Movement Strategies for the Stomatognathic System

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Introduction

As the Rolf Institute's® Little Boy Logo shows, structuralists tend to emphasize the role of the pelvis in postural organization. Yet infants initiate the organization of verticality from G-prime (G') – the upper center of gravity – first by following caretakers with the eyes, and then by raising the head and chest with the help of the hands and arms. It seems that the impetus for verticality starts at the mouth, which is far more important for the organization of posture and movement patterns and the dynamics of reaching than we have recognized.

We have long known that balance is organized through the feet, eyes and vestibular system. Both tonic and phasic muscles, the tonus of which continually adjusts to keep us erect, are regulated by the vestibular apparatus and eyes, while the feet influence the body's organization in the sagittal plane. However, we now know that the mandible, temporomandibular joint (TMJ) and the four oral reflex functions (sucking, mastication, breathing, and swallowing) are essential to the organization of our balance and posture.

The TMJ, one of the body's most innervated joints and the only moving joint of the face, acts in three planes. *The TMJ registers information about body position and movement in space*, and its own position adjusts accordingly. Conversely, because the receptors in the mandibular fossa of the TMJ register the position of the condyles of the mandible, it is sensitive to whether the plane on which they lie is other than horizontal; if so, afferent signals from the TMJ *signal the body to adapt in order to create support for the head*. Basically, the jaw affects the spine and the spine affects the TMJ.

The four oral reflex functions and the position of the mandible (relative to the rest of the standing posture) are interdependent and influence each other. The oral reflex

functions also influence the tonus of the tongue and performance of various other oral functions, such as speaking. Because all four oral reflex functions employ some of the same neuromotor components, a problem in any one of them manifests in the others.

Taken together, the TMJ, the mouth, and those parts of the head, neck, and upper thorax (muscles, bones, ligaments, fascia, and nerves) that control sucking, biting, chewing, swallowing, are called the *stomatognathic system*.

Human Verticality Starts at the Mouth

Classically, the Seventh Hour is about *putting the head on* or *finding the skyhook*. While in structural terms it concerns the suboccipitals, in functional terms it concerns the senses – finding directions in space, and reaching to do so. In that respect, the impetus for our verticality starts *in utero*, at the same time human motor control starts with the mouth. In the fourth month of gestation, the human fetus performs its first voluntary movement: sucking the thumb and consequently swallowing amniotic fluid. This activity cause ingestion of substances essential to the maturation of the digestive tube and lungs, and also prepares the hyoid muscles for sucking at the breast, which, in turn, rehearses the verticality to come. In *putting the head on*, we implicate primal developmental events and engage the enormous portion of the motor and sensory homunculi devoted to the mouth.

Exploration: Suck your thumb and notice how it awakens the neck muscles and evokes the up direction. To experience the baby's complex coordination among sucking, swallowing, and breathing, get two feet of IV tubing and place one end in a cup of water. Suck the water through the other end and breathe through your nose in the intervals. Notice how this action evokes the up direction.

TMJ: The Fourth Balance Factor

> *When you work in the neck your fingers will be as close as possible to the control structures of the body than at any other moment.*
>
> Ida Rolf

The front of the head is heavier than the back. For that reason alone, balancing the head on the neck is complex. But, because the postural mechanism of the head and the movements of the mandible are intertwined, whatever influences the latter (e.g., cavities, missing teeth, misaligned teeth) will affect the balance of the head on the neck. In that sense, the masticatory system is part of the postural system:

- The anterior and posterior muscle chains meet in the masticatory system, with the mandible and tongue associated with the anterior and the maxillae (via the cranium) associated with the posterior;
- Positioned along the brainstem are nuclei of the trigeminal nerve. Although this is primarily a sensory nerve, it does have motor functions in respect to biting, chewing, and swallowing.
- The information transmitted by these nuclei, as well as by other afferent structures, influences tonic postural balance.
- Many studies have confirmed the reciprocal influence between the masticatory system, on the one hand, and the feet and eyes, on the other hand. Other studies have shown how the function of the masticatory system is affected by muscle adjustments triggered by exteroceptor activation consequent to the presence of dermal scar tissue in the cervical region; e.g., a surgical scar can have an impact on the masticatory system.

In any event, whether the masticatory system is a regulator or a perturbator of the tonic postural system, we do know that imbalances in one affect the other.

Experiencing the Jaw in the Context of the Ten Series

Though the jaw is addressed specifically in the Seventh Hour, we influence the jaw in each session.

In the **First Hour**, when we enhance the orientation to space by differentiating the arms and neck from the thorax and freeing the breathing, already we're affecting the jaw. **Exploration:** Sitting as before, try rotating your arms medially and laterally, and notice how the rotations affect your breathing and the sensations in your jaw. Next – in the millisecond before you want to inhale – think, *just think*, that your jaw is seeking a direction in space (as if it were a drawer opening), and notice how it feels to breathe like this. Then try the opposite: think, *just think*, that your jaw wants to go back, towards your throat, and feel what happens to your breathing and the connection of the feet to the ground. Perhaps just imagining to project your jaw forward encouraged inhalation, while the opposite encouraged exhalation. In fact, we can encourage a client to inhale or exhale simply by slightly extending or flexing the client's head.

The **Second Hour**'s work at the ligamentous level of the feet and lower legs reaches up to the cranium, and thus affect the jaw. **Exploration:** Assume your habitual standing posture and notice how your jaw is, how it feels. Then release into your inner arches, maybe even collapsing them, and feel the effect on your throat, jaw, tongue and neck. Next, observe the effect of resting into your lateral arches. See how the neck and jaw feel when you either hyperextend the knees or never really straighten them. What happens to the jaw when you activate the extensor digitorum muscle or shorten the low back?

In the **Third Hour**, we influence the TMJ through our organization of the G'/G relationship, as well as the lateral neck work. **Exploration:** Assume your habitual standing posture and notice how your jaw and neck feel. Then change the relative position of G' and G, taking G' way behind or way forward of G and feel what happens.

As we open the mid-line of the legs in the **Fourth Hour**, we affect the jaw *via* the pelvic floor, respiratory diaphragm, and thoracic inlet. **Exploration:** Standing or sitting, notice what you feel in your jaw. Then tighten the pelvic floor and notice what happens. Next, reverse the sequence: clench your teeth and notice what happens in your pelvic floor.

In the **Fifth Hour**, as we organize the legs with the pelvis, and through the pelvis to the visceral space, the affect on the core influences the jaw. **Exploration:** From your habitual standing posture, rotate the femurs medially and laterally and feel what happens to both the pelvic tilt and the jaw. And, as we organize the core by organizing the abdominal wall, we affect the jaw and TMJ via the abdominal, thoracic and cranial cavities. **Exploration:** Notice how your jaw feels when you are in your habitual standing posture. Completely release your abdominal wall and feel what happens. From there, activate your transversus abdominus (TA) and feel. Next, release

the TA, activate rectus abdominus (RA), and feel the changes in the TMJ/jaw. The exploration around the TA and RA becomes clearer with sit-ups: without activating the TA, you'll notice the strong shortening of the neck. But if you first activate the TA and only then the RA, the neck will remain movable and relatively free, and so will the jaw.

As we organize the whole back of the body in the **Sixth Hour**, our work on the spine as a whole influences the jaw. **Exploration:** Shorten your spinal erectors and feel what happens in the jaw; next, see what happens when you lengthen the front of your neck and throat. **Exploration:** Stand, one leg in front of the other, (let's say the right leg in front), feet pointing straight ahead, the right arm bent at your back over the upper lumbars, and the left arm along the body. Reaching with the left arm down and then to the front and then up, while your feet make the best possible contact with the floor, ask then the ischial tuberosities to widen, and lower the torso toward the floor by flexing at the hip hinge (not at the lumbars), reaching with the extended arm as far down as you can, feeling the jaw, and reaching towards the floor with the forefoot of the front foot and with the heel of the back foot. To come back up, draw the ischial tuberosities closer together and still reaching with the arm allow your body to come to standing while you take your awareness to your jaw and notice what happens there. Explore the same sequence again – but without activating the contact of the feet with the floor, or reaching with the arm/hand, or widening or narrowing of the ischial tuberosities – and feel what happens to the jaw.

Finally, in the **Seventh Hour**, if we consider the functional goals as well as the structural goals, we will influence the TMJ by taking the arms and hands to a higher level of integration. The functional goals include:

- freeing the vestibular system
- having the head leading the body through the dynamics of the senses, with the dynamics of the senses organizing posture and movements)
- having the spine free of interference from the girdles and diaphragms.

Explore the following arm/hand movements, and notice what happens in the TMJ:

- Clench your fists
- Sit at the computer, hands on the keyboard, wrists straight – then dorsiflex the wrists
- Sit at the computer, hands on the keyboard – keep the fingers straight but palmar-flex the wrists
- Medially or laterally rotate the humeri, or just pull the upper arms back;
- Pull the shoulders up towards the ears
- Allow the arms to hang freely – then pronate and supinate the forearms
- Stand in front of a very stable piece of furniture and push it away as if you were reaching through it – then pull it towards you
- Next time you drive, grasp the steering wheel hard

As Ida Rolf said, if the client is adequately prepared, the mouth will not be vulnerable; but if the client is not prepared, the mouth will be quite vulnerable, indeed. Therefore, if the arms, hands and shoulders have not yet been adequately differentiated, they should be addressed before proceeding to the classical territory of the Seventh Hour.

Jaw Movements Influence the Postural Mechanism of the Head

The position of the mandible affects not just of the head, but the whole person. Changing the position of the mandible changes the whole line, as well as how the person relates to the environment. The next exploration uses movements of the mandible to help the client become aware of head and neck position.

Exploration: Stand, connect your feet to the ground, and find the *up* direction and your Line. Notice your breathing and where your body weight rests in your feet. Leaving your cranium where it is, project your chin forward.

- What happens to the distribution of weight in the feet?
- To the lumbar and cervical curves?
- To the sensations on your abdomen?
- To the breathing?
- To the Line as a whole?

After returning to neutral, leave your cranium where it is and pull your chin toward you. Ask the same questions.

Finally, in the seated position, place a thumb under your chin, its tip touching the throat, to hold the chin steady. Keeping the chin in place, first project the neck forward and feel what happens to the lumbars, the sternum, and the breathing. Second, take the neck back as if you wanted to make it a straight continuation of the spine, and feel what happens to the spine, the distribution of weight in the feet, and the breathing.

To balance the action of the posterior erector muscles with that of the hyoids, it helps to imagine that the face to belongs to the sternum, while the cranium belongs to the spine. Let's work first with the whole head, and then with the jaw specifically.

Exploration: Sit slightly forward of your ischial tuberosities, feet connected to the ground, head suspended in space by the dynamics of the senses, and the weight of your head balanced between front and back in such a way that the cranium rests on the spine and the face on the sternum. Now, allow your whole neck and head to go forward and recheck all the landmarks: what happened to the connection of your feet with the floor, your up direction, your down direction, your breathing? Return to neutral, imagining your head suspended from or reaching toward the ceiling. Without moving the neck or head, imagine the cranium staying with the spine as the jaw goes forward. This overactivates longus colli and the hyoids, yielding considerable throat tension that makes it hard to swallow.

Psychobiology: The Jaw in the Expression of Emotions

Smile from your cervicals.

Vivian Jaye

Hubert Godard teaches that our spine gives us the sense of self. Hugh Milne, however, teaches that the mandible is the bone most associated with the person's sense of who he is. Because so much of our self-expression happens through the face, the jaw helps display many feelings. When we feel:

- aggressive, we protract the jaw to signal our readiness to fight;
- ambivalent, we hold the chin to prevent the head from sending a signal we are not clear about sending, such as a nod *yes*, when we want to agree but know we need more information;
- bored or tired, we support the chin with cupped hands;
- defensive, the head tilts down (even more than in submission) and the eyes

are downcast (gestures of shyness and flirting are similar);

- determined, we set the jaw against adversity;
- defiant, we jut the chin out;
- intimidating, we project the head forward, with eyes wide, teeth clenched and shoulders up;
- contemptuous, we can "point" the jaw at someone (insulting, but more subtle and less threatening than pointing with a finger);
- self-protective or threatened, we retract the chin in to protect both the chin and the throat;
- submissive, we lower the head as we retract the chin;
- tenacious, we dig in, clench the teeth, grin and bear it;
- thoughtful, we tap the chin with our fingers.

Communicating through the jaw as much as we do, we develop movement patterns that can contribute to TMJ dysfunction and temporal region tension headaches, which have repercussions throughout the body. Fortunately, movement patterns of the jaw can be addressed through Rolf Movement education. Jaw tension is hard to control, but the first step is to help the client recognize the context in which the TMJ/temporalis tension arises. Next, encourage the client to acknowledge any feelings associated with the situation or events. Finally, identify the manner and sequence in which client builds the tension pattern.

Sitting quietly for ten or fifteen minutes before bed time, contemplating the day and releasing the tension generated by the day's stress, allows us gradually to release accumulated jaw tension. While sitting in the meditative attitude, the client can place a pencil as a brace between the upper and lower molars to encourage the jaw muscles to relax. As the muscles lengthen over time, the client can use two pencils taped together. Take care to increase the size of the brace gradually, and to respect the average limit of how far the mouth can open (forty to sixty millimeters).

Functional Interventions

The face is just the other side of the neck.

Ida Rolf

To embody Dr. Rolf's observation, sit slightly forward of your ischial tuberosities, with "footy feet" on the floor and "handy hands" in your lap. Turn your head to either side and notice the quality of movement. Next, instead of turning the head from the face (or the nose in front), turn it from an imaginary nose in back. Notice that in the first action, when you turn to the left, it seems to turn from an imaginary axis close to the left sternocleidomastoid (SCM), and when you turn to the right, it seems to turn from an imaginary axis close to the right SCM; but, in the second action, the whole head seems to turn on a single axis that lines up with the cervical spine, which is what we want to evoke. Notice also that here a perceptual shift improves the coordination. Perception is also key to the functional interventions described below.

Rolf Movement Integration is helpful for stomatognathic system and TMJ problems *only if the client has the discipline to work with it daily*. First, teach the client to keep the upper and lower teeth separated, even as the lips are softly closed. Next, the tip of the tongue should rest on the palate, just behind the upper front teeth. This positioning alone is often enough to reduce TMJ tension by opening some space at the condyles. Persons with TMJ problems should be educated not to chew gum or eat hard things like beef jerky. The client should be educated to avoid collapsed standing postures and poor sitting habits that throw the head forward, as well as carrying heavy handbags on one shoulder and chewing on one side only.

Exploratory Repatterning Exercises for the Jaw

For each of the following exercises, sit slightly forward of the ischial tuberosities, feet on the floor, finding the *down* direction with the ischial tuberosities and the *up* direction with the top of the head. The back of the spine *looks back* and opens graciously towards the wall, even as its front remains open.

For the Lateral Pterygoids

Before a mirror, if possible, cradle the mandible in the crescent of the thumb and index/second fingers. With teeth resting apart, translate the jaw from one side of the crescent to the other, the cradling hand neither encouraging nor inhibiting the translation of the mandible. Are you moving the lips more than the mandible? Explore this movement daily, starting with one minute, and increasing the daily duration by one minute each week until you reach the three to five minutes. If the jaw translates asymmetrically, have a competent dentist evaluate it.

For the Depressors of the Mandible

The depressors of the mandible open and retract the mandible. Included in this group are the lateral pterygoid (also an auxiliary of mastication) and the suprahyoids (digastrics, stylohyoid, mylohyoid, and geniohyoid).

Before opening the mouth, stroke the mandible with the thumb, from the mastoid process to the tip of the chin, inviting something there to let go before opening the mouth. Or, cradle the mandible in the crescent of the thumb and index/second fingers and invite the mandible to rest in your hand before opening the mouth. Both touches give support for the temporalis to release and the suprahyoids to work more freely.

For Flexibility and Strength of the Jaw

Work gently with isometric exercises. First, place three fingers of each hand along the sides of the mandible to offer a bit of resistance to its reaching side-to-side movements. Next, place the fingers under the chin and let the mandible reach through the fingers as the mouth opens. Start with one minute per day and gradually increase to three minutes.

For the Temporals-Masseters-Chin

Cradle the mandible to guide its movement gently forward, so that the lower teeth go anterior to the upper teeth. Start with one minute per day, and gradually work up to three minutes. Take it easy: Overdoing this exercise might leave you with a sore temporalis!

For Increasing the TMJ Range of Motion

Slightly open the mouth, and place a thumb under the upper front teeth and two fingers of the other hand over the lower front teeth. Invite the jaw to remain passive as you gently open the mouth. Take care not to put too much pressure on the teeth: the more gentle you are, the better and more quickly this works. This is good for clients whose mouths barely open. Start with one

minute per day and gradually work up to three minutes.

For Coordinating the Three Planes of Movement of the TMJs

Draw imaginary figure eights with the tip of your chin. For this you'll have to open and close the mouth, and take it side-to-side. Draw two equal figures, one to each side of the mouth, taking care not to cut any curve. Start with one minute to one direction and another minute in the reverse direction. Gradually increase to two minutes each side.

Conclusion

Better understanding of the stomatognathic system as a whole, and of the jaw in particular, offers a new and broader perspective on the Seventh Hour. It enhances our ability to help our clients by facilitating their awareness of existing patterns, and by giving them self-help movement tools. It also opens the door for us to work cooperatively with holistically oriented dentists and speech therapists.