

Some Common Perversions of the Functions of Facial Muscles with Practical Methods For Their Correction*

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As orthodontists, we enlist our time, efforts and talents toward the establishment of beauty, harmony and efficiency; beauty in form and contour, harmony by eliminating discords of mal-alignment and unbalance, and efficiency in the dental mill for the proper mastication of food with the least effort expended.

Some orthodontists accent beauty; some think mostly of harmony; others concentrate upon efficiency. But if all three of these factors are not recognized in their own proper harmony and balance, does it not indicate that our mental viewpoint, our ideals, need adjustment, need regulating?

All harmonious action, when most efficient, is properly timed and is balanced. The spark and compression of the gasoline engine must synchronize; they must be correctly correlated for the most efficient results. Hence we may truthfully say that mechanical efficiency is always beautiful, harmonious action is always efficient and balance is always pleasing.

These axiomatic declarations may be applied to orthodontists and their technique, or to appliances or even to muscles. It is upon the latter problem that the writer wishes to concentrate at this time.

To approach maximum success in his work, and that is what we are all striving for, the orthodontist must be balanced in his concept of all the problems involved. For instance, beyond the correct interdigitation of cusps and inclined planes he must recognize any deviation from normal of the axial inclination, particularly in the buccal teeth; he should not ignore any of the extra oral forces and influences for or against normal occlusion as brought to our attention by so many observers and investigators of late, such as the disturbing influence of swallowing with the mandibular and maxillary teeth apart, sleeping and studying with the weight of the head resting upon the facial bones through pillow or hand, lip biting, finger nail biting and

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thumb sucking; neither should he fail to recognize that old and almost ever present enemy to normal occlusion, mouth breathing and its seemingly endless chain of ill effects particularly aggravating to the orthodontist during the period of retention; and he should always look for the unbalancing influence of overdevelopment of some facial muscles by overuse and the partial or complete atrophy of others through lack of use. All of these factors must be considered and if any are associated with the case all necessary means must be taken to eliminate and rectify their effects.

Drs. Angle and Oppenheim have placed the physiological and mechanical treatment of malocclusion upon as nearly a scientific basis as it now seems humanly possible to reach. Hence there seems to be no excuse for inefficient mechanics in orthodontia. Yet the orthodontist who confines his corrective efforts to the use of the most perfect appliance and ignores any of all of the correlated functions or forces of the dental mill is, in the writer's opinion, courting failure or at least, delayed success. This is the crux of my message today.

It seems, at times, difficult to separate cause and effect and the orthodontist is not immune to this experience. Do teeth protrude because of a large lower lip and a small upper one or have the protruding teeth been caused by unbalanced muscular development? This question has often presented itself to all of us and perhaps more often than we have realized. In fact, so intimately related are cause and effect in cases of malocclusion of the teeth that they must always be considered together and simultaneously corrected.

The writer often compares malposed teeth and their relation to the primary causes of this condition, to a feather held in mid air between two or more air currents of varying power. The feather always sways toward the area of least resistance. So it is with the teeth and their retaining structures—the mandible and maxillae. These, too, tend to move and develop in the direction of least resistance. Then, from that viewpoint, one of the most important considerations in all orthodontic treatment is the ability to read the subtle, latent and hidden forces that are themselves unbalanced and so act as primary or secondary causes of malocclusion. Hence the mechanical treatment of malocclusion should be supplemented by concentrated attempts to overcome these causative factors and the prognosis hinges as much upon the operator's success in dealing with the latter as in establishing a normal relationship in the component parts of the masticatory organ.

Histologists tell us that muscles grow in response to exercise and atrophy

from lack of it. But before we can supply this law to the treatment of distorted facial muscles we must remember that behind all exercising methods is a thought that impells the muscle to move and hence the artificial stimulation can only succeed when the operator has established a perfect co-operating mental attitude in the parents and in the patient. Their interest must be enlisted one hundred percent and while different methods of approach may be needed for varying mentalities, yet the daily concentration upon deficient, atrophied, unfunctioning or malfunctioning muscular tissues must be developed in the patient during both active and passive treatment or the natural retaining forces of normal facial muscles will be found wanting when needed for the final retention.

Applying the generally accepted laws of muscle tissue growth to the mouth breathers, we find that the muscles of the lower lip and adjacent tissues receive more exercise than any of the other facial muscles while those of the upper lip and associated parts receive less exercise. This results in a hypertrophy of the lower group and an atrophy of the upper lip muscles. When this condition has established itself it is easier for the patient to close the mouth by the contraction of the lower lip muscles accompanied by a relaxation of the upper lip and its correlated muscles. This unbalanced use of the muscles around the mouth results in an unbalanced development which can only be rectified by excessive use and functioning in the right direction. In this artificial effort there should be a *singling out and a concentration upon the deficient group only*. Any mechanical device that tends to exercise the strong group as well as the weak one will of necessity do more harm than good by making the hypertrophied muscles continue to grow through this excessive use as well as strengthening the atrophied ones. Furthermore the larger and stronger muscles will work harder than the weaker ones, under equal stress, so that instead of holding the overdeveloped group in abeyance and bringing the atrophied ones up to normal, thus balancing the muscular forces and resorting the contour of the face, the relative difference will be little if any bettered either esthetically or mechanically.

The writer's experience with the various methods of muscle exercise suggested in our current literature from time to time, has not been satisfactory because the need of this selective factor was underestimated by these men. I therefore offer a set of exercises that have proven efficient, both in practice and in the clinic at the College of Orthodontia. The instructions to the patient may be tabulated as follows:

1. Bring and hold the molars of the upper and lower jaw in occlusion.
2. Contract all of the cheek muscles on *one* side which results in pulling the corner of the mouth directly backward on that side.
3. While still holding this position push, with the hand, all the muscles of the opposite of the face toward the side already contracted.
4. While these muscle groups are all being held tense, take a deep and long inhalation and exha'tation.
5. Reverse the procedure and duplicate the same steps on the opposite side.

The effects of this exercise when done daily from ten to one hundred times, depending upon the physical condition of the patient, are:

First:—Lengthening of all the muscles of the levator anguli oris group, including the upper half of the orbicularis oris.

Second:—The simultaneous reduction in resiliency and the size of the lower half of the orbicularis oris and the right and left depressor anguli oris group.

Such a change is absolutely necessary for the ultimate success of such cases as these.

Third:—An increase in the size of the muscles forming the walls of the nose is also noted as well as an increased ease in breathing.

This change in the nasal structures is due to the forcing of air through one nostril at a time which gives each nostril all the work to do every other inhalation instead of allowing the one larger nasal chamber, usually characteristic of these cases, to carry the major amount of air and thereby automatically decreasing the demands upon the diminutive nostril which by all means should have this major stimulation if it is hoped to restore its normal capacity for air carrying.