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Research Article

SMILE DESIGNING WITH MINIMAL PREPARATION LITHIUM DISILICATE E-MAX VENEERS -AN AESTHETIC MAKEOVER!

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ABSTRACT

Smile designing is an esthetics enhancing treatment modality, for which a plethora of treatment options are available today, by virtue of the leaps and upsurges of materials advancements witnessed in dentistry in the recent years. One such viable & suitable procedural treatment for management of malaligned anterior teeth, when the patient is reluctant for receiving an orthodontic correction has been explained with the following narrated case report.

Key Words:

Smile designing, Lithium Disilicate,
E-Max Veneers.

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INTRODUCTION

“Beauty lies in the eyes of the beholder”.

There is no denying the fact that today we live in a beauty conscious society; wherein one's cosmetic & esthetic appearance is of paramount concern. In fact it has a direct bearing on one's social health, because a glowing glistening attractive smile is often equated with confident, exuberant personality that allows an individual to enjoy a healthy social life.

Esthetic dentistry has come a long way today. In the recent times, there has been a colossal increase in awareness & acceptance for metal free breeds of ceramics restorations, owing to their far more superior esthetics & durable longevity, in comparison to conventional feldspathic porcelains. Furthermore the minimally invasive, conservative crown preparations & acid etching mediated enhanced adhesive retention of IPS Empress pressable E-Max Veneers^[1] have popularized their clinical applications in contemporary prosthodontics, esthetically high demanding cases.

Case Report

A 26 years old female reported to a dental clinic with presenting complaints of being unhappy and dissatisfied with

spaces prevalent in her upper and lower front teeth. She revealed that she had spaces in her anteriors, ever since their eruption, that resorted to her social embarrassment and her restrained herself from smiling and laughter in public places. No contributory medical history was elicited. On detailed intraoral examination, it was noted that there 1 mm midline diastema between the central incisors, and distal to maxillary right lateral incisor. Furthermore, 2mm of spaces persisted bilaterally, distally to both mandibular central incisors that augmented in patient's unaesthetic concerns.

The possible treatment modalities for closure of these spaces were mutually discussed with the patient, with the primary insistence being harped upon the orthodontic space closure, however the patient was reluctant for it, due to time constraints, as she had an unavoidable social event to attend, round the corner. Hence the next best suitable & viable treatment option that was chosen for this patient, was conservative and minimally invasive teeth preparations for metal free breed of Lithium disilicate reinforced pressable IPS Impress E-Max Veneers for teeth 13 12 11 21 22 23 and 31 32 41 42.

Treatment Plan

Teeth preparation for E-Max Veneers is extremely precise and equally technique sensitive, that requires adherence to stern procedural accuracies^[2].

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Figure 1 Pre Operative frontal view



Figure 2 Pre Operative Occlusal view – Maxillary arch



Figure 3 Pre Operative Smile



Figure 4 Diagnostic Wax Mock up

planing was carried out to eliminate the subgingival flecks of calculi and render the gingivae healthier & inflammation free for subsequent course of treatment. Diagnostic impressions were also made after scaling and the patient was relieved. In the subsequent seating, the diagnostic casts so obtained were utilized for mock teeth preparations and wax mock up, so as to precisely estimate the amount of enamel reductions required for E-Max laminates. Also it enabled the patient to pre visualize the final esthetic outcome of the treatment. Hence it supplemented as an educating & motivating tool for the patient.



Teeth preparation with gingival cord retraction & putty wash impression



Figure 5 Teeth preparations for E-Max Veneers & Putty Wash final Impressions after double cord gingival retraction



Figure 6 Finished polished individual veneers seated & verified for marginal seatings on master cast.



Figure 7 Post operative frontal view after cementation of veneers

The treatment plan for this patient was executed step wise with successive clinical visits. In the first visit, scaling & root

To commence with the teeth preparations, depth guiding grooves were created on the facial surfaces of each of the tooth with 0.5mm three wheel diamond depth cutter bur on the gingival, middle and incisal halves. The islands of enamel prevailing between these depth orientation grooves were removed with a round ended tapered diamond bur. The objective was to obtain a heavy chamfer finish line slightly subgingivally in the maxillary and mandibular anterior teeth, excluding the mandibular canines, which were spared off. For the proximal enamel preparations, distally it was extended till the contact area, and terminated slightly behind it, thereby accomplishing a “splice through” type of preparation.

An overlapped 3mm incisal edge preparation was opted for it enables an optimal vertical stop, that aids in the correct seating of the veneer while leuting. The finish lines were refined further with yellow round ended burs, and placed 1mm away from centric contacts. The veneers extended slightly onto the lingual surfaces which aided in enhanced mechanical retention and increased the surface areas for bonding.

Shade matching was carried out using the 3-D Master (Vita) shade guide in conjunction with digital photography. For fabrication of definitive restorations, a double-cord retraction technique was used for gingival deflection



Figure 8 Rehabilitated left & right post operative frontal views



Figure 9 Group function occlusal scheme verified & interferences eliminated

(no. 00 and no. 0, Ultrapak, Ultradent, for compression and deflection respectively) and polyvinyl siloxane (Affinis Precious, Coltene/Whaledent) dual step putty wash impression technique was used for making final impressions. Provisionalization was carried out using bis-acryl restorations (Protemp 4, 3M ESPE), that were held in place for optimum function and aesthetics till 1 week.



Figure 10 Post operative rehabilitated full blown smile



Figure 11 Smile transition achieved

The IPS e-max monolithic crowns were fabricated with a thickness of 1 to 1.5 mm (IPS e-max Press MT) using the press able ceramic furnace. The patient was called for the Try in verification of the definitive restorations. The individual veneers were wet with tooth colored glycerin (Variolink try-in paste, Ivoclar Vivadent) and verified for the marginal fit, internal adaptation, overall aesthetics and gauge patient's satisfaction.

Veneers Cementation

At the same definitive insertion appointment, the prostheses and teeth were prepared for adhesive cementations. Internal surfaces of the restorations were etched with 5% hydrofluoric acid for 20 seconds and washed with an air water spray and air dried. A silane coupling agent (Monobond Plus, Ivoclar

Vivadent) was then applied to internal surfaces of restoration for 60 seconds and air dried. The prepared teeth (13 to 23 in the maxillary sextant & 31 32 41 42 in the mandibular arch) were etched using 37% Phosphoric Acid (N-etch, IvoclarVivadent) for 15 seconds. After rinsing and air drying, bonding agent (Tetric N Bond, Ivoclar Vivadent) was applied & light cured for 10 seconds. Dual curing luting composite (Variolink N, Transparent low viscosity as catalyst and White A1 as base, IvoclarVivadent) was used for cementation. While handling the crowns in place, crowns were spot cured for 5 seconds initially and excess resin cement was carefully removed. Subsequently a prolonged light curing was performed at facial, incisal, and palatal sides for 90 seconds each (Bluephase, IvoclarVivadent). Following photopolymerization, residual remnants of cement were removed with the help of a sharp ended explorer and flossing was performed at the interproximal areas.

On completion of the cementation procedure (Fig.5, Fig.6, Fig.7) the occlusion was checked in centric and eccentric positions for interferences, as it was aimed to provide for a group function occlusal scheme post rehabilitation. Follow up visits were scheduled at regularly spaced intervals of 1 week, 2 weeks, 1 month and then at every 3 months intervals. So far 3 follow up visits have been accomplished in which the patient expressed her satisfaction with regards to aesthetic and functional competency, without any notable complaint. The restorations have been functioning well for 2 months.

DISCUSSION

The above narrated case report described a viable & suitable procedural treatment for management of malaligned anterior teeth sextants, using metal free Lithium disilicate reinforced IPS "E-Max" All ceramics Veneers [3]. The amount and quality of remaining tooth tissue is a decisive factor when choosing between all-ceramic crowns and veneers, with conservation of as much possible natural enamel being the concern of highest priority. Furthermore, the invention of high strength dentin bonding agents and reliable adhesive resin cements have only catalyzed the acceptance towards bonded breed of porcelains amongst patients [4].

Lithium disilicate ceramics have gained immense popularity for anterior and posterior single crowns and partial coverage restorations because unlike feldspathic or leucite reinforced ceramic system, they have higher flexural strengths (360-400 MPa) and can be used where bonding is limited [5]. They have excellent translucency and respond better chromatically to small thicknesses than does leucite glass-ceramic in cases with discolored abutment teeth [6].

Despite following all precautions, because of the delicate nature of porcelain veneers, a possible post-operative complication is cracking. Although glass ceramics exhibit lower mechanical strength than oxide ceramics, the fracture resistance has been shown to increase with resin cementation [7]. An adhesive technique utilizing dual cure resin cement was used to bond the restorations is a minimally invasive approach for replacement of lost tooth tissue.

CONCLUSION

The quest for the ideal material of choice of prosthesis satisfying both functional durability and esthetic harmony is a never ending one, and will hence will keep improving with unraveling of newer inventions of material sciences; however, it would not be entirely wrong to say, that for now IPS "E-Max" based prostheses is the go to option for present clinicians when it comes to fulfilling the esthetic demands of highest strata in patients today!

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