

Tutorial

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THE SPEECH PATHOLOGY TREATMENT WITH ALTERATIONS OF THE STOMATOGNATHIC SYSTEM

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ABSTRACT

This article analyzes differences in orthodontic and craniofacial classifications and the role of the speech-language pathologist in adequately treating those patients with varying Class II and Class III malocclusions. Other symptoms, such as those of mouth breathing and tongue position, are compared and contrasted in order to identify characteristics and treatment issues pertaining to each area. The author emphasizes a team approach to myofunctional therapy and stresses the importance of collaborative treatment.

Key words: myotherapy, anterior open bite, Class II/III malocclusion, collaborative treatment, speech-language pathologist, speech production, mouth breathing.

INTRODUCTION

For thirty years, speech pathologists (SLPs) have worked in the area of myotherapy in Brazil. This work has been modified mainly in the last decade. The area of orthodontics also has been changing a great deal and growing overwhelmingly with innovations in its techniques and approaches. Speech pathologists follow closely the paths of the odontologists (general practitioners), odontopediatricians, orthodontists and functional orthopedists of the maxilla. Discoveries that occurred in the area of professionals working with the stomatognathic system interest speech pathologists especially because they strongly interfere with our work. In the past, orthodontists rarely forwarded their patients for speech pathology treatment. Now, speech pathologists are an indispensable professional working together with orthodontists. Nowadays, after many discussions SLPs are part of the group of specialists who work with occlusion problems. This article includes the practice developed during twenty years. I will try to show the problems that this subject involves.

THE HISTORY OF THE MYOTHERAPY WORK IN SPEECH PATHOLOGY

“Each case is a case!”

There may not be any other phrase more often spoken and heard by speech pathologists than this one. However, in therapeutic practice, this utterance is forgotten, and SLPs indiscriminately use the same old steps to treat patients. SLPs

take a clinical history, evaluate and do therapy that usually includes the following procedures:

1. To increase muscular tonus
2. To increase proprioception
3. To work with tongue mobility, the lips, cheeks, soft palate and mandible through adequate exercises (we have a list of approximately 100 exercises).
4. To observe the adequacy of oral functions:
 - a. Sucking
 - b. Chewing
 - c. Swallowing
 - d. Breathing
 - e. Speech
5. To automatize everything that has been taught
6. To work with “frustration”

Evidently this last step was not included in training programs, either in the textbooks or in the study outline. In therapy, that was exactly what was happening. The exercises many times, despite being learned by the patient, were almost never automatized and this caused frustration. Frequently, although these procedures were religiously followed, patients did not carryover out of the therapy session behaviors such as breathing through the nostrils, positioning the tongue on the papilla, swallowing without projecting the tongue onto the teeth, chewing with closed mouth etc., etc., etc.

Intriguingly even today, orthodontists and dental surgeons refer to SLPs in order to obtain this “a

bit magic list" that apparently might reeducate functions and avoid relapses. Interesting! If "each case is a case", how can therapy always be the same for everybody?

REFLECTIONS ABOUT MYOTHERAPY AND THE SEARCH FOR NEW PATHS

After observing the inadequacy of this traditional kind of therapy, the question became "What to do?" The initial consideration was "Is it really joint treatment between the SLP and the orthodontist, or is the patient only the same patient being treated by both professionals?" The second consideration was "Does each professional know what the other one does?" Speech pathologists needed to become more familiar with what each area of orthodontics proposed.

Speech pathologists also began studying cranial - facial growth patterns and its variations. We have observed that it is necessary for the speech pathologists to make a more precise diagnosis, to know if the case is or not a case appropriate for speech therapy treatment. For example, it is known that a person who breathes through the mouth with hypertrophy of the tonsils and/or the cornets should be seen by an ENT before an SLP. On the other hand, patients with Class II Division 1, Class III, or skeletal open bites should be referred to speech pathologists to learn how to position their lips and tongue correctly to improve functions, primarily the swallowing function that has been always diagnosed as atypical.

Other frequent questions we have posed in our reflections included: Would it be important for the patient under dental care to receive intervention by the speech pathologist? If so, when is the best time for speech therapy: before, during or after dental care? Would the adult patient stabilize a new muscular pattern? What about children? Should children be aware or not be aware of the therapy being done with them? Should parents participate or not participate in therapy? To raise these questions is easy because there are lots of questions that often have many different answers. Who should answer these questions: speech pathologists or professionals linked to buccal health such as dental surgeons, orthodontists, or functional orthopedists of the maxillaries?

PRESENT PATHS AND SOME ANSWERS

Instead of presenting a new and miraculous therapy (equal for all), the following discussion presents the possibilities of therapy by considering the characteristics of the alterations in each type of patient. We are going to present some characteristics of occlusal alterations, questions to ask of the patients, and some treatment considerations.

Anterior Open Bite

- Complete or incomplete?
- Osseous or dentary?
- With deciduous dentition, mixed or permanent?
- With topped canines or crossed?
- With or without sucking habits?
- Is it in normal individuals, mental disabled or individuals with neurological problems?
- Is it in an individual with fixed or removable appliance or under orthopedic treatment or only with abrasion?
- Does it follow with atresic palate, buccal respiration or unilateral crossbite?
- Is it with or without orthodontic documentation?
- Is it in short, long or mesio face individuals?

How many questions should be asked? It is evident that the speech pathologist's treatment will be diverse in relation to cases of open bite after these and other questions about the patient are answered. However, we do have knowledge about some things that, in general, do not vary in the practice. At first, children with deciduous dentition and sucking habits improve enormously when the habit is removed allowing their bite to close if topped canines or crossbite is not present. The positioning of the tongue on the papilla is rather difficult since there is an open space and the tongue tends to thrust itself forwards.

When the open bite permits lip sealing, it is more important that therapy target the external musculature than with attempts to position the tongue, because with correct pressure of the lip towards the teeth, we can favor the closure of the bite. Stimulating adequate chewing also helps the dentist's job in general. Children who chew bilaterally and alternately stimulate a

better occlusion. As it is observable, we cannot and we should not prescribe prompt solutions because, in fact, my apologies for the cliché but “each case is a case”.

Unilateral Crossbite

We could start again with a series of questions: the patient's age, the type of crossbite, time of occurrence, etc. In every case innumerable questions could be made by straightforward professionals because it is not up to the speech pathologist to know if the crossbite is osseous or dental, or if it is or is not the correct time to be uncrossed.

However, if the speech pathologist is not informed about the real situation, success in therapy will be practically impossible. After all, we all know that chewing, in general, will be occurring in the crossed side because it has the vertical dimension reduced and it does not work properly since it is blocked by the maxilla.

The muscles also will be altered. The masseter in the non-working side will be stretched and weaker, and in the working side, it will be smaller and stronger. This is what provokes, in general, a facial asymmetry.

Osseous asymmetries also can be occurring or may have already occurred. When there is a crossbite, the maxilla in the working side has its growth inwards and downwards. The palate will be atresiated making it difficult to correctly position the tongue.

If there is not an uncrossing, the chewing will not be established in a suitable way. In case there is an uncrossing not only may the chewing be changed and settled satisfactorily, but there may ALSO be a memory of the unilateral mastication leading again to a crossbite.

How can we know what will happen? Besides giving information to the patient and the family, the professional's observation is fundamental. The speech pathologist may intervene in the end or in the middle of the correction of the occlusion helping to establish this kind of function and other ones.

The bond of the speech pathologist with the patient, in general, is strong because therapy sessions are weekly and the treatment includes explanations about their problem and how to work with it.

Knowing that the alterations of only one of these functions tend to affect the others because of their very proximity and the fact that muscles make adaptations to perform their functions, there is a priority to target the most altered aspect for therapy without ignoring the orientation and care of other functions.

Class II

Depending on the size of the osseous alteration, the correct positioning of the lips may be impossible. Mastication, in general, occurs with the dorsum of the tongue while the tip remains low since in Class II alteration, the position of the tongue is usually with a high dorsum and a low tip.

The narrowing of the palate together with discrepancies between the osseous bases usually presents difficult for tongue positioning on the papilla. Speech may have its articulation points altered causing the emission of the bilabial phonemes /p/, /b/, and /m/ with the inferior lip in contact with the superior teeth. Swallowing many times is done with the interposition of the inferior lip behind or with the support of the superior incisive teeth.

Lip tonicity may also be altered. It depends on lip involvement in the oral functions. In general, in Class II, when the mouth is open, the superior lip is hypertonic and the inferior lip is hypo tonic. When there is a hypotony of the inferior lip, the mentalis can be hypertense because it is making an effort to compensate for this hypotonicity.

Many other considerations need to be made in respect to the Class II and about the diverse changes that may occur. Everything will depend on how much and how the alteration studied is. Similarly, the work of the speech pathologist will be more or less limited to the conditions found at the time of the evaluation.

Class III

Class III individuals; in general, have the tongue supported at the inferior arch since it is larger. Not only is the inferior arch wider but almost always it is rather profound. The tongue staying in this region appears large, and many times is higher than normal which makes it more difficult to position the tongue in the superior arch that is narrower. I observe major differences in the myotherapeutic work between Class III (long

face) and Class II (short face), and it is evident that short faces are much easier to treat because of the genetically stronger musculature. We do not believe in speech pathology treatment isolated from the orthodontic treatment in Class III. The best results for a Class III case in adults are the orthognathic surgeries. Good results also occur when the individual is treated from childhood with interceptive orthodontics or functional orthopedics of the maxillaries.

With Class III individuals, I think it is fundamental that preventive treatment be a joint approach between the speech pathologist and/or orthodontist and/or orthopedist. This treatment should be accompanied by systematic information for the parents who also must participate actively in the treatment for improving the functions of correct chewing and breathing, and subsequently results in adequate posturing of tongue and lips.

Long Face Individuals

Patients with this kind of facial characteristic are our most frequent visitors independently of the kind of occlusion presented. Generally, in long face individuals the muscles are hypotonic and these patients are almost always buccal breathers. When the third inferior part of the face is longer, it makes labial occlusion enormously difficult. In this kind of face another problem is the positioning of the tongue, which ends up more distant from the hard palate.

In these cases, as well as in the case of Class III, I believe more in a preventive work than in corrective. We know that dental correction will not provide the correction of the osseous form and the final result is not always satisfactory to the patient.

The speech pathologist has cooperated tremendously with preventive work by establishing nasal breathing and strengthening of the musculature that elevates the mandible by means of correct mastication. Head positioning has also been our goal since the tongue can position itself in a more or less anterior way depending on the inclination of the neck.

The long face individuals deserve systematic follow-up and orientations during all their growth and craniofacial development. This follow-up does not mean obligatorily formal therapy.

Short Face Individuals

The greatest difficulties for the speech pathologists in relation to this kind of face are related to phonemic dislocations in the sibilant sounds. The vertical internal space is rather reduced, and consequently the tongue does not have enough space to raise its borders to produce the /s/ or /z/ sounds with precision. Anterior diastemas also collaborate to produce a typical whistle in the speech and this strongly disturbs the individual. Without an increase of the vertical internal space or the closure of the diastemas, it is difficult to totally correct the speech pattern.

Disorders of the Tempromandibular Joint

Individuals with alterations of speech, in general, look first for a speech pathologist for treatment. We should be attentive in our exams so as to verify the dental occlusion; the facial type and also we should observe TMJ disorders.

Initially, TMJ disorders will not be treated by the speech pathologist, who should only detect any alteration in the exam and make necessary arrangements to forward the patient to a specialized dentist in the area. Some atypical movements of the mandible during speech, inadequate postural positions, pain while speaking or chewing, deviations or clicks when opening the mouth may be a sign of TMJ disorder. If these disorders are not treated, the speech pathologist's work can be impossible.

After the disorder has been treated by the dentist, the speech pathologist can complement the dental treatment by reeducating the functions that have suffered alterations due to these disorders. In some cases, the speech pathologist work simultaneously with the dentist. While the orthodontist addresses the occlusion, the speech pathologist gives muscular exercises that may help to improve and stabilize the functions.

Position of the Head

This is another aspect that has worried us a lot because we have observed that if there is not an adequate balance between the head and the trunk, there may be the possibility of anomalous growth of the osseous bases. Depending on the position of the neck, the tongue will tend to

position forwards or backwards contributing to an inadequate growth. When the tongue leaves the superior arch, it alters the position of the larynx, which tends to provoke a vocal problem. Associated with inadequate positions of the head, we can observe lordosis, scoliosis or siphosis.

The Class III individuals in our clinical observation tend to keep the head down contrary to the Class II individuals who elevate the head stretching the neck. We believe that this occurs because of the size of the mandible.

In a Class III case there is generally an unconscious attempt to disguise the "big chin". It is possible to observe alterations in patients who have hearing and vision difficulties. Subjects with unilateral hearing losses turn the good ear to the speaker and this leads to an inadequate posture of the neck. Cross-eyed individuals also have a change in the position of the head to have a better vision. All kinds of treatment, whatever the alteration, must always start with correct positioning of the trunk and the head as well as the establishment of nasal respiration.

Mouth Breathing

While growing up, we are strongly influenced by genetics and the environment around us. This means that even having a favourable genetic constitution if the environment is not favorable, we may have modifications which will not always be pleasant in terms of our development and growth. We know that the pacifier, bottle and thumb sucked for a long time may bring alterations as to conformation of the dentary arcade and even for facial growth.

What we have not discussed a great deal are problems caused by buccal breathing. When children are born, they breathe through the nostrils and nasal breathing will be continuous until the end of the life if there are not negative interferences such as: rhinitis, allergies, bronchitis, hypertrophy of the tonsils or adenoids. The nose is for respiration and, in doing it so, it can clean, heat and humidify the air doing it in a way that the air reaches the lungs with a better quality, thus protecting the inferior air passages.

When we invert that movement using the mouth instead, we can cause anything from a simple

irritation of the oral mucosa to serious alterations in the growth. The tongue may position differently inside the oral cavity in an attempt to protect the oropharynx and the tonsils. This new kind of positioning may also be done in order to facilitate the air entrance, or to make the tongue do the role of the nose by cleaning, heating and humidifying the air. These things may cause severe alterations.

Besides abandoning its role of molder of the dentary arch, when the tongue has a diverse position inside the mouth, it causes the following types of problems:

- a) Tongue with an elevated dorsum and a low tip inhibits the mandibular growth and stimulates the growth of the anterior part of the maxilla creating possibly a case of Class II. This positioning of the tongue may cause lateral lispings due to the narrowing created between the palate and the dorsum of the tongue making air passage difficult.
- b) Tongue totally lowered on the floor of the mouth directing the mandible forward and stimulating the prognathism.
- c) Tongue interposed between the arcades causing an anterior open bite.

Other frequent characteristics of the oral breather to which we have to pay attention are:

- children who snore and bib at night waking up many times with the mouth dried;
- irritated children because of bad sleep who get extremely hyperactive having learning difficulty or, sometimes, feeling very drowsy going to sleep as soon as they sit down;
- children who do not like playing, for example, riding a bicycle, playing ball or running because this demands great physical effort and usually they become tired easily;
- gums with hypertrophy and/or with altered color;
- eye-bags;

- hypotonic lips;
- very flaccid tongue and tongue in an anterior position;
- atypical swallowing;
- stuffed nose;
- facial asymmetries;
- shoulders inclined forward;
- poor head posture;
- lack of appetite;
- hypodeveloped nose wings;
- little eating, very fast or too slow;
- too thin or too obese children, also may be pale;
- noisy breathing;
- noisy chewing with open mouth or in only one side;
- unilateral cross bites;

We will not have all the alterations shown above but, as they may be occurring, we should be attentive to a precocious treatment or indication. After the doctor examines the child, we then will initiate therapy that involves training the patient to learn how to use the nose and the strengthening of the oral musculature. It is also necessary to inform the family in relation to alimentation which many times is composed of only pasty food that increases the hypotony of the speech articulatory organs.

It is clear that I have not explored all the possible alterations to be treated together, I wanted here only to show how there are and there must be considerations peculiar to each problem. The speech pathologist is not anymore the kind of professional who does equal muscular exercises to any type of alteration.

There are no, and there must not be, equal evaluations, equal therapies and equal ends. The respect and the comprehension of each alteration will permit us to conclude, for example, that the tongue does not always have the palatine papilla as the best position. If there is comprehension of the form, the function will be adapted in a better way so reducing the possibilities of relapses.

COMPLEMENTARY EXAMS

For many years, we were professionals of the "I think so". We used to say, "We think" that the muscle is hypotonic, "We think" that the tongue has to stay here or there.

Nowadays we prescribe complementary exams which are not a substitute for clinical exams that continue to be indispensable. But, as the denomination itself explains, such exams complement our clinical reasoning.

In fact, we can use videofluoroscopy to observe how the patient chews, swallows and speaks. However, this is not a recommendable exam as a routine because of the use of x-rays. Another exam that I consider important for diagnosis is electromyography. With surface electrodes, it is possible to evaluate how the muscles are working in the functions of chewing and swallowing before and after the myotherapeutic work. The telerradiography has also helped to verify if there are or are not possibilities of adjustments of the muscles in the present form. The cephalometric analyses discussed with the orthodontist clarify the comprehension of the case. The greater the amount of information obtained in the clinical exam and in the complementary exams, the greater are the possibilities of success in myotherapy treatment.

FINAL CONSIDERATIONS

The diagnosis is a fundamental aspect in any kind of speech pathology treatment. To know exactly the type of craniofacial growth the individual has and which class or bite he or she presents, may help SLPs to better understand how the soft structures are working. After all, there is a perfect correlation between hard and soft parts.

The speech pathologist must understand with precision the kind of conduct that the other

professional (orthodontist, functional orthopedist, dental surgeon, odontopediatrician, otolaryngologist, or homeopath) is taking so that when there is a necessity of joint-work, they can conduct the case better. As each professional of odontology has diverse principles and academies, the evaluation and the work may have great variations. If we are not connected with each other, the probability of errors will increase. To avoid this, it becomes urgent that a frank dialogue between the professionals occur. The dialogue should be free of personal pride that might disturb the information. With that kind of attitude, the only one who is a loser is the patient.

Speech pathology treatment must be done in parts permitting a follow up from the beginning to the end of the dentary treatment. In general, the average time for the patient in treatment is three or four months with adults and six to eight months with children. After treatment, we should follow patients monthly or bimonthly until the dentist's work is finished.

The therapy, when it is very well planned after diagnosis, and with the collaboration of the parents and patients should be effective. It is not possible for a speech pathologist to change a function in a patient without his or her understanding of this change. Oral functions are automatic actions. In general, these actions are well understood and demonstrated in the therapy session, but they are rarely internalized because the muscular memory of the functions and tongue position remains.

Therefore, I do not believe in therapists using lists of exercises without making the patient comprehend exactly what he or she should change and why this modification must be made. Many times, even without doing the exercises, patients make good modifications, performing the new function desired. After all, when repeating the action many times but in a new way, you break with old schemata settling and fixing other new ones. I observe that the patients many times do not use an appliance in a correct way because they were not informed about the benefits and importance of its use.

It is fundamental to give information to the patient and family. Sometimes, because of the patient's initial problem, we do not achieve good results. To listen to what the patient wants, to show possibilities and even the chances of

relapses, may result in a better quality treatment and practically without complaints in the end. The limitations of the therapy must be openly discussed with the patient to provide the patient with an opportunity to choose if he wants or does not want to do the therapy. For example, the speech pathologist knows that the labial occlusion in subjects of Class II, long face with mouth breathing rarely establishes itself without joint treatment by an orthodontist and otolaryngologist. Alteration of the sibilant sounds /s/ and /z/ in short face subjects are common, and seldom will they be corrected without structural modifications. Class III individuals not treated with orthodontics or with surgery will maintain their tongue in the inferior arch since it is bigger than the superior arch. Some attempts to change, with rare exceptions, are a waste of time and money. It is stressful for the professional and the patient. These and other limitations show that the paths to the muscular work have real relationships with the osseous and/or dental treatment.

The ideal is to have the professional work as members of an interactive team when it is possible. If there are respiratory problems, we cannot begin the myotherapy intending to reestablish the nasal breathing without having a consultation or even treatment with the otolaryngologist or homeopath, according to the preferences of the family. Similarly, it can be very difficult to correct lateral lispings in Class II, lateral open bite or overbites because, in general, this distortion of speech is associated with these types of occlusion. Before speech therapy, it is necessary to have a consultation and possible treatment of the malocclusion

Closing this discussion, I do not mean, with all of this, that isolated treatment in any of the areas cannot be possible. What matters is the correct diagnosis so that the prognosis also can be better. Patients without the benefit of a team approach, whatever the reasons are, may have modifications although they are not always the ideal or desired ones. The considerations of our limitations as professionals in development, and the patient's limitations with their peculiar and particular structure make us keep our feet on the ground. So, we propose individualized therapies with periodical re-evaluations and better results for each individual case, and therefore, eliminating many frustrations and disappointments for both professionals and patients. We always need a team approach,

and must forget the idea of having a patient looking for different professionals.

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