Review Article

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Rehabilitating dentitions in four visits – The Smylist® technique

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Abstract :

Smylist® is an innovative creation of the principal author and it outlines the importance of blending aesthetics with function and uses digital technology effectively to allow the dental clinician to establish ideal mandibular – maxillary relationships and rehabilitate the dentition in just 4 to 5 visits to the dental office. There are different materials and methods by which the end goal can be achieved very fast by harnessing digital technology. Using the Smylist® software in conjunction with digital CAD/CAM software it makes it possible to rehabilitate dentitions extremely fast with minimal expenditure of time.

Smylist® is an original and unique concept evolved and created by the principal author after having started her clinical practice. As patients were treated it was observed that aesthetics and function of the dentition was completely dependent on the position of the mandible. It was realized that the mandible should ideally be placed in functional, bilateral harmony with the muscles of mastication and the mimic muscles on both sides neither being contracted or in spasm and nor being overstretched. It was realized that if this is not the case it soon causes serious damage not only to the dentition but also to the entire body in the musculo skeletal system, digestive system and the respiratory system. Furthermore such an improperly placed mandible also leads to early onset ageing making the individual look way beyond the actual age.

All these observations were quantified as also was the effect of the correction of the improperly placed mandible. The end result of this documentation was the creation of the Smylist® concept. This concept established that aesthetics and function go hand in hand and that the aesthetics of the teeth should be based on the facial geometry, essentially the genetic geometrical map. These objective aesthetic rules are applied and termed as the W.A.C.P (White Aesthetic Conscious Preplanning) to great the proper aesthetics which in turn ensures optimum function.

One of the most dramatic finding of Smylist® was the manner in which the correction can be carried out and the amazing results of the correction on the patients. This correction can be done by rehabilitating the

dentition in its entirety in just four sitting, which includes deprogramming the mandible in 15 to 20 minutes.

This rehabilitation not only restores the lost dental structure but will also harmonize the occlusal plane established on the basis of horizontal lines on the face like the inter pupillary line, the TMJ-TMJ line and others. This occlusal plane is thus in concurrence with the musculo skeletal system and establishes the ideal maxillary mandibular relationship, which in turn keeps the masticatory muscles as well as the mimic muscles in a state which neither over stretches them nor contracts them and maintains the condyles in bilateral harmony. Using modern day technological advances in digital CAD / CAM and the Smylist® principles, it becomes possible to completely restore highly debilitated dentitions in as little as 3 to 4 sittings.

The fundamental principle used in this concept is to establish the maxillary dentition and specifically the maxillary occlusal plane in accordance with the patients individual mid line which could be straight, sloped or curved to the right or left. Once the maxillary plane is established, the mandibular teeth just follow the maxillary. The relation of the maxilla and mandible is established with the "Smylist® Bite". There are a number of steps from the start to finish of the Smylist® rehabilitation process. Even though the steps are multiple, with proper planning the entire process can be completed in 4 visits. The last two visits are longish and require patience and considerable chair side time.

The first step in the process is to fill in the two Smylist® forms. These are the Smylist® patient history form and the second is the Smylist® patient examination form. Generally the history form can be completed at the front desk while the examination form has to be completed by the dentist. Optionally registered users could fill in the forms on the cloud after logging in. The data on these forms is a very strongly indicative if the mandible is deviated and/or over-rotated. The cloud based data system also allows the user to obtain a tentative diagnosis and a plan of action for the rehabilitation.

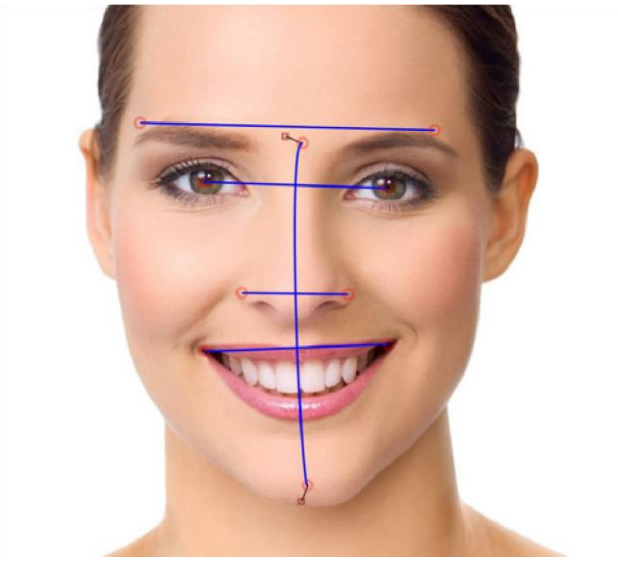


Fig 1 The horizontal lines and the midline as plotted by the Smylist® concept

The next step is to carry out the initial photo documentation. A number of pictures have to be made in the standard and Cheese A positions. Full body pictures are also taken to document the posture of the individual. The Cheese A is then loaded on the Smylist® software and the patient analysis and planning is carried out. With practice this is less than a 15 minute procedure. Once the proposed digital smile obtained from the Smylist® software has been approved by the patient a complete rehabilitative treatment plan is designed for the software. This plan could involve restorations, onlays, veneers, crowns, bridges, implants or direct on the chair build ups using conventional bonding

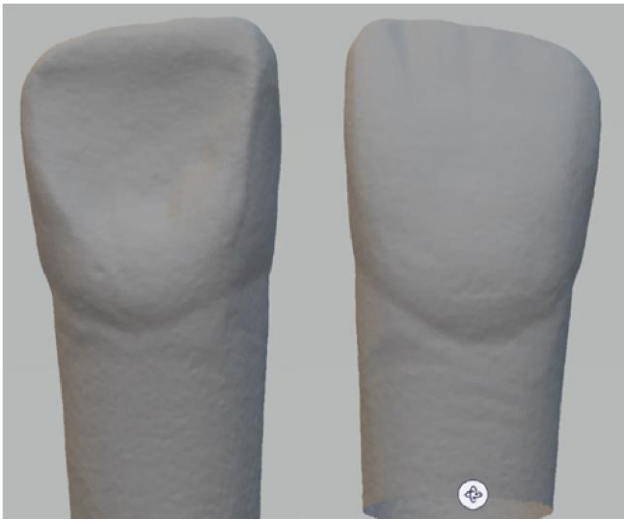
dentistry.

Smylist® does not propose any particular modality of rehabilitation. It is totally the clinicians choice, based on the clinical situation of the patient to go in for direct or indirect forms of rehabilitation. It is also the clinician's choice if the rehabilitation has to be based

Fig 2: The Smylist® software with a suggested smile based on the Smylist® rules

on prepped teeth or with no preps. The clinician may decide to do some preliminary orthodontic movements and then go ahead with restorative/prosthetic work. The only contention of the Smylist® rules is that the relationship of the maxillary / mandibular teeth has to be based on the Smylist® bite that has been obtained. The mandible should be in what is termed as the "G Space" in the Smylist® concept and in maximum intercuspation it should be in the "BCP" (Balanced Condylar Position). In the BCP the maxillary central incisors and canines should provide the stop for the mandible. It is not critical as to what restorative material has been used. Zirconia, ceramic, resin based ceramic, laboratory composite are all fine as long as the Smylist® rules are being adhered.

Once the rehabilitative plan and approach has been finalized the next step is to record the Smylist® bite. This is the most important and definitive step. The further this recording is from the ideal, the lesser the benefits accrued to the patient. The Smylist® bite is recorded in wax and can only be done after deprogramming the mandible. This deprogramming is a clinical skill that has to be learnt and then applied. The more the experience the better the clinician will be in recording the Smylist® bite. This bite is preferably taken on the side opposite to where the mandible is deviated. If the mandible is only over roated, then any side bite can be recorded.



Once deprogrammed, the patient will display almost instant changes in posture, movement

Fig 3: The 3D STL custom teeth generated by the Smylist® Lab Software

and pain. This is also like a confirmatory test of the Smylist® bite. Wearing the bite for about 15 minutes achieves the desired effect and results can be observed. It is a good idea to photo document these changes. At this point the Cheese A photograph should be taken once again and loaded into the Smylist® software and the exact midline and maxillary teeth design should be created. Aesthetic tweaks should be made to achieve objective aesthetic parameters which will be in synchrony with the face and its characteristics. Once the final digital smile has been obtained it should be exported for subsequent loading in the Smylist® lab software. In case, the patient does not exhibit the full complement of teeth in the Cheese A* position, a retracted arch view photograph can be loaded into the Smylist® software and the digital design created with this photograph and then exported for use in

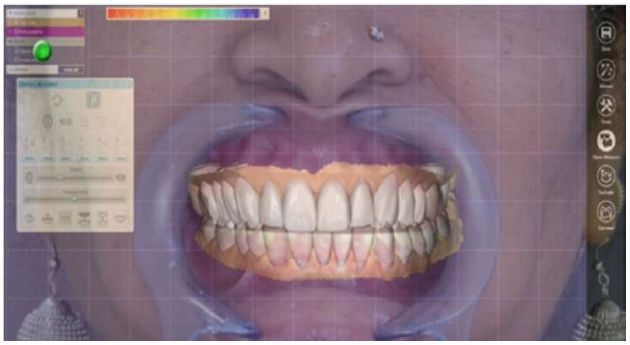


Fig 4: The Smyist lab software super imposing the patient photograph on the CAD CAM software

the Smylist® lab software.

Based on the final definitive treatment plan the further steps will be slightly different.

Direct Bonding Option (Freehand Additive)

It is possible that a direct bonded approach be carried out without any CAD/CAM support. The digital smile will have to be mimicked by the clinician in the mouth. This is a free hand work and is not the simplest of jobs and requires a lot of clinical skill and patience. In case this approach is being followed, the Smylist® bite has to be placed in the mouth and the contra lateral side direct bonding process for the maxillary teeth should be carried out using the bite as the reference point. Once all the maxillary teeth on the contra lateral side have been built up a bite should be made in wax on that side with the Smylist® bite in place. This new bite will now become the reference point for the original side where the maxillary teeth should be built up. Once all the maxillary teeth have been built up the mandibular teeth on the original side should be built up with the contra lateral bite being used as a reference point.

Once the mandibular teeth are build up on the original side it serves as the reference point for the build up of the mandibular teeth on the contralateral side. This will establish the Smylist® bite in the patient. Further fine treatment and finishing and polishing can then be carried out in a routine fashion.

Direct Bonding option (Silicone Key Index)

In case CAD/CAM based lab support is available, it is a very good idea to use the laboratory to generate multiple key indices in Silicone to facilitate the direct bonding process and also make it much more accurate **Additive with no preparation** : This is the simplest of the methods for a full rehabilitation in the least amount of sittings. Final impressions of the upper and lower teeth should be made. If an intra oral digital scanner is available it is ideal to make an intra oral digital scan. The exported digital design from the Smylist® software is sent to the lab along with the impressions or the digital impressions. The Smylist® bite has to be also sent to the lab to establish the articulation relationship of the maxillary and mandibular teeth. The lab will import the digital design and superimpose on their CAD/CAM software and generate 3D templates for all the maxillary teeth. These templates are then used on the CAD/CAM software and the virtual design is generated. The mandibular teeth have to just follow the maxillary using the Smylist® bite as the relationship point. Once approved the lab will then print a hard copy of the finished model. The lab will also print a second model in which the lateral incisors and the second molars will not be digitally reconstructed. This will be done for the maxillary as well as the mandibular teeth. Once the models are ready the lab will make a transparent silicone key index for both the sets of models.

The clinician will then use the silicone key index made on the model where the laterals and second molars have not been reconstructed. Using this silicone index it will be very easy to build up all the maxillary teeth except the two incisors and second molars which will serve as stops for the key index. The transparent index will allow polymerization of the composite used for the build up. Once this process has been completed the key index of the model where all teeth have been built up will be used to build up the two lateral incisors and the two molars.

This will complete the maxillary teeth. The same process is then used for the build up of the mandibular teeth. Another appointment for finishing as well as minor occlusal rectification completes the process.

Additive with preparations: In case preparations are required for the case there is some additional work that has to be done. After the design is ready on the Smylist® software and the treatment plan has been finalized all teeth that require preparation should be identified. The next step is to start the preparation on the teeth on the contralateral side of the bite. After preparation are done the prepared teeth have to be temporized. This is very important. The next step is to make a bite on the contra lateral side with the existing Smylist® bite in place. Once a second bite on the other side is available the preparation can be carried out on this side. After the preparation are completed the temporization has to be carried out for this side also. The next step then is to make the impressions. All temporaries have to be removed and the impressions made conventionally or digitally if an Intra oral scanner is available.

The rest of the procedure is more or less similar to the process where no preparation are done. The key is to remove the temporary before starting the build ups. Once the build up process is initiated all subsequent steps are exactly the same as explained in the previous section.

Indirect Crowns/Table Tops/ Onlays Option

If an indirect approach is being taken for achieving the new Smylist® bite, the latest CAD/CAM techniques are most efficient and the role of the Smylist® lab software in generating 3D templates of the suggested design is of paramount importance. The process is more or less similar to that of the direct bonded build ups. Once the design of the maxillary teeth has been tweaked and harmonized with the Smylist® software the design has to be exported. In case preparation are being done the process is exactly the same as mentioned in the direct bonded preparation. If the decision is to go without preparation it is again same as mentioned in the direct bonded preparation.

Final impressions have to be made and the Smylist® lab software superimposed on the CAD/CAM software and the 3D STL templates of all the maxillary teeth are generated. These are then used in the CAD/CAM software. The Smylist® bite has to be sent to the lab along with the impressions to enable the CAD/CAM software to establish the relationship of the maxillary and mandibular teeth. Once the maxillary design is in place the mandibular teeth are made to just articulate with the maxillary teeth. After approval of the virtual design the indirect prosthesis is ordered. Once delivered the prostheses is checked in the mouth to confirm and assess the correctness in accordance with the available Smylist® bite. If all is fine the prosthesis is bonded/cemented in place. Optionally the lab can be ordered to send in temporary copies which can be tried and fit in the mouth for a short period of time prior to fitting the final restorations.

Thus the Smylist® workflow allows complete and complex rehabilitations to be completed in a short period of time with minimal sittings and still achieve excellent results and rehabilitation for patients with objective aesthetics and complete function blended and incorporated effectively.

***Cheese A** : The Cheese A photograph is a specific view as defined in Smylist®. This is a front face tight picture taken after the subject is asked to say the word Cheese followed by the letter A. The letter A has to be said as a long trailing A like “aaaaaaaaaaaaaaaaaa”. The picture is to be clicked when the patient is saying “aaaaaaaaaaaa”. The purpose is to make the subject stretch the mouth as wide as possible simulating a smile. This allows the capture of muscle positions on the face very clearly.