Article

Systemic Odontology

Authors

Agné Cervo Peres

Dental Surgeon; President of ICAK–BR (International College of Applied Kinesiology – Brazil);
Vice-President of SOSSP (Sociedade de Odontologia Sistêmica - Society of Systemic Odontology – São Paulo);
Specialist in OFM (Ortopedia Funcional dos Maxilares - Functional Jaw Orthopedics)
Excellence in RDFM (Reabilitação Dinâmica e Funcional dos Maxilares - Dynamic and Functional Maxillary Rehabilitation)

Roseli Luppino Peres

Dental Surgeon; President of SOSSP (Society of Systemic Odontology – São Paulo); Vice-President of ICAK–BR (International College of Applied Kinesiology – Brazil);
Specialist in OFM (Ortopedia Funcional dos Maxilares - Functional Jaw Orthopedics); Excellence in RDFM (Reabilitação Dinâmica e Funcional dos Maxilares - Dynamic and Functional Maxillary Rehabilitation)

Gabriella Luppino Peres Santos

Dental Surgeon; Specialist in OFM (Ortopedia Funcional dos Maxilares -Functional Jaw Orthopedics; Member of SPSSP (Sociedade de Odontologia Sistêmica - Society of Systemic Odontology – São Paulo), Member of ICAK–BR (International College of Applied Kinesiology – Brazil)

"If we want to progress, we must not repeat history, but make new history"

Mahatma Gandhi (1869-1948)

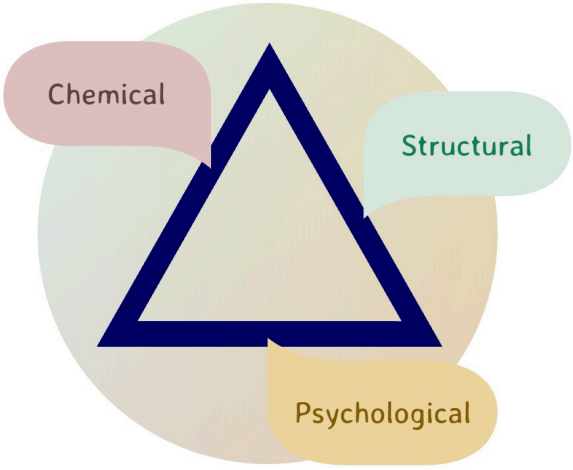
São Paulo,
2020

Systemic Odontology emerged in the 90s when the Society of Systemic Odontology was found, which aim is to form study groups whose proposal is always the improvement of odontology.

The foundations of these studies are based on the Oral Bio-Cybernetics, developed in the 60s by the geniuses Denisar Figueiredo and Mário Baldane as well as on Applied Kinesiology by George Goodheart, Osteopathy, Craniosacral Therapy, Chiropractic, Acupuncture, Homeopathy, Allopathy and others. These therapies help us in the diagnosis and treatment of oral pathologies that interfere with the organic whole as well as organic pathologies that interfere with the stomatognathic system. The organism must be analyzed as a cell, a complete indivisible unit.

Our goal in Systemic Odontology is always to recover the balance of the stomatognathic system and observe the consequences of this on the human body. In order for us to make a proper analysis, our anamnesis tries to be as complete as possible. This is the only way we can evaluate where our work really interferes, favoring an improvement in the patient's quality of life. For us, the diagnosis is the most important part; the techniques that will be used to reach the balance will depend on the needs of the patient and the skill of the professional, the best technique is the one that we master completely because with it we will reach our goals of recovering balance.

As many therapies, Systemic Odontology believes that health is a result of the balance of three basic factors that make up the sides of an equilateral triangle which are interdependent, that is, what interferes in one side will also interfere in the other two, in pathology or treatments.



The emotional side concerns the emotional changes that we suffer during our life, and also the various lines of treatments that exist, whether in psychology or psychiatry; the chemical side tells us about the chemical changes that our body suffers and also the treatments: allopathic, homeopathic, herbal, to which we submit ourselves; and the Structural side shows us the structural changes that we suffer and the physical treatments that we have available.

It is known that from the intrauterine life we suffer emotional influences that will be fixed in the organic whole for the rest of our lives. In the uterus, we start our neuro-functional development. When we start sucking and swallowing the amniotic fluid, we have the first stimulus of development of the stomatognathic system. It is known that the tongue papillae are ready in the eighth week of life of the fetus and the stomatognathic system in the thirteenth week, the formation of the palate begins at the end of the fifth week of pregnancy and its fusion occurs from the twelfth week. With this, we can say that this system suffers influences from the environment very early in our lives.

The mouth is always described as having three dimensions, height, laterality and anteroposterior dimension. For us, these three dimensions form a fourth dimension that is the oral space, where the function of the mouth is, where the tongue rests and functions/works.

Our attention is on the oral space, since any atresia with decrease of this space can generate a very large number of consequences in the whole organism.

In cases of atresia, lack of adequate development of the stomatognathic system, with consequent decrease of the oral space, there may be a bad positioning of the tongue; the tongue not being able to occupy its normal space, with the dorsum on the palate and the tip on the incisive papilla, it may shift posteriorly or anteriorly. When posteriorization occurs, we may have a physical blockage to the air intake, causing a decrease in the volume of air entering the body.

Our body is very intelligent, it knows that a few days without food or water does not lead to death, but a few minutes without breathing can lead to irreversible brain damage. Because of this, we can have an increase in the respiratory rate as organic regulation to supply our body with the necessary amount of oxygen, our vital food.

This increase in respiratory rate can lead to dryness of the oropharyngeal mucosa, which may be a predisposing factor for respiratory allergies, because with the sensitive mucosa, any element that is introduced into the airways can trigger the allergic process. Another consequence of mucosal dryness may be the overproduction of mucus that can lead to coryza and clogged nostrils, especially when the individual lies down.

The overproduction of mucus can also lead the patient to asthma or bronchitis, as an inadequate stimulus to the bronchi and bronchioles may occur resulting in shortness of breath.

Change in respiratory rate, can also interfere with the oxygenation of peripheral tissues since it is in the alveolus that the gas exchanges occur. The red blood cells arrive loaded with residues from cellular metabolism and exchange them for oxygen, which will be transported to the tissues of the whole body. It is easy to understand that vital tissues and organs have priority in receiving the necessary amount of oxygen, often resulting in oxygenation deficit in peripheral tissues.

We often receive patients with many skin infections, which during the process of rebalance of the mouth tend to decrease, as well as it is observed that some respiratory problems diminish.

During a child's development, breathing has a very strong influence; when correct, it is responsible for the growth stimulus of the middle third of the face. With incorrect breathing, such as mouth breathing, there may be the formation of an ogival palate, lateral underdevelopment of the upper dental arch, with its consequent anteroposterior increase and protrusion of the teeth. That is, this can be the origin of lack of growth, the beginning of an oral atresia, which at this moment is a consequence of inadequate breathing, but may, in the future, be the origin of a respiratory problem, since with lack of space, the tongue will always be out of its physiological position and can provoke a number of organic changes.

An altered respiratory rate can cause changes in heart rate, the circulatory system, and the immune system; in this, there is no heart to pump lymph through the body; it is the abdominal movements of expansion and contraction that occur during breathing that, among other factors, propel lymph throughout the body. When there is an increase in respiratory rate, there may be

associated inefficiency of the immune system, which can favor the beginning/origin of pathologies.

When the mouth is atretic, we can assume that the facial musculature is contracted. Within this musculature, there are some large salivary glands as parotid and sublingual. It is fair to assume that this compression can cause change in the light of the salivary ducts that leave from inside this musculature, causing retention of the salivary juice and compression in the gland itself, which could cause change in the composition of the salivary juice. Some research carried out by us, show that an atretic mouth presents saliva with Ph more acidic than normal. When with the appliance in the mouth, recovering the dimension and reestablishing the oral space, even temporarily, this saliva presented a normal Ph. This showed us the need for recovery of the balance of the stomatognathic system to favor the rebalance of the digestive system, since digestion begins in the oral cavity and if the salivary juice is altered, it may favor inadequate digestion.

Individuals who breathe inadequately, in addition to the organic damage, may present postural problems. Postural muscles work in the form of synergistic or antagonistic sets. Some authors consider these muscle chains starting from the feet and call them "ascending chains", when the starting point is on the top, they call them "descending chains". Most of the time, these two compensations coexist.

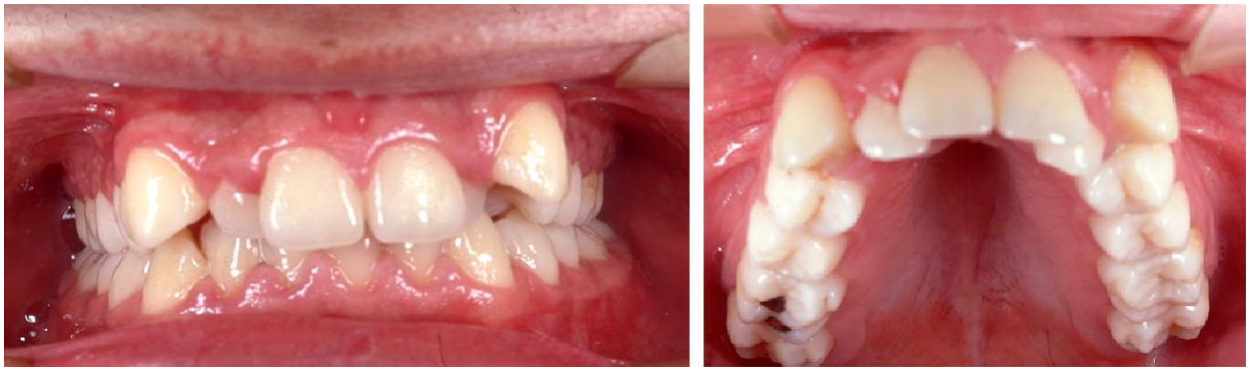
It becomes clear that the overall postural system can be altered by problems in the stomatognathic system.

Craniocervicofacial dysfunction can occur by alteration of the growth pattern, mainly of the mandible, which will generate adaptation of the morphology of the face and head, which is forced to adapt to a state of balance with the cervical spine, either by growth or muscle force.

According to studies, a relationship has been described between hypertrophy of the adenoids and tonsils, mouth breathing and facial morphology (for example, retrognathism). Relationships can be observed between the morphology of the head and the longitudinal axis of the first cervical vertebrae, when the head tends to fall back when the airways were obstructed. Thus, changes in the lordosis or kyphosis of the spine can be related to the inclination of the head in the sagittal plane and the morphology of the face.

It is likely, then, that changes in the growth of the mandible generate compensation in the overall morphology of the face and skull, interfering with the balance of the head and muscle groups responsible for the global balance.

Before:



After:

This patient came to us as an adult, with organic problems ranging from rhinitis to digestive problems, emotional alterations, and postural problems involving cervical and lumbar pain. It became clear that the buccal alterations he presented favored the organic disorders when, after we finished the treatment several symptoms had disappeared. This does not mean that only dental treatment solves every problem, but by itself, it greatly favors the recovery of overall balance.

All the muscles that have insertion in the skull can lead to structural defects when there is a muscle problem. To stand up and to perform any action, the individual activates different

groups of muscles by heredity, life choices, emotional attitude, body attitude, reaction and adaptation to the impositions and needs of life.

Proprioceptors are structures present in the joints, muscles and tendons; the term proprioception is used to describe the awareness of body position or movement. This involves both the sensation of body position with respect to gravity and the relationship position among its various parts. Proprioception is the most important sensory impulse for postural control in humans. The postural balance depends on proprioception, vestibular impulses and visual impulses.

The cervical region is rich in proprioceptors, especially the first three vertebrae. It has been described by some authors that an interference from these first three vertebrae on the vestibular nuclei can alter proprioception and produce a kinesthetic illusion. The vestibular system is involved in sensory information about head position in relation to gravity and gaze stabilization. Dependence of the occlusal plane on morphological variation of the plantar arch has been demonstrated.

Through electromyography, it has been demonstrated the existence of a muscle chain that becomes active during postural control and a functional relationship between the leg muscles and the masticatory muscles has been observed.

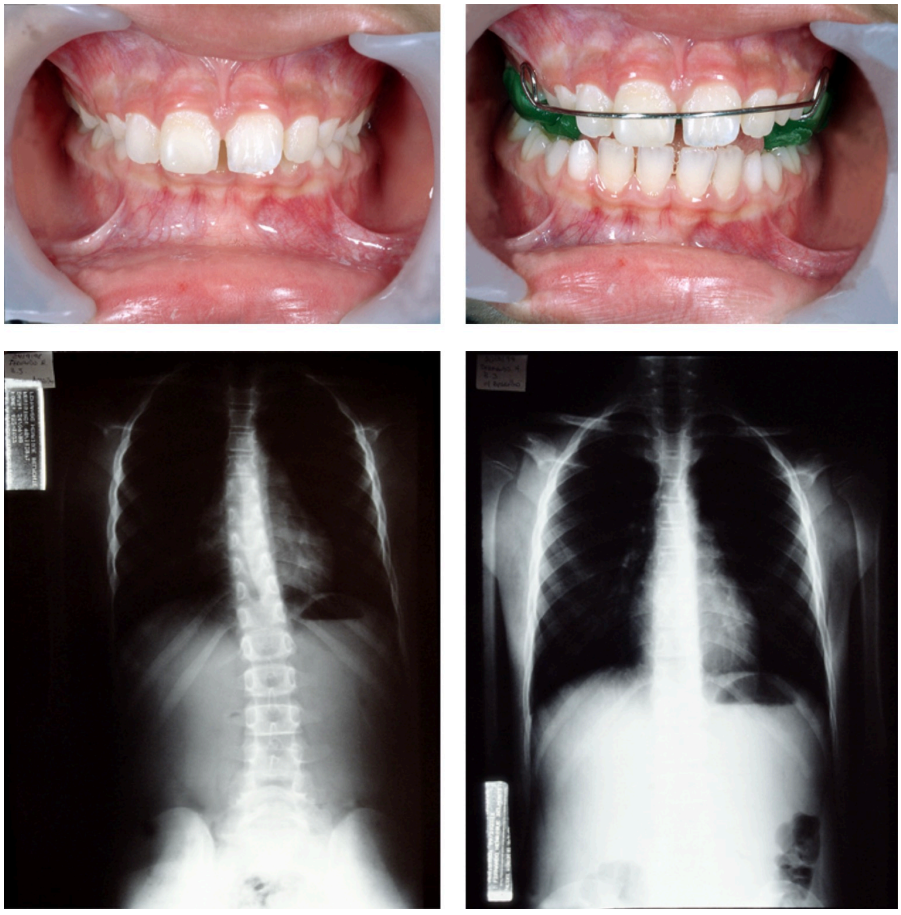
It is important to remember that a muscle chain is a system of functional muscle chaining organized into muscle groups that generate functional mechanical connections between them. Balanced muscle chains shape the body by optimizing its functioning.

The research mentioned above lay the foundation when we say that any change in the temporomandibular joints can lead to a change in the positioning of the skull and its relationship to the cervical spine, generating consequences for the whole body regarding body posture, that is, the overall body posture interferes with the position of the head which in turn is directly responsible for the posture of the mandible; but the inverse relationship may occur, with a dysfunction of the stomatognathic system leading to changes in body posture. Nowadays, odontology must look at the general well-being of the individual, their level of development, learning and quality of life. It is also important to collaborate in the differential diagnosis of scoliosis, headaches, earaches, hyperactivity, depression, and dyslexia, respiratory, digestive, and

visual problems, that is, the patient should always be seen as a unit; no biological system functions alone, independent from the rest of the organism; this is the main topic of Systemic Odontology.

We can illustrate these statements with this case of Class II, where there is a posterior positioning of the mandible and significant overbite. With the appliance used by us from the Dynamic and Functional Maxillary Rehabilitation, associated with the PAMs (Aero Muscular Facilitators), we lead the Stomatognathic System to a position of balance generating a possibility of general balance, when the cause of bad posture is of superior/higher order. The radiographic images were taken in a single session, that is, the first when the patient was in their usual bite posture and the second with the appliance in the mouth.

The treatment aims to acquire a buccal posture that facilitates the maintenance of the overall balanced posture. Postural tests are performed at the beginning of treatment and throughout its duration.



These results show us the possibilities of favoring a good body posture from the rebalance of the stomatognathic system, provided that a good diagnosis has been made to determine the origin of the pathology. Based on this, we use tests that determine whether the problem is of superior origin (upper segment, head) or inferior origin (feet, legs; lower limb girdle / cingulum, etc).

The position of the head may trigger a postural problem in cases of visual, auditory and occlusal alterations. If the position of the head is of compensatory origin, the reharmonization of the posture will correct the position of the head and therefore suppress the tension in the trapezius or splenius of the neck, sternocleidomastoid and scalene. It is necessary to treat the main cause of the postural change in view of the general problems. If before the postural correction some change in the patient's occlusion has been made, with the head in the wrong position, when body correction is made, this occlusion can, for example, lead to a recurrence of the postural disorder.

In the Functional Jaw Orthopedics, we provoke the elimination of pathological memory, which can take the facial musculature to its most physiological position. With this, we can assume that there is an alteration in the positioning of the skull bones enabled by the non-muscular compression, which can release the flexibility of the bones, favored by the non-fusion of the spheno-basilar synchondrosis and the presence of all unfused sutures.

Through the use of appliances, we can alter cranial dysfunctions caused by muscular alterations, such as a dysfunction in extension where we have the opening of the spheno-occipital angle, the skull increases its anteroposterior diameter, the orbits decrease their size, palate is narrow and high and favors myopia. Similarly, when we have a dysfunction in flexion, with the closure of the spheno-basilar angle, the skull has its transverse diameter increased, an increase in the diameter of the orbit, hard palate flatter and favors hyperopia.

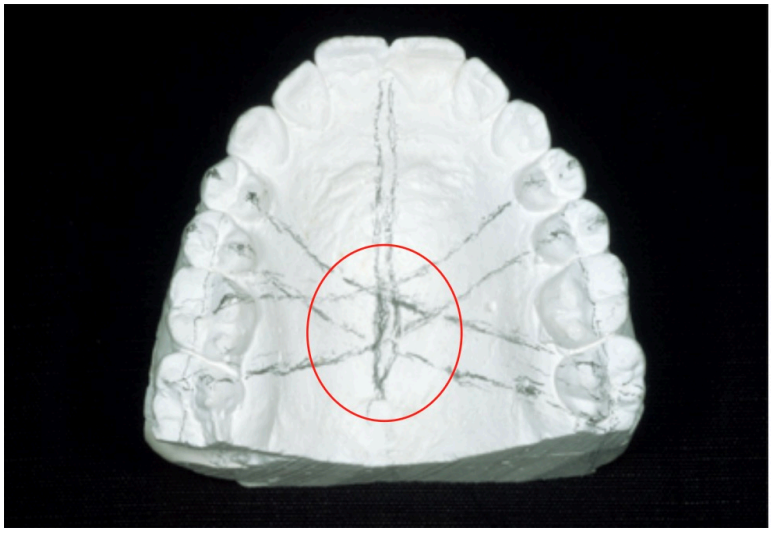
With the musculature kept in balance through the use of appliances, we can facilitate the movements that stimulate facial growth, since extensive cephalometric data have revealed continuous growth of the craniofacial complex at all age levels. In adults, the observed changes were similar to those that occur in adolescence, but to a lesser magnitude and degree.

Another aspect that has been studied by us is the somatotopy of the palatal suture and vertebrae column. This means that from the studies carried out, the same pattern is observed in the palatal suture and vertebral column.

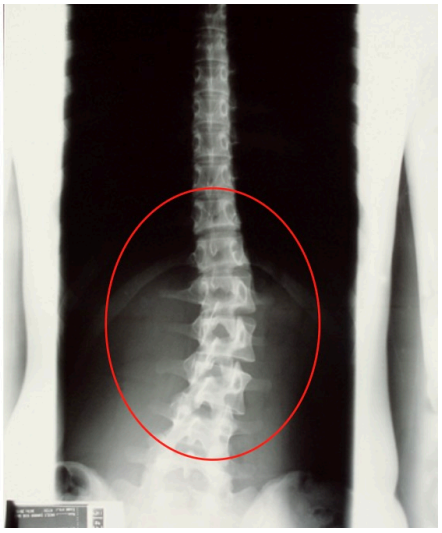
To confirm this, comparisons were made among models, photographs of the palate and occlusal radiographs with the spine radiographs of the same patient, and the same patterns were found.

This could be justified by the fact that the bony palate, roof of the mouth and floor of the nasal cavities, in its posterior part is separated by the posterior edge of the nasal septum; just behind is the sphenoid bone from which the pterygoid processes project inferiorly, on each side, with their lateral and medial plates. The medial plate laterally bounds the choana, which offers suspension to the pharynx and attachment to some masticatory muscles. Posteriorly to the sphenoid, in the median plane, follows the basilar part of the occipital bone and then the foramen magnum of this bone. This large foramen connects the cranial cavity to the vertebral canal. Anterolaterally to the foramen, on each side, is the occipital condyle with articular surface to the superior articular fovea of the Atlas. The posterior part of the external base of the skull is formed by the occipital squama, which articulates laterally with the temporal bone.

All these bony joints can generate, through the pressure of the musculature connected to the bones involved, adaptations that can lead to this somatotopy studied. It is important to remember that Systemic Odontology establishes a relationship between regions of the raphe and regions of the body



Photograph 1



Photograph 2

Case observed during the Systemic Odontology Advanced course in a patient from the course. The pattern on the model shows a deviation of the raphe to the left, in the drawing/ pattern of the M line from the Dynamic and Functional Maxillary Rehabilitation technique, we have a rhombus with deformation on the patient's left side. Photo 2 shows a panoramic radiograph of the spine with the same deviation in the lumbar region.

Aesthetics alone does not determine that our patient is in balance, it is necessary for us to have the means to determine that the buccal posture is balanced, and one of the methods we use are muscle tests. Muscle testing consists of the reactions of the nervous and muscular systems resulting from physical, chemical and sensory stimuli, which facilitate the evaluation of the patient and the efficiency of the treatment. These tests come from Applied Kinesiology which is a method of functional neurology that uses manual testing of specific muscles for diagnostic purposes.

The tests are applied at the beginning of treatment as a way to diagnose pathologies, during the treatment to indicate that we are on the right path and at the end of it to ensure the efficiency of the treatment. Balance is not always related to the aesthetic paradigm; it is common to find situations of balance even with slight crowding, or small bad dental positions. This is because, the musculature is already in a physiological position and leads the mandible, also, to its most physiological position. Achieving this aesthetic paradigm will then depend more on the patient's expectations than on the need for treatment to achieve balance. Often, we find patients

with a beautiful aesthetic, but without function, and presenting painful symptomatologies. Mandibular balance does not mean only an occlusal balance, but also bodily muscular balance.

To determine which treatment we should follow, we use, in a special way, Rocabado cephalometry, among others, as it indicates the angular relationship of the skull and cervical spine (craniovertebral angle), distance between the base of the occipital and posterior arch of the Atlas (C1 - first cervical vertebra) and its association with craniofacial pain syndrome, the position of the hyoid bone in determining the physiological curvatures of the cervical spine, the cervical-hyoid relationship to the lingual resting position and also the airways.

When the cranio-cervical angle is reduced, there is a posterior rotation of the skull, a reduction of the suboccipital space, and craniofacial pain. There may be an increased distance between the cervical spine and the mental symphysis. Dynamically, this means: stretching and increased tension of the supra- and infra-hyoid muscles; lowering and protrusion of the tongue; a tendency for mandibular retro-position with class II malocclusion, possible temporomandibular joint dysfunction. Among other aspects, it may indicate loss of cervical lordosis and anteposition of the head and neck.

An increased craniocervical angle indicates excessive anterior rotation of the skull. As a direct consequence, there will be: an increase in suboccipital space (the measure will be greater than 9mm); verticalization, or even inversion of the cervical physiological curve. As an indirect consequence, a stretching of the ligaments and muscles of the cervicodorsal area, mainly suboccipital region.

An occipito-atlas distance of less than 4mm means posterior rotation of the skull with a reduction in the craniocervical angle and muscular and articular dysfunction. There may be radicular neuralgia due to mechanical compression, pulsatile pain due to compression of the cervical artery, symptomatology of facial pain and loss of postural alignment.

A distance greater than 9mm between the base of the occipital and the upper part of the Atlas may mean verticalization or inversion of the cervical curve with tendinous muscle stretching, neuropathies and pain in the cranial aponeurosis. The Atlas may appear verticalized with compression by the odontoid support of the cruciform ligament.

With this cephalometry one can also analyze the position of the hyoid bone, which in a "normal" position will show a physiological cervical lordosis, absence of tensions in the supra and infrahyoid muscles, as well as in the elevator muscles of the mandible and an elevated position of the tongue whose tip rests on the incisive papilla.

We can also diagnose an enlargement of the hyoid triangle, which is associated with a very low tongue position that puts pressure on the lower incisors and can lead to their inclination, altering the anterior bite. In this position it is possible to observe the hyoid tension associated with the mandibular traction force in the dorsal caudal direction, which can cause important changes in mandibular development and growth; forces that prevent the mandibular advancement associated with etiological factor of classes II.

Absent triangle – it can mean a tendency for verticalization of the cervical spine

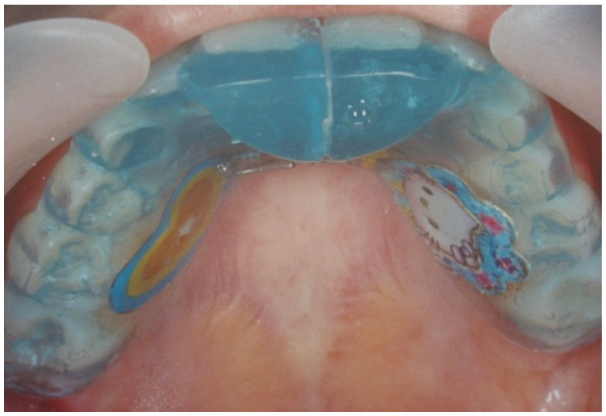
Negative triangle – we may have an inverted cervical curve, stretching of the elevator muscles of the mandible due to the tendency to anterior bite opening. Low position of tongue with a tendency to protrude and become interposed. It is known the interrelationship between the position of the hyoid in relation to the cervical spine and the position of the tongue at rest.

To bring the musculature to a position of balance, we use the Aero Muscular Facilitators, which are devices placed over the Dynamic and Functional Maxillary Rehabilitation appliances; this technique allows us to use these devices. PAMs are sliding tracks and inclination guides, topologically reorienting the dento-maxillary relationship.

There are two types of Aero-Muscular Facilitators: anterior and posterior. The objective is reprogramming, that is, to create a new relationship dynamic in the oral space, changing posture and giving greater freedom of movement. With them, there is separation/ distancing of teeth, and release of the oral space, change in the position of the jaws and muscles, performing reprogramming of joints, favoring bone remodeling, normalization of salivary pH, regularization of body metabolism, of breathing and other important stimuli to achieve balance. They organize mandibular movements of laterality-protrusion-retrusion, and circumduction.

The mouth is indivisible and contains the oral space that interacts with all the spaces of the body. Therapy using PAM: anterior and posterior, acts on muscle memory information and opens a range of possibilities for inner change, through the stimulus, of the microsystem (stomatognathic system), which interacts with the macrosystem (mind-body).

The aim in using PAMs is to have a myo-balanced position of the mandible, a resting position, the musculature presents a minimal tonic contraction to oppose/counterbalance the weight of the mandible. Occlusal interferences cause muscle contractions that modify this resting position.



ANTERIOR PAM

POSTERIOR PAM

The repositioning work within Systemic Odontology uses the Dynamic and Functional Maxillary Rehabilitation, the Be Flash Technique, and, in some specific cases, we use fixed techniques. Functional appliances like those by Balters, Frankel, Klammt are also very useful. The stage of the treatment and the best technique to be used at that phase are always analyzed, in order to accelerate our results. It is always important to have several tools at hand during treatment.

Within the systemic viewpoint, we have a great concern in alerting dentistry of its importance in obtaining and maintaining health. Not only locally, but we have to become aware of the importance of the interference of our field of activity on the balanced functioning of the whole human body. Given this finding, it is agreed that health is more than the absence of

disease in the body, being a set of factors conducive to psychological, chemical and structural well-being.

Hippocrates already said that one must seek the understanding of the whole of the human being and the integral parts of this whole, so that the focus of care is centered on the human being and not on the pathology of the body. Health is then the result of the balance of the parts in their relationship with the whole.

Bibliographic References

- Bricot, 1999;
- Villeneuve Parpay - Podiatric Posturology Conference Paris, 1996
- Rocabado MS – Ver Chil Ortod – 1984
- Sá Jr N Nogueira - Treatise on Systemic Dentistry - 2004
- Vaz de Lima M and Soliva H - Dynamic and Functional Maxillary Rehabilitation, 1994
- Peres, Agné and Roseli - Relationship Between the Posture of the Stomatognathic System and Body Posture - 2004
- Christopher J. Stevens,Translation of J.J.Barros - Postural Assessment in Maxillofacial Orthopedics
- Garten Hans – Training in Applied Kinesiology, AK – Stomatognathic Systems – 1997
- Guyton AC - Treatise on Medical Physiology - 1971
- Douglas CR - Treatise on Physiology - 2002
- Colletes Alves L. M. – 2002
- Cheida Afrânio P. - 2004
- Cheida Afrânio P. and Colletes Alves L.M. - 2000
- Andréa G. Portnoi - Stress and Craniomandibular Disorders
- D.L. Figueiredo, and M. Baldani – Oral Bio-Cybernetics, 1976