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Bite alteration to reduce gummy smiles

By David S. Frey, DDS

The traditional method for correcting a gummy smile with too high a gum-to-teeth ratio has been enormously invasive. It has involved cutting and lifting the gum tissue back in order to remove bone, after which the gums must be sown back in place.

This process requires a six to eight-week healing process, which is not only painful, but esthetically displeasing during that period. Another method, which involves repositioning the lip after cutting into the vestibule, is equally invasive with an excessively long period of healing.

Today, cosmetic dentists often perform a gingivectomy utilizing a scalpel, electrosurge or diode laser in order to correct an overly gummy smile. However, these methods are contingent upon the amount of biological width available in each individual patient. Two to three millimeters of gum tissue must remain over the bone after the tissue has been removed. This biological width limitation usually creates one of two options.

Either the patient must be subjected to invasive surgical gum flaps accompanied by bone removal or the patient must be satisfied with very little change in the gum-to-teeth ratio. If the patient presents with a significantly short vertical index (measured from the CEJ of tooth No. 8 or No. 9 to the CEJ of tooth No. 24 or No. 25), the gummy smile condition may not be satisfactorily corrected when only a gingivectomy is performed.

Cosmetic dentists train regularly to adjust horizontal smile abnormalities such as over-crowding and large gaps. The idea of changing the vertical dimension of occlusion as part of improving dentofacial esthetics is not new. While occlusal philosophies may differ, most will agree that the occlusion must be given careful consideration when changing its vertical dimension, both as part of the diagnostic process and to avoid possible iatrogenic results.

When the patient presents with a significant difference between the mandibular position at habitual occlusion relative to an optimized occlusal position, increasing vertical...
Dr. Nushin Shir, owner of Artistic Center for Dentistry, is celebrating the grand opening of her practice in Santa Monica, Calif., by offering free comprehensive dental exams and basic teeth cleaning services to 120 new patients.

In exchange for free dental treatment, the practice is asking that all patients donate $10 to Heal the Bay, a local environmental outreach effort.

The monthlong promotion runs from April 1-30. “Among the great karmas to be performed, charity is the greatest,” said Dr. Shir, who is an expert in cosmetic and intricate dental procedures. “In these tough economic times where many families are hurting, the charitable contribution to nonprofits and their important missions has fallen significantly. “This is an ideal time to repay the support I have received from the community and to give back to one of the most important causes in Santa Monica, Heal the Bay.”

The mission of Heal the Bay is to promote the importance of making Southern California’s coastal waters and watersheds safe, healthy and clean, while fostering a global footprint. The practice is chartless that can bookend a patient’s dental experience, such as massage, foot reflexology, hand and facial treatments, and Botox and dermal fillers. Shir has served many well-known celebrities in addition to owning and managing several successful dental practices in Los Angeles County since 1993. She graduated from UCLA School of Dentistry in June 1993. She earned her bachelor’s degree in biological sciences from UC Irvine.

Dr. Nushin Shir (left) of Artistic Center for Dentistry in Santa Monica, Calif. (Photo/Provided by Dr. Nushin Shir)

The Consumer's Research Council of America recently selected Shir to be included in its 2010 edition of Guide to America's Top Dentists. “Receiving this designation is an honor,” Shir said.

More information
Founded in 1985 by Dorothy Green, the organization's focus on Southern California coastal waters. However, Heal the Bay's efforts primarily affect the water quality for California as a whole and the rest of the United States. Please visit www.Healthebay.com for more information.

Dr. Nushin Shir treats a patient in her practice in Santa Monica, Calif. (Photo/Provided by Dr. Nushin Shir)

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smile revitalization. Because this procedure is very complex and detailed, these books have been very successful for my practice because they're easy to read and contain several before and after pictures.

Patients show them to other potential patients, so they've been very strong internal marketing tools. It's also easy for me to share these books with other dentists. I allow them to co-write my books by adding their own before and after pictures so that they can enjoy the marketing success that I've had. I call this the Instant Author Program [www.instantauthorprogram].

Your office is in Beverly Hills, where many people are known to get frequent cosmetic procedures. Do you find that injections in the face and lips — such as Botox, restylane and collagen — cause problems with a patient's smile?

Yes. Women often enlarge the size of their lips to the point of sacrificing their smiles. So when they smile, they no longer show much of their teeth.

In that case, these injections can create a vertical abnormality. If they want to show more teeth, they need to open the vertical dimension in their bites.

We must open the bite up so that when they close their mouth, the top and bottom teeth touch sooner. That allows more of the teeth to show and gives the dentist room to make a larger central that peers through the lips and gives the patient a more youthful smile.

Not showing enough teeth is the opposite problem of what you call a gummy smile, correct?

Yes, a gummy smile is the opposite vertical abnormality. With a gummy smile, the patient shows too much of the teeth and gums. These patients often have a very small vertical dimension, 13 to 14 millimeters.

By opening them up to their natural physiological vertical length, which might be closer to 17 millimeters, they show more teeth and less gum as the ratio between the gums and teeth is reversed. By opening the bite, you can also reduce gummy smiles, as my article [in this edition] illustrates.

What kind of patient would you consider a good candidate for what you call full-mouth revitalization?

People who have had lots of dentistry in the past or worn their teeth down, as well as people who don't like their smile and want veneers on the top and bottom teeth. If you're going to veneer 20 teeth, the only remaining teeth are molars.

Many of these patients already have amalgam fillings or crowns on these teeth. So it only makes sense to do the full-mouth with a corrected bite on these patients.

If you fail to correct the bite, you also fail to address the core problem of why so much dentistry is already in the patient's mouth. By leaving the patient in his or her habitual bite, that patient is going to continue to have the same problems he or she has had for the past 50 years or more.

However, by creating a harmonious environment between the temporal mandibular joint, the teeth and the muscles of mastication, you can achieve beautiful and long-lasting restorations.

Are there patients who aren't good candidates for full-mouth revitalization?

Yes. There are times when it makes sense to be a tooth or smile doctor. Someone who has all virgin teeth without any cavities or someone with a vertical dimension of 17 to 21 millimeters with no history of neuromuscular symptoms wouldn't require full-mouth revitalization.

The same can be said for someone who is very young and open to the idea of orthodontics. If someone's natural teeth are in the proper shape, size and contour without any contortions, they don't require a full-mouth approach.

Do your patients often ask you to fix a tooth and then end up going for the full-mouth approach?

Yes, sometimes it's important for a patient to understand why his or her teeth are fracturing and decaying. Teeth restored back into the patient's habitual bite may be very limiting.

Again, it's always the patients' choice, but I want them to make a very informed choice.

I have a patient now who is dissatisfied with his previous dentist. He struggled with three teeth on the bottom right where he was given three porcelain-fused-to-metal crowns.

His bite is so tough and so limited in the back molars that after his bite was adjusted many times, he can now see the metal on his crowns.

So I explained to him that I could redo the crowns, but he will have the same problem because his teeth are very flat and worn down with a lot of old dentistry.

I showed him how full-mouth revitalization will open his bite and allow the necessary room to restore his teeth. Without this, he will continue to wear down his teeth. [1]
dimension can have dramatic cosmetic effects on a patient by increasing the crown-to-gum ratio and effectively decreasing the gummy smile.

The cases presented here illustrate that vertical abnormalities such as gummy smiles may sometimes be further enhanced and the need for surgical intervention minimized if the vertical dimension of the bite is altered.

In adjusting the vertical dimension, care must be taken to insure a functional occlusion in the finished case. Jankelson described the method for muscle relaxation to determine mandibular position at physiological rest as compared to habitual rest. These calculations indicate how much vertical index can be increased or how much free-way space can be decreased without interrupting the patient’s true physiologic rest position.

Concerns about changing the entire arch to effect anterior defects are unfounded for two reasons. First, the newly diagnosed mandibular position is verified as correct by using an orthotic before anything is done to the natural teeth. Secondly, this technique of treating a gummy smile is based upon opening the bite. Therefore, when porcelain is added to the full arch to increase vertical dimension, it involves little restoration of the natural dentition because the restorations are placed over the occlusal surface.

In the author’s experience and as illustrated in these cases, once PRP of the mandible is established, the increased teeth-to-gum ratio is significant prior to the removal of any gum tissue. It is prudent to mention here that if the patient’s PRP does not differ significantly from habitual after TENS relaxation, very little change in vertical dimension would be available for this procedure.

Use of the Golden Proportion to establish a pleasing esthetic effect has been seen in art, architecture and various scientific fields for centuries and used in dentistry for at least 25 years. Like occlusal philosophy, some question its validity. However, it is used by many today in plastic surgery, orthodontics and esthetic dentistry as an element of treatment planning of facial esthetics and, in the author’s experience, patients are highly pleased with the outcome.

Calculations utilizing the Golden Proportion equation can also be applied to tooth shape and will show whether the “golden” vertical index can be reached through a combination of bite correction and gingivectomy. These simple calculations indicate whether the vertical length of the patient’s smile will be more esthetically pleasing after the corrections have been made.

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\frac{\text{Width of central incisor}}{1.618} = \text{golden length of central incisor}
\]

\[
\text{Length of central incisor} \times 1.618 = \text{golden vertical index}
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Based on these two calculations, an orthotic in the optimal bite position for both esthetics and function can be fitted for the patient’s upper teeth.

The orthotic is worn for a period of approximately one month to be certain that no headaches, neck pain, grinding or chewing issues ensue. This period also provides the patient with time to become psychologically accustomed to the additional tooth length that shows prior to the gingivectomy and application of veneers. If the patient is dissatisfied with the length-to-width ratio of the teeth in the orthotic, adjustments can be made to the orthotic before beginning the procedure.

Correcting the bite before performing a gingivectomy can offer a greater esthetic result, significantly reducing the amount of gum tissue that shows before a gingivectomy is performed. It should be noted that placement of porcelain on the molar teeth to increase vertical height is extremely conservative because the porcelain is lying on top of the existing teeth.

Even if the available biological width is significant, correcting the bite allows the dentist to remove less gum tissue during the gingivectomy. A frenectomy can also be performed, when appropriate, to remove a small portion of the lip frenulum with a diode laser. This allows the lip to move down slightly over the previ-