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Review Article

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The Negative Cascade Effect – Impact of a Rotated Mandible

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Abstract

The human body is a vertical bilaterally balanced entity capable of locomotion on two legs. The entity maintains an upright stance because of an intricately connected musculo skeletal system. This system works in synchrony with a vast number of muscles, tendons and nerves, which holds the bony parts as one unit allowing them to move as joints, thus making it possible for the human body to carry out complex physical tasks. The mandible, is housed right at the top, just below the brain. This is a unique bone having a bilaterally connected joint with similar muscle attachments on either side. Any imbalance in the bilateral symmetrical function of the muscles can trigger of a variety of complex interactions leading to major problems in the entire musculo skeletal system right till the feet. In addition this asymmetry also impacts internal organs unfavourably. This sequence of events has been termed by Smylist® as the negative cascade effect. This article explains how an imbalanced (rotated) mandible can cause a vast variety of problems and issues in the human body.

Keywords: Smylist®, Facial, Midline, Design, Software, Face Analysis, Parameters, Ageing, Gnathoageing, Wrinkles, Folds, Negative, Cascade, Muscle Ache, Knee Pain, Tinnitus, Migraine, Acidity

Introduction

The human body is a complex interconnected entity with a number of elements involved in the entire structure. The bones of the body, which is the skeletal system is the core around which the body is built and defined. The bones are all attached to each other muscles and tendons and these are layered with fascia and further protected by the skin. Together this makes the musculo skeletal system. The organs which provide sustenance and life are housed within this system and provides energy to the musculo skeletal system as well as other systems in the body. The musculo skeletal system is what makes human beings move and have major as well as fine motor skills. The default smooth functioning of this complex interconnected elements is dependent on a few factors. One of the key factors is the role of the mandible and its associated muscles. In fact, a closer look at the four legged animals reveals that the mandible is used by the animals as the key balancing point when the animals run and hunt very effectively. This can be found as an atavistic effect in the human body.

The mandible is the first mobile bone from top down in an upright human being. It also happens to be the only bilaterally connected single bone with an equal set of muscles on either side of the mandible. Unlike the hands or the legs where the right and left can and do move independently, the mandible does not have a right or a left. It is a single bone and ideally when it moves, the movement should be symmetrical, balanced and controlled. If it is not, then some of the masticatory muscles and the other involved muscles (the mimic muscles) on one side will get overstretched and go into a spasm or severe contraction on the other side. It would be naturally assumed that this would lead to problems like pain and discomfort in the associated muscles, improper functioning, TMJ issues and dental damage and disease. The mandible is also connected by muscles to the hyoid bone and the clavicle and a constant rotation of the mandible leads to a constant overstretching of these connected muscles leading to neck and shoulder problems.

All of the above listed problems are documented in the literature but hardly any of the literature co-relate the above mentioned conditions with an improperly placed mandible and asymmetrical masticatory and mimic muscle function.

The Smylist® Concept

The Smylist® theory of muscle controlled mandibular movement is the only concept that co-relates the asymmetrical mandibular movement and its consequential effects on the TMJ and the dentition in a rational and logical way. But the Smylist® concept does not stop there. It goes on to explain how this improper mandibular movement can lead to an extremely deleterious chain of events

which can and does impact the entire body.

It seems quite unbelievable that an improperly placed mandible can lead to problems in the entire musculo skeletal system and other internal organs. Of course Smylist® has an extremely logical and rational proof of principle of how an improperly positioned mandible can lead to so many problems in the entire body from the muscles and the chewing process and all the way down to the knees with even ageing changes on the face.

The Smylist® concept identifies an improperly positioned mandible as a rotated mandible which basically is a forced position and it even forces the muscles to be in an uncomfortable stressfull position holding the bones and working in asymmetry. The mandible might be rotated to the right or the left side. It can also be upward rotated. Smylist® states that the mandible should be positioned in a symmetrically driven position with the condyles in the fossa and muscles on both sides being stable without any over stretching or contraction. This position is achieved by the mandible if the maxillary teeth are in the correct position and guide the mandible appropriately, literally acting as a fence for the mandible and holding it in place. When the maxilla does not provide this stop the mandible is constantly trying to search for its desired place and since it does not get its rightful place it gets pushed to either side or gets pushed upwards. This malposition of the mandible is termed by Smylist® as a rotation since the condyle is actually rotating the mandible either to the left or the right side. The mandible might also be upward over rotated which means that both the condyles are rotating much more than they should. It is possible to have a combination of a lateral rotation coupled with an upward rotation.

Depending on the type and severity of the rotation the musculo skeletal system gets impacted in various ways. The objective of this article is to elucidate and explain all such conditions and the origin of the problem – which is an overrotated mandible, a lateral rotated mandible or a combination of the two. This chain of reaction has been called as the "Negative cascade effect" in Smylist® terminology. This logical progression of events, as presented by Smylist®, explains a few observed phenomenon which do not have a consistent etiology. As mentioned earlier, the musculo skeletal system is interconnected throughout the body, just like a spiders web. A pull on the spider, which in our analogy is the mandible, creates a kind of ripple effect through out the web. Similarly, a contraction or spasm of one side of the masticatory muscles creates this kind of effect in all the muscles of the body. Contracted muscles lead to pain and stiffness and the human body compensates for this by tilting the body and favouring the affected muscles. This leads to a second level compensation and then a third level compensation, ultimately leading to a complex situation of muscular imbalance throughout the body. This is the theoretical basis of the logical outcome of mandibular muscles in spasm unilaterally or even bilaterally. This can be amply demonstrated in various clinical situations. The final confirmatory test of this concept is the almost instantaneous resolution of these conditions (sometimes very long standing ones) with the relaxation and balancing of the mandibular muscles achieved by using the Smylist® deprogramming technique. (More information is available in other published articles with full extensive information in the text book written by Dr. Maria Csillag).

Effects of a Rotated Mandible

Thus a rotated mandible can potentially lead to over two dozen problems of varying complexity in the entire body due to the negative cascade effect phenomenon. These could be grouped together as

1. Muscular aches and pain like migraines, neck and shoulder aches, cervical spondylitis kind of pain, upper-middle-lower back aches, pain in the heels
2. Organ related problems like swallowing problems, speaking problems, tinnitus (ears), hoarse voice (larynx), shortness of breath (lungs), acidity (stomach)
3. Joint problems - Clicking and pain (TMJ), Phantom pain in the maxilla, Restricted hand movement (Shoulder Joints), difficulty in walking (Knee joint)
4. Posture problems – Improper posture which further strains muscles and joints throughout the entire body
5. Early onset aeging – facial muscles hypertrophy, asymmetry in the facial muscles, lack of skin tonicity, flaccid underlying fascia

Figure 1: A mandible can lead to problems in various systems of the human body

It tends to seem quite incredible that a few small muscles working for mandibular movement can lead to all of the above conditions. Smylist® has published a complete article on one of the cascade effects, which is unilateral knee pain and joint damage and explained extensively how one of the manifestations of the negative cascade effect can lead to unilateral knee pain and damage, ulti-

mately requiring knee replacement surgery. This article deals with a few of the most important debilitating effects of a rotated mandible and to present how therapeutic correction of these situations is possible.

Migraine Type Headaches

Migraine is a vexing pathological condition, which in its more severe form can lead to a life time of constant suffering and pain. These painful conditions are either episodic or at times constantly present. There are a number of explanations of migraine in general medical literature but most of these are more of probabilities rather than solid reasons. A migraine like situation with no associated blood changes or any other pathology is now accepted to be caused due to a severe spasm of the temporalis muscle on one side. The spasm tends to be triggered off due to a continuous contraction of the muscle, ultimately leading to a severe spasm which is extremely painful. Traditionally the treatment of migraine has been to provide symptomatic relief and medications to prevent such a muscular spasm. A couple of decades ago there a new approach was made to prevent a temporalis spasm and this approach provided tremendous relief. This was in the form of an appliance give to the patient to wear in the night. It was called the NTI appliance. The hypothesis was that constant nocturnal clenching of the teeth by the patient ultimately triggers off the spasm and thus a migraine attack. The appliance discluded teeth from canine backwards and thus the temporalis could not be contracted anymore. This did work but it still did not provide the explanation as to why does the patient get into severe and constant clenching. Smylist® goes a step further and provides a complete explanation of why the clenching which results in a migraine episode.

The underlying cause is a rotated mandible which is trying to reach its desirable balanced position. The maxillary teeth which should act as a fence and guide and hold the mandible in such a comfort zone are improperly placed. Due to this the mandible gets rotated laterally or upwards and now is not in its comfort zone. It is the constant search by the mandible, for its ideal position, that makes the patient keep clenching and grinding on the maxillary teeth. A detailed examination of such a chronic migraine patient will clearly present the tell-tale signs of a rotated mandible. The ideal treatment for a permanent resolution is to deprogram the mandible using the Smylist® technique, makes a Smylist® bite and then rehabilitate the dentition to create an intercuspation in this desirable position. If the patient is unable to initiate full rehabilitation, it is recommended to give the patient a "G space Smylist® positioner" till such time that the full rehabilitation can be carried out. This will help to bring the muscles in a symmetrical position to hold the mandible in a steady state position during the night and also during movements.

Tinnitus

Unexplained tinnitus is yet one more pathological conditions which can be extremely annoying and troublesome for a patient. It is only when the ENT cannot attribute any known cause for the tinnitus (which is fairly common), the Smylist® explanation makes it so understandable. There has been other documentation also in the literature which gives a somewhat similar hypotheses but does not delve into the primary cause. Smylist® states that a laterally rotated mandible will cause a constant contraction of the medial and lateral pterygoids which have an insertion on the pterygoid plate. This constant contraction leads to a hypersensitization of the trigeminal ganglion which leads to the tinnitus symptom. This can actually be dramatically resolved in some cases with the Smylist® deprogramming The technique overstretches muscles during the deprogramming and this can at times, almost completely stop the ringing. If the ganglion is extremely sensitized, it will take a few days for the tinnitus to be completely resolved.

Cervical Spondylitis, Restricted Hand Movement, Backaches

All of these conditions are a resultant of muscles spasm which originate from the masticatory and mimic muscles and propagate to the neck and back muscles. Neck pain and stiffness in the neck which is very similar to cervical spondylitis, but without any concomitant degenerative changes seen in the radiograph or a scan of the cervical vertenrae, is a resultant of severe muscle spasms. The sequence of events that transpire is a series of compensations made by the body to find more comfortable muscular positions. Starting with one or two of the mandibular muscles in spasm the subject compensates by reducing the movement of the neck. This triggers a chain reaction of opposites sides compensating moving down along the musculo skeletal system. One very common symptom is inability to raise the hand on one side beyond the shoulder level because of severe pain. The sterno cleido mastoid on that side has gone into spasm because the subject is favouring the other side where the neck is compensating for the mandibular muscles spasm. Relaxation of the sterno cliedo mastoid will bring about an immediate relief and almost instantaneously allow the hand to move upwards. Similar chain reactions cause backaches of varying intensity in varying muscles. Essentially all these problems are only muscles in constant contraction leading to spasms originating from unilateral mandibular muscles which are in spasm. All these problems get very fast resolution when the Smylist® deprogramming is carried out and the mandible appropriately positioned. The teeth have to be rehabilitated to hold the mandible in this position. Till the rehabilitation is achieved the "Body Balance Smylist® positioner" will help considerably.

Unilateral Knee Pain

This is a very common problem seen in 40 plus age individuals. An article has been published explaining the Smylist® philosophy about this phenomenon. This is a cascade of event arising out of a laterally rotated mandible. If the mandible is rotated to the left, it will be the left knee that is afflicted since the subject is favouring the right knee and overloading the left knee. The reason that the right knee is being favoured is that the right hip has been rotated forward and slightly upward as a compensation by the patient. The right hip is rotated forward to compensate for the left shoulder which has been rotated forward and elevated. The left shoulder is rotated forward and elevated as a compensation for the neck and head which is also titled to the left. The head and neck is tilted to the left because of the spasm and contracted mandibular muscles on the left. The full article on this chain of events explains in detail with graphics on how this complex negative cascade effect unfolds.

Chronic Acidity

It may seem quite bewildering to the reader that a rotated mandible can cause a problem of chronic acidity. Smylist® offers a very straightforward explanation of how this happens. This is usually seen in young adults who have mild to moderate to severe chronic

acidity. Depending on the discomfort level, the subject will have undergone tests and investigations to find the reasons for the acidity. In all cases where the acidity does not seem to have any underlying pathology, the subject is usually put on a palliative therapy and classified as having acidity of unknown origin. Smylist® presents the etiology of this chronic acidity. A closer observation of these patients reveals that all such patients have retroclined maxillary anterior teeth. Because of this retroclination, the mandible is not able to reach its desired position. It is an under rotated mandible. The maxillary teeth position is preventing the mandible for achieving this position. Hence the mandible sits in a retruded position which reduces the space in the oral cavity. More often than not, these patients will have a tongue which has indentations of the tooth contour on its lateral sides and the front. This is mentioned as macroglossia in the text books. It is not really a "macro" or a large tongue. On the contrary it is a reduced space for the tongue.

This reduced space necessitates the tongue to be positioned further back. The posterior border now constantly or intermittently touches the back of the throat. Everytime the tongue touches the back of the throat it triggers of a response that food is coming to the stomach. Of course, there is no food arriving. The stomach constantly releases acid as a response of the food reflex. The patient becomes a chronic acidity patient. How is this situation resolved? Ideally be orthodontically correcting the retruded maxillary teeth. An extreme option is to prosthetically correct the retrusion, but this will need extensive tooth preparations and loss of healthy tooth structure. The objective is to bring the mandible into its rightful place and allow the tongue to be seated without touching the back of the throat.

Shortness of Breath

This condition is not generally classified as a disease but rather a situation arising out of some underlying pathology. Certainly, any form of lung disease or anaemia or some other related medical pathologies will lead to shortness of breath. A large percentage of individual with this symptom do not present any underlying pathology after a comprehensive diagnostic examination. If these patients are 40 plus in age, the condition is accepted as an aeging phenomenon and becomes part of life. Just a simple task of climbing two to three flights of stairs becomes a very strenuous task and the patient slips into a more and more sedentary life style. This further adds to the patients inability to undertake any physical exertion and becomes a vicious cycle.

Smylist® presents such a logical explanation for this condition that it seems to be too good to be true but it is absolutely true. An overrotated mandible is the underlying cause of this condition. The involved muscles in an overrotated mandible become very uncomfortable as the over-rotation becomes chronic and increases in severity. Individual with this condition will push the neck forward to get relief and this is the start of an extremely poor posture. Because the neck and head is constantly shifted forward as a reflex the next compensation made by the body is to rotate both the shoulders forward. The back is no longer upright. In this posture it is completely impossible for the individual to use the lungs to full capacity. The lungs are used only to about 60 to 70% capacity thereby reducing the oxygen flow to the body and the subject will feel a shortness of breath with minimal exertion.

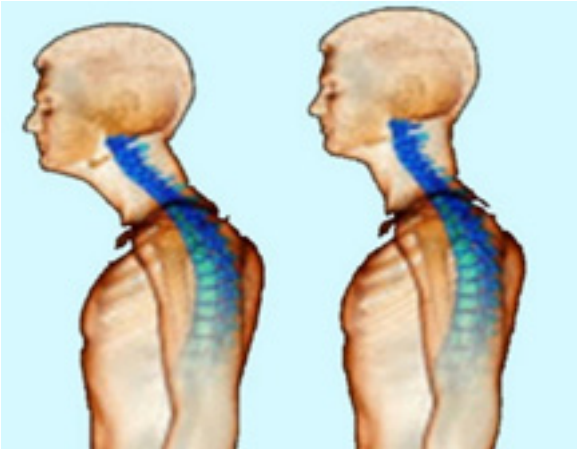

Figure 2: The head pushed forward to compensate for an over rotated mandible

A very simple test to confirm this is to ask the subject to take a deep breath in this posture. Repeat this a couple of times. Now the subject is asked to consciously throw the shoulders back and straighten the back. Now when the patient is asked to inhale deep and there will be a perceptible difference in the volume of the breath. A mere 15 minutes of consciously holding this posture and breathing will make a dramatic increase in the amount of exertion the subject can comfortably do. This is the most rational approach to this situation. A long term resolution can be achieved by giving this patient a "Body Balance Blue Smylist® Positioner" and a permanent resolution achieved be correcting the teeth relationship which will bring the mandible into the right position and eliminate the over rotation.

Figure 3: The left image shows forward rotated shoulders with a very poor posture with the head thrust forward. The lungs will not be able to inhale to full capacity. The right image is with the shoulders thrown back and the posture straight. Now the lungs will inhale to full strength and provide optimum oxygenation

Gnathoaeging

This is a Smylist® terminology which refers to an early onset aged look on the face. An article has been published which explains this entire process in extensive detail. The underlying cause is yet again a rotated mandible leading to hypertrophy of certain muscles and reduced blood supply to the fascia and skin, thereby causing an aged look on the face. This gnathoaeging can be reversed by deprogramming the mandible and rehabilitating the dentition in the corrected mandibular position or even with "Gnatho aeging pink Smylist® positioner".

Conclusion

The remarkable Smylist® concept provides rational and logical explanations for a number of clinical situation which do not seem to have any given etiology. Smylist® not only gives the reasons, but it also offers therapy and solutions to resolve these situations. Understanding the "Negative cascade effect" not only gives a better understanding of what is happening in the body, but it also expands the purview of the dentist in being able to resolve so many clinical problems for patients which impact a good healthy lifestyle. Instead of accepting problems as a part of life and living a compromised life, individuals can now enjoy a much more healthy and enhanced life style. The dentist is now in this privileged position to provide this enhancement to the patient [1-12].

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