Case Report

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LASER ASSISTED SMILE DESIGNING USING MULTIDISCIPLINARY APPROACH

See Deshmukh

ABSTRACT:

Treating anterior dental problems is challenging task. Esthetics, impact on function, structure, and biology has to be considered while dealing with such clinical cases. The clinician should incorporate various disciplines in dentistry along-with modern technology to deliver the highest level of dental care to each patient. The treatment sequencing also plays a critical role. This article demonstrates the combined use of all ceramic restorations and dental lasers to successfully address the esthetic concerns of a patient.

Key Words: smile design,LASER

INTRODUCTION:

Dento-facial esthetics plays a critical role in patient's appearance and confidence. A heightened awareness of esthetics has challenged dentistry to look at dental esthetics in a more organized and systematic manner, yet the health of the patient and his or her teeth still is the most important underlying objective. But some existing dentitions simply cannot be restored to a more esthetic appearance without the assistance of several different dental disciplines. Evaluation of dento-facial esthetics should be done in a logical, interdisciplinary manner so as to maximize final outcome.

To design the optimal outcome for a patient during esthetic enhancement, the restorative dentist must seek to create a symmetrical and harmonious relationship between the lips, gingival architecture, and the positions of the natural dentate forms.

Today dentist can perform various gingival recontouring and de-pigmentation procedures easily with little pain and blood loss by using lasers.[1-4]

Following is one such case report where laser assisted smile designing was achieved with multidisciplinary approach.

CASE DETAIL:

A 20 year old female reported to our dental OPD with chief complaint of pain in upper front teeth and unaesthetic appearance. She was also not satisfied with "yellowness of her teeth and wanted them to look more white". Past dental history included crowns on upper front teeth and prolonged orthodontic treatment for last 5 years. Clinical examination revealed ceramo-metal crowns on maxillary right and left central incisors (Fig, 1). The crown on left central incisor was mobile. Radiograph showed post and core restoration with the same (Fig, 2). The post space was inadequately

*Corresponding Author Address: Dr Deshmukh S.Email: drsaeedeshmukh@gmail.com

prepared. The crowns were opaque and esthetically unacceptable. Also they were labially proclined resulting in lip incompetency (Fig, 3). The gingivae showed heavy pigmentation in anterior area. The orthodontic treatment was also incomplete with axial inclination of right maxillary premolar being mesially tipped and generalized inadequate space closures.

Intermediate phase: After removal of crown and post on both maxillary central incisors, the teeth showed no mobility in the tooth. However there was gingival inflammation due to mobile crown along-with the post. It was decided to retain the tooth and re-do the post and core restoration. Since the clinical crown height was less, gigivectomy using soft tissue Diode laser at wavelength 940nm (Ezlase 940, Biolase) was performed on these teeth (Fig. 5) followed by fibre post {ParaPost, Coltene Whaledent} and composite core build up {Luxacore, DMG , USA} on the same (Fig. 6). Crown preparation was modified so that it was more palatally placed to improve lip competency. Provisional crowns were given with heat cure acrylic resins (DPI, India) until the orthodontic treatment was completed. After face bow record, casts were mounted on semiadjustable articulator and diagnostic wax up was performed. Informed consent of the patient was obtained. The treatment was performed in following sequence.

Orthodontic treatment was restarted with ceramic braces to perform space closures more uniformly and improve the overall axial inclination of teeth (Fig. 7).

Improving gingival esthetics: After completion of orthodontic treatment, laser assisted gingivoplasty was performed on maxillary anteriors to improve the gingival zeniths along-with laser assisted gingival de-pigmentation (Fig. 8). The laser parameters were as follows: - 1W, 20 Hz, 8% water, 11% air.

Final restorations (Fig. 9): After 2 days, healing of the tissues after gingival health was excellent, teeth preparation was done for ceramic laminates on right and left maxillary lateral incisors, canines and premolars. The central incisors were prepared to receive all ceramic crowns. Gingival retractions were done using pre-impregnated cord (Ultradent, USA) impressions were made in elastomeric impression material (Affinis, Coltene Whaledent) with putty & light body double mix double step technique. All restorations were fabricated in pressable ceramic (IPS e.max Press, Ivoclar Vivadent, Schaan, Lichenstein). With try in paste, the shade was judged, once the patient was satisfi ed with the restorations, etching of the laminates and crowns with 9.5% Hydrofl uoric acid (Ultradent Porcelain etch) was carried out for 60s followed by silane (Ultradent Silane) application, bond application (Adper Single Bond Plus, 3M ESPE) and luting.Veneers and crowns were luted with light cure resin cement (Variolink, Ivoclar Vivadent), short curing was done to remove excess cement followed by full curing, contacts were checked, occlusion

was adjusted to harmonize the anterior guidance and remove any prematurities. Patient was given an occlusal night guard fabricated using polyethylene sheet to prevent any parafunctional activity from affecting the all ceramic restoration. The lip competency improved (Fig 10).

Regular follow up till one year showed the dentition in good health and the patient was also satisfied with the final esthetic and functional outcome.

DISCUSSION:

The sequence of any treatment plan always should begin with the management or alleviation of acute problems. Therefore in the present case firstly the inadequate posts in central incisors were removed and redone using esthetic fibre posts. Patient was given temporary crowns until the pain and inflammation subsided. The treatment involved a multidisciplinary approach with orthodontics, periodontics and restorative dentistry working together towards a common goal.

Esthetic as well as functional factors were considered to optimize final outcome.

In this case diagnostic wax up was very important as the patient required both dental and soft tissue modifications. To design the optimal outcome for a patient during esthetic enhancement, a symmetrical and harmonious relationship between the lips, gingival architecture and the positions of the natural dentate forms must be created. In this case, the incisal edge position was modified to suit lip position and phonetics. The gingival level was assessed relative to the projected incisal edge position.

Orthodontic treatment was completed before final restorations so as to improve long term prognosis.

Lasers served as an excellent tool in this case to carry our gingival de-pigmentation as well as recontouring. The advantages were many viz., less invasive, less painful and faster healing as compared to conventional surgical approach.

All ceramic laminates and crowns have showed excellent esthetic results and longevity. In this case the final shape and shade of the anterior teeth was remarkably improved and the patient was very pleased with her appearance.

CONCLUSION:

Advances in dental ceramics and advent of laser dentistry has simplified esthetic rehabilitation with predictable results. Lasers give the advantage of being relatively painless procedures and rapid healing as compared to conventional techniques.

In this case an esthetically based approach was used to optimize the final outcome of the esthetic treatment plan without sacrificing the structural, functional and biological aspects of the patient's dentition.

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FIGURES:

Figure 1

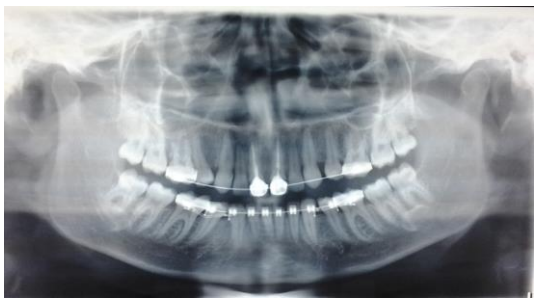

Figure 2

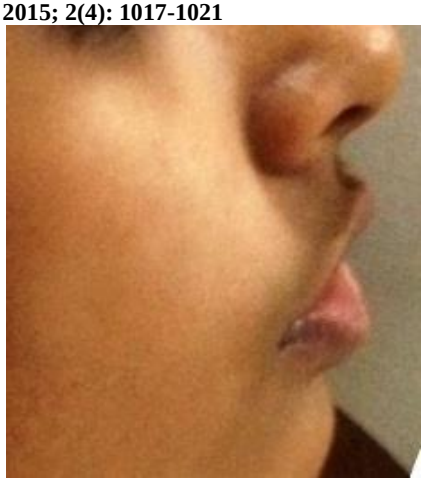

Figure 3

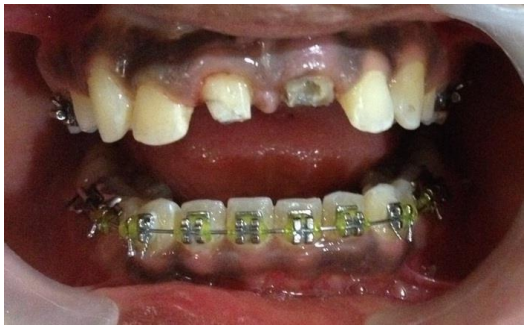

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

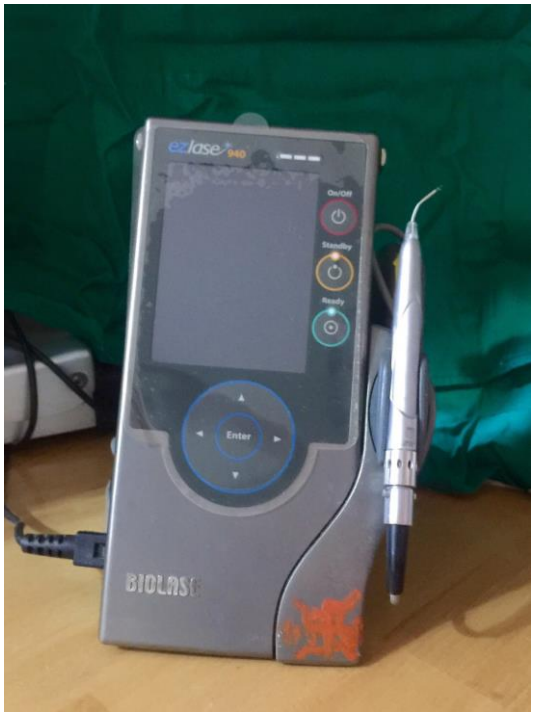

Figure 9

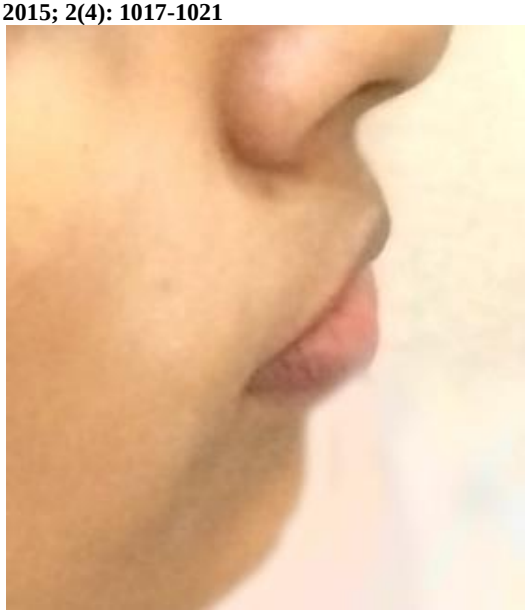

Figure 10