Playing Esthetics With Enamel

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Abstract

Straight, beautifully aligned, sparkling white teeth that are vital elements for a perfect and enigmatic smile are desired by most people. Unfortunately, every individual is not lucky to have a perfect smile. Irregularities may vary from poorly aligned (rotated, tilted, crowded) teeth, discolored teeth or minor chipping or fractures of the teeth, etc. In certain cases, the appearance of the teeth can be slightly or dramatically improved by only slight contouring of the enamel. Though this procedure is routinely done more in the anterior teeth, sometimes teeth further back in the mouth can also be cosmetically improved. The current article presents an overview of this simple, ultraconservative and noninvasive procedure- **Enamel Recontouring or Cosmetic contouring.**

Definition

Recontouring or reshaping of the teeth (also called odontoplasty, enameloplasty, stripping or slenderizing) is a procedure in which small amounts of tooth enamel are removed to change a tooth's length, shape or surface.

In today's society, cosmetic contouring is becoming increasingly popular as it is one of the most economical, esthetic and conservative procedure. In a two-year study performed on 60 beauty contestants, cosmetic contouring was strongly indicated in 40 percent of cases and almost all the rest of the contestants could have been helped through contouring as a compromise to more extensive treatment.[1]

As Pincus declared, "One must always keep in mind that one is dealing with organs which can change an individual's entire visual personality. Few things will cause a patient to enthuse as much as the results which may be obtained by a little rounding of very long sharp cusps, creating a 'softer' more rounded effect instead of the harsh angular appearance."(2) Therefore one must always consider cosmetic reshaping as the treatment option while performing esthetic enhancement procedures.

Indications

Recontouring is an effective method to correct minor imperfections, such as:

1. Alterations of Tooth Structure (Fixing small chips or Ellis class I fractures, Smoothing out bulges or pits in a tooth's enamel, Adjusting the length of the teeth)
2. Correction of Developmental Abnormalities
3. Substitute for Crowning
4. Minor Orthodontic Problems (Aligning slightly overlapped teeth)
5. Removal of Stains and Other Discolorations
6. Periodontal concerns
7. Bruxism
8. Residual caries that does not penetrate to full depth into enamel (only 1/3rd the enamel depth)

Contraindications

- Hypersensitive teeth
- Large pulp chambers
- Thin enamel
- Deeply pigmented stains
- Occlusal interferences
- Susceptibility to caries
- Large anterior restorations
- Recontouring is not recommended if teeth have substantial imperfections, such as substantial chip or deep fracture.
- Caries extending to the full depth of enamel (More than 1/3rd the enamel)
- An extremely deep pit or groove which might undermine cusps after saucerization
- Recontouring is not a substitute for veneers or bonding, however, it is often used in combination with these procedures.
- Negative psychological reasons

Advantages

- Recontouring is the most conservative cosmetic treatment.
- It is a quick procedure whose results can be seen immediately at the same appointment.
- This is usually a painless procedure (no local anesthetic is administered)

Preliminary Considerations that guide towards treatment planning

1. Laws of proportionality that help to govern esthetics

- **Golden Proportion:** Based on this formula a smile, when viewed from the front, is considered to be esthetically pleasing if each tooth in that smile (starting from the midline) is approximately 60% of the size of the tooth immediately mesial to it. The exact proportion of the smaller tooth to the larger tooth is 0.618.[3]
- Another accepted theorem for achieving esthetically pleasing central incisors maintains that the ideal width-to-length ratio should be 0.75:0.8. This ratio represents the ideal proportions needed to optimize the esthetic result.[4]
- **RED (Recurring Esthetic Dental) proportion:** states that the proportion of the successive width of teeth remains constant while progressing distally from the midline.[5]
- **Golden percentage:** states that the proportional width of each tooth should be

Canine 10%, Lateral 15%, Central 25%, Central 25%, lateral 15%, and Canine 10% of the total distance across the anterior segment, in order to have a pleasing smile. [6] While performing smile makeover procedures, the dentist must give foremost attention to the laws of proportionality. Whether or not a tooth or other structure conforms to these laws is best evaluated by visualizing the silhouette form of a tooth or an arch. An evaluation of tooth's proportionality in the context of the patient's mouth and face may lead to a conclusion that enameloplasty is sufficient to appropriately change the smile architecture. [7, 8]

2. Gender Differences

The feminine tooth has more curves while the masculine tooth is more angular and boldly textured. (9-14)

3. Occlusion

Cosmetic contouring must always be done with the principles of good occlusion in mind. Nothing should be added or eliminated that will produce occlusal disharmonies.

Initial examination : To determine whether the candidate/case is appropriate for recontouring. This can be accomplished with the help of

Computer imaging: The technique accomplishes two purposes: first, it serves as the best method for patient communication and second, it can be invaluable in letting you know exactly how much tooth alteration is necessary to achieve the best result.

Diagnostic study casts : It helps to analyze where and how tooth structure has to be altered. It also preserves an exact record of what the teeth were like before they were reshaped

Intraoral marking : A third method of predetermining the effect of cosmetic contouring is to block out the tooth surfaces that will be contoured with a black alcohol marker. Dry the teeth with air syringe and mark the visible overlapping tooth surfaces.

Radiographs: Dental radiographs help to determine the size and location of the tooth's pulp. If the tooth's enamel layer is too thin or if the pulp lies too close to the tooth's surface, recontouring should not be attempted, instead other procedures such as bonding or veneers might need to be considered.

The procedure

- Since recontouring procedure does not have any effect on the pulp, any anesthesia is not usually needed.
- To aid for better visualization and judjement, the enamel areas that need to be reduced can be marked with an alcohol marker pen.
- The marked areas are then carefully trimmed or recontoured use a sanding disc or a fine diamond instrument to remove small amounts of tooth enamel. Contouring can be accomplished with the help of a commercially available kit, The Cosmetic Contouring Kit (Shofu, Shofu Dental Corp., Menlo Park, CA; Figure 1).
- The initial shaping of the teeth can be done with fine and ultrafine diamonds on a high speed handpiece with water spray.
- Once shaping is complete, finishing is started by using an extra-coarse sandpaper disc and the procedure is completed by properly polishing the trimmed enamel areas by using the impregnated polishing wheels of varying grits in order; plain shank, single yellow band, and double yellow band.
- This will restore the enamel to its original luster.

Follow up.

A simple recontouring protocol that is not combined with other cosmetic procedures (such as bonding or veneer placement) does not require special care or follow up.

Risks are Associated with Teeth Recontouring

The only risk that is of concern is the reduced thickness of residual enamel. If the enamel of the tooth that has been recontoured becomes too thin or exposes the dentin layer (the layer beneath the enamel), tooth sensitivity to hot, cold, and sweets could result. Accordingly the amount of the tooth or enamel should be predetermined at the initial treatment planning stage. In case the remaining enamel becomes too thin, sensitivity can be reduced with the help of desensitizing dentifrices or iontophoresis. If excessive reduction has been done that has exposed the underlying dentin, then in these situations veneering or direct restorations must be considered.

Cfase- I

The figure 2 illustrates a case with a class I fracture in 11, slightly elongated 21 as compared to 11 and asymmetric incisal edges of 12 and 22. A detailed analysis was done. Though a direct composite restoration makeover could have been the best treatment option but a simple recontouring procedure was planned considering patient's economic and time constraints. Based on the proportionality laws as mentioned earlier, enamel contouring was performed on the four maxillary incisors to provide more symmetry and enhance the appearance and smile. (figure 3)

Case II

The figure 4 illustrates a case with a class II fracture in 11 (involving both enamel and dentin), and asymmetric incisal edges. A detailed analysis was done. A direct composite restoration (Filtek™ Z250 Universal Restorative, 3M ESPE, St. Paul, MN, USA) was done for 11. To further enhance the patient's smile as per the proportionality laws, enamel contouring was performed at the edges of the maxillary

incisors to provide more symmetry. (figure 5)

Patients were happy with the new smile and a new look through these simple easy and conservative procedures.

Conclusion

In today's time, it is advisable for the dental artisan to address patient's esthetic challenges with procedures that involve minimal invasive techniques. The enamel contouring procedure is one such option to improve appearance by "creating more harmony or balance" in the look of the smile.

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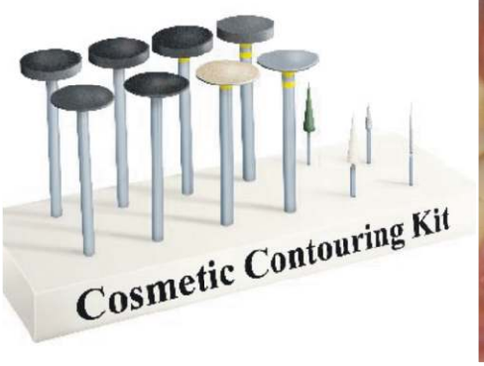

Figure 1.: Cosmetic contouring kit (Shofu)

Figure 2.: CASE I: Pre-operative

Figure 3.: CASE I: Post-operative

Figure 4.: CASE II: Pre-operative

Figure 5.: CASE II: Post-operative