

# The Temporomandibular Joint Revisited

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## Abstract

Most of us are all familiar with the standard diagnostic work up that is taught in the textbooks of Walther and Leaf. [1] [2] [3] In this paper I would like to quickly review those, and add some other diagnostic factors that I have found very useful when faced with cases that are more difficult to analyze not showing the usual stomatognathic findings.

## Introduction

The standard approach to the temporomandibular joint that I use is a combination of David Walther's and David Leaf's methods and is as follows:

### Visual examination

- ✓ Look for postural and facial asymmetries.
- ✓ Use standard Applied Kinesiology techniques to level the head and shoulders.
- ✓ Correct any cranial faults found.

### Palpation

Palpate for muscle hyper and hypo tonicity as well as referred pain from trigger points, dural tension points etc.

### Therapy localization

I usually use the high gain therapy localization [8] approximating the little finger and thumb and using the index and second finger for the therapy localization.

This is done in the rest position and then with the following additions:

#### Open the jaw slightly

- ◆ *This activates the inferior division of the External Pterygoid.*

#### Open the jaw fully

- ◆ *This activates the inferior division of the External Pterygoid and the anterior belly of the Digastric and possibly the Geniohyoid.*

#### Close the jaw with gentle occlusion

- ◆ *This if a positive therapy localization ensues will indicate a possible prematurity with malocclusion or a neurologic tooth or both.*

#### Bite on the right side

- ◆ *This activates the closing muscles on the right side, the Temporalis, the Masseter the Internal Pterygoid and the superior division of the External Pterygoid.*

#### Bite on the left side

- ◆ *This activates the closing muscles on the left, the Temporalis, the Masseter the Internal Pterygoid and the superior division of the External Pterygoid.*

#### Bite with the incisors

- I. *This activates the anterior fibers of the Temporalis and the superficial fibers of the Masseter.*

#### Bite with the molars

- ◆ *This activates the posterior fibers of the Temporalis and the deep fibers of the Masseter.*

#### Protrude the jaw

- ◆ *This activates the superficial fibers of the Masseter, Internal Pterygoid and inferior division of the External Pterygoid.*

#### Retrude the jaw

- ◆ *This activates posterior fibers of the Temporalis with assistance from both the anterior and posterior Digastric as well as the Geniohyoid and Stylohyoid.*

#### Laterally deviate the jaw to the left

- ◆ *This activates the posterior fibers of the left Temporalis as well as the right Internal Pterygoid.*

#### Laterally deviate the jaw to the right

- ◆ *This activates the posterior fibers of the right Temporalis as well as the left Internal Pterygoid.*

#### Swallow (Deglutition)

- I. *This activates the hyoid muscle group: the Omohyoid, Sternohyoid, Thyrohyoid, Stylohyoid, Geniohyoid, Mylohyoid, and both bellies of the Digastric, as well as the muscles of the tongue: the Genio-glossus, Hyo-glossus, Chondro-glossus, Stylo-glossus, and Palato-glossus.*

- ◆ *It also activates the muscles of the pharynx: the Inferior constrictor, Middle constrictor, Superior constrictor, Stylo-pharyngeus, Palato-pharyngeus, and Salping-pharyngeus.*

UNFORTUNATELY, THERE ARE NO TESTS AT THIS TIME THAT ARE IN THE LITERATURE OF APPLIED KINESIOLOGY FOR THESE MUSCLES OF THE PHARYNX.

### Speak

- I. *This activates the hyoid muscle group: the Omohyoid, Sternohyoid, Thyrohyoid, Stylohyoid, Geniohyoid, Mylohyoid and both bellies of the Digastric. It activates the muscles of the tongue and pharynx listed above.*
  
- I. *It also activates the muscles of the larynx. The muscles of the larynx are eight in number with five being muscles of the vocal cords and three connected to the epiglottis. The five vocal cord muscles are: Crico-thyroid, Crico-arytenoideus posticus, Crico-arytenoideus lateralis, Arytenoideus, and Thyro-arytenoideus*

### Reactive muscles

For reactive patterns I have them do as Walther recommends in his text such as wag your jaw side to side and stop to the left, then repeat stopping to the right etc. Then sequential movements as I feel might be involved such as the following:

- ✓ Abduction to open
- ✓ Abduction to closed
- ✓ Open to abduction
- ✓ Open to closed
- ✓ Protrusion to retrusion
- ✓ Retrusion to protrusion

These are examined to see if the indicator muscle is strong after the first movement but not after the second movement.

These previous tests can also be done in the following positions:

- ✓ Head and neck in flexion and or extension
  - ✓ Swallowing or phonation
  - ✓ Weight bearing in various combinations
- I. Chewing something such as almonds which challenges the stomatognathic system.

I have over some time observed some other factors that have helped me in treating disorders related to the stomatognathic system. These are given below.

## **Observations and Methods**

### **Additional observations that I would like to share**

#### **Hidden cranial faults**

I also like to use tongue depressors as recommended by Dr. Leaf in his video on the temporomandibular joint. However, here I like to add a concept that was originally put forth by Dr. Bob Blaich [4], to stress the body to find which components are going to break down next. This, Bob Blaich did with speed reading, taking a person to a point of neurological disorganization and then correcting the findings present and testing for improved performance. I use tongue depressors to bring out hidden cranial faults. I do the normal challenges for cranial faults: for instance, external and or internal faults and then, if the challenge is negative but their symptom pattern indicates that there may be an involvement of that cranial fault, I have the patient put a tongue depressor between the left molars and/or right molars and redo the challenge.

Many times I find a hidden fault that needs correcting.

#### **Hidden muscle imbalances related to common lesions**

I have also found that at times, you will have patients who show a problem such as a category II posterior ischium which would usually have a related Hamstring inhibition pattern (weakness) on the ipsilateral side [5] [1] and I would not be able to find the Hamstring weakness. I found that if I had the patient hold a static challenge on the hyoid in various vectors, I would often find the Hamstring would show a weakness in one vector of challenge yet not with another indicator muscle. In this case, I would find which hyoid muscle would be involved and correct it by spindle cell or other activity, and follow it by a second challenge to see that the correction held.

#### **Postural imbalances that are only partially corrected after the usual AK procedures are done**

Dr. Leaf in his flow chart manual, [2] states, “When imbalances in the muscles of the hyoid are found, they tend to cause the patient to be unable to maintain perfect structural balance.” I therefore check my patients for postural distortions that come back or partially come back after correction. For instance, when I have someone who showed the classical signs of a high pelvis, shoulder and head on the same side, it is an indication of a Gluteus Medius weakness (inhibition) on the involved side. After that is corrected, I find that frequently, although the high pelvis etc., was corrected, that a lateral shift of the pelvis remains.

This I then try to address with the hyoid challenge which in one direction of challenge will only show a weakness (inhibition) of the Gluteus Medius on the same side.

The hyoid muscle responsible for the imbalance is treated and the Gluteus Medius does not weaken again with the hyoid challenge and a better postural balance is established.

Then the patient is asked to exercise the involved muscle as well and to reeducate themselves in front of a mirror in maintaining better postural balance.

I have found this helpful in patients who show foot pronation. You work on the Tibialis Posterior and the dropped navicular, possibly the posterior calcaneus, the shortened Triceps Surae if applicable etc., but when they stand the pronation is still obvious. I could then test the above factors again and not find any associated inhibition or weakness pattern. In these cases I find that the Tibialis Posterior and or Tibialis Anterior will show a weakening (inhibition) if the hyoid is challenged in a certain direction. Correcting the hyoid imbalance will often improve the postural findings of pronation with less tension of the plantar fascia on erect palpation.

This would also fall in line with the principles of the Alexander technique [6] in which Matthias Alexander stated “When I was experimenting with various ways of using myself in an attempt to improve the functioning of my vocal organs, I discovered that a certain use of the head in relation to the neck and of the neck in relation to the torso.....constituted a ‘*Primary Control*’ of the mechanisms as a whole.”

Alexander was also able to demonstrate improvement of pronation with using his improved body usage technique which included this area of primary control which he talked about. [5] This technique of balancing the hyoid can help in this regard.

**To determine a weak muscle that you cannot test in the usual way**

Just as our status statement says that Applied Kinesiology procedures are to be used as an enhancement of standard diagnosis, I like to have more than one finding to make a diagnosis. I therefore like to use my palpatory skills as well as muscle testing etc., to determine a problem. Most muscles that are weak (inhibited) will exhibit decreased tone to palpation especially when compared to the same muscle on the opposite side and or the synergists of the involved muscle. Some muscle weaknesses are not obvious and do not therapy localize in the normal manner as we are taught to do as for the Sacrospinalis. I found that they will therapy localize easier when the muscle is contracted.

- I. *I thought that this was an original observation, but was reminded that at the ICAK-USA meeting in New Orleans, John Corneal had demonstrated this and presented a paper including this form of therapy localization [13].*

Therefore, my finding of this therapy localization done with the involved muscle being contracted is a confirmation of Dr. Corneal's original observation. On review, if I find that on palpation and observation that the hyoid is inferior on the right, it would indicate either one or more hypertonic infrahyoid muscles on the right or weakness of one or more of the suprahyoid muscles on the right. I therefore palpate for lack of tone in one of the suprahyoid muscles, which would be one indicator of possible weakness (inhibition). Then I have the patient therapy localize the involved muscle. If positive, I know to treat the muscle, but if the therapy localization was not positive, I find that simultaneous therapy localization and contraction of the involved muscle will often show a weakening (inhibition) of the indicator muscle. When this finding is present, you know to apply treatment that will help facilitate (strengthen) the muscle involved.

Much of the information in our literature dealing with the Stomatognathic system deals with toning down the hypertonic muscles. This goes against the primary tenet of Applied Kinesiology, which is to address the weak (inhibited) muscle first, and that in most cases the hypertonic muscle which is often the symptomatic muscle will be relieved and normalized. [7] [8] [11].

In our previous treatments we were falling into the same trap that most professions prior to George Goodheart's observations did with muscles, that is only addressing the hypertonic muscle. A case in point is a book by Goldman and McCullough [12], which reports that "TMJ is basically a muscle-spasm problem" and report using splints, dry needling and equilibration with the main purpose of relieving spastic External Pterygoid muscles and thereby a "Tooth Gearing Discrepancy" [12]. The above procedures, palpation for hypotonicity, and combined therapy localization with muscle contraction, helps us to determine which muscles are not functioning adequately and need tonification by the various methods available to the Applied Kinesiology practitioner.

Please also keep in mind that occasionally, the apparently hypertonic muscle needs tonification, as Goodheart teaches in relation to "Repeated Muscle Activation Patient Induced, RMAPI" [8]. In this case a muscle does a contraction response to its weakness (inhibition). I have noticed that in a number of cases that, using the technique given in the next section, the spindle cells of the muscle that was palpated as short (appearing hypertonic) responded by spreading the spindle cells apart (which tonifies) rather than together (which reduces tone) as would normally be the case. I suspect that these cases would fall into that category but I have not yet tested that idea.

*The main reason for not testing for RMAPI above is that it is difficult to devise a motion to have the patient do 10 times that singles out a hyoid or TMJ related muscle and puts it through its full range of motion. I could possibly devise such a motion, but to teach the patient to do it would likely be difficult and time consuming.*

### **The use of a static challenge on spindle cells**

I have found that a static challenge of holding the spindle cells apart or together can be done when a muscle is found that is causing a remote dysfunction by its contraction.

For instance, I have a patient who came in for a severe plantar fasciitis and treated him in the usual ways, foot pronation, tarsal tunnel syndrome treatment, flexor hallucis limitus treatment, Triceps Surae lengthening, myogelosis treatment etc., with good results. He was beginning to run some distance again with minor discomfort. I still found that he demonstrated foot pronation in the erect position, but that his Tibialis Posterior tested strong (facilitated) when supine. I had him stand and palpated his arch and had him clench his teeth together and felt a slight contraction under his plantar fascia and elevation of the arch.

This finding was more consistent when he clenched his teeth together on the ipsilateral side to the side that I was palpating. I had him lie prone and felt the same finding with the clenching action. I then had him assume the supine position and open his mouth wide open, contracting the anterior belly of the Digastric and possibly the Geniohyoid and the Tibialis Posterior muscle I was testing weakened dramatically (*we will discuss this muscle activation more in the next section*). I had him then keep his mouth wide open and therapy localize over the anterior belly of the Digastric on the ipsilateral side and the Tibialis Posterior muscle strengthened dramatically. I then had him use two fingers to pull the spindle cells apart with his mouth wide open while I tested the Tibialis Posterior again and the muscle was strong. I then had him do the same but hold the spindle cells together and the Tibialis Posterior muscle weakened again.

The treatment then was obvious - to pull the spindle cells apart. These findings were present on both sides and treated accordingly. On standing, his plantar fascia on the left was less tense and the arch more well formed - therefore less pronation. The left foot was less problematical. The right planar fascia was less tense but the pronation on the right was only slightly improved. I then had him lie supine again and hold his hyoid in various challenge directions while testing the right Tibialis Posterior. When he held the hyoid superior and to the left and superior, the right Tibialis Posterior weakened again dramatically. I had him maintain the challenge

and therapy localize the various right sided infrahyoid muscles until one caused the right Tibialis Posterior to strengthen.

When the muscle was found I had him again hold the spindle cells apart for one test and together for the second test while he did the challenge and found that the Tibialis Posterior required the spindle cells to be pulled apart as in the above treatment for his Digastric. After the treatment, his plantar fascia on the right exhibited less tension, his arch on the right more well formed, and his pronation visibly improved.

**The activation of a Stomatognathic muscle to bring out a related hidden weakness (inhibition pattern).**

I have found that if a muscle was previously treated and tested intact but still showed some signs of the original weakness, that not only can a hyoid challenge bring out a hidden weakness, but contracting the stomatognathic muscle involved can bring out the hidden weakness as well.

**Case # 1** For example, I have a patient who is an older woman with a left hip joint problem, who I treated successfully in the usual ways but after a day of shopping with numerous uses of her car and much walking, her symptoms returned. Erect, I palpated her hip joint and found a tender area at the posterior aspect. The tenderness was reduced when she shifted her weight to the outside of the left foot (supinating the foot). I therefore tested the Tibialis Posterior which appeared intact, but if I had her open her mouth up wide contracting the anterior belly of the Digastric, it weakened dramatically. This finding was confirmed with the previously mentioned hyoid challenge earlier in this paper.

**Case # 2** Another case was of a patient with a category II right posterior ischium but the usual Hamstring weakness (inhibition) was not found until I had him hold a static challenge on the hyoid to the left and superior and then it weakened dramatically. Using therapy localization along with the challenge, I determined the problem to be in the Omohyoid muscle. Rather than just treat it, I decided to have the patient contract the Omohyoid which is done by holding the shoulders superior and anterior, a Beardall test [9]. When he contracted the Omohyoid, the right Hamstring weakened dramatically. It was then treated successfully.

**Case # 3** A male patient with a chronic right rotator cuff injury that had been according to him successfully treated medically, but still occasionally bothered him a little, showed a weakening of the right Teres Minor muscle on a hyoid challenge superior and to the right. The same weakening response could be shown with contraction of the Omohyoid muscle which needed treatment.



**Case # 4** This patient was mentioned in the above section where there was a dysfunctional anterior belly of the Digastric and on activation, caused the remote weakness in the Tibialis Posterior to occur.

**Useful information and exercises for the temporomandibular joint.**

- A. When discussing the temporomandibular joint, Hertling and Kessler [10] they focus a lot of attention on the postural distortion referred to as “forward head position FHP” as being a contributing factor to a TMJ problem. Theirs is a very valid point. You can palpate your own Masseter, Temporalis, External and Internal Pterygoids when the head is in a neutral position and again when it is in a forward head position FHP and will find that they contract. This corresponds well with the teachings of Mathias Alexander that were mentioned earlier in this paper. We, in Applied Kinesiology, can influence the forward head posture by testing for and correcting neck extensor weakness by correcting sacral fixations and by using strain and counterstrain and other methods on the muscles of the anterior neck flexors and the hyoid muscles.
- B. I have also found that I can reduce hypertonic neck flexors by adjusting the upper ribs superiorly. When this is necessary the palpation findings of muscle hypertonicity will reduce if a static superior challenge is held on the first or second rib. After the rib is adjusted you can check for the need of strain and counterstrain to the intercostal muscles related to the adjusted ribs.
- C. If translation begins before 11 mm of opening as measured by the intercuspal distance, it is called premature translation as the initial motion should be rotation. According to Hertling & Kessler [10], normal mandibular opening has been reported to be between 35-50 mm. To complete 40 mm of functional range 25 mm is rotational and 15 mm translation. They feel that if there is a large anterior translation at the beginning of opening when rotation should be occurring it is an indication of excessive joint mobility, which can lead to joint subluxation. They propose the following exercise:

*The patient is asked to place his or her tongue on the hard palate as far back as possible. This effects retrusion. While keeping the tongue on the hard palate, the patient opens and closes his or her mouth slowly and rhythmically within pain limits several times in succession practicing mandibular opening with only condylar rotation taking place.*

*The next step is to have the patient contact the chin and exert resistance as the mouth is opened.*

If the suprahyoid muscles demonstrate poor tone, an exercise described by Hertling & Kessler [10] which they indicate came from Shore, is the following:

*They teach the patient to use isometric contraction of the suprahyoid muscles in front of a mirror. The patient closes his or her mouth with the teeth in light contact. The patient then tries to retrude the jaw and depress the floor of the mouth without actually moving it. Each day a little more mouth opening is introduced to the exercise working to achieve coordinated muscle action of the mandible.*

*The patient can eventually guide the movements of opening and closing in front of a mirror correcting for deviation or protrusion thereby increasing the rotation aspect of the mandibular opening and reducing the translation aspect to create a more balanced motion and develop a new engram.*

## **Discussion**

The practitioner of Applied Kinesiology is faced with a great number of therapeutic intervention possibilities and subtle variations of the classical findings that can make the use of the techniques perplexing and difficult. Just as earlier discoveries of EID and BID, PiLUS and other procedures have helped take some of the difficulties out of finding hidden problems, it is my hope that the above observations will help to more easily unravel some of the body's more subtle problems.

I would be remiss if I did not add to all of the above, that when you are therapy localizing anywhere and are not finding any weakening of your indicator muscle, where you are pretty sure there should be, then be sure to check that it is not in a hypertonic state. This could be the reason for your not finding a lesion which is there. *If a muscle is in a hypertonic state, then it will not weaken when its spindle cells are pushed together and or its meridians sedation point is stimulated.*

For this observation I have the work of Dr. Gerz to thank [11] as I have found a number of cases that I would not have succeeded in helping unless I brought the indicator muscle back to a normal responsive state.

## **Conclusions**

All practitioners who work diligently to advance the treatment of patients will occasionally observe findings that are novel and helpful in practice. In this paper I share a few of my observations as well as some information from other sources. If any of my above observations have been written about previous to this paper, I have missed them in the literature and apologize to the original author. I did find (with the help of my good friend Kathy Conable), that one of my observations was a rediscovery of a finding of Dr. Corneal and acknowledged it earlier in this paper.

It is my hope that these observations will help practitioners of Applied Kinesiology to better help their patients. Some of these observations should also be useful in demonstrating to patients the complex interactions in the body that can be related to the stomatognathic system. My good friend and mentor Dr. Lance West who taught so much to many of us and who was a master at patient communication, always told me to spend more time demonstrating AK to the patient. He called it "SHOW AND TELL", just like we had to do in primary school. He believed that it helped the mental side of the triad of health and was just as necessary for the patient to get better as the physical treatment.

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