

Restoring a Smile: The Perio-Prosthodontic Way

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Abstract

Dental treatment now-a-days is focusing not only on restoring function but also restoring and improving aesthetics. An esthetics smile requires a perfect integration of facial and dental composition. The facial composition includes the hard and soft tissues of the face, whereas the dental composition relates more specifically to teeth and their relationship to gingival tissues.

We present here the Periodontic and Prosthodontic interdisciplinary management of a 26 year old female patient who reported to M. A. Rangoonwala College of Dental Sciences & Research Centre, Pune, with the complaint of spacing between the teeth and an unaesthetic smile and a desire for restoration of an aesthetic smile after a failed Orthodontic attempt.

Keywords: smile design, aesthetic crown lengthening, perio-prosthodontic interdisciplinary

Introduction

A smile is a person's ability to express a range of emotions. It can also determine how well a person can

function in society. ^[1] The appearance of the gingival tissues surrounding the teeth plays an important role in esthetics. ^[2] Abnormalities in symmetry and contour can significantly affect the harmonious appearance of the natural or prosthetic dentition. Also, nowadays, patients are more aware and conscious about esthetics and have a greater desire for esthetic treatment outcomes. This may influence treatment choices. The increase in aesthetic expectations and the knowledge of the rules of aesthetics obligates one to perform restorations in harmony with the arrangement of lips, face, homonymous teeth, and with the preservation of a healthy periodontium. ^[3] Maintaining a healthy periodontium during tooth reconstruction procedures is a prerequisite for obtaining aesthetics and function. For this purpose it is necessary to know the correct anatomy and dimensions of teeth and the effects of fillings and prosthetic appliances on periodontium. ^[4] A common problem encountered with this type of restoration is the difficulty in maintaining adequate supracrestal attached tissues. However, some authors have questioned

the necessity of performing procedures to maintain the supracrestal attached tissues, suggesting that if the supracrestal attached tissues is invaded, the body can re-establish the necessary dimensions on its own over time.

^[5] However, it is generally accepted that crown-lengthening surgery helps to relocate the alveolar crest at a sufficiently apical position to allow room for adequate crown preparation and reattachment of the epithelium and connective tissue, maintaining the supracrestal attached tissues. ^[6]

Hence, to achieve optimal results, good communication between the restoring dentist and the periodontist is important, particularly in esthetically demanding cases. ^[7]

The restoring dentist determines the ideal incisogingival length and mesiodistal width of the teeth, and on the basis of these projections, the periodontist recontours and relocates the gingival margin and the alveolar crest to achieve maximum functionality with both an esthetically pleasing appearance and periodontal health. The present report describes one such case:

Clinical Report

A 28-year-old female reported to M. A. Rangoonwala College of Dental science & Research centre, Pune, Department of Periodontology and Oral Implantology, concerned about her unaesthetic smile and gaps between teeth. A detailed dental and medical history was obtained. Past dental history revealed that patient had undergone orthodontic treatment which was not completed. The patient was in good general health and the medical history was non-contributory. Extraoral examination revealed no significant findings. The patient's face was symmetrical and had a concave profile. Her smile line extended to the second premolars, and smiling displayed approximately 4 mm of gingival tissues (Fig. 1).

Dental examination revealed that the midline was shifted; 12 and 23 were missing; 13 and 14 were transpositioned;

and there was non-uniform spacing present between all maxillary anterior teeth. (Fig. 2). The anterior maxillary teeth looked asymmetric with respect to their contralateral counterparts. Periodontal examination revealed good oral hygiene with minimal plaque and calculus deposits. The gingiva was pink and firm, and the interdental papillae between all maxillary anteriors were flattened. No mobility was present with any of the teeth and there was presence of adequate amounts of keratinized attached gingiva. IOPA radiographs revealed that the crestal bone level was within normal limits, and the crown to root ratio was favourable. The prosthetic treatment plan for the patient involved E-MAX crowns for teeth 14 to 24.

The patient was explained that the best treatment option for her was orthodontic treatment followed by prosthetic replacement of the missing teeth. The patient however adamantly refused orthodontic treatment even on repeated counselling. Hence, an alternative treatment plan which included perio-prostho interdisciplinary approach was planned, which included esthetic crown-lengthening and preparation of extra pontic site. The restoring dentist then made impressions. A mock-up of the maxillary anterior teeth was done to determine the dimensions and the contour of the teeth, which guided our future treatment plan (Fig. 3). Mock-up included extra pontic in region of 12 and 23 for which new papilla reconstruction and receptacle preparation in the bone through ostectomy was planned. Crown preparation was planned for 11, 13 and 14, such that preparation of 11 and 14 would create space for 12; 14 would be converted into 13; and 13 would be converted into 14 as these teeth were transpositioned. Also, the space created for 12 would require osteotomy to give an emergence profile to the pontic. In the second quadrant, 21,22 and 24 were present, crown preparation for second quadrant was planned such that 21 was prepared as it is, 22 and 24 were prepared to create a space

between them to accommodate 23 for which receptacle site preparation was planned through osteotomy so as to give emergence profile to 23. All this planning also included restoration of the midline to coincide with facial midline.

Following this, a surgical stent was made from the mock-up (Fig. 4). The amount of gingival recontouring and osteotomy was guided by the stent. Bleeding points were marked using the surgical stent as a reference (Fig. 5), and an inverse bevel incision was placed along the bleeding points. The initial incisions lead to creation of new papillae between 11, 14 and 13 as well as between 21, 22 and 24. According to the principles of smile design, the gingival margin of the maxillary canines were kept approximately at the same level as that of central incisors, whereas the gingival margins of the lateral incisor were slightly coronal (Fig. 6). The collar of the soft tissue was removed and the gingival margins were reassessed by keeping stent in place (Fig 7 & 8). A full-thickness flap was elevated and osseous reduction was performed on the buccal aspect so as to maintain the supracrestal attached tissues. This was followed by osteotomy in 13 and 22 region to create a receptacle site in the bone to receive the future pontics (Fig. 9). The flap was then sutured back to its original position using interrupted sutures (Fig. 10). The patient was given appropriate postoperative instructions. Crown preparation of the teeth was done immediately and temporary prosthesis was cemented (Fig 11). Care was taken to ensure that the margins of the temporary crowns were smooth and closely adapted to ensure gingival health. The patient was recalled after 3days, 7days and 1month for periodic check-up. After one month temporary crowns were removed for assessment of gingival contour and pontic site (Fig.12) and new temporary crowns were cemented. The final E-MAX prosthesis was delivered after six months.

Discussion

Confidence is an important aspect of one's personality and an aesthetic smile makes the picture complete. ^[8] With the increased awareness and changing times people seeking dental treatment solely for aesthetic purposes has significantly increased. This report describes the treatment of a 28 year old patient desiring an aesthetic smile.

The main challenges in the case were:

1. Midline deviation.
2. Transpositioning of the teeth.
3. Uneven spacing between teeth.
4. Treatment plan not involving orthodontics.

Careful treatment planning and mock-up with composite resin on the patient's cast gave a three-dimensional perspective which was helpful for confirming the challenges and the expected aesthetic outcome.

The patient was able to visualize the projected results along with their limitations to help her understand the realistic results. Involving patients in the decision-making process leads to a mutually satisfying outcome.

The present treatment was successful in restoring the midline to an acceptable level, and the maxillary anteriors were brought into arch form, the gingival zenith was corrected and a satisfactory emergence profile was obtained for the pontics. This was achieved by performing aesthetic crown lengthening surgery, osteotomy with pontic site preparation and well planned crown preparation, all of which resulted in a pleasing smile with ideal properties. After crown-lengthening surgery, the crown preparation and temporary prosthesis was immediately cemented allowing the periodontium to remodel and mature around the crown. Temporary crowns will be retained until the wounds completely heal (possibly up to 6 months) as Bragger et al have reported that gingival recession can occur between 6 weeks to 6 months following surgery. ^[9] The final crowns preparation

and EMAX prosthesis insertion was done after 6 months. The pre-operative and post-operative smile difference is shown in Fig. 13 and Fig 14 respectively.

Conclusion

This is an interesting case report where perio-prostho interdisciplinary approach was employed to optimally rehabilitate an unaesthetic smile, after a failed orthodontic attempt. The patient exhibited greater confidence with a new smile and was happy and satisfied with the final appearance. When considering treatment of the maxillary anterior teeth for esthetic purposes, the dentist must consider each case on its own merits. This case report is an example of well-planned sequence of treatment protocol from diagnostic evaluation, mock-up fabrication, perio-plastic surgery, teeth preparation and prosthesis cementation. Patient's satisfaction and achievement of an optimal esthetic results confirmed the success of this approach for smile make over in cases where patients are not willing to undergo orthodontic treatment.

References

1. Mohan B. Principles of smile design. *J Conserv Dent.* 2010 Oct-Dec; 13(4): 225–232
2. SC Nagara, Md Imran Ul Haque. Surgical lengthening of the clinical crown a prosthodontic concept- Case report. 2015; 1(4); 60-63
3. Weronika Lipska, Marcin Lipski, Małgorzata Lisiewicz, Andrzej Gala, Krzysztof Gronkiewicz, Dagmara Darczuk et al. Clinical crown lengthening — a case report. *Folia Medica Cracoviensia.* 2015; 3: 25–35
4. Sonick M. Esthetic crown lengthening for maxillary anterior teeth. *Compend Contin Educ Dent.* 1997; 18 (8): 807–819.
5. Ramfjord SP. Periodontal considerations of operative dentistry. *Oper Dent.* 1988; 13(3):144-59.
6. Carnevale G, Sterrantino SF, Di Febo G. Soft and hard tissue wound healing following tooth preparation to the alveolar crest. *Int J Periodontics Restorative Dent.* 1983; 3(6): 36-53.
7. Jim Yuan Lai, Livia Silvestri, Bruno Girard. Anterior Esthetic Crown-Lengthening Surgery: A Case Report. *J Can Dent Assoc.* 2001; 67(10):600-3
8. Nidha Madan, Deepak Raisinghani, Ashwini Prasad, Nikita Sarraf, Rohan Gupta. Designing a smile: A case report. *International Journal of Applied Dental Sciences.* 2017; 3(2): 01-04
9. Bragger U, Lauchenauer D, Lang NP. Surgical lengthening of the clinical crown. *J Clin Periodontol.* 1992; 19(1):58-63.

Legends Figure:



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 12

Fig. 8



Fig. 13

Fig. 9



Fig. 14

Fig. 10



Fig. 11