when chewing and speaking. Any problem that prevents this system of muscles, ligaments, discs and bones from working together properly may result in a painful TMJ disorder.

When the patients reported having symptoms in the TMJ either before or after their accidents or both, the authors evaluated symptoms, including clicking, locking and TMJ pain. They also asked patients to rate their pain intensity and report the degree to which symptoms interfered with their daily lives, including sleep disturbances, use of pain relievers and the need to take sick leave.

"One in three people who are exposed to whiplash trauma, which induces neck symptoms, is at risk of developing delayed TMJ pain and dysfunction during the year after the accident," the researchers concluded.

Note: This story has been adapted from a news release issued by American Dental Association.

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T.M.J.
TEMPORAL MANDIBULAR JOINT

• Two separate synovial joints with discs that control mastication by hinging and gliding through three plain lines of motion when working normally. They rely on optimal teeth size, position and occlusal surface alignment.
DOCTOR PATIENT POSITION

The patient’s EOP (external occipital protuberance) should be at the level of the navel on the doctor. This allows visualization of the mandible in relation to the tip of the nose of the patient.

LOCATION

On the skull the TMJ is located in front of the external auditory meatus.
The right TM joint as seen from the outside.

Note the soft tissue flap in front of the external auditory canal called the tragus.

This is where you can feel the TM joint when opening and closing the mandible.

Both illustrations superimposed for clarity of position.
If you place your finger in front of the tragus of each ear you can palpate the closed TMJ.

Now open the mouth slowly and feel the finger fall into the glenoid fossa. If you do this bilaterally they should open at the same time. If one finger falls in sooner you should note how the mentum of the mandible deviates to the left or right. The finger falling in second is usually the involved side and the side the jaw initially deviates toward.

Avoid pressing firmly into this fossa due to patient sensitivity. Ask them if there is pain and which side is it on or both.
Whiplash-associated disorders and temporomandibular symptoms following motor-vehicle collisions.
Epstein JB, Klasser GD.
Source
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Abstract
Recent research has shown that temporomandibular symptoms may be associated with or occur independently of whiplash-associated disorders related to motor-vehicle collisions. A PubMed/Medline search was conducted using the terms "temporomandibular disorders," "orofacial pain," "temporomandibular joint," "whiplash," and "whiplash-associated disorders and motor-vehicle accidents and motor-vehicle collisions" for the years 1995 to 2009. Systematic reviews, meta-analyses, and clinical studies were included if they addressed temporomandibular disorders, whiplash epidemiology, diagnosis, and prognosis. References in the selected articles were also reviewed (including those prior to 1995) if the articles specifically addressed the topic. An evidence base was established for general outcomes using the Oxford Centre for Evidence-Based Medicine Levels of Evidence. Temporomandibular symptoms may develop following motor-vehicle collisions and be more complex, representing a component of a symptom cluster of potentially regional and widespread pain impacted by psychosocial factors. Oral health care providers must be aware of the relationship between temporomandibular symptoms, whiplash-associated disorders, and trauma and the more complex nature of the symptoms for appropriate diagnosis and management.
TRANSLATION
Translation strength is tested with the face looking straight ahead and pulling posterior on the anterior projected mentum.
Note which side is weak because the mentum of the mandible will move toward that side when testing.
Also look for bilateral weakness of translation. This motion along with opening are frequently less exercised unless a helmet chin strap has forced these motions into use.
Therefore the TMJ is one of the most musculoskeletonally imbalanced areas in the human body.
How many trainers teach you jaw exercises?

TRANSLATION
Utilization of the index and middle fingers to pull straight posterior is optimal in the adult and offers a broader surface area for comfort to the patient. It also prevents excessive pressure by the doctor during the test.
CLOSE - To perform the closing muscle test start with the patient's teeth together and place your distal thumbs on the superior mentum of the mandible below the lower lip. Have the patient clench their teeth and resist your inferior pressure. This is also a good time to palpate the superficial muscles of mastication for tonicity at the sides of the mandible and skull.

OPEN - When muscle testing the mandible it is to be remembered that this is not a contest and we are to only feel the strength of the patient to determine if the strength is consistent with other muscles. Allow the patient to open their mouth fully and then place multiple finger tips under the mentum and lift. Avoid using your palm or proximal phalanges as this may overpower the patient and strain the jaw muscles.
LEFT LATERAL FLEXION - is tested with finger tips and if you use the tip of the nose as a site you can compare the lateral deviation of one side to the other. Note which side is limited compared to the other and document it in your records.

RIGHT LATERAL FLEXION - Comparing deviation to the right and muscle testing with the finger tips can give you a good idea of the restriction involved in this plane line. Usually the side with greater motion is the involved side because the opposite side disc is not impeding the condyle forward glide.
Abstract
Temporomandibular disorders (TMDs) following motor vehicle collisions (MVCs) may result from direct orofacial trauma but also occur in patients with whiplash-associated disorder (WAD) without such trauma. TMDs may not be identified at the time of first assessment, but may develop weeks or more after the MVC. TMDs in WAD appear to occur predominantly in females and can be associated with regional or widespread pain. TMDs following MVCs may respond poorly to independent therapy and may be best managed using multidisciplinary approaches.

12 MAJOR SIGNS AND SYMPTOMS OF T.M.S.
You must have 3 or more signs to have T.M.S. diagnosis

1. Pain at T.M.J.
2. Crepitus in T.M.J.
3. Bruxism - grinding teeth especially at night
4. Inability to open mouth wide - 3 fingers in mouth
5. Inability to close teeth together - front, back or side
6. Headaches
7. Neck aches
8. Tinnitus - ringing of ears (with dizziness)
9. (W) (V) Pattern/Tracking deviation
10. Chronic recurring cervical subluxations
11. Muscle weakness during R.O.M.
12. Ocular dysfunction

BIOMECHANICS OF BILAMINAR DISC
1. Glides forward with opening and inferior
2. Glides superior and posterior with closing

Finger in glenoid fossa - which finger falls in first
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Abstract
BACKGROUND:
In 10-20% of patients with a simple whiplash-injury without severe structural lesions, a chronification of the complaints occurs. The question is whether some unidentified pathogenic factors exist.
QUESTION:
Investigations have demonstrated that mandibular and head-neck movements are coordinated and centrally controlled and that a craniocervical dysfunction (CCD) can lead to a temporomandibular dysfunction (TMD) by reflex action and vice versa. This study investigated whether a whiplash-injury can lead to a TMD.
METHODS AND RESULTS:
A total of 187 patients with whiplash-associated disorders (WAD) were examined for TMD. Simple tests with and without loading of the mandible were used to initially diagnose TMD and the diagnosis was confirmed electrophysiologically. TMD could be verified in all patients with WAD.

PROGRESSIVE MANDIBULAR ANATOMY
Shapes vary in individuals at the TM joint and yet share a commonality of function.
Note the equal spacing surrounding the condyle of the mandible in the glenoid fossa. This is known as:
NEUTRAL POSITION
It is neither in flexion or extension, superior or inferior, anterior or posterior.
It is neutral.

NEUTRAL POSITION - As it may appear in a relaxed jaw position.
Would teeth height and position affect the position of the condyle in its fossa?
NORMAL TMJ AND ATTACHMENT SITES TO DISC

With space at a minimum between the two bones, the bilaminar disc, ligament and tendon are literally between a "rock and a hard place" with very limited space to function.
Trauma to the mandible gets translated into these confined tissues rather readily.

The painful proximity of the TMJ to other structures may create confusion as to its origin.

It may be thought to be an ear infection, headache, toothache, C-1 subluxation or sinus infection.
With careful analysis and evaluation of the mechanics of the TM joint it can be easily ruled in or out as a causative factor.

Imagine the trying to open your mouth and the right TM joint is bumping into the bilaminar disc.

How will the mentum of the mandible move if the Lt. TMJ is gliding normally?
A blockade that will typically create a sudden shift and click of the disc as the condyle attempts to move forward against the malpositioned disc occurs.
ANTERIOR DISC DISPLACEMENT WITH REDUCTION
NOTICE THE POSTERIOR NECK ATTACHMENT
ANTERIOR DISC WITHOUT REDUCTION  
NOTICE THE LACK OF POSTERIOR NECK ATTACHMENT

T.M.J. - Sup. Lat. =  Condyle moves up and laterally in the glenoid fossa because the disc moves forward, down, and medially.

IND. - Prominence of condyle with tenderness on either side at glenoid fossa, with crepitus upon jaw movement. Upon opening the mouth, the jaw will deviate to the side of involvement, frequently seen after seeing their dentist or orthodontist or receiving a blow to the jaw. A bilateral involvement restricts jaw opening.

P.P. - Supine or sitting.
D.P. - Behind patient.
S.C.P. - Condyle of mandible.
S.H. - Supporting opposite condyle.
C.P. - Thenar eminence of hand on same side as lesion.
L.O.C. - S.I., R-L or L-R.
Jaw initially deviates toward side of involvement due to condyle bumping against anterior disc until jaw opens far enough to allow the condyle to drop inferiorly.

(Anterior disc displacement)
Stabilization hand on opposite side of involvement supporting jaw and cervical spine without compressing ear canal.

Contact hand with thenar pad flexed utilizing the proximal phalanx base of the thumb as the contact onto the condyle.
The proximal phalanx of the thumb for contact is clearly identified here. Can you touch that landmark on your thumb?

The right contact hand glides gently up to the zygomatic bone, then tissue pull is applied inferior onto the condyle with three to five pounds of pressure.

Tilt the head toward the side of involvement.
Gently turn the head away from the side of involvement to mild tension and notice if the forearm lines up directionally between the nipple and the shoulder on the opposite side. This is the correct line of drive down the side of the mandible.

Thrust inferior down the angle of the jaw to free the fixated anterior disc position about two to three inches in depth to the clavicle. It is important to have the fingers flexed to avoid jamming the finger tips into the clavicle and have enough space to thrust deep enough.
The ideal function of the disc is to glide forward with the condyle in the glenoid fossa acting as a protective slippery and flexible interface that reduces friction and creates smooth function.

A mandible functioning like this should open straighter and smoother.
ANTERIOR INFERIOR condyle subluxation with posterior disc fixation. The pathognomonic sign of this is an inability to close the teeth together on the side of involvement.

ANTERIOR INFERIOR TMJ The disc is displaced in the posterior position moving the condyle anterior and inferior thereby limiting closing of the teeth together.
Open your mouth really wide and place your fingers deep into your glenoid fossa’s and then try to close your mouth. This is what it feels like to have this condition. This person cannot chew food on the side of involvement and sometimes this can happen bilaterally. Food must be blended and sucked through a straw with these patients.

Moving the disc from the posterior position to on top of the condyle is what needs to happen.
T.M.J. - Ant. Inf. (Posterior Disc Displacement)

IND. - Inability to close mouth entirely. The involved glenoid fossa is tender and more hollow.

P.P. - Sitting.

D.P. - Behind patient.

S.C.P. - Chin and ramus on involved side.

S.H. - Interlocking fingers with contact hand supporting opposite side.

C.P. - 1st and 2nd phalanx of index and middle fingers with thenar pad supporting ramus of mandible.

L.O.C. - A-P, I-S, Take contact gently and then have the patient open their mouth wide. Apply posterior firm pressure and have the patient close their mouth slowly. As the jaw releases, apply superior pressure also, until the mouth is closed.
Anterior inferior TMJ
The disc is posterior.

Have the patient open their mouth wide, then place your fingers on the mentum of the jaw as shown.

Anterior inferior TMJ

Pull gently posterior on mentum and instruct the patient to let the jaw relax to the closed position.
As the jaw closes it frequently has a resistance like it is going over a ridge and then upon clearing it, closes easy.
The TMJ restored to normal position and function.
RECTUS CAPITUS POSTERIOR MINOR
THE DURAL CONNECTION

Connective tissue bridges were noted at the atlanto-occipital junction between the rectus capitis posterior minor muscle and the dorsal spinal dura.

The dura-muscular, dura-ligamentous connections in the upper cervical spine and occipital areas may provide anatomic and physiologic answers to the cause of the cervicogenic headache. This proposal would further explain manipulation's efficacy in the treatment of cervicogenic headache [1].

Foods to avoid are tough to chew e.g., beef jerky or taffy. Icing the area with a Dixie cup ice massage for five minutes, three times a day is an excellent idea. Protocol for patients with dentures is as follows: if patient does not respond within three visits.
1. Schedule an appointment with their denturist immediately following your office visit.
2. Take dentures out and adjust their T.M.J.
3. Send them to the denturist for fitting and alignment without dentures in!
4. With new dentures the patients T.M.J. has a better chance of responding. Exercises for the first two weeks should be in the directions of weakness.
COSTO STERNAL - Ant.

**Muscle** = Pect. Maj. Sternal [upper 6 ribs]

**IND.** - Prominent rib, tenderness at prominence, difficult breathing, chronic recurrent subluxation of vertebrae on same rib.

**P.P.** - Supine, 30 degrees to involved side.

**D.P.** - Opposite side of involved rib facing patient.

**S.C.P.** - Prominent rib.

**C.P.** - Support patient's back with caudal thigh. Pisiform of caudal hand.

**L.O.C.** - M-L, A-P. Contact point designed to slip off during thrust once segment is set.

Pectoralis Major Sternal

Muscle - Pect. Maj. Sternal [upper 6 ribs]

IND. - Chest pains, difficult breathing, tender and prominent at costo chondral space.

P.P. - Supine.

D.P. - Opposite side facing patient.

S.C.P. - Cartilage of rib and anterior rib.

C.P. - Inferior hand with index finger taking tissue pull from medial to lateral.

S.H. - Index and middle fingers of superior hand; One on each side of cartilage taking tissue pull medially.

L.O.C. - Pulling apart costo chondral articulation to allow the rib sheath to align the segments, then release.
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle</td>
<td>Ant. Serratus</td>
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<tr>
<td>IND.</td>
<td>Intercostal neuralgia, narrowed intercostal space, difficult breathing.</td>
</tr>
<tr>
<td>P.P.</td>
<td>Prone.</td>
</tr>
<tr>
<td>S.C.P.</td>
<td>Rib angle.</td>
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<tr>
<td>S.H.</td>
<td>Knife edge along posterior rib in intercostal space of rib above for Sup. and below for Inf.</td>
</tr>
<tr>
<td>C.P.</td>
<td>Knife edge of hand or thumb.</td>
</tr>
<tr>
<td>L.O.C.</td>
<td>Sup. for inferior rib, Inf. for superior rib. Scissors action of both hands with arms nearly parallel to surface of Pt.'s body.</td>
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COSTO TRANSVERSE AND COSTO VERTEBRAL - Sup. and Post.

Muscle = Rhomboid

IND. - Tender with prominence on either side of spinous rotation of vertebrae. Anterior dorsals. Intercostal neuralgia.

P.P. - Prone.

D.P. - Same side facing patient.

S.C.P. - Posterior superior surface of rib head.

S.H. - Opposite transverse with caudad thenar pad.

C.P. - Pisiform of cephalad hand.

L.O.C. - P-A, S-I, depth of thrust is slightly less than that used for spinal adjustment. When this has been accomplished, move to the other side of the patient to correct the rotation and posterity or anteriority of the vertebrae involved.
Abstract

The origin, distribution, and termination pattern of nerves supplying the vertebral column and its associated structures have been studied in the human fetus by means of an acetylcholinesterase whole-mount method. The vertebral column is surrounded by ventral and dorsal nerve plexuses which are interconnected. The ventral nerve plexus consists of the nerve plexus associated with the anterior longitudinal ligament. This longitudinally oriented nerve plexus has a bilateral supply from many small branches of the sympathetic trunk, rami communicantes, and perivascular nerve plexuses of segmental arteries. In the thoracic region, the ventral nerve plexus also is connected to the nerve plexuses of costovertebral joints. The dorsal nerve plexus is made up of the nerve plexus associated with the posterior longitudinal ligament. This nerve plexus is more irregular and receives contributions only from the sinu-vertebral nerves. The sinu-vertebral nerves originate from the rami communicantes and, in the cervical region, also from the nerve plexus of the vertebral artery. Thick and thin sinu-vertebral nerves are found. Most frequently three types of thick sinu-vertebral nerves are observed, i.e., ascending, descending, or dichotomizing ones. Finally, the distribution of the branches of the ventral and dorsal nerve plexuses and of the sinu-vertebral nerves is described.
ANTERIOR DORSALS T6-4

The stabilization hand curls the distal fingers to form a sulcus, into which the spinuses move, and vertical stabilizers for each side of the paraspinal muscles, in the form of the heel of the hand and a row of mid phalanges.

The hand is placed at the bottom of the involved block of anterior dorsals so that the lowest vertebra spinus (T6) is at the level of the ring and middle finger.

This placement can be adapted up or down the thoracic spine to the level of involvement and allows for tissue glide superior upon lying the patient down.
ANTERIOR DORSALS T6-4
The proximal arms hand is placed on the opposite side of the neck.
The distal arms hand is brought underneath the elbow to the opposite shoulder.

ANTERIOR DORSALS T6-4
The patient is laid back onto your stabilization hand. Note that the contact hand is on the bottom elbow for the thrust of the arm into the ribs, which are moving the vertebrae posterior. This position requires less thrust than the top elbow.
ANTERIOR DORSALS T6-4

Thrusting is performed by leaning over the patient and utilizing a gentle body drop through the contact hand on the bottom elbow toward the stabilization hand in back of the patient.