

Restoration of Anterior Esthetics and Function through Interdisciplinary Approach

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ABSTRACT

Smile is an integral part of dentistry. Patients come with the prime aim of achieving esthetics. The dentist may preserve or alter the relationships of the visible components of the oral region to give the desired esthetic result. But, it is our responsibility to attain this result through a scientifically based and thoroughly planned treatment.

The appearance of gingival tissue surrounding the teeth plays an important role in the esthetics of anterior region. Abnormalities in symmetry and contour can significantly affect the harmonious appearance of natural or prosthetic dentition.

There are a variety of cases of teeth wear, wherein interdisciplinary intervention is essential. Also the factor causing severe wear of natural teeth must be identified and eliminated, or reduced before attempting restorative treatment to improve long-term prognosis of restorative treatment.

This article deals with a case of anterior teeth wear, stressing upon diagnosis, treatment planning and progression of treatment with regards to perio-prostho esthetics.

Keywords: Anterior teeth wear, Anterior esthetics, Perio-esthetics, Electrosurgery.

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INTRODUCTION

A smile is the most eye-catching feature of our face. Even a subtle change can make a big difference in the way one looks. One such change may occur due to tooth wear.

Tooth wear is the irreversible loss of tooth structure, which is often painful, unsightly and impairs the function of tooth. There are three types of tooth wear:¹ Abrasion, attrition and erosion. Abrasion is the wearing away of tooth enamel by a foreign object. Attrition is the gradual loss of enamel through wear. Erosion is the chemical wear of tooth enamel. Later, abfraction has been added to this category, which is the chipping away of enamel or dentin due to stresses resulting from biomechanical loading forces exerted on the teeth. It is sometimes difficult to determine the type of tooth wear present, because different types often occur together.

Apart from these causes, other causes known for causing wear of teeth are congenital anomalies.^{1,2,4} Bruxism

and other parafunctional habits^{3,4} and loss of posterior support.⁴

Patients with severe wear may need extensive restorative procedures to achieve appropriate function, esthetics and comfort. Initially our consideration should be to identify the cause of tooth wear. This necessitates a thorough detailed history of the patient. Factors contributing to tooth wear should be eliminated or reduced to enhance longevity of the restorative treatment.⁵ Evaluation of the vertical dimension of occlusion (VDO) is a critical step in restoration of worn dentition. Many techniques are used for the same.⁴ It is only after all these factors are considered that the treatment should be commenced.

There are many options to deal with such situations of teeth wear: Composite veneers, complete veneers-metal or porcelain fused to metal (PFM), porcelain veneers. Depending on the site, cause and severity of tooth wear treatment might be planned.

This article deals with a case of anterior teeth wear, stressing upon diagnosis, treatment planning and progression of treatment with regards to perioprostho esthetics.

CLINICAL REPORT

A 32-year-old male patient reported to the Department of Prosthodontics with the chief complaint of an unpleasant smile due to wear of the front teeth (Fig. 1).

A thorough medical and dental history was recorded along with psychological, occupational, familial and social history. This was done to determine possible etiology of



Fig. 1: Pretreatment intraoral view

tooth wear. The condition of tooth wear was attributed to the habit of chronic tobacco chewing. The patient was counseled against the use of tobacco. Investigations included medical examination to rule out any systemic cause unknown to the patient. Orthopantomograph and intraoral periapical radiographs of anterior teeth were taken. On examination, oral hygiene was poor. Upper and lower anterior teeth showed generalized stains along with wear (11, 12, 21, 22, 23, 41, 42, 43, 31, 32 and 33); posterior teeth were sound with intact morphology. Closest speaking space was 1 mm and interocclusal distance was about 2.5 mm (normal). There was no loss of VDO as determined by above measurements and clinically by facially appearance. Thus, the patient belonged to Turner and Missirlian classification class III-tooth wear with no loss of VDO.⁴

Diagnostic impressions of the upper and lower arches were made in irreversible hydrocolloid and poured in dental stone to obtain diagnostic casts. Face-bow record and transfer was done on semiadjustable articulator (Whipmix 2000 series, Whipmix Corporation, USA) and diagnostic models were thus articulated. Wax mock-up of the anterior teeth was done at existing VDO with mutually protected canine-guided occlusion. The patient required an interdisciplinary approach to the rehabilitation of the occlusion.

This was explained to the patient and after his consent the treatment planned was implemented. The first phase of treatment included oral prophylaxis followed by intentional root canal treatment of the severely worn teeth—11, 21, 22, 31, 32 and 41. In consultation with the periodontist and taking the biological width into consideration, crown lengthening was planned and a stent was made on the mock lengthening on the diagnostic cast and used for the crown lengthening procedure. This was done to obtain adequate height of tooth structure for restoration. Gingival sculpting⁶ was also done for remaining anterior teeth to achieve uniform and symmetric gingival zenith for esthetics. This procedure was done by electrosurgery⁷ (Sensimatic™, model 600 Se Electrosurge, Parkell Electronics, New York) (Figs 2A and B). Soft tissues were allowed to heal for 1 month. This was followed by post and core treatment of 11 and 21 with passive threaded prefabricated posts (Threaded posts, Luminex system; Dentatus AB, Sweden), followed by composite cores built-ups of all the upper and lower anteriors to restore form, function and esthetics (Charisma, Heraeus Kulzer, Germany). Impressions with alginate were made and the casts thus obtained were used to make putty index for indirect fabrication of provisionals.

Tooth preparation of 11, 21, 22, 31, 32 and 41 was done for porcelain fused to metal crowns. This was done by preparing the teeth to allow for 1.5 mm of restorative

material on the incisal surface. Porcelain of the facial surface was planned to extend over the incisal edges and up to the midpalatal surfaces. A rounded shoulder of 1.5 mm width on the facial side and a chamfer of 0.5 mm width on the palatal side were prepared. Tooth preparation was kept to minimum. Finishing was completed without any sharp line angles.

Impression was made in irreversible hydrocolloid to obtain casts for provisional fabrication. Interocclusal record were taken and casts were articulated in centric occlusion on the semiadjustable articulator. Mounting was done at the existing vertical dimension of occlusion. Provisionals were fabricated following the putty index of the composite restorations. Once evaluated for esthetics, functional occlusion and phonetics, the provisionals were cemented with a temporary luting cement-templute.

The patient was recalled after approximately 3 weeks to evaluate the status of the provisionals. The provisionals were removed preparations were refined and impressions were made in addition silicone (Exaflex, Vinyl polysiloxane impression material, GC America Inc) after gingival



Figs 2A and B: (A) Crown lengthening and gingival sculpting of lower anteriors, (B) crown lengthening and gingival sculpting of upper anteriors

retraction with Expasyl. Working casts obtained in die stone with removable dies were transferred to the articulator with a face-bow and interocclusal records. A customized incisal guide table was formed taking the provisional restorations as a guide,⁸ wax patterns were fabricated cut-back for porcelain was done and these patterns were casted in nickel chrome alloy. Trial evaluation of the metal copings was done before commencing with the porcelain built-up. A putty index made of the provisional, aided in built-up of porcelain. The try in of the crowns was done to visualize the shade, shape and size of the restorations. Final glazing was done and cemented with GIC (GC Corporation, Tokyo, Japan) using the recommended powder: Liquid ratio (Fig. 3). Thus, the anterior teeth were restored with PFM to obtain form, function and esthetics (Fig. 4).

The patient was recalled after 3 and 6 months to evaluate the restorations. He was instructed to maintain oral hygiene and follow recall appointments. As a precautionary measure, 'Night guard' was fabricated for the patient with 'Biostar' sheet.



Fig. 3: PFM crowns with 11, 21, 22, 31, 32 and 41



Fig. 4: Posttreatment extraoral view

DISCUSSION

The treatment was aimed at restoring the form, function and esthetics of the anterior teeth. The case as diagnosed did not need an alteration in the vertical dimension of occlusion, according to Turner and Missirlian⁴ classification. Therefore, the restoration of worn down anterior teeth was planned without altering VDO. Porcelain fused to metal restorations were planned keeping in mind the wearing down tendency of patient's anterior teeth.

Cuspid protected occlusion and disocclusion is a natural adaptation for preventing destructive occlusion, as stated by D'Amico.⁹ Therefore, a mutually protected canine-guided occlusal scheme was given to the patient, which was achieved by wax build-up on the programmed articulator.

Intentional root canal treatment of the severely worn teeth, followed by crown lengthening procedure for these teeth was done to obtain adequate tooth structure for restoration. Gingival sculpting was done for remaining anterior teeth to achieve uniform and symmetric gingival zenith for esthetics.

Also, post and core was done for 11 and 21 as they could not retain the coronal restoration and at the same time a more desirable inclination of 11, 21 could be achieved through this for an optimum functional and esthetic relation with lower anteriors.

The entire treatment done is a proven and predictable treatment modality. However, careful treatment planning and execution is required for a predictable success. The entire treatment plan was explained to the patient and approved at the mock-up stage. Treatment required an interdisciplinary approach between endo-perio-prostho. The patient was followed up at regular intervals and motivated to maintain good oral hygiene.

CONCLUSION

The case presented has been rehabilitated by interacting with other branches to be able to give the best to the patient. The required results could not have been achieved by the prosthodontist alone. Treatment planning with the endodontist and periodontist has helped us to achieve the desired results to restore the form, function, position and esthetics, for the patient thereby emphasizes the importance of interdisciplinary approach in such cases. The result of a methodically undertaken and well-planned treatment is satisfactory not only to the dentist but also the patient, boosting his self-esteem and confidence by means of an esthetic and confident smile!!

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