International Journal of Community Medicine and Public Health
Alghamdi H. Int J Community Med Public Health. 2022 May;9(5):2283-2286
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20221005

Case Report

Interdisciplinary approach for complex esthetic periodontal or prosthodontic treatment: a case report

Hamdan Alghamdi*

Department of Periodontics and Community Dentistry, College of Dentistry, King Saud University, Saudi Arabia

Received: 14 March 2022
Accepted: 29 March 2022

***Correspondence:**
Dr. Hamdan Alghamdi,
E-mail: dalghamdi@ksu.edu.sa

ABSTRACT

Patients with a complex periodontal/restorative esthetic condition can only be successfully treated with an interdisciplinary approach. This report presents case managed with varying levels of periodontal and prosthodontic coordination of care. A 48-year-old female patient with no medical conditions, presented chiefly to enhance her dental esthetics and eliminate the central diastema. There was also gingival asymmetry and altered passive eruption (APE). High frenal attachment was also noticed in relation the central diastema space. The depigmentation, gingivectomy, and gingivoplasy procedures were planned accordingly. After 3 months of periodontal healing, the patient returned for the final porcelain veneer restorations limiting to the upper anterior incisors. The treatment of the complex periodontal/prosthetic esthetic patient can be achieved with an interdisciplinary approach. Such a dental rehabilitation should be beginning by a comprehensive esthetic examination. Then an accurate diagnosis, prognosis evaluation, and treatment planning have to be identified. In addition, the utilization of an advanced surgical and restorative biomaterials will ensure the best result with patient satisfaction.

Keywords: Interdisciplinary approach, Esthetic dentistry, Periodontal/prosthodontic treatment

INTRODUCTION

As esthetic demands of dental patients are increasing, complex periodontal/restorative cases require a multidisciplinary solution. In fact, the cross-discipline between periodontal and restorative treatment is an important factor in ensuring optimal function and esthetics of teeth as well as the surrounding periodontium.[1,2] For a good esthetic outcome, more attention should be paid to an accurate diagnosis, a comprehensive treatment plan, and the effective implementation of clinical skills. Indeed, interdisciplinary solution for a complex esthetic restoration should be based on the clinical and biological health of the periodontal tissue.[3]

Periodontal/prosthodontic treatment include a detailed intraoral exam, diagnostic records of the lip profile, smile, centric occlusion, and functional movements of all anterior/posterior teeth. Also, for a complex prosthodontic case, a diagnostic wax-up needs to be fabricated. The diagnostic wax-up should help to set all treatment options and plans prior to starting the definitive therapy.[4] The potential periodontal surgical therapy to eliminate disease and rebuild gingival architecture should be considered prior to teeth preparation and placement of provisional restorations.[4]

This report utilizes case example to demonstrate the principles of planning and delivering interdisciplinary complex esthetic periodontal/prosthodontic treatment. The periodontal surgical therapy and prosthodontic care shown was directed by the diagnosis and treatment plan.

CASE REPORT

A 48-year-old female patient with no medical conditions, presented chiefly to enhance her dental esthetics and

eliminate the central diastema (Figure 1). She was also complaining of the unpleasant discoloration of the gingival tissues in upper/lower anterior regions. The gingival pigmentation was physiological and not associated with other medical conditions or smoking habits. There was also gingival asymmetry and APE. High frenal attachment was also noticed in relation the central diastema space (Figure 2).

Figure 1: Extraoral frontal view of patient's smile and teeth.

Figure 2: Intraoral view of upper teeth with spacing, excessive gingival display and pigmentation, preoperatively.

In this case, it was not possible to satisfy the patient's needs using a pure prosthetic solution. Periodontal health must be established prior to beginning final prosthodontic therapy. The guidelines for treatment include pocket elimination and restoring the normal contour/color of gingival tissues.

The depigmentation, gingivectomy, and gingivoplasy procedures were planned accordingly. After the administration of a local anesthetic solution, a Bard Parker handle with a No. 15 blade was used to remove the overgrowth gingiva. Then, depigmentation was performed using a round diamond bur (Figure 3). The entire pigmented epithelium along with a thin layer of connective tissue was removed. Abnormal frenal attachment was also surgically removed and then sutured with a 4-0 silk (Mersilk, Ethicon, J and J Pvt. Ltd. India).

Pressure was applied with sterile gauze to control hemorrhage during the procedure. The exposed surface was irrigated with saline; the surgical area was covered with a periodontal dressing. Post-surgical instructions were given along with antibiotics (Amoxicillin 500 mg, three times daily for 5 days) and anti-inflammatory analgesics (Ibuprofen and Paracetamol three times daily for 3 days). The patient was advised to use 0.2% chlorhexidine gluconate mouth wash 12 hourly for 1 week.

Figure 3: The depigmentation, gingivectomy, and gingivoplasy procedures were planned accordingly.

After 3 months of periodontal healing (Figure 4), the next phase of treatment was to proceed with the porcelain veneer restorations limiting to the upper anterior incisors. In brief, an alginate transfer impression of the mock-up was delivered to the laboratory in situ. A silicon index was also fabricated to evaluate the veneers space requirements. The dental technician prepared a wax-up on the working cast, reproducing all diagnostic information previously approved by the patient. The least invasive preparation with maximal preservation of enamel was performed. Following the preparations, a small diameter retraction cord was placed in the bottom of the sulcus to obtain an adequate gingival displacement. A high-quality polyether precision impression material was applied at the gingival margin and gently blown over the preparations. Then, a full metallic tray was loaded with the heavy body impression material (Duosoft H, 3M ESPE), inserted in the oral cavity, and allowed to set according to the manufacturer's instructions and then removed. A working model of the upper arch was obtained by pouring the definitive elastomeric impression. Definitive restorations were seated on the working model and sent to the clinician. Finally, the patient returned for placement of the final veneers and a try-in was carried out (Figure 5). Pre-op and post-op views for the periodontal/prosthetic treatments are presented in Figure 6.

Figure 4: Three-months postoperative periodontal plastic surgeries.

Figure 5: Placement of the final veneers for upper incisors.

Figure 6: Pre-op and post-op views for the periodontal/prosthetic treatments.

DISCUSSION

Patients with complex dental condition can only be successfully treated with an interdisciplinary approach. For these cases, it is important to properly identify and manage many details related to different dental disciplines. Mainly, more attention should be devoted to the analysis of the patient dental/medical status from many perspectives, as well as introspection of previous treatments. Underestimating factors contributing to the esthetic condition will lead to less optimal results and a dissatisfied patient. This report presents case managed with varying levels of surgical and restorative coordination of care.

A guide for comprehensive esthetic examination was originally presented by Dr. Leonard Abrams in the 1980s.[5,6] It is starting with the more general and external findings and then progressing to the intraoral conditions. One critical part of the examination is interviewing the history of esthetic changes, especially related to the movement of teeth and periodontal disease. Therefore, it will be very helpful if there are previous dental records, photographs, models, or/and radiographs.

First, the features of facial and lip symmetry and movements should be considered.[7] It will give clues to the amount of gingiva and teeth visible with various motions including a smile, a grimace, and while speaking. The relationship of the interpupillary line to the mid-sagittal plane should be at 90^{o} angle.[7,8] Also, it will be important to have the maxillary incisal edge line follow the interpupillary line.[7]

The upper lip line (smile line) needs to be checked.[9] Indeed, a high smile line presents a significant challenge to the esthetic dental treatment. The relationship of mandibular anterior teeth to lower lip may also have additional challenges to esthetics and phonetics depending on the degree of overlap.[9] Prominent upper teeth and vestibular appearance are important dental features that also associated with a high smile line. These features may indicate a thin tissue biotype surrounding teeth, which is related to non-esthetic gummy smile.[4]

Besides, gingival characteristics contribute significantly to the esthetic smile.[3,4] Gingival contour, thickness, and pigmentation must be carefully considered with any cosmetic restorative procedures. Physiological pigmentation of gingiva is clinically manifested as multifocal or diffuse melanin pigmentation with variable amount in different ethnic groups.[10] Therefore, gingival depigmentation by various surgical techniques is highly recommended to improve esthetic before the prosthetic therapy.[10]

The heights of gingival margin in the maxillary esthetic zone should be also checked.[11] A useful rule of thumb is that the gingival margins of the maxillary incisors and

canines touch on a straight line. The margin of the lateral incisor should be ~1 mm coronal to this line.[11]

Open embrasures (black triangles) are usually detract from the esthetic zone. Generally, the embrasure space of the maxillary central incisors will be filled with the interdental papillae if the distance between the crest of the bone and the interdental contact is <5 mm.[8]

Additionally, APE is the condition, whereby an excessive amount of the anatomic crown is covered with gingiva.[12] In general, the width of the maxillary central incisor should be 75% to 80% of the height of this tooth.[12] While the width of the tooth may be seen, the height of the anatomic crown can be determined using a periapical radiograph or estimated using periodontal probes. More recently, Chu's aesthetic gauges (Hu-Friedy Inc, Chicago, IL) has been fabricated to predict the optimal height of the anatomic crown. It is designed for the width-to-height ratio to be 78%. Finally, excessive gingival display may not be related to APE. It could be the result of a skeletal condition known as vertical maxillary excess, which should be managed with orthognathic surgery.[13] Other dental characteristics including diastemas, malpositioning, discoloration, attrition, and teeth contours may require additional interdisciplinary solution (e.g., orthodontic treatments).[9,13] The final step in the periodontal/restorative esthetic therapy is restoring phonetics. The labio-palatal dimension, anterior teeth positions, and incisal edge length will affect the F-V sounds and S sounds.[8,9] Also, patients with an anterior open bite or diastemas may have developed improper swallowing habits.[5] Therefore, these features should all be adjusted during the phase of preliminary restorations, and then transmitted to the laboratory work for the final restorations.[14]

CONCLUSION

The treatment of the complex periodontal/prosthetic esthetic patient can be achieved with an interdisciplinary approach. Such a dental rehabilitation should be beginning by a comprehensive esthetic examination. Then an accurate diagnosis, prognosis evaluation, and treatment planning have to be identified. In addition, the utilization of an advanced surgical and restorative biomaterials will ensure the best result with patient satisfaction.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Spear FM, Kokich VG, A multidisciplinary approach to esthetic dentistry. Dental Clin North Am. 2007;51(2):487-505.
2. Spear FM, Kokich VG, Mathews DP. Interdisciplinary management of anterior dental esthetics. J Am Dental Asso. 2006;137(2):160-9.
3. Starr CB. Management of periodontal tissues for restorative dentistry. J Esthetic Restorative Dentistry. 1991;3(6):195-208.
4. Terry DA, McGuire M. The perio-aesthetic-restorative approach for anterior reconstruction--Part I: Evaluation and periodontal surgery. Practical Procedures Aesthetic Dentistry. 2002;14(4):283-91.
5. Greenberg JR, Bogert MC. A dental esthetic checklist for treatment planning in esthetic dentistry. Compendium. 2010;31(8).
6. Mahshid M. Evaluation of "golden proportion" in individuals with an esthetic smile. J Esthetic Restorative Dentistry. 2004;16(3):185-92.
7. Merrifield LL. The profile line as an aid in critically evaluating facial esthetics. Am J Orthodontics. 1966;52(11):804-22.
8. Nold SL. Analysis of select facial and dental esthetic parameters. Int J Periodontics Restorative Dent. 2014;34(5):623-9.
9. Al-Johany SS, Alqahtani AS, Alqahtani FY, Alzahrani AH. Evaluation of different esthetic smile criteria. Int J Prosthodontics. 2011;24(1):64-70.
10. Yadav AK, Giri DK. Gingival depigmentation: a surgery for aesthetics. J Nepalese Society Periodontol Oral Implantol. 2019;3(1):29-31.
11. Padbury Jr, A, Eber R, Wang HL. Interactions between the gingiva and the margin of restorations. J Clin Periodontol. 2003;30(5):379-85.
12. Mele M. Esthetic treatment of altered passive eruption. Periodontology. 2000;77(1):65-83.
13. Trushkowsky RD, Alsadah Z, Brea LM, Oquendo A. The interplay of orthodontics, periodontics, and restorative dentistry to achieve aesthetic and functional success. Dental Clin. 2015;59(3):689-702.
14. Mack MR. Perspective of facial esthetics in dental treatment planning. J Prosthetic Dentistry. 1996;75(2):169-76.

Cite this article as: Alghamdi H. Interdisciplinary approach for complex esthetic periodontal/ prosthodontic treatment: a case report. Int J Community Med Public Health 2022;9:2283-6.