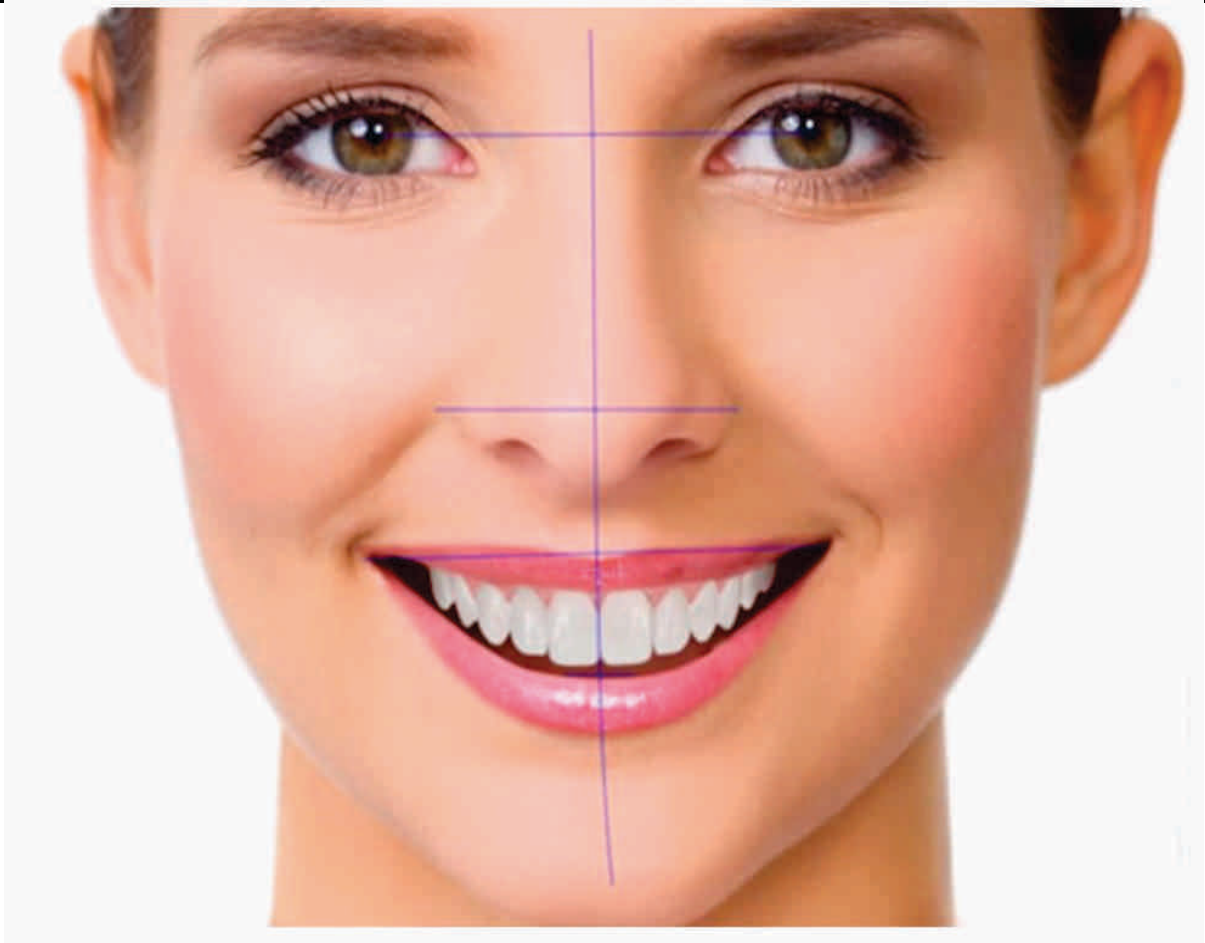


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Harmonizing the dentition with the face for function and aesthetics - The Smylist concept

Dr. Maria Csillag

Dr. Maria Csillag is the creator and inventor of the Smylist concept and owner of the Smylist® Academy in Budapest, Hungary. She has been delivering training sessions on the use of the Smylist® Design Software and general smile design all over the world, adding courses in 2012 on her unparalleled, new, step-by-step complex approach, the Smylist® concept.

Introduction

The Smylist® concept is a completely original and unique thought process developed by Dr. Maria Csillag from Budapest, Hungary. She has worked on this concept for the past decade and half and has treated a large number of patients using these concepts.

Smylist® not only addresses the aesthetic component of the face and the dentition but also includes the proper functionality of the mandible and the facial muscles involved with not just the movement of the mandible but also with facial aesthetics. These muscles have been termed the "mimic muscles". This system analyses the size, shape and actual and relative proportions of the maxillary teeth and harmonizes it with the muscular skeletal system and gives the treatment guidelines to achieve the ideal harmony.

The Smylist Paradigm shift

The Smylist system deviates from the norm on two major aspects and these two form the corner stone for this fascinating concept. These two deviations are as follows

a) The maxillary teeth are harmonized with the face following a number of principles laid down in the Smylist concept. Once achieved, the mandibular teeth are matched to the maxillary teeth to achieve a stable occlusion and "maxilla protected" mandibular movement. The term "Maxillary protected guidance" encompasses a few more aspects than the conventional "Canine guidance function" and/or "Group function".

b) The occlusal plane is not established on the basis of the

conventional "Facial Midline". In fact the Smylist concept states that the Facial Midline is not necessarily a linear entity, means it is not necessarily a straight line. In fact, data shows that it is a straight line in less than 20% individuals. The correct midline should be plotted from three points on the face lying between the eye brows, the tip of the nose and the pogonion point on the chin. More often than not this midline is a curved entity and the occlusal plane should be perpendicular to this curved midline.

The above two are complete paradigm shifts in the way rehabilitative as well as aesthetic dentistry is approached. The evidence for these two paradigm shifts comes from observing the unique nature of the dental apparatus as well as the facial muscles, more appropriately the "Mimic Muscles". The most evident observation that stares us in the eye is the fact that the mandible is a one of the most unique mobile joint in the body. All our mobile joints are uni lateral. The mandible is the only bi lateral joint and is connected to the right and the left side as a single entity. The movers and shakers of the mandible are primarily the well studied muscles of mastication, the diagastric and the not very well studied mimic muscles of the face.

Understanding mandibular movements

During work the mandible moves and the condyles on either side work in synchrony and harmony. The condylar fossa guides the condyles in an appropriate fashion and once function is complete the mandible should be in a state of rest. This state of rest is a specific position of the condyle in the fossa, called the stable mandibular position, whereby no surrounding muscles or ligaments are in contraction and in spasm. This is an

Abstract :

This will be the first in a series of articles that will present the very unique and innovative Smylist concept developed by Dr. Maria Csillag. The Smylist concept blends function with aesthetics and blends digitization of smiles with final laboratory outcomes. All of this is tied together by the Smylist Aesthetic Software and the Smylist Laboratory Software which generates individual customized templates for each patient. These templates can be imported into Exocad/3Shape laboratory software for final fabrication of veneers, onlays, crowns.

ideal scenario but is not always seen in a majority of individuals. The bilateral symmetrical movement of the mandible is very often hampered. The range of movement of the mandible is guided, governed and actually restricted by

- a) The anatomy and relation of the condyle in the mandibular fossa
- b) The boundaries set by the maxillary teeth.

The most important finding which arises from the Smylist concept is the fact that when the maxillary teeth do not guide the mandible optimally, instead of moving in a bi-laterally symmetrical and harmonious fashion the mandible tends to get deviated to one side leading to an imbalance in the condylar position in the fossa. Even though it is not necessary that the mandible will always unilaterally deviate when not properly guided and held in place by the maxillary teeth, in many individuals these kind of deviations take place.

If the mandibular movement thus gets imbalanced and out of synchrony

some of the “mimic muscles” tend to over work and can be studied and noted on the face. This also causes for early onset wrinkles to develop on the face and can cause an ageing effect which is not aesthetic. As dental practitioners and even as Smile Designers, we do not tend to pay much attention or focus on the facial musculature. The Smylist concept has identified and elucidated not only this concept of assymmetrically over worked facial muscles but even gone one step ahead to chart further serious repercussions of such assymetries.

Cascading effects on body functions

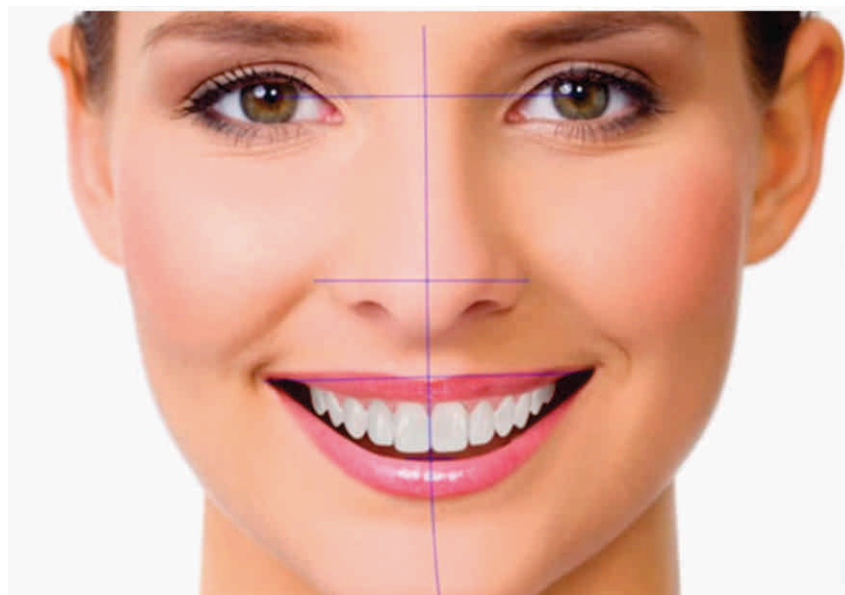
The Smylist concept has suggested that such uncontrolled and unilateral mandibular movement patterns can lead to para function and thereby a severe over work of the mimic muscles. This in turn can (not in 100% of cases but surprisingly in a large number of cases) lead to very complex scenarios. A few of these cascading effects are enumerated

a) Scenario One : A deviation of the mandible leading to over work of some of the mimic muscles depending on the deviation and also of the muscles of mastication. This leads to a para functional habit but is not very severe. The consequence is a constant state of spasm of certain muscles leading to hyper sensitisation of the trigeminal ganglion triggering off various pain reactions in the adjoining areas of the face

b) Scenario Two : The same deviation causes some muscles to hypertrophy leading to an aesthetic asymmetry of the face coupled with wrinkling creating an aged look.

c) Scenario Three : Similar deviations lead to very severe spasms which get trigger extremely painful episodes. These episodes present as migraine headaches, cervical spondylitis, shoulder pain and tinnitus.

d) Scenario Four : Similar deviations leading to unilateral spasms in the neck musculature which gets compensated by the body on the contra lateral side. Can lead to compensation of the deviation by contra lateral contraction and early spasm of the shoulder muscles leading to unexplained back aches and unilateral knee pain. It can also lead to a foot positioning disparity



leading to favouring of one leg and consequent discomfort and/or pain in the other leg. This is quite fascinating and extends the therapeutic role of the dentist literally to the entire musculo-skeletal system.

e) Scenario Five : A skeletally Class II positioned mandible with retroclined maxillary central incisors which causes the mandible to be seated in a much more retruded position thereby causing a reduction in the intra oral space causing the tongue to develop lateral indentations – usually referred to as macro glossia – Rather than being a hypertrophied tongue it is a normal tongue confined in a restricted space. The tongue thus has a restricted space in the oral cavity causing it to be pushed backwards into the soft palate area. This constant position of the tongue stimulates the swallow reflex. This in turn makes the brain send signals for acid secretion in the stomach without any food in the gastric system. This leads to unexplained chronic “Acidity”.

All of the above is happening because the mandible is attempting to get to a normal stable position in the condylar fossa without any deviation, and an interference in this attempt to achieve intercuspation leads to destabilization of the condylar path and position. The above six scenarios are a bewildering cascade of outcomes that can result from a mild deviation of a maxillary canine or a retro-clination of maxillary incisors or any situation wherein the role

of the maxillary teeth as a guardian/fence for the mandibular teeth is compromised.

Smylist therapy benefits

The Smylist methodology thus provides multiple solutions for various situations

a) A scientific and harmonious aesthetic solution for the natural dentition.

b) A conclusive functional rehabilitative solution for the dentition

c) A reversal of the ageing process on the face caused due to early onset wrinkles.

d) A definite solution to migraine, cervical spondylitis and shoulder pain arising out of improperly controlled mandibular movement

e) A solution for lower back ache and severe unilateral knee ailment

f) A solution for chronic gastritis

With extensive documentation, it is possible in the very near future that a dentist completely trained in the Smylist system will be not just treating teeth but would be curing a multitude of general ailments of not only the musculo skeletal system but also preventing other systemic problems. It is quite mind boggling as to how a

single maxillary tooth which is slightly out of place, can lead to cascade of serious consequences.

Diagnostic and treatment protocol for the Smylist concept

Since this concept is very different than convention a certain sequence of suggested protocols helps in arriving at definitive understanding of the mandibular disharmony in patients. It is not expected that patients will come to the dentist complaining of the range of systemic problems that have been listed out earlier. At least not at the current moment of time. Patients will probably come in for Aesthetic corrections or maybe for facial pain and occasionally for migraine headaches. Keeping the entire Smylist concept in mind, the following sequence of steps would be most appropriate in finding solutions for the problems.

1. History of the patient
2. Observation of the face, posture and movement of the patient
3. Clinical examination of the mandibular movement
4. Forced guidance of the mandible into a stable and relaxed position
5. Photographic documentation of the face for Smylist analysis
6. Detailed intra oral examination of the dentition
7. Detailed analysis and treatment planning using the Smylist software
8. Detailed Photographic documentation for maxillary corrections
9. Correction of the maxilla
10. Correction of the mandible on the basis of the corrected maxilla
11. Follow up in 4 to 6 months to record resolution of the symptoms

History taking protocol

After all basic parameters like age, gender past dental history has been taken a few pertinent general health data should be collected about any chronic illnesses and long term treatments being given for illnesses. If the patient has a diagnosis of migraines, cervical spondylitis, ringing in the ears and gastritis, ask for a more detailed symptomatology and if the diagnosis is backed by any pathological evidence of the disease process and the etiology of the problem. Also ask for a history of shoulder pain, back ache,

unilateral knee pain and hiatus hernia and gastric reflex oesophagitis. The history has to be co-related with the other clinical findings subsequently.

Observation of the face, posture and movement of the patient

The patients face should be examined in great depth. This is an exercise and skill that has to be learnt by the dentists. Reading the face is generally not part of the training which is undertaken in dental school. This is an art that has to be learnt and will require a lot of practice. The first element to be observed and points noted down is the face of the patient.

Reading the Face: The initial observation to be made is the bilateral symmetry of the face. The face has to be studied from forehead to chin and points made where the bilateral symmetry is off. This can happen due to a variety of reasons.

- The smile could be canted.
- Certain teeth could be missing.
- The arch form could be bad.
- There could be crowding.
- Key teeth could be malpositioned

The other key aspect to be checked is if any of the mimic muscles is hypertrophied. Hypertrophy will indicate a para functional habit leading to over use of the same muscle and thus causing it to hypertrophy. Only the particular affected muscle would demonstrate this hypertrophy. Very commonly seen is the mentalis hypertrophy which is a clear indicator of a severe clenching habit in a protrusive position where the mandible is not held in place by the maxilla. Assymetrical hypertrophy is commonly seen with the Zygomaticus and the LaevatorOris muscles. This happens when maxillary teeth are missing or lose vertical dimension. Other common mimic muscles which are affected are the laevator angular oris, the risorius and even the Orbicularis Oris orbital.

Reading the wrinkles on the face: It is important to completely study and imbibe all the mimic muscles of the face and learn to identify each of the muscles on the face of the patient either in normalcy and in hypertrophy. Once identified the next dimension on the face can be analysed and these are the wrinkles which form on the face due to the mimic muscles being subjected to varying activity. As a person ages, the skin tends to loose its elasticity and sag a bit and

wrinkles start developing between underlying muscles. Many a times due to mandibular disharmony deeper and more pronounced wrinkles develop making a person look much older than the actual chronological age. One very easy example is the naso labial fold where the wrinkle develops between the laevator muscles and the orbicularis oris. Similarly wrinkles come up between other muscle pairs on the face. Reading these wrinkles is a very fine art and requires a great amount of learning and patience to acquire the skill. This skill is one of the important areas of the Smylist methodology.

Posture of the patient: This is one of the key elements of the Smylist concept. It demonstrates how minor positional changes in the maxillary teeth and its relation to the mandible can lead to major effects on the musculo skeletal system. This aspect is also one of the most difficult parts to imbibe and diagnose. It is very much possible that by observing the walk of a patient or by observing the way the feet are placed on the floor by the individual, it can be deduced that some muscles of the leg/hip are being favoured by the person. This is yet another cascading effect originating from an improperly placed condyle. The improperly placed condyle can lead to a parafunctional habit leading to a possible spasm of the muscles of the face and neck on the contra lateral side. This happens due to an undue favouring of the afflicted side. The over worked muscles on the contra lateral side lead to a spasm and contraction of the sternocleidomastoid and the upper back muscles. This in turn leads to a favouring of one side of the waist and hip and thus too much load on the knees. This is what is observed as a gait which is not balanced.

It requires a thorough understanding of the entire set of muscles involved and a lot of experience. It is possible to just observe an individuals stance, posture and way of walking and deduce which maxillary teeth are out of position and balance. It is beyond the scope of this article to give full details of this cascade of events.

Clinical examination of the mandibular movement : This is the

first actual step involved in ascertaining if the condylar movement of the mandible is in sync or not. Any deviation of the mandible as the patient opens and closes the mandible has to be noted and kept in mind for the next step in the Smylist methodology. This exercise is best carried out by seating the patient on a regular chair, could be done on a dental chair but is actually a tad easier on a regular chair. The clinician should be right opposite the patient, a few feet away and ask the patient to open and close the mouth very slowly a few times. As the patient follows these instruction, please observe if the chin moves in a straight line or deviates to any direction. It is important to note down at what stage of the opening does the mandible start deviating. If it deviates, this is the point at which one of the condyles is not moving in sync with the other condyle.

Photographic documentation of the face for the Smylist Software

This step will generate the basic data which has to be uploaded to the Smylist software which will allow the clinician to plot the significant locations on the face to be able to generate the required analysis and subsequent correction of the maxillary teeth from the point of view of Aesthetics, Function and Mandibular guidance. The patient should be seated on a regular chair with a black curtain backing to allow for ideal photography. A DSLR camera is preferred for taking this photograph. The photograph should be taken with the object about 5 to 6 feet away from the camera. The picture should capture the entire face. The patient should be asked to open and close the mouth wide 3 to 4 times and then say "CHEEEEESE". This will display the maximum heights of the maxillary teeth which is important for the subsequent treatment planning. This front face picture is the corner stone of the Smylist therapy suggestions. The preferred format for the picture is the standard "JPG" format and will be subsequently loaded onto the Smylist software for further analysis. It is a good idea at this point of time to also take left and right lateral pictures of the face as it will help in making the definitive treatment plan.

At a latter point of time the retracted arch view pictures will also be required. These could be taken at this point of time or could be done when a definitive

treatment plan is being created with corrections as suggested by the Smylist software. A cheek retractor will be needed for this photograph as the entire length of the maxillary teeth will be required in this picture. This photograph has to be taken from a much shorter distance using a macro lens to capture all details of the teeth. The most important aspect of this photograph is to get the entire length of the maxillary teeth along with the marginal as well as attached gingiva of all visible maxillary teeth.

Detailed intra oral examination by the dentist

This is the simplest step in the entire Smylist system since it does not involve any additional learning curve. This is a regular intra oral examination to check for missing teeth, teeth with pathologies and most important the alignment of all individual teeth and the relationship of the maxilla to the mandible. Intra oral photographs of the teeth in occlusion also serves as a very important documentation for the case. It is reiterated that the Smylist concept creates a harmonious arrangement of the fixed maxillary teeth to the face and the musculo skeletal apparatus and the mandibular teeth have to be rehabilitation in accordance with the balanced maxilla.

Creating a functionally harmonious smile and dentition

All of the above findings are then assessed and considered as a whole. The photographic documentation is the loaded into the "Smylist Software" which is a creation of the author. This software makes it a very easy task to upload the findings of the patient using what has been termed as the eight Smylist parameters. All this data is assimilated by the software and it outputs before and after photographs of the patient with the corrected smile and dentition.

This software also has a special feature to export the new smile. This can be imported into the Lab version of the Smylist software which in turn generates a custom template of all the maxillary teeth for the patient based on all the features set by the user in the Smylist software. These custom templates are used by laboratory in either the Exocad Software or the 3 Shape software to process and fabricate the new

prosthesis. It is also possible to just generate and print the end point 3D model on which a transparent stent is made. This stent is ideal to be used a preformed sent to build up the teeth with direct bonding procedures.

Conclusion

The power and wide application of the Smylist software and the Smylist Lab version can only be experienced. There is no other comparable tool in the dental industry

Look out for further articles on the use of the Smylist Dental Software and the Smylist Lab Software. It is a fascinating concept and changes the approach to dentistry by leaps and bounds.



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