

Black Triangle Closure Follow-Up of 1 Year - A Case Report

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Abstract

Periodontal surgery, while necessary, can lead to gingival recession and formation of black triangles. This outcome is often deemed unesthetic for patients and warrants the want for treatment options to improve compromised esthetics. When discussing options with patients regarding esthetic procedures, a practitioner must keep in mind finances, health of gingival tissues, and the importance of conserving as much tooth structure as possible without losing esthetic quality. This case report discusses a 52-year-old male patient who, after discussion of risks/benefits, opted for a treatment plan consisting of a direct additive composite technique to close his black triangles. At the 1 year follow up, patient comments and concerns were reassessed and satisfy.

Keywords: *Esthetic; Bone Loss; Black Triangle; Composite*

Introduction

Periodontal disease resulting in bone loss and gingival recession can have unaesthetic outcomes for patients [1-5]. Even if periodontal disease is arrested, the procedures that must be done to re-establish health often lead to gingival recession, which can cause black triangles. Usually, the black triangles occur due to the lack of interdental papilla that fills the space cervical to the interproximal contact, something that occurs with apically positioned periodontal flap surgery which aims to reduce the detriments of periodontal disease. Managing black triangles can be done through a multidisciplinary approach with techniques such as periodontal regenerative therapy, esthetic restorations such as veneers, prosthetics, orthodontics, and there has been new research into injectable hyaluronic acid as a possible solution [1-5]. While there are numerous approaches, they can be expensive and complex to reach an acceptable outcome. They can also be time consuming, which can become un motivating for a patient who has already gone through multiple surgeries and is left with an outcome that is unappealing. A restorative approach using an additive method with composite resin can be a more economical and conservative solution to this dilemma [3]. This technique uses a direct addition of composite resin material mainly to the cervical portion of a tooth to close embrasures, thus closing the black triangles, but can also be added to the facial, mesial, distal and even lingual surfaces of a tooth for further esthetic improvement. Performing this direct chairside procedure allows the input of the patient's comments and concerns by showing them the additions tooth-by-tooth using a patient mirror. Direct restorations are technique sensitive, which should be considered when offering this treatment for patients. The emergence profile should be identified and respected when restorations are placed to obtain closure because healthy periodontal tissues and acceptable esthetics depend on it [6]. Following up with this kind of case is important to determine whether additive composite is a successful treatment choice and whether it should be given as an option for patients with black triangle concerns.

Case Report

A 52-year-old male classified as ASA Class II with a chief concern of: “After periodontal surgery, my upper teeth show black space between them that I don’t like it” (Figure 1 and 2). The patient has a previous smoking history that the report quit for the past 20 years. Patient was treated for periodontal disease in 2015 and has since arrested the disease and improved his oral hygiene. A panoramic radiograph (Figure 1) depicting over 50% horizontal bone loss. Secondary to periodontal therapy, the patient had gingival recession and lack of interdental papilla filling the cervical embrasure which he found extremely unattractive (Figure 2). Once the periodontal disease was arrested the patient sought out the prosthodontics clinic for treatment of the black triangles. Orthodontic therapy was recommended before beginning any prosthetic treatment. The patient proceeded with the orthodontic therapy, getting braces for a couple years in hopes for the veneers that were discussed with him previously. Although the patient was extremely motivated to find a solution for his black triangles and was referred for an aesthetics consultation, due to financial constraints as well as timing required for more extensive procedures, the patient could not accept the treatment plan for veneers. Instead of moving forward with the original plan of veneers after finishing orthodontic treatment, the patient returned to the undergraduate clinic and a direct composite additive technique was suggested as a solution. After completing upper and lower arch whitening, the patient was ready to move forward with treatment and get the smile he’d been desiring for years. The total cost of this treatment plan was one-tenth of the plan for veneers. Since this was within the patient’s budget and time frame, he eagerly accepted and moved forward with the treatment from teeth number 4 through 12 (Figure 2-5).



Figure 1: Panoramic image showing > 50% bone loss due to periodontal disease.



Figure 2: Post periodontal treatment.



Figure 3: April 2022.



Figure 4: October 2022.



Figure 5: Prior to treatment.



Figure 6: April 2022 immediately after.



Figure 7: October 2022, 6 mo. after.

Materials and Methods

First, the treatment risks, benefits and alternatives were provided to the patient. Upon various professional and specialty consultations and in terms of financial ability, the patient chose to proceed with an additive composite technique to close his black triangles. The first step of the treatment was for the patient to receive maxillary and mandibular arch whitening. This was followed by direct composite additive technique from the mesial of tooth #4 to the distal of tooth #12. Due to the patient's smile line and less esthetic concern, the mandibular arch was not treated with additive composite. A mix of A2B and A3B composite shades were added to abfraction areas of said teeth as well as the interproximal areas from the facial surface to close the gingival embrasures. A red flame bur was used to contour and shape the additive restoration for a natural look as well as to maintain an easily cleansable surface of the restorations and teeth below. When the additive composite procedure was finished, the restorations were polished by first using interproximal finishing strips, followed by soft-lex discs from most-to-least coarse, and lastly green and yellow rubber cups were used, respectively, for the final polished touch. The patient was satisfied with the results and was followed up with at the next 3-month periodontal maintenance recall. During the 3-month follow up, pictures were taken to evaluate any changes on the results, in addition satisfaction of treatment outcomes was discussed.

Discussion

While periodontal and orthodontic treatment can be necessary for the re-establishment of health for an individual, it can lead to unaesthetic outcomes [1,5]. In this case, the patient's main concerns were the black triangles between his teeth following periodontal

and orthodontic therapy. After discussing all possible treatment options, financial constraints and desire for a conservative approach led to using direct composite resin [3]. Using the mix of composite colors, polishing technique, and contouring resulted in a highly aesthetic outcome and overall patient satisfaction. Contouring the teeth and closing the gingival embrasures ensured a natural look as well as the ability for the patient to maintain pristine oral hygiene. Overall, the patient was able to achieve an aesthetic outcome within his financial means while avoiding the loss of a large amount of natural tooth structure. The patient was satisfied with the result of this treatment and was able to maintain good oral hygiene in recall visits, which supports the use of this economical and conservative approach for closing black triangles. A large part of success of this case has been patient compliance and motivation. The patient has excellent oral hygiene habits and keeps up-to-date with his 3 months periodontal maintenance recalls. The composite additive technique is only a good treatment option if the case is selected properly. As discussed, the success of this treatment depends on many factors outside of the providers control, such as oral hygiene habits, lifestyle modifications and patient motivation. As noted in the pictures comparing April to October of 2022, the patient has been able to maintain the composite restorations well. There is no sign of irritation of the gums nor is there sign of difficulties in maintaining gingival health (Figure 3, 8-11). The patient offers no complaints and is still happy with the results of this treatment. This case is clinically relevant as oftentimes the re-establishment of health after a history of periodontal disease can result in unwanted outcomes, which can affect the confidence and esthetics of the patient.



Figure 8: April 2022 right lateral view.



Figure 9: October 2022 right lateral view.



Figure 10: April 2022 left lateral view.



Figure 11: October 2022 left lateral view.

Conclusion

In conclusion, the direct additive composite technique has been used in various cases and proves to be successful in a case-by-case basis. Direct composite buildups are aesthetic, functional, and biologically sound treatment options for recontouring teeth and closing diastemas or other spaces with clinically promising survival rates [7,8].

While technique sensitive, the support of various case-reports in the literature suggest that this approach can and should be given as an option to patients requiring diastema or black triangle closure. The clinical technique described in this paper shows the advantages of a conservative approach to correct diastemas on maxillary anterior teeth. The application of these techniques can not only help achieve optimal esthetics, but also avoid the removal of extensive dental hard tissue and achieve a predictable result, especially in esthetically demanding cases [7]. Understanding different options that can be offered to patients in circumstances like these, while keeping in mind finances, can greatly increase one's quality of life and happiness in their dental esthetics. The comprehensive approach that this patient decided to journey on not only re-established periodontal health, but also improved his esthetics to an extent that was deemed acceptable him as well as us practitioners. The 1 year follow up of the treatment for this patient along with other case reports in the literature regarding direct composite additive techniques has proven to be successful both clinically and esthetically (Figure 12).



Figure 12: 1 year after.

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