

Post Orthodontic Cosmetic Detailing

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Abstract

Post orthodontic cosmetic detailing is perhaps one of the most deceiving and difficult phases of orthodontic treatment. The cosmetic detailing procedures are considered as a part of the total scheme of treatment to enhance the stability and esthetics of the cases. In recent times, a great deal of emphasis is placed on achieving perfect finishing and detailing of the orthodontic treatment, so that the results are pleasing to the eye. This article aims to provide comprehensive knowledge about post orthodontic cosmetic detailing.

Keywords: *Esthetics, finishing and detailing, cosmetic detailing, orthodontic treatment.*

Introduction

Enhancement of facial beauty is one of the primary elective goals of patients seeking dental care. The goal of orthodontic treatment should be the attainment of the best possible esthetic result. Orthodontists enjoy a high level of patient appreciation, partly because their results are almost always an esthetic improvement. Still, many orthodontists finish treatment short of the finest possible esthetic result¹.

The finishing of orthodontic cases can usually be enhanced through restorative techniques such as cosmetic contouring, bleaching, bonding, porcelain laminating, or crowning. Each patient should be educated in advance about these techniques and told that the orthodontist will evaluate the treatment after the appliance therapy and decide what, if any, additional treatment would be beneficial. This should be a joint consultation with the patient's general dentist to ensure that all choices are considered^{2,3}.

The following are certain procedures that are considered under the cosmetic finishing:

1. Gingivectomy
2. Gingivoplasty
3. Bleaching
4. Veneers.
5. Porcelain jackets
6. Selective contouring.
7. Bridges and
8. Cosmetic build-ups

Gingivectomy: It is done to eliminate gingival enlargements – aesthetic considerations particularly in the anterior maxilla either by conventional surgery or by electrosurgery. Pockets on each surface of the tooth are explored and marked with pocket markers. Kirkland knives are used for labial and lingual incisions and Urban's knife for interdental incisions. The incision is given apical to points marking the course of the pockets and directed coronally to a point between the base of the pocket and the crest of the bone. The excised pocket wall is removed along with the granulation tissue and any remaining calculus or necrotic cementum. The area is covered the area with surgical pack^{4,5}.

Gingivoplasty: It is Similar to the gingivectomy technique. Gingivoplasty is reshaping of the gingiva to create physiological gingival contours, with the sole

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purpose of recontouring the gingiva in the absence of pockets⁶.

Conservative alteration of tooth contours and contacts:

Reshaping of teeth: Rounding of sharp angles—prophylactic measure to stress and to help prevent chipping and fracture of incisal edges is done to achieve youthful feminine characteristics; Rounding the incisal edges, reducing facial line angles, opening incisal embrasures. Opposite characters are considered masculine.

The patient must understand what is involved and just want to have the alteration made. The patient should be explained about the expected postoperative result. Areas to be reshaped should be marked with a pencil. Diamond instruments, abrasive points are used contouring, finishing and polishing⁷.

Many orthodontic results can be improved by a slight reshaping, or cosmetic contouring, of the teeth. This can help achieve an illusion of straightness, especially in cases where patients demand early removal of appliances or where particular teeth are impossible to position ideally.

Contouring is useful in compromise treatment. When the occlusion is good but anterior crowding is present, minor tooth repositioning followed by cosmetic contouring will often improve the appearance⁸.

Irregularly fractured incisal surface: In these cases, the esthetic result can be achieved by slightly shortening incisal edges and reshaping both teeth to symmetrical form. Similar procedures are done to recontour the tooth⁹.

Alteration of embrasures: Anterior teeth may have embrasures that are too open, e.g. when laterals are congenitally missing. Facial surface and cusp angle of some canines reshaped to appear like lateral. But in many instances, mesio incisal embrasure remains too open. Composite restorations can be done to enhance the esthetic contour and correct open embrasure. Evaluation of occlusion before restoration determines if the addition will be compatible with functional movements.

Coarse flame-shaped diamond is used to remove overly convex enamel surfaces and to roughen area to be augmented. Wedge with abrasive strips is used in difficult proximal surfaces. Polyester strip is inserted to protect

the adjacent tooth during acid etching. After etching, rinsing, and drying the contoured strip is positioned. Either self-cure or light cure material is inserted and the strip closed for polymerisation¹⁰.

Closure of Diastema: The most frequent site of diastema is between the maxillary central incisors. Prominent labial frenum with nonelastic fibers extending proximally is often the cause. Other factors are congenitally missing tooth, undersized or malformed teeth, Bolton discrepancy, supernumerary and heredity. Diastema should not be closed without first recognizing and treating the underlying cause. Occasionally diastema is too large to esthetically close with comp augmentation alone. In such cases, spaces are best redistributed orthodontically among anterior teeth so that symmetrical and equal composite additions can be made¹¹.

Discolored teeth:

Discolorations are of two types; Extrinsic and intrinsic: Extrinsic discoloration is due to the remnants of Nasmyth's membrane, poor oral hygiene, existing restorations, eating habits and presence of chromogenic bacteria. Most of the surface stains can be removed by routine prophylactic procedures. Some require micro abrasion or macro abrasion^{12,13}.

Intrinsic discolorations are generally caused by deeper internal stains or enamel defects and are more difficult to treat than external types. It is due to hereditary disorders, medications, excess fluoride, high fever etc. Tetracyclines create the most distracting, generalized, intrinsic stains. Severity will depend on several factors such as—dosage, duration and the type of tetracycline analog. Yellow-orange to dark blue-gray (more difficult to treat) type of staining is the most difficult to treat¹⁴.

White spots: Poor oral hygiene during orthodontic treatment creates decalcified areas. White spots with intact enamel surface—evidence of remineralization—no invasive procedures. Mild discolorations are best left untreated, bleached or treated conservatively with micro or macro abrasion, because no restorative material is as good as the healthy, natural tooth structure. The patient should be told that the gingival tissue never would be as healthy when adjacent to a restorative material as when next to normal tooth structure.

Bleaching treatments: The lightening of the color of the tooth through the application of a chemical agent to oxidize the organic pigmentation in the tooth

is referred to as bleaching. Most bleaching techniques required some form of hydrogen peroxide in different concentrations.

Mechanism of action—Bleaching agents creates oxidation of organic pigments. Generally has a life span of 1-3 yrs, although the change may be permanent in some cases. With all bleaching techniques there is a transitory decrease in the bond strength of the composite is generally expected. Residual oxygen or peroxide residue in the tooth which inhibits the set of bonding resin. No loss in bond strength is noted if the composite treatment is delayed at least 1 week after cessation of any bleaching¹⁵.

Micro/Macro abrasion: It is called Microabrasion as it involved the surface dissolution of enamel by acid along with the abrasiveness of the pumice. Croll modified the procedure by reducing the concentration of acid to 11% and adding silicon carbide particles —'Prema' for improved and safer means of removal of superficial stains. They represent conservative alternatives for the removal of superficial discolorations. As the term implies, the stained areas or defects are abraded away only when stains or defects do not extend beyond a few tenths of a millimeter (0.2-0.3mm) in depth. If the defect persists a restorative alternative is indicated¹⁶.

When should they be used?: The nature and extent of the defect should be evaluated. Non-hereditary developmental demineralization defects (white or light brown fluoretic enamel and the idiopathic white or light brown spots) versus the incipient carious lesion should be properly differentiated. *Incipient caries* usually near gingival margin where abrasion contraindicated (thin enamel). Smooth surface, opaque or chalky white when dried but invisible when hydrated. It is generally reversible by improved oral hygiene.

Developmental discolored spots (opaque white or light brown) are due to unknown local traumatic events during amelogenesis and are Idiopathic. They occur on Intact, smooth and hard surfaces usually in the incisal half. The patient should be informed that an accurate prognosis for microabrasion cannot be given. It will be tried first and if unsuccessful due to the depth of defect exceeding 0.2-0.3mm, the tooth will be restored with tooth-colored restoration. Surface discolorations due to fluorosis can be removed by microabrasion if the depth is within 0.2-0.3mm¹⁷.

Technique—Rubberdam to isolate and protect the gingiva from acid. Prema paste is applied to a defective area with a special rubber cup with fluted edges. Low-speed handpiece, to avoid excessive removal of tooth structure. Treated areas are polished with fluoride-containing prophy paste to restore surface luster. Immediately after treatment topical fluoride to enhance re-mineralisation¹⁸.

Microabrasion: Simply utilizes 12-fluted composite finishing bur or a micron finishing diamond in high-speed handpiece to remove defects.

Care should be taken to monitor the removal of tooth structure.

Air-water spray is recommended — facilitates assessment of defect removal.

It should be emphasized that these techniques involve the physical removal of tooth structure and does not remove stains or defects through any bleaching phenomena. *Microabrasion* have better control over tooth removal

Microabrasion: *It is done using* high-speed instrumentation. It is technique sensitive and can have catastrophic results. The procedure is faster and does not require a rubber dam or special instruments. It is easier to remove the defect with Macroabrasion¹⁹.

Veneers: It is a layer of tooth-colored material that is applied to the tooth for esthetically restoring localized or generalized defects or intrinsic discolorations. It is made of chairside composite, processed comp, porcelain, or cast ceramic materials. Veneers are indicated on the facial surfaces that are malformed, discolored, abraded, and/or eroded. *Partial veneers* are indicated for the restoration of localized defects or areas of intrinsic discoloration. *Full veneers* are indicated for the restoration of generalized defects or areas of intrinsic discoloration. Discolored mandibular anterior are rarely indicated for veneers, because the facio-incisal portions are thin and usually subject to biting forces and attrition.

Conservative bridges: In selected cases conservative bridges can be made by acid etching and bonding a pontic to the adjacent teeth. According to the type of pontic are of four types; Natural tooth pontic. Denture tooth pontic. PFM or All Metal with metal retainers and All-porcelain pontic. They are used for the conservation of natural tooth structure. Because of

the bonded nature of these bridges retention is never as strong as conventional bridges. Patients should be told of potential risks of dislodgement and must be cautioned not to bite hard food²⁰.

Periodontal Plastic Surgery and Orthodontics:

For many years, periodontal mucogingival surgery was employed only to cover exposed roots with soft-tissue grafting. Today, periodontal plastic surgery is used not only to enhance esthetics in a variety of ways, but also to aid in orthodontic treatment.

Periodontal plastic surgery is the term for a procedure that corrects or eliminates an anatomic, developmental, or traumatic deformity of the gingiva or alveolar mucosa. This would include treatment of excessive gingival display, marginal tissue recession, asymmetrical or unesthetic gingival margins, and localized alveolar-ridge deficiencies, as well as exposure of unerupted teeth for orthodontic movement.

If excessive gingival display, commonly called a “gummy smile,” or high lip line is caused by insufficient clinical crown length, this can be corrected with gingival contouring.

Root-coverage techniques can be used to correct inadequate attached gingiva, root sensitivity, or an unesthetic appearance. Although the success of root coverage for treatment of canine marginal tissue recession was once unpredictable, Miller has recently developed a reliable technique using a free gingival graft after citric-acid root conditioning. Langer and Langer have described a subepithelial connective tissue graft that improves the esthetics of root-coverage grafting; this technique is particularly useful in treating the recession of canine marginal tissues²¹.

Esthetic finishing of an orthodontic case often involves periodontal plastic surgery. The art of periodontal procedures can be used to improve facial esthetics and complement the results of orthodontic treatment.

Conclusion

Post orthodontic cosmetic detailing is probably the most challenging and difficult stage of treatment. In certain cases, it takes much effort for planning the detailing to provide better esthetics. The time spent by individual clinicians in detailed finishing is an important factor in the variation of treatment duration.

Orthodontists must keep them in mind and take care of the beginning of treatment to minimize errors in the different stages so that he has to do the minimum amount of work during the actual stage of finishing and detailing thereby providing efficient treatment to his patient.

Conflict of Interests: None

Ethical Permission: Approved

Funding: Nil

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