Clinical Perspective

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Marvin L. Hanson

Galen Peachey

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Current Issues in Orofacial Myology

PART I

Marvin L. Hanson, Ph.D.

and

Galen Peachey, M.Ed.

INTRODUCTION

The scope, nature, and focus of clinicians who treat oral myofunctional disorders are continuously changing. Healthy disagreements exist among practitioners on a number of important issues and procedures. Certain concepts and practices, however, are not objects of disagreement; they simply persist in spite of a lack of theoretical foundation, or in spite of the potential harm they offer to the client and to the profession.

The purpose of this article is to review four areas that deal with some of these issues. They are:

- I. **Terminology.** Some terms used by orofacial myologists are outdated. Others are controversial and arouse unnecessary hostility in the professional and/or lay listener. Certain terms should be avoided, and others used in a much more restricted manner than is often the custom.
- II. **Treatment considerations.** Philosophical considerations will be presented, along with rationale for specific groups of exercises, such as those carried out for the purpose of strengthening lips, and assignments designed to alter sleep habits.
- III. **Relationships between orofacial muscle activity and dental malocclusions.**
- IV. **Informed consent: An important protective document.**

I. TERMINOLOGY

Orofacial Muscle Imbalance. Use of this term presumes that there exists, in persons with normal dental occlusion, a balance between oral and facial muscles. There is no research that demonstrates such a balance. There does appear to be some kind of biological/physiological *equilibrium* that allows teeth to remain straight even though pressures from behind the teeth are consistently stronger than are pressures from in front of the teeth. It is important to remember that lingual pressures are not equal to labial or buccal pressures, in people with straight teeth. "Orofacial muscle imbalance" is a term best to be avoided, because it presumes a condition for which there is no evidence.

It is safer, more acceptable and more accurate to simply describe what you see as you observe a patient. For example: "There is a chronic resting of the tongue against the upper anterior teeth and a chronic lack of approximation of the lips at rest," or "a habitual open lip rest posture."

Deviant Swallow or Deviate Swallow. This pair of terms should also be avoided. There is no point in offending patients or parents of patients by using words to describe them that have such negative connotations

concerning human psychological behavior. Neither term is descriptive in a positive sense. The term "swallow" or "swallowing" is too limited in scope to adequately describe the oral myofunctional disorder.

Infantile Swallow. Several months ago a big, muscular gentleman entered one of our offices and as he explained his purpose in being there, dropped his head forward just a bit in shame, and muttered in a quiet voice that his orthodontist had told him he had an "infantile swallow." Clearly, the orthodontist who called his problem that must have felt adequately insured. Even though the term is probably correct, since all infants appear to carry the tongue forward and to create a labial-lingual seal during sucking and swallowing, the term is offensive to many and certainly an over-simplification of the problem presented. Additional terms that are recommended to be avoided include abnormal swallowing, perverted swallowing, abnormal deglutition, reverse swallowing, etc. Descriptive terms are, once again, preferable to labels. If a label is necessary, "oral myofunctional disorder" is about the best we have to date.

Mouth Breathing. Only those few persons who have lived with a completely occluded set of nostrils could be convicted on being "mouth breathers" only. Nearly everyone breathes some of the time through the mouth and some of the time through the nose. Rather than search for people guilty of mouth breathing, we should try to determine whether a person whose mouth is often resting in an open position might have a nasal airway interference. A subjective, variably accurate estimate of a person's habitual nose or mouth breathing can be obtained by simply asking the patient whether he or she breathes most of the time during the day through the mouth or through the nose. Another question following the answer might be "Is it difficult for you to breathe through the nose when you try to do so?" It is important to inform the person that just because they habitually have their lips apart at rest and have been told they are "mouth breathers" it is not necessarily true. In this case if it looks like a duck, walks like a duck and quacks like a duck IT MIGHT NOT BE A DUCK. An objective answer to the question can only be gained by measuring nasal air resistance during breathing and speaking, nasal air flow, and simultaneous oral air flow in a speech-language pathology clinic or laboratory using instrumentation. These tests establish ratios between nasal and oral air flow. If the patient's report, or objective tests, determine that nasal air flow is inadequate to permit comfortable lips-closed resting postures, a referral to a medical specialist is advisable.

Relapse. When this word is used by orofacial myologists, it refers to a post-orthodontic treatment movement of dentition toward their pre-treatment positions. To use it is to risk offending the specialists who probably refer most of your patients to you. It is a disagreeable term, especially when its user represents a profession other than the orthodontist's own. Orthodontists prefer descriptions to terms, but if a term needs to be used, one that is offered in the literature is "physiologic recovery." It is very normal for structures moved from one position to another in the human being to return toward their original position. There are forces that contributed toward the original malocclusion that may still be operative. One example of those forces is growth. Late vertical growth of the maxilla tends to produce a counter-clockwise rotation. This results in an increase of the anterior malocclusion. When an overjet or openbite returns following the removal of braces or retainers, it may simply be an evidence of the continuation of growth patterns.

If it is necessary for you to describe a return to an earlier malocclusion, it is simply better to do so by describing the extent of the present malocclusion, in writing, on your own records. Let the labeling of the condition, or its description, remain in the domain of the treating orthodontist. The avoidance of the term "relapse" should extend, as well, to descriptions of patients we see who have been previously treated for "tongue thrust," and who we observe to be exhibiting abnormal lingual behaviors. It is of little benefit to anyone to place blame for the "relapse" of the unwanted lingual behaviors on the inadequacy of the previous therapist.

Advice that is generally sound is to replace labels, in written reports and in conversations with patients and professionals, with descriptions of behaviors.

II. TREATMENT CONSIDERATIONS

A very basic recommendation we wish to make, and one that has widespread application in clinical work, is this: do not undervalue your clinical observations. In most disciplines that attempt to alter human behavior, clinical observations precede research investigations to test hypotheses formed from these observations, by several years. If you conceive an exercise or procedure that seems rational, give it a try. If its use seems to disagree with what good research has found to be true, try it with considerable reticence. Very few assignments given by an orofacial myologist are likely to produce harmful results. However, "a little knowledge is dangerous." Before instructing patients to employ nasal washes, it is advised that they see their physician first. Before instructing them to hold surgical tubing between their teeth to avoid pain or promote tooth eruption, they should get permission from their dentist/orthodontist. Peachey also feels dietary instructions should come from a licensed dietitian or their physician. We should use the team approach; we cannot be all things to all persons. One of the important procedures Hanson learned from Dick Barrett years ago was the use of water, air or objects

to plump out the crease across the chin that was created, presumably, by an over-developed mentalis muscle. Hanson decided years ago to just wait and see what happened to that crease were it left alone. He found that in his experience, when the overjets accompanying this mentalis contraction crease were eliminated, the line across the chin almost always disappeared. He rarely does any exercises to eliminate that crease in patients in his practice. If you don't trust omitting those exercises, and come up with one that works better than those you learned, try it for a while and record your observations, photographically or descriptively.

An example offered by Peachey illustrating the same point concerns the rugae as a diagnostic criterion. Many of us were taught that tongue thrusters have more pronounced rugae, because the tongue did not rest against them to smooth them out as the years went by. In his clinical observations, Peachey did not find that to be diagnostically significant, so long ago abandoned it as something to observe. He has found that recognizing the nature of the rugae has no effect on the efficacy of his treatment.

Dr. Robert Mason, in discussion on this topic, postulated that the rugae have something to do with the width of the dental arch and the vault of the palate. Narrower dental arches, "V" shaped arches, tend to have higher palatal vaults. Higher vaults tend to be accompanied by more sharply defined rugae. "It's like putting a piece of contact paper on a flexible surface; if you squeeze the sides up, you're going to get more buckling than if you have a flatter surface. To me, that is not a diagnostic sign, it's simply an anatomical observation that tends to reflect the vault of the palate."

Inter-Relatedness of Functions. Hanson was fortunate to have studied under a speech pathologist named Dr. George Kopp, who championed what was called, forty to fifty years ago, the organismic approach. One of the tenets of the organismic approach is that every human behavior is related to every other human behavior. One of the reasons we should work with the functional aspects of tongue behavior, in addition to its resting postures, is that all lingual behaviors are inter-related. In other words, if the tongue rests forward against the anterior teeth nearly all the time, it will probably remain there during the production of lingua alveolar sounds, during chewing, and during swallowing. Speech-language pathologists who treat patients with frontal lisps and defective /r/s/ have found these problems to be sometimes extremely recalcitrant. Seeing a patient with one of these articulatory defects who has had therapy for months or years, and who still cannot make the /r/ or /s/ sound is a fairly common occurrence. We have found, through research and through clinical observations, that if we attend to the habitual resting posture of the tongue, elevating it to the upper alveolar process, the correction of the /r/ or /s/ is simpler and quicker. By attending first to the more basic lingual and labial resting

postures, then moving to the correction of speech and vegetative functions, we achieve optimal results.

An observation that we feel is valid is that most children who have articulation problems not attributable to any known organic deficiencies are using excessive genioglossus muscle activity and under-using the other muscles of the tongue. A change in resting posture facilitates changes in functional behaviors. If it is true that it is the resting postures of the tongue that assist in creating anterior malocclusions or in moving the teeth to pre-orthodontic positions, it does not follow that attention only to resting postures will take care of the problem. If vegetative and speech functions are allowed to persist in their pre-treatment manner, they will encourage the return of the forward resting tongue. Those specialists who work with rest posture and with vegetative processes but are not qualified to work with the speech problem that may accompany the other patterns, will find retention of learned postures and movements to be more promising if they also refer for speech therapy as a part of the total treatment. Speech therapy has been found to be most beneficial when initiated following several weeks of attention to the resting postures. Speech-language pathologists will find a distinctive feature approach to be particularly useful with these problems.

Lip Exercises. Robert Front, in *Mending Walls*, contended that rock walls are useful when there are cows. "But here there are no cows." He questioned the practice of the springtime custom of replacing fallen rocks when there was no good reason for the existence of the walls. We would advise that you think carefully before you assign any strengthening exercises, either to the tongue, the lips, or the muscles of mastication. There is research that demonstrates that these muscles can be strengthened through exercises, but there is no research to indicate that people with oral myofunctional disorders need stronger orofacial muscles in order to perform patterns correctly. In our practices we use strengthening exercises to a very limited degree. Anyone whose speech pattern is essentially normal has enough strength and mobility in tongue muscles to effect proper resting and vegetative patterns. When lips meet each other only with considerable difficulty, it is certainly worthwhile to include a program of exercises designed to facilitate proper lip resting postures. In most cases the stretching of the inadequate lip (usually the upper lip) is the procedure of choice. Exceptions, of course, are people with congenital structural or physiological insufficiencies, such as people with repaired cleft lips or children with cerebral palsy. The research has demonstrated that lips can be strengthened by as much as 600 percent, and that strength maintained for a considerable period of time following the cessation of treatment. The same research, however, found no effects on the dentition of the stronger lips. It is possible that increasing muscle strength may have a positive effect on range and speed of movement of the involved structures. Some

research to demonstrate whether those effects exist would be helpful. Hanson's research on retention of corrected malocclusion in patients several years out of orthodontic treatment found his therapy to be effective in maintaining the corrected positions of the teeth. None of the patients studied had received any lip strengthening exercises. Perhaps the most important point to make is that you should have a clearly developed rationale for every exercise and assignment that you use with a given patient. If you feel that greater awareness of lip resting postures can be fostered by having the patient do lip strengthening exercises, and your experience demonstrates to you that that is the case, you have a reason to continue to use that procedure. Before investing a great deal of money in instruments to measure lip strength, simply ask yourself whether the desired results are "strong lips" or a comfortable habitual approximation of the lips at rest. Strengthening may be overkill and unnecessary.

Sleep Assignments. An application of the concept that all orofacial patterns are interrelated is that resting postures of lips and tongue during the 8-10 hours a night while a child is sleeping are likely to contribute to the total habit patterns of those structures during the daytime. In addition, since nighttime behaviors are subconscious rather than conscious, many clinicians have felt that it is important to work toward achieving a lips-closed and tongue-up posture during sleep. Other clinicians theorize that there is some danger attending the practice of attempting to condition a child or adult who has difficulty breathing through the nose at night to do so. We have to place some weight on the fact that in our combined fifty years of experience in working with the extension and maintenance of proper resting postures during sleep, neither of us has experienced any difficulty of any kind with any patients because of the use of that procedure. We have found in our practices also that it is best to devote a number of weeks to the strengthening of proper daytime resting postures before making assignments dealing with sleep. Usually once the lips are closed habitually during the daytime, we will see a natural carryover into sleep. It is our strong advice that the lips *never* be taped shut, especially during sleep. One clinician we know takes the opposite approach; she works mainly on establishing correct lip and tongue resting postures during sleep and finds excellent carryover from those efforts to daytime postures. Feedback from adult patients who have long experienced the unpleasantness of acquiring a very dry mouth during sleep has led us to place significant confidence in the ability of adults as well as children to learn to sleep with their lips closed.

III. ORAL FACIAL MUSCLES AND MALOCCLUSIONS

One of the most frequent errors made by clinicians is to attribute cause and effect relationships to phenomena that occur together. After seeing numbers of patients with an anterior openbite and watching the tongue protrude into the space between the upper and

lower teeth during swallowing, it is easy for an orthodontist or an orofacial myologist to conclude that it is the tongue thrust that is causing the openbite. Since forward tongue positioning occurs most obviously during swallows, it is natural to conclude that it is the swallowing behavior that causes the malocclusion.

It is not difficult to understand, at the cellular level, how an anterior resting posture of the tongue can cause malocclusion. In order for teeth to move, very light, constant pressures must be exerted against them by a force, in this case the tongue. It is difficult to explain, biologically, how heavier intermittent forces, such as those that occur during swallowing, could move teeth. Therefore, it is more logical, as you discuss these things with orthodontists, to be specific and ascribe harmful effects of the tongue against teeth primarily to resting postures of the tongue. If the tongue rests against the anterior teeth, or between the upper and lower anterior teeth, and the action of the tongue is unopposed, such as by habitually closed lips, it is biologically possible for the tongue to affect anterior occlusion.

We have all heard orofacial myologists explaining that we swallow 2,000 times a day and push the tongue against the teeth with several pounds of pressure. Neither of these figures is accurate, and the explainer is implying that it is the swallowing behavior that moves the teeth. In order to have resorption of bone tissue on one side of the teeth and a build-up of cells on the other side, light constant pressures have to be exerted. Intermittent forces, at least in and of themselves, are ineffective as tooth movers.

In Hanson's mind, however, has always existed the question of whether it might be possible for those heavier intermittent pressures to help the light constant pressures in their efforts to move the teeth. All analogies are flawed to some extent and the following is certainly heavily flawed, but Hanson's teenage summers spent on farms, some of the time working with fences with wooden posts, lead him to wonder whether, in the same manner that you can loosen a misplaced fencepost by tapping it repeatedly, rather gently, at the right distance from its contact with the ground, and you can do a nice job of breaking the post if you hit it too high and too hard, but that a combination of several light taps with an occasional medium size hit seems to do a better job of moving the post than any other. At any rate, research might test whether what actually seems to be happening in a child with an oral myofunctional disorder, i.e., constant resting forces coupled with intermittent heavier forces, might be, after all, the most effective way of moving teeth in bone. The research, of course, would have to be done with animals such as Rhesus monkeys. To date, no one has done that kind of investigation.

IV. INFORMED CONSENT

An informed consent document is standard in any surgical situation and should probably be standard in any orthodontic office, in these times when patients are

very aware of the possibilities of litigation in the event of unforeseen, negative consequences of treatment. Braces on the teeth might loosen them unintentionally; temporo-mandibular joint problems might develop as a result of the orthodontics. The signature of the patient or parent who has read a warning, who realizes that there are risks involved in the treatment being accepted, and who accepts those risks, protects the orthodontist against such litigation. The use of such a document might be warranted by an orofacial myologist any time they place in the oral cavity, or instruct that it be placed there, as a part of treatment, any object, since there is the possibility of aspiration of that object into the trachea. The insertion of anything into the mouth might damage the mucosa, and be possibly injurious to a person with a heart disorder. Certainly people with heart problems have died from having their teeth cleaned. Millions of bacteria are sent through the system, lodging in the heart and setting up an infection that may damage the heart valve and cause death.

The possibility of the patient suffering some unforeseen consequence related or suspected of being related to treatment you have provided certainly exists. An informed consent document would certainly not involve any risks, whereas avoiding using one might.

V. SUMMARY

It is easy to persist in doing that which you were originally taught to do. It is easy to treat all patients homogeneously, give them all the same exercises and assignments, in the same order. It is easy to use terms, to describe conditions, that others are using. It is easy to avoid keeping up on related research. Our recommendation is that orofacial myologists take the road less travelled by, that they use prudence in their choice of terminology, exercises, assignments and goals. Let research findings combine with your own clinical experience to help you make sound decisions in evaluating and treating oral myofunctional disorders. Allow individualization of procedures to replace cookbook approaches. Replace questionable labels with accurate, understandable descriptions. Become the best possible communicator you can.