

Designing The Perfect Smile: A Case Report

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ABSTRACT:- Smile esthetics has always known to influence the perception of beauty and attractiveness. Smile design is considered as an effective tool in maintaining a harmonious relation between dental and soft tissues in order to achieve desired smile esthetics.

The present cases reported the implementation of smile design to re-establish the gingival contours through the gingivectomy done by the conventional scalpel technique. It was concluded that long term aesthetic results can be achieved in patients through a well-planned smile design.

I. INTRODUCTION

Smile not only reveals self confidence in an individual but also helps to express a range of emotions coordinated with the movement of the teeth and lips.¹ Ideal smile line should display a minimum amount of gingival tissue. A smile design should always include the evaluation and analysis of both facial and dental composition.²

There are two crucial features that play a major role in the smile design i.e. the interpupillary line and the lips. Ideally interpupillary line should be perpendicular to the midline of the face and should also be parallel to the occlusal plane. Lips are important because they form the boundaries of smile. If there is any discrepancy in these two features, then correction of facial composition should be considered.³

Factors determining the dental composition can be categorized as tooth related and soft tissue related components.⁴ Tooth related components include incisal length, tooth dimensions, dental midline, zenith points, interdental contact area and point, axial inclinations, incisal embrasure, gender, age and symmetry, whereas, soft tissue related components include gingival health, gingival levels and harmony, interdental embrasure and smile line.⁵

As clinicians it is important to conduct a systematic clinical examination which should include a smile analysis and the evaluation of the teeth, temporomandibular joints, occlusion, existing restorations, periodontal tissues, and other soft tissues of the oral cavity in order to achieve a pleasant smile with favourable contours.

Case report no. 1

A 28 year old male patient visited the Department of Periodontics, DAPM R.V. Dental College and Hospital, Bangalore with the chief complaint of unpleasant smile which made the patient uncomfortable. Patient was systemically healthy. (figure – 1)

Aesthetic and periodontal evaluation

Periodontal examination revealed mild gingivitis with plaque and calculus, shallow probing depth, no evidence of mobility, adequate amount of keratinized gingiva, and crestal bone levels within limits.

Comprehensive smile assessment reveals a high smile line which displayed almost 6 mm of gingival tissue. His upper lip when measured from the sub-nasal to the inferior border of the upper lip was 18 mm, which is considered to be within normal limits. While, the incisor display at rest position measured from upper lip to incisal edges of maxillary incisors was 8 mm.



Figure 1- Preoperative view

Diagnosis

Aetiology for the gingival discrepancy was found to be dento-gingival and could be corrected through the gingivectomy on the facial aspect of maxillary right canine to maxillary left canine.

Patient was informed about the treatment plan and complications of surgical procedure. Informed consent was obtained from the patient.

Clinical procedure

After the consent was obtained, phase I therapy was done. Patient was recalled after a week for the surgical procedure. Surgical procedure was carried out by the administration of adequate anaesthesia (2% lignocaine, 1: 80,000 epinephrine). After anaesthesia was given, bleeding points were marked. These bleeding points were used as a reference for the external bevel gingivectomy incision from maxillary right canine to maxillary left canine on the facial aspect using surgical blade #15C (Hu-Friedy) placed 45° angle to the tooth long axis, apical to the bleeding points (figure 2). Following this, the gingiva was contoured and scraped to remove residual tissue tags (figure 3).

Analgesics and antibiotics were prescribed, and post-operative instructions were given.



Figure 2- Bleeding points



Figure 3- Gingivectomy

Evaluation

Immediate post-operative evaluation showed an increase in crown length and a decrease in the gingival exposure (Figure 4). Follow up was done after a week and at three month which showed good adaptation of the crown margins and satisfactory healing (figure 5).



Figure4 - one week postoperative



Figure5- Three month postoperative

Case report no. 2:

A 38 year old female patient complaining of asymmetric smile visited the Department of Periodontics, DAPM R.V. Dental College and Hospital, Bangalore. On examination, gingival discrepancy was seen on the right side which made her feel uncomfortable while smiling (fig-6). No relevant medical history was found.

Aesthetic and Periodontal evaluation:

Periodontal examination showed mild gingivitis with plaque and calculus, shallow probing pocket depth, adequate width of keratinized gingiva, no mobility, and crestal bone levels within limits. Cementoenamel junction was not visible clinically.

On comprehensive smile assessment, the patient was found to have a high smile line on the right side which displayed almost 4 mm of gingival tissue (fig. 6). Her upper lip when measured from the sub-nasal to the inferior border of the upper lip was 20 mm, which is considered to be within normal limits. While, the incisor display at rest position measured from upper lip to incisal edges of maxillary incisors on right side was 6 mm. On spontaneous smiling, patient's teeth were visible from maxillary right first premolar to maxillary right central incisor.



Figure 6- Preoperative view

Diagnosis

Therefore, the patient's main problem was periodontal rather than being a tooth problem for which gingivectomy was planned from maxillary right canine to maxillary right central incisor in facial aspect.

Clinical procedure

The patient was informed about the treatment, complications and a written informed consent was obtained. After obtaining informed consent, the phase I periodontal therapy including supragingival and subgingival scaling was performed, and oral hygiene instructions were given. A week later, the patient was recalled to perform conventional gingivectomy.

A series of steps was carried out while performing gingivectomy. Anaesthesia (lignocaine 2% with epinephrine 1:80,000) was administered in the vestibular mucosa from maxillary right first premolar to maxillary right central incisor.

Then bleeding points were marked with the pocket marker and the points were joined to prepare a line of excision (figure 7). After that, external bevel gingivectomy incisions were done in the anterior region on the facial surface only using surgical blade #15C (Hu-Friedy) placed at a 45° angle to the tooth long axis, apical to the bleeding points. Afterwards, the gingiva was contoured and scraped to remove residual tissue tags (figure 8). Analgesics and antibiotics were prescribed, and post-operative instructions were given.



Figure 7- Bleeding Points



Figure 8- Gingivectomy

Evaluation

Immediate post-operative results showed symmetrical and reduced gingival display (figure 9). The patient was recalled after one week for re-evaluation which revealed satisfactory healing and good oral hygiene. The results showed a definite change upon smiling where the gingival display on the right side was decreased to 1 mm, which is seen in (figure 10)



Figure 9- Immediately after gingivectomy



Figure 10- One-week after gingivectomy

II. DISCUSSION

In this era, where looks hold the key to success and confidence, smile designing has emerged as a powerful tool for patients with facial or dental discrepancies.⁶

Conventional procedures for gingivectomy involve the use of scalpel, electrosurgery, or a laser. However, scalpel offers advantages like the ease of use, precise incision with well-defined margins, uneventful healing, no unwanted lateral tissue damage and is economic. Whereas advanced treatment modalities like laser and electrocautery have advantages over the scalpel like immediate hemostasis, but they also have many disadvantages in relation to lateral heat damage, delayed tissue healing, skill of the operator and higher cost. Although laser has advantage over electrocautery such as less lateral heat damage, better wound healing, and can be used in close proximity to bone as compared to electrocautery.

Funde S and Baburaj MD in their comparative study between scalpel, laser, and electrocautery employed for the treatment of gingival enlargement concluded that conventional scalpel treatment could be considered as a better option in terms of precise incision line, faster healing at much lower cost and seems to be beneficial for routine surgical procedures like gingivectomy.⁷

In the first case, on examination a male patient had excessive gingival display. Therefore, Gingivectomy was done to improve the smile line and reduce gingival display. Thus, extensive surgical procedures (orthognathic surgeries) were avoided and good results were obtained through gingivectomy with satisfactory healing.

In the second case, a young female patient complained of gingival discrepancy that affected her smile. Since the problem was gingival in nature, a gingivectomy procedure was done and a symmetric smile line was achieved.

Smile design should always be as conservative as possible to achieve best aesthetic outcomes. However, some cases are not solved totally through gingivectomy because the amount of gingival display on smiling will not decrease significantly if the smile design requires facial composition to be corrected.⁸ Rubinstein et al. elaborated a procedure in which a portion of gingiva and buccal mucosa was excised followed by suturing of the approximated borders.⁹

Litton and Fournier applied a treatment in which they bring the lip down by muscle detachment from the bony structures above.⁹ Silva et al. investigated the modified lip repositioning technique in patients with gingival discrepancy and reported satisfactory results.¹¹ Nevertheless, such surgeries may lead to frequent relapse and undesirable side effects such as scar contraction.¹²

III. CONCLUSION

Smile design is based on the principles that are easier to understand and should be analysed properly to obtain a harmonious smile. An aesthetically pleasing appearance was achieved in this case by performing gingivectomy to recontour and relocate the gingival margin.

Thus, through smile design not only aesthetics but also functional competency is maintained by establishing a balance between the dental and soft tissues. Long-term aesthetic results can be achieved in patients through a well-planned smile design.

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