Changing the face of dentistry

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Dentistry is not just about teeth any more, as will be demonstrated in this case presentation article. In the past few years, with thousands of dentists being trained in the use of non-surgical, minimally invasive facial injectables, such as Botox and dermal fillers, dental esthetic and functional treatment has changed for the better.

This article seeks to demonstrate how the use of facial injectables in the oral and maxillofacial areas directly relates to the teeth in terms of function, smile lines, lip lines, phonetics and esthetic dentistry, thereby clearly showing the totality of this oral and maxillofacial treatment is indeed dental treatment.

Case study

This patient’s story starts a few years ago when she had two all-ceramic crowns on the upper right and upper left central incisors as well as veneers placed on the upper and lower teeth (Fig. 1). One day, she noticed that her upper left central incisor crown seemed loose. A radiograph was taken and you can clearly see in Figure 2 that a horizontal fracture is present. This tooth is obviously non-restorable and so it was extracted and an implant was placed, as shown in Figure 3.

The implant was restored with a Procera crown and the patient is enjoying the newfound stability of this tooth. What she does not enjoy is the creation of deficient interdental papilla known as black triangles (Fig. 4). This is one of the most frustrating esthetic challenges that can happen in any kind of implant or crown and bridge procedure.

A new innovative procedure that I have pioneered in conjunction with the American Academy of Facial Esthetics (www.facialesthetics.org) is using dermal fillers (Juvederm Ultra XC) to plump the interdental papilla to eliminate these black triangles, which was successful, as seen in Figure 5.

A few months later, the patient was interested in retreatment of her crowns and veneers because she wanted whiter teeth and a fuller smile. Some of the issues that she complained about with her current smile are seen in Figure 6: the new crown on the upper left central incisor is a slightly darker shade than the other teeth and when she goes into a full smile, she does not show as many teeth as she would like.

She also requested that all of the teeth be whiter. She has also exhibited over the past few years a number of chips on the veneers, especially on the lower teeth (Fig. 7), and an occasional veneer has pop-off that had to be recemented from time to time. This has resulted in making the lower teeth look “very short and stubby,” as she explained. This patient also has a very deep overbite, as demonstrated in Figure 8.

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I trend in facial injectibles, let me give you my perspective as to what I look for now in this kind of case and why the facial conditions here are part of her dental esthetic treatment. Let’s take another look at this patient in a full-face picture and in a pre-operative full smile, as shown in Figure 6.

Here in a full smile, she does not clearly show the buccal corridors, which would give her a fuller looking smile. As dentists, in the past, we would never think about why she is unable to deliver a fuller looking smile, thinking incorrectly that there was nothing we could do about it. We would just assume that we should place veneers on the bicuspids and that will be enough when, in most cases, it will not provide the desired result because other factors are at play here.

In addition, please notice in this photograph that in her present full smile, the upper lip is not in an aesthetic relationship with the teeth. Ideally, for esthetic lip lines and smile lines, when the patient goes into a full smile, the bottom of the upper lip should straddle the gingival margins of the central incisors and cuspids, which should ideally be at the same heights.

Facial aging happens to everyone

This patient clearly demonstrated a very typical scenario with facial aging, which is usually present after the patient reaches age 50. Dermal collagen and facial fat are lost in the oral and maxillofacial regions and the midfacial tissues begin to sag and drop. This results in patients showing less of their upper teeth and more of their lower teeth. This patient reports, and clearly demonstrates by pictures of her in her youth, that she had higher cheekbones and more volume in her face. At that point in her life, she had a much fuller smile.

You can clearly see in the full-face photograph (Fig. 6) that she has lost some of the volume in her face and try as she might, she can’t pull her upper lip higher in a full smile because of the loss of volume in the zygomatic areas of her midface. As a result of this facial aging and loss of support, she also has deeper nasolabial folds, which again puts more pressure on depressing the upper lip in a full smile.

All of these factors together result in a dental esthetic challenge and are easily treated with Botox and dermal fillers, by properly trained clinicians, in addition to the use of veneers. The main point here is this: With her loss of facial volume as it was at the time, you could put a whole mouth full of veneers and she still wouldn’t show the bicuspids and buccal corridors because her full smile is not a function of her teeth but rather of the oral and maxillofacial structures.

Figure 9 shows the patient post facial injectable treatment with Botox and dermal fillers, and you can see the desired result of showing more teeth and proper lip and smile lines before the re-treatment of the veneers. Take a close look at her cheeks and you will find significantly more volume as well as much less prominence of her nasolabial folds.

When she goes into a full smile, she shows a lot more teeth than before because her upper lip now has greater support from the added volume in the midface. This was accomplished by using a calcium hydroxyapatite dermal filler (Radiesse) with 1.3 ml used in the left zygomatic area and 1.1 ml in the right zygomatic area. A hyaluronic acid dermal filler (Juvéderm Ultra XC) was used in the naso-labial folds with 1 ml used in the left nasolabial fold and 0.9 ml in the right nasolabial fold.

You can now see when she goes into a full smile in Figure 9 that she has the proper lip lines and smile lines, and the bottom of her upper lip straddles the gingival margin of the upper central incisors and cuspids. This clearly shows the direct relationship between dermal filler procedures in the nasolabial and zygomatic areas as dental esthetic and therapeutic treatment.

New face, new smile

Once this patient could see her teeth better and showed more teeth when she smiled, she wanted new veneers to make the teeth whiter. Now we could address the challenges discussed above and proceed with veneers. One other issue that the patient was concerned about due to her broad smile was the upper left central incisor having a higher gingival
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margin than the upper right central incisor because that is the area where an implant was placed (Fig. 10). Once we had addressed the underlying cause of her deficient smile, we were ready to proceed with new porcelain veneers.

The treatment plan consisted of 10 new veneers on the upper teeth and 10 new veneers on the lower teeth. The upper central incisors, however, did produce somewhat of a challenge. Cutting off a Procera crown on a tooth with an implant is no dentist’s idea of fun in the office. In fact, significant damage can be done to the implant abutment and it is not a wise choice if other options are available.

In this case, we chose to bond a porcelain veneer onto the existing upper central incisor crowns instead of trying to remove them. The system we chose was Cristal Veneers by Aurum Ceramics. Cristal Veneers is the next generation of no/minimal preparation veneer systems with veneers that can be made as thin as 0.3 mm and exhibit very high strength and excellent esthetics. Cristal Veneers can also be made as thick as any other veneer.

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This case had multiple thicknesses of every type of veneer possible. In Figure 11 you may see the teeth after preparation. All of the previous veneers were removed on the upper and lower teeth. A hard- and soft-tissue laser (Waterlase iPlus, Biolase) was used on the upper right central incisor to perform not only a gingivectomy, but also a closed sulcus crown lengthening procedure to match the gingival height of the upper left central incisor. The closed sulcus crown lengthening procedure at this point is a very well established procedure and can be done very precisely and conservatively with an erbium laser, such as the Waterlase iPlus.

As a matter of fact, at this same veneer preparation appointment we performed this closed sulcus crown lengthening and because of its predictable nature, we were able to take the final impression on the very same day.

Figure 12 shows the prep guide created by Aurum Ceramics and demonstrates the very minimal preparation on the two upper central incisor crowns so that the Cristal Veneers on these teeth will be approximately 0.3 mm in thickness while the veneers on the lateral incisors will be anywhere between 2.5 mm to 3 mm in thickness.

All of the other veneers were of various thicknesses as well, as you can imagine by looking at the lower no/minimal veneer preparations of the lower teeth in Figure 13.

**Challenges with veneers**

Let’s talk about this issue for a moment because this is a challenge when seating a veneer case such as this one. Every dentist knows that when he or she is seating veneers with different thicknesses, the biggest challenge is trying to match up the final shade. Many times seating these veneers is very time
consuming in the office as the dentist is trying to use different resin cement shades and even different values of the resin cement shade to achieve a color match of all of the veneers.

Personally, I have always believed that this should not be the dentist’s problem but it should be the laboratory’s responsibility if it has the esthetic expertise necessary and the technicians know the porcelains that they are using. Cristal Veneers porcelain was developed by Aurum Ceramics and they have the esthetic expertise to understand the optical qualities of the porcelain they are using, as well as the different opacities that will go into a challenging veneer case such as this one.

This case then came back to my office with all of the different thicknesses of porcelain veneers (sometimes there are even different thicknesses on the same porcelain veneer), and because of this laboratory’s expertise in producing these veneers, I was able to seat all of these veneers with one shade of cement.

It is a huge advantage to have such a talented laboratory, and here is where your choice of laboratories can make all of the difference in the world in terms of the ease of cementation, saving time and producing an esthetic result that you and the patient are proud of.

Figure 14 shows the veneers cemented into place. The veneer shade is 020 and the corresponding cement was used. Note a few of the challenges presented above have been addressed completely. Look at the gingival margin of the upper right central incisor and notice that now it exactly matches the gingival margin of the upper left central incisor. Remember that the veneers on the central incisors are approximately 0.3 mm and the rest of the veneers are anywhere from 1 mm to 3.5 mm in thickness, and all of these veneers are the exact same shade.

There was absolutely no need to try to use different shades of cement to achieve a final matching shade, but only one shade of cement was used. Notice also that the lower veneers now restore the proper height to the teeth and they are no longer short and stubby as the patient complained about before.

Bonding veneers to existing porcelain crowns includes the use of a number of agents and a sequenced approach. Please go to my website www.commonsensedentistry.com for a full step-by-step technique as how to bond a porcelain veneer to an existing porcelain crown.

_Total facial esthetics results in happy patients_

Figure 15 shows a very happy patient who has been treated with total facial esthetics and we have addressed all of her concerns. The final dental esthetic and therapeutic result is a combination of each of the oral and maxillofacial treatments in and around the mouth.

This article sought to demonstrate how the use of Botox and dermal fillers in the face are as much responsible for the success of dental esthetic cases as are porcelain veneers, crowns and implants._

**_about the author_**

Louis Malcmacher, DDS, MAGD, is a practicing general dentist and an internationally known lecturer, author and dental consultant known for his comprehensive and entertaining style. He is president of the American Academy of Facial Esthetics. His website is www.commonsensedentistry.com, where you can find information about his seminar schedule and live patient hands-on Botox and dermal filler training, download his resource list and sign up for a free monthly e-newsletter. He may be reached at (800) 952-0521 or at drlouis@facialesthetics.com.