

Length, Shape, Color, and Materials Do Matter (Part 1)



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A variety of communication of a patient's expectations for her aesthetic case is crucial to both the acceptance of treatment and satisfaction with the outcome. When designing orthodontic treatment, tooth shape can be just as important to the success and satisfaction of the case as color. Furthermore, it is important to determine what a stimulus to the patient, not necessarily just what a dentist might choose for the patient. In determining what the patient desires in tooth shape, color, and length, it is best to have you join precise verbal communication, but also a form of predictable visual communication. For this purpose, as part of these authors' research project, a truly high quality showing photographs of different tooth designs from which patients can help choose their preferred tooth shape and length is used, along with computerized aesthetic imaging. By using an aesthetic imaging program with a tooth style guide such as the Little Library Smile Style Guide (developed by Leta Barlow and David L. Brink, author of Digital Imaging Communications), a dentist can quickly show patients a computer simulation of how they would look with their chosen smile. Different people like different smiles. The various combinations of tooth shape are too

important to leave to the whims or preferences of the dentist or dentist. The patient must decide. Based on these patient decisions, the dentist is to a better position to decide on the most appropriate dental materials to achieve the desired aesthetic goals.

Case Study

The patient, a young woman, already had surgery on her two central incisors (Figure 1), but a fracture and aesthetic concern kept her desire postponed a visit to these authors' office for a second opinion. While discussing the option of replacing the porcelain, she revealed that she was never happy with the shape, length, or orientation of the two incisors (Figure 2). After much consultation, these authors were able to determine that she felt they appeared too short, fat, and blocky. Furthermore, her lower incisors had not been prepared during the previous treatment and were chipped and flared out. Finally, she wanted longer, more slender teeth. She was one of the overall look she wanted, but wanted to show authors examples to determine how many teeth would give her this result and how her desired smile design could be achieved.

Using verbal communication of what the patient wanted

Abstract

Communication among the dentist, patient, and laboratory is essential for the acceptance of treatment and successful outcome of any esthetic case. Selection of smile designs that reflect patient satisfaction with esthetic dental treatment include tooth shape, color, and length. Smile libraries have proven to be a highly effective tool used in treatment planning with the patient and communication with the laboratory during smile design. The different tooth guides available offer an immediate form of communication to choose a desired tooth shape and size. In addition, computerized esthetic imaging programs can be used with or without smile libraries to create the desired and subjective smile design that increase case acceptance, help laboratory communication, and ensure patient satisfaction.

Learning Objectives

- After reading this article, the reader should be able to:
- Discuss the importance of all attributes of smile design in regard to patient satisfaction with the final case, such as tooth shape, color, and length.
 - Describe the new available technology that can help to create a successful case outcome, such as computerized imaging programs and shade taking devices.
 - Explain how the use of a smile library can increase case acceptance, help with treatment planning and smile design, and communication with the laboratory.

help guide her out of treatment that she now undergoes. A more visual means of communication was needed. The solution to shape can make the difference between a happy case and a case such as this one, in which the patient accepted the work but was not very happy with the results.¹ To create a beautiful, desirable outcome with complete patient satisfaction, we used the Little Library Smile Style Guide (Figure 3) in conjunction with esthetic imaging. The Smile Style Guide and digital imaging provide the true 2D esthetic arch of teeth for the dentist and patient to select from

when designing the patient's smile makeover. In addition, the library illustrates the fine details of incisal length to illustrate the margins. Profile or angled views of each smile design gives patients the most complete and thorough selection available anywhere when making the final decision concerning their esthetic dental treatment. This enables both the dentist and the patient to select, design, and communicate the appropriate smile, with or without imaging. Patient satisfaction is almost guaranteed.

In which her favorite smile, the patient received the photos and glossy print of each of the



Figure 2: Close-up



Figure 3: Close-up (front view)



Figure 4: Natural Library Digital Design No. 08



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Figure 5: Smile Design

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was natural smile designs in full color, position, shape-up smile, and lateral smile views based on the shape of her flat cusps. The lateral view shows patients how their smile appears to others, a view they rarely see of themselves. This view was particularly important in this case, because she knew she was unhappy with the outline of her current crown facial contours and natural lateral incisors. During the consultation, she had difficulty expressing exactly what she did not like about her crown, but it was much easier to show those surfaces exactly what she did like using the Smile Tools Guide.[®]

After seeing the smile she desired in the smile library, we were able to show the patient how she would look with different treatment options.

After discussing at length what the patient did not like about her crown, a look into reasons for her to choose which shape she found appealing from the Smile Library Smile Design material, she almost immediately chose Smile Design No. 10 (natural central, round buccal) for her auxiliary incisors. The next step was computerized software imaging. After seeing the smile she desired in the smile library, we were able to show the patient how she would look with different treatment options including two, four, six, and eight teeth, using a full-face portrait when with our digital camera,



Figure 4: Digital impressions, virtual modeling, 3D design.

allow patients conveniently and discreetly wear their teeth. Each treatment workflow using Invisalign Express, Invisalign Full (Figure 6) with our multi-layer digital imaging system (Digital Exam, Digital Imaging Communication). Together it was decided that the results we wanted could be achieved with systems on the four premolars with the central 3 mm longer to drive in the Lower Liberty teeth (Lytic) treatment classification (3). When she saw the process with her stone models, customarily enhanced with (Figure 6), she could not wait to see her system. Patient acceptance, confidence, and ultimate satisfaction can increase when patients "step in to work."

Impressions were taken and poured up to stone. The progressive models were sent to the laboratory for the fabrication of wax-ups according to the approved treatment protocol, including the integral process and table design along with the case notes containing the company stock cases for the laboratory. In this case, the technicians were heightened and engaged as well as directed by the integral process (Figure 6). The wax-up was then displaced to facilitate the manufacture of a preparation grid and a finished matrix.

Clear aligner systems utilize an integrative factor that makes it "brilliant" patient satisfaction. Current solutions: study taking devices such as ShadeEye™ (3), (Study)™, Direct™, Composite™, ShadeWax™ system (3, 4, 5, 6), (3, 4), and the VITA® Shade Guide (VITA Zahnfabrik, Metsham, Vitar®) are designed to interact with the operator to identify the most precise, aesthetic shade match possible, and communicate this information to the labo-

ratory for fabrication to meet "white and final position." In this case, the maxillary maxillary premolars and lower incisors were looked at. Once the base shade was established, it was decided that both the maxillaries and the final centers should be half a shade lighter. Further modification of the shade can be accomplished through the choice of

stain systems. Along with the prescription, these authors like to send a digital photograph of the shade tabs to the Central Liberty Study Laboratory (3) Dental Corporation) placed over to the unprepared and prepared teeth to capture the natural visual characteristics and transference qualities of the teeth to be displayed.

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Acadentia was administered locally. Diamond burs from the Contemporary Cutting Kit (Dorco® Dental Corporation) (Figure 7) were used to remove the existing veneers and prepare the acetab for new veneers. The depth cutter (3007-1) was used to score the facial surfaces of the base material to facilitate porcelain facial tooth structure removal. A

coarse tapered diamond (3030C-1) removed the remaining porcelain and a supraline tapered point (3049-1) polished the preparations. The fine flange shaped diamond (3037-1) adjusted the post and incisal lingual line angles to complete the preparations.

Adhesive reduction was verified using a thin transparent prep-

aration guide (Figure 8). This preparation matrix was made from a vacuum formed plastic template pulled on a wax model of the teeth prepared wax-up. Because the previous restoration had bulk margins and contours of excess, the inflated gauge required a gate 50 using the Rubin Digital Electrovisography System (Rubin International).



Figure 7—Contemporary Cutting Kit.



Figure 8—Preparation guide.



Figure 9—Final facial restoration.

When the reduction was sufficient and interproximal margins were clean, Fluoroseal® PVS Impression (Fluorocare Dental) was taken.

When patients choose their desired smile design and appear of their esthetic image, the choice of tooth shape with the provisional can be verified. A handbuilt matrix created from the wax-up of the simulated smile using auto-cure bis-acryl will produce results that look just like the imaged picture. The desirable layer of soft and hard auto-cure bis-acryl provisionals that have correct tooth contours, fine margins, and ready shut occlusion. There is minimal and takes only seconds to trim and polish. The beautiful finishing provisional shows patients to enhance the tooth shape in their mouth before proceeding to make their final restorations. Following this simulation, satisfaction is practically guaranteed.

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Figure 10—Wax build-up.

was aligned with Shofu® bonding diamonds. These were polished with the Superlog® (Shofu® Dental Corporation) for a resulting beautiful translucent (Figure 10).

When the patient has approved of the shape and length shown in the esthetic image and corresponding photographs, accurate duplication by the labora-

These cases are a success because of the planning and control that are maintained throughout the restorative process.

tory according to the image, wax-up, and matrix design close help to facilitate a successful outcome. These cases are a success

because of the planning and control that are maintained throughout the restorative process.

The wax-up of the front teeth



Figure 11—Wax-up and matrix placed in position. The wax-up and matrix are placed in position. The wax-up and matrix are placed in position.



Figure 12—Wax-up and matrix placed in position. The wax-up and matrix are placed in position.




Figure 13—Wax-up and matrix.

Next, the wax was coated with Glaze® (Heraeus Kulzer, Inc.) After filling the matrix with Proform® (3M ESPE) wax-on wax-off temporary crown and bridge material in shade B1, the wax and soft matrix were placed over the wax (Figure 11) with firm pressure, and the wax was allowed to cure on the wax. After ensuring the hard matrix free, the soft matrix was peeled off to reveal a polished wax surface. The matrix was removed and the wax-on


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Figure 14—Central incisor in High Shine Seal hybrid glazing.



Figure 15—Composite Polishing Kit.



Figure 16—Final case up.

They arrived to be fabricated according to the esthetic request in the laboratory. The wax was taken off the dies and platen foil adapted. The study diagram used for this case can be seen in Figure 11. To reduce any negative color effects from the underlying dentin, an initial masking layer was laid down as a foundation. This layer consisted of 3 parts Black opaque glaze, 1 part V11 Bright Value Dentin, after the foundation was fired to glass, the dentin build-up was done using 60 plus Bright Value Dentin shade V1.2 (Heraeus), Heraeus Kulzer, Inc.) one part to one part at the gingival third blending to a 30 plus Bright Value Dentin V1.2, one part to three parts in the incisal two-thirds (Figure 12). The mask-off was back to be completed (Figure 13). Then the final layer 1 finished was created.

"Hot-ear" porcelain-opaque enamel created materials reflect and transmit light the way natural enamel does, creating natural lifelike transparency. The physical and optical properties of these glass-ceramic restorations make it an ideal choice for the esthetically demanding anterior case. The refined, optically pure quartz glass component (Bio-Sil) demonstrates excellent light and optical properties, including superior optical clarity. This optical clarity makes Heracore™ a color-matching translucent porcelain that reacts in the same way as dentin and enamel. It gives natural-looking, light-reflective behavior, appearing vital and natural to any light.

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After the build-up was completed and the veneers were baked, the fracture, contour, and surface texture were refined (Figure 14). They were then glazed, platen foil removed, fired to a solid model, soaked, and aesthetically finished.

At the waxing appointment, the temperatures were notated and recorded using a spoon-calculator to control bleeding during the waxing appointment. Expul® (Dent Corporation) was expressed into the gingival margin, the Expul® also served to prevent the gingiva as residual wax was removed with gentle abrasion (Ardent™, An Technologies, Inc.) Soreness-free parts of the Biolit™ Veneer Cream (3M ESPE) were used before choosing A-1. The abrasives were then etched with 34% phosphoric acid for less than 15 seconds before being thoroughly rinsed and dried. Heracore™ was applied as a waxing agent for no-

increased bond strength and desensitizing properties.¹⁷

Adper™ Single Bond (3M ESPE) adhesive was applied to the teeth had a uniform glossy appearance and the curing flow off. This was cured with the Heracore™ Supplite™ Veneer Power Air Curing Light (Bio-Mat Corporation). Biolit™ Veneer Cream was expressed on the teeth to prevent an inhibition. The porcelain was then fired with heat being again and waxed on the abrasives with gentle pressure. Bulk controls were noted here followed by the finish to prevent overpolishing. The contacts on facial and incisal were smoothed with a soft brush before curing. This allows for less stress and more clean up.

The restorations were then cured using a Supplite™ Veneer Power Air Curing light. After complete polymerization, the Composite Polishing Kit (Duo® Dental Corporation) (Figure 15), which included six shades of fine and superfine 1 and 2 diamonds and one ceramic cup and pencil were put in ultra pulsat was used to smooth the lingual incisal margins and overpreparations in a gingival facial direction. The Intense Cut™ Cupper (Bio-Mat Corporation) opened the contacts, which were then smoothed with flow. The margins were finished and polished with cups and pencils.

CONCLUSION

The resulting beautiful esthetic smile made the patient thrilled at her choice to smile her veneers (Figures 16 and 17). Dental and estheticians were proud by patient satisfaction. This successful outcome for a dis-

covering patient was only possible by using excellent communication tools to ensure a proper smile design selection, the Smile Design Guide and consistent imaging in consultation with an excellent ceramic technician named, Heracore™. Allowing the patient to actively participate in choice of length, shape, and color, and communicating the information to the laboratory for predictable duplications made the final difference.¹⁸ Without being able to analyze and design what the patient wanted, her expectations in creating the exact smile that she desired could never have been met. ☐

DISCUSSION

Dr. Richard receives financial support from Heraeus Kulzer, Inc. and is part owner of the Larkia Library.

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1. The teeth found and filed (image provided) have areas that probably indicate of occlusal:

1. 0
2. 1
3. 2
4. 3

2. The Liberty (Biosync) have been clinically tested length to indicate the length:

1. 1
2. 4
3. 3
4. 0

3. Which view shows patients how their smile appears to others?

1. Frontal
2. Lateral
3. Cervical
4. Sagittal

4. What was used for the review made by each combination transfer using "Smile Design No. 30"?

1. Self-face picture
2. Cervical wax
3. Self-mouth mirror
4. Polystyrene wax cap

5. Adaptive techniques were involved using:

1. polyethylene
2. clear orthodontic Progressive Guide
3. waxbite
4. contact modeling paper

6. The depth base of soft and hard waxbite gives patients:

1. contact with occlusal
2. this design
3. nearly total occlusion
4. all of the above

7. What the patient has expressed the practitioners assessed duplication by the laboratory according to which of the following criteria a successful outcome?

1. shape
2. wax cap
3. wax bite design sheet
4. all of the above

8. To reduce any negative color effects from the waterbath during, when the lead done as a finalization?

1. ultrasonic
2. ultrasonic granules
3. an ultrasonic bath
4. surface particles

9. In the mixing apparatus, the temperature was increased and reduced using:

1. ultrasonic
2. a quartz resonator
3. a high-speed fan
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