



CASE STUDY

SMILE DESIGNING WITH ANTERIOR ALL CERAMIC RESTORATION - A CASE REPORT

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ABSTRACT

A beautiful smile enhances the self esteem of the patient. Cosmetically acceptable smile shows a harmonious relationship between the displays of teeth to the gingival tissues. A gummy smile poses a restorative challenge for dentist attempting to achieve ideal esthetics. However with advancement in cosmetic dentistry bleaching, bonding, veneering and laminates have opened door to a wide variety of elective dental treatment. A case is reported here on the cosmetic correction of gummy smile wherein periodontal plastic surgery for esthetic crown lengthening was performed and the teeth were restored with all ceramic restoration for aesthetic enhancement.

INTRODUCTION

First impression is the best impression. A pleasant smile leaves an everlasting impression in anyone's mind. During smile designing aesthetic and function should go hand in hand to provide long term function of restorations and patient satisfaction. Smile designing is a complex process and requires judicious planning before actually executing it. It is to recreate beauty by combining science and art (Kirtley, 2008). Poorly executed aesthetic and restorative procedure can compromise immediate or long term health of the soft and hard tissues (Oberoi et al., 2017). However, during aesthetic correction understanding of the gingival tissues is an important aspect of any restorative treatment plan. A pleasant smile displays 1mm of the pink attached gingiva. 2-3 mm of the gingival visibility is cosmetically acceptable. A gummy smile is seen usually when more than 3mm of gingiva is visible (Narayan et al., 2011). The form of the lips and the position of the lips during speech and smiling cannot be changed easily, but the dentist can modify or control the form of the teeth, inter dental papilla, position of the gingival margin and incisal edges of the teeth. A gummy smile along with poor anterior restorations can rob a person's self confidence. This case report describes the aesthetic rehabilitation of a young patient by replacing the faulty prosthesis with all ceramic restorations and reducing the gingival display with periodontal plastic surgery.

Case report: A 28 yr old female patient reported to the Department of Prosthodontics at Government Dental College and Hospital with chief complaint of unpleasant smile due to fractured anterior tooth. She gave a history of root canal treatment and crowns with upper anterior teeth 3 years back. Past medical history was insignificant. Extraoral examination revealed ovoid facial form with the convex facial profile. Patient displayed excessive amount of gingiva on normal smile (Fig 1). She had a normal lip length with thick and hypertonic upper lip and a reverse smile line. Intraoral examination revealed fractured right central incisor at gingival level and #13 to #23 were restored with metal ceramic restoration. The height of restored clinical crowns were excessively short and not in harmony with the facial form. Patient had a canine guided occlusion with good periodontal status of all the teeth. Radiographic examination revealed endodontically treated #13 to #23. The orthopantomography (opg) showed improper obturation with all restored teeth and periapical lesion with #22. There was adequate bone support with all these teeth (Fig 2). After discussing all the treatment options with the patient a definitive treatment plan was designed, its risks and benefits were explained and a written, informed consent was obtained. The following treatment was carried out for this patient. Diagnostic impression were made in irreversible hydrocolloid and poured in dental stone to obtain diagnostic cast. A diagnostic wax up was carried out considering the principles of smile designing. The length of the teeth was changed to get proper clinical heights of the crowns to suits the patient and to achieve the desired results.

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Fig. 1. Pretreatment Extraoral view



Fig. 5. Tooth preparation



Fig. 2. Pretreatment orthopantomogram



Fig. 6. Final impression



Fig. 3. Acrylic template used as guide for crown lengthening procedure



Fig. 7. Provisional restoration



Fig. 4. Periodontal flap surgery to achieve new gingival zenith



Fig. 8. Final restoration



Fig. 9. Post treatment extra-oral view

Putty index was made to prepare provisional restoration. It was decided to carry out surgical crown lengthening of all restored teeth i.e. 13, 12, 11, 21, and 23 to achieve desired clinical heights of the crown. Re-RCT was planned for 13, 12, 11, 21 and 23 followed by post and core with 11 and 12, and extraction of 22 due to poor prognosis. It was decided to restore the anterior esthetic zone with zirconia restoration. Treatment was explained to the patient. Periodontal surgery was performed to achieve proper gingival contour and adequate crowns heights. Acrylic template made from diagnostic waxup was used as a guide to achieve desirable gingival contour (Fig 3). Using the acrylic template the new gingival zenith was marked on the gingiva prior to the surgery. Periodontal flap was raised and osseous reduction was done to maintain biologic width (Fig 4). Post operative recall after seven days revealed sufficient tooth structure with 11 and new established gingival zenith. Four weeks of stabilization period was given. Simultaneously old ceramometal crowns were removed and re-RCT were done for the remaining anterior teeth Cast post was prepared for 11 and 12. After post cementation final tooth preparation done for all ceramic crown with 13, 12, 11, 21 and 23 (Fig 5). Gingival retraction was carried out with the knitted chord impregnated with 23% aluminium chloride. The final impression was made by using polyvinyl siloxane impression material by double mix single step technique (Fig 6).

Provisional restoration was given immediately after preparation of the teeth (Fig 7). Provisional restorations were assessed for their size, shape and position, whether desired result is achieved or not. This restoration was shown to the patient and approval was taken. Definitive restorations of zirconia crowns were fabricated for 13, 12, 11 and FPD with 21 and 23. Bisque trial was carried out for verification of marginal adaptation, size, shape, shade, symmetry and visibility of restoration at rest and when patient smiled. The occlusion was checked for any inferences in centric and eccentric position. Approval was obtained from the patient at the bisque trial stage. Final glazing was carried out. Final cementation of restoration was done with glass ionomer cement (Fig 8, Fig 9).

DISCUSSION

A person with attractive smile is often considered more successful and intelligent. Ideally, an esthetic smile line should reveal minimum amount of gingival tissue. Gummy smile is often emotionally challenging esthetic concern for the patient.

It is more commonly seen in females and has an incidence of 10% among the individuals of 20 to 30 years of age (Tjan, 1984). Once correct diagnosis of gummy smile is established, formulating predictable treatment plan becomes easier. The various factors are considered while smile designing. Tooth component: dental midline, incisal length, tooth dimension, zenith point and soft tissue component: gingival level and interdental embrasure (Narmadha, 2014). With the aid of diagnostic wax up both the clinician and the patient can determine the height width ratio following the esthetic standard resulting in fast work with predictability. The associations of periodontal surgery with restorative procedures demonstrate satisfactory results for functional and esthetic rehabilitation of the gummy smile, increasing patient self esteem and well being (Santos *et al.*, 2016). Currently many surgical procedures are available for the periodontal tissue aiming at establishing the tooth gingival esthetic standard.

In the present case, periodontal flap surgery was carried out to change the height of the teeth and to correct the gummy smile followed by a stabilization period of four weeks (Oakley *et al.*, 1999). Old metal ceramic prosthesis was replaced with all ceramic restorations. Although metal ceramic restorations gained popularity for their predictable performance and reasonable esthetics for more than three decades, the demand for improved esthetics has led to introduction of all ceramic restorations (Kelley, 2011; Hatai, 2014). These restorations have potential to replicate the life like appearance of the natural dentition.

Conclusion

This is an interesting case wherein all ceramic restorations along with periodontal surgery were employed to optimally rejuvenate an unaesthetic smile. The new smile of patient was satisfactory with excellent esthetic appearance. Detailed diagnosis, correct treatment planning and interdisciplinary approach contributed to a harmonious smile and evident satisfaction of the patient.

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