
Esthetic Rehabilitation Of A Severely Compromised Anterior Area-Combined Periodontal And Restorative Approach

Dr. SRIRAM RAVI¹, Dr. J. SRI VISHNU DURGA², Dr. KARTHICK KUMARAVADIVEL³, Dr. R. RENUKA DEVI⁴, Dr. SREE VARSHINI⁵

¹3rd Year Post Graduate Student, Department Of Conservative Dentistry & Endodontics, KSR Institute Of Dental Science And Research

²2nd Year Post Graduate Student, Department Of Periodontics, KSR Institute Of Dental Science And Research.

³Professor, Department of Conservative Dentistry & Endodontics, KSR Institute of Dental Science And Research.

⁴Professor, Department Of Periodontics, KSR Institute Of Dental Science And Research

⁵2nd year Post Graduate Student, Department of Conservative Dentistry & Endodontics , KSR Institute of Dental Science And Research.

Abstract:

Esthetics in dentistry focuses on improving the appearance of a person's teeth, smile, and overall facial harmony. It encompasses various treatments and procedures aimed at enhancing the esthetic aspects of the teeth, such as tooth color, shape, size, alignment, and overall smile design. The foundation of a pleasing smile depends not only on the teeth but also on the gingival status. Attention should first be given to anomalies of the periodontium by initiating periodontal therapy which should be followed by the restorative therapy for long-lasting esthetic and functional results. An interdisciplinary approach is mandatory to diagnose various esthetic problems combining periodontal and prosthetic approaches. This report brings to light a case of esthetic rehabilitation of a failed composite restoration.

Keywords: esthetics; periodontitis; veneers

1. Introduction

Esthetics in dentistry plays a crucial role in enhancing a patient's smile, overall appearance, and self-confidence. It involves the art and science of improving the visual appeal of teeth, gingiva, and the entire oral cavity. Esthetic considerations are particularly important in restorative dentistry, as dental restorations should blend seamlessly with the natural teeth for a beautiful and natural-looking result.¹

Modern esthetic treatments have evolved to be more conservative and long lasting due to advancements in adhesive materials, composite resins and increasing demands of patients for esthetic restorations. Establishing a pleasing smile relies not only on clinical crown dimensions, the tooth position but also the amount of gingival display and gingival architecture. An interdisciplinary approach is imperative to evaluate, diagnose and resolve esthetic problems combining orthodontic, periodontal and prosthetic approaches.

Pink esthetics and white esthetics are two inter-related aspects that should be in harmony to create a pleasing and balanced smile. The gingiva acts as a frame for the teeth, and their appearance greatly influences the overall esthetics of the smile by enhancing the white esthetics. In cases with uneven or excessive gingival display, gingival contouring procedures may be needed in conjunction with white esthetic treatments like dental veneers or crowns. Optimal pink esthetics depends on healthy gingiva that are free from inflammation, infection and recession. When planning dental restorations, such as crowns or veneers, the color, shape and position of the restorations must be chosen so that it seamlessly blends with the natural teeth and gingiva for a cohesive and esthetically pleasing result.

One of the reasons why patients seek dental advice is the presence of diastemas in the anterior dentition that distorts an esthetically pleasing smile. Diastemas can be due to tooth size discrepancies, tooth angulations, growth and development deficiencies, excessive incisor vertical overlap and many other causes. A proper

diagnosis and treatment planning is essential for diastema closure depending on its size. If diastema is present, the interdental papilla in between two adjacent teeth changes to a round, flat or reversed form due to the spaces. The loss of interdental papilla may lead to a number of issues like esthetic compromise, food impaction and phonetic impairment. Reconstruction of the lost interdental papilla is one of the most problematic situations as it may not be always successful through surgical procedures. Prosthetic reconstruction with the help of porcelain laminate veneers will be needed in most of the cases.

Porcelain laminate veneers have now been considered a desirable treatment option for the rehabilitation of the anterior esthetics. They are far superior than composite veneers in respects like compressive strength, surface smoothness, abrasion resistance, gloss, greater preservation of tooth structure and low plaque retention.

This article reports a case describing an interdisciplinary approach done to treat periodontal breakdown caused by over-contoured anterior composite restorations and the subsequent closure of diastemas using porcelain laminate veneers.

2. Case report:

A 35-year-old female patient reported to the Department of Periodontics with a primary complaint of pain in the upper and lower front teeth region that aggravated during brushing for 3 months. The patient was reported to be systemically healthy and had no positive family history of dental or medical complications. A detailed dental history revealed that, she had undergone filling of the gaps in the upper front teeth, four months back. She reported to have bleeding from her gingiva while brushing which was on and off in the beginning but aggravated later for which she sought our practice for proper dental advice.

Clinical examination revealed the presence of over contoured composite restorations in her upper anterior teeth (13 to 23). Papillary and marginal gingival enlargement was evident with bleeding gingiva and a generalized probing pocket depth of more than 5 mm. Miller's class 3 recession was seen in lower anterior. Orthopantomographic image showed a generalized horizontal bone loss and a diagnosis of generalized periodontitis Stage 2, according to American Academy of Periodontology (AAP) 2017 classification system⁵, was made.

Non-surgical periodontal therapy was done but the upper anterior teeth did not respond well to it and hence the patient was referred to the Department of Conservative Dentistry and Endodontics for the removal of cause which in this case was the over contoured composite restorations. Following its removal, the gingival inflammation reduced considerably within a week's time. Periodontal flap surgery with complete curettage and root planning was performed and the one-month post-surgical evaluation revealed reduction in both probing pocket depth and inflammation. During restorative phase, ceramic veneers were planned for the upper anterior teeth for the closure of diastemas. The tooth preparation was driven by existing tooth structure with butt joint margins placed supra-gingivally in the cervical area and sub-gingivally in the gingivo-proximal area. The veneers were fabricated with lithium disilicate and was bonded in place using light-curing resin cement (RelyX).

3. Discussion:

The rehabilitation of a smile relies not only on restorative dental procedures, but also on a healthy and esthetic gingival appearance. Inflammation of the gingiva and the associated periodontium can reverse the esthetic outcome in the long term. Establishing definitive restorations when inflammatory periodontal problems are present not only restrains esthetic success, but also accelerates the rate of periodontal destruction. Elimination of gingival inflammation is mandatory before initiation of any restorative treatment. Thus, designing an esthetically pleasing smile involves addressing both the tooth and the soft tissue components. There was an imbalance seen between tooth and soft tissue components in the presenting case.

Non-surgical periodontal therapy or Phase I periodontal therapy plays a significant role in the treatment and management of periodontal disease as it targets the underlying cause of the disease by removing the accumulated bacteria, toxins, and debris from the teeth and roots thus reducing inflammation and preventing disease progression. It also helps to create an environment that is more conducive to maintaining good oral hygiene. Hence, non-surgical periodontal therapy was planned as the initial phase of treatment.

If there is persistent gingival inflammation and residual probing pocket depth that exceeds the critical probing depth, the patients may even require advanced periodontal treatment consisting of surgical procedures. Periodontal surgery eliminates residual periodontal pockets and aids in regeneration of the lost periodontal

tissues. In the present case, the chronic inflammation induced by the faulty restoration is the result of activation of the adaptive immune response of the host. This adaptive immunity is crucial for the regrowth and reconstruction of the injured tissues. The development of inflammation is thus a consequence of the host's immune response. As the inflammation did not subside, periodontal flap surgery was performed in this case following the removal of the over-contoured composite restoration.

The removal of the over-contoured composite restorations led to the presence of multiple diastemas associated with loss of interdental papilla architecture in the anterior teeth. Reconstruction of the lost interdental papilla is one of the most challenging tasks as the morphology of the interdental papilla is strictly dependent on the size and shape of interproximal contact, crest of alveolar bone, and shape of lateral tooth surfaces. Prosthetic approach in the form of porcelain laminate veneers were planned during the restorative phase for the reconstruction of interdental papilla in this case. Moreover, the factors like the presence, contour, design, delivery and the material of the restoration has an impact on periodontium as these are associated with an increase in plaque retention and occasionally allergic reactions. It is hence highly important to place the restoration margins without violating the boundaries of periodontal attachment apparatus.

Veneers hold great significance in the restoration of smiles due to their ability to transform the appearance of teeth with a conservative approach. These thin, custom-made shells are bonded to the labial surface of the teeth to address various cosmetic concerns including discoloration, chips, cracks, diastema, and even minor malalignments. Therefore, following periodontal therapy, veneers were established in the presenting case for the closure of diastema and the reconstruction of the interdental papilla.

The preparation of the teeth in the cervical and gingiva-proximal areas had minor changes to ensure that the interproximal spaces are closed and the soft tissue is recontoured. The cervical one-third of the clinical crown should have a flat emergence profile in order to maintain an area that is cleanable and to achieve a good marginal seal of the restoration. The finish line of restorations should follow the contour of the cemento-enamel junction and be always kept at least 2.5 mm away from the crest of the alveolar bone. A greater distance between the bone crest and finish line of the restoration is needed to ensure that margin of the restoration could be well reached by the plaque control instruments.

The gingiva-proximal area is the most critical area in tooth preparation during diastema closure. The margins were placed sub-gingivally near the diastema area and extending palatally to create over-contoured veneers between the buccal and palatal papillae. This enhanced the shape of the papilla and established a progressive emergence profile for the interdental zone of extension.

4. Conclusion:

This report illustrates an interdisciplinary approach that is crucial for attaining a long lasting, esthetically pleasing smile and functional results. Esthetic restorations should have an accurate fit and contour that harmonizes with the natural shape of the teeth and the surrounding gingival line. This ensures a seamless transition between the restoration and the gingiva, preventing food accumulation, plaque build-up and gingival irritation. Thus, both pink and white esthetics must be considered and addressed to achieve optimal esthetic results in dental treatments.

References:

1. Aschheim KW, Dale BG. Missouri: Mosby Publications. 2nd ed. Missouri: Mosby Publications; 2001. Esthetic Dentistry – A clinical approach to techniques and materials.
2. Dawson PE. Determining the determinants of occlusion. *Int J Periodontics Restorative Dent.* 1983;3:8–21.
3. Mohan Bhuvaneshwaran. Principles of smile design. *J Conserv Dent.* 2010 Oct-Dec; 13(4): 225–232.
4. Roshna T, Nandakumar K (2005) Anterior esthetic gingival depigmentation and crown lengthening: Report of a Case. *J Contemp Dent Pract* 6: 139-147
5. Papananou PN, Sanz M, Buduneli N, et al. Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Periodontol.* 2018 Jun;89 Suppl 1:S173-S182.
6. Tanwar J, Hungund SA, Dodani K. Nonsurgical periodontal therapy: A review. *J Oral Res Rev* 2016;8:39-44.
7. Shenoy and Shenoy .Clinical diagnosis and management of endo-perio lesions. *Indian J Dent Res,* 21(4), 2010

8. Araujo E, Perdigão J. Anterior Veneer Restorations - An Evidence-based Minimal-Intervention Perspective. *J Adhes Dent.* 2021 Apr 7;23(2):91-110.
9. Gresnigt MMM, Cune MS, Jansen K, van der Made SAM, Özcan M. Randomized clinical trial on indirect resin composite and ceramic laminate veneers: Up to 10-year findings. *J Dent.* 2019 Jul;86:102-109.
10. Rogers JP, Stewart PR, Stapleton JV, Hribar DL, Adams P, Gale AE. An interdisciplinary approach to the management of complex medical and dental conditions. *Aust Dent J.* 2000 Dec;45(4):270-6.



Figure 1: pre-operative intral oral image



Figure 2: radiographic image



Figure 3: evidence of inflammation one week after scaling & root planning



Figure 4: intraoral image after removal of overcontoured composite restorations



Figure 5: root planning and curettage for 2nd quadrant



Figure 6: continuous sling suture placed

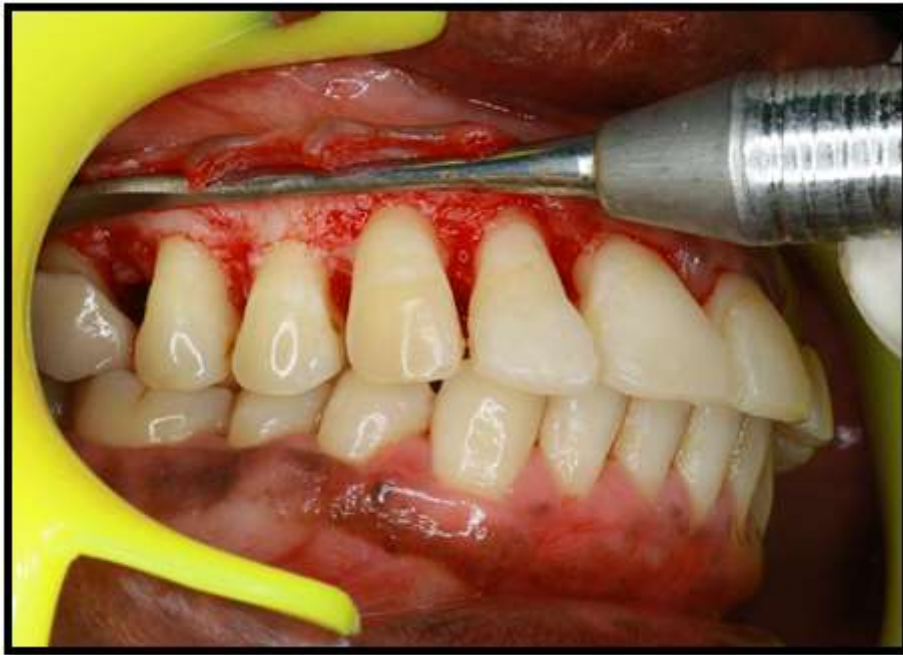


Figure 7: complete root planning & curettage for 1st quadrant



Figure 8: continuous sling suture placed



Figure 9: reduction in inflammation evident one week after flap surgery



Figure 10: preparation for porcelain laminate veneers from 13 to 23



Figure 11: lithium disilicate veneers fabricated with a2 shade.



Figure 12: immediate post operative image after bonding



Figure 13: one month postoperative afteroperative



Figure 14: complete root planning & curettage of lower anteriors



Figure 15: continous sling suture done



Figure 16: complete root planning & curettage done



Figure 17: continuous sling suture done



Figure 18: post operative after 3 months

Bichacho N. Papilla regeneration by noninvasive prosthodontic treatment: segmental proximal restorations. *Practical Periodontics and Esthetic Dentistry: PPAD*. 1998 Jan 1;10(1):75-7.

3. Kolakarnprasert N, Trushkowsky R, Parilli AC, Alharthy F, Pizzi P. Effective utilization of pink and white esthetics in smile design: case report. *Compendium*. 2020 Jan;41(1).