

Prep Less for the best – A case report on thinners

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Abstract:

Porcelain laminate veneers (PLVs) enhance the patients smile in a minimally to virtually non-invasive manner. Today, we are moving towards minimally invasive dentistry with the philosophy that Less is More. Less tooth reduction means more adhesion and clinical longevity. Modern material and adhesive techniques have innovated dentistry towards aesthetic restoration which are truly invisible to the patient. Purpose of this case report is to achieve superior aesthetic rehabilitation by utilising minimally invasive methods.

Key-words: Minimal Invasive Dentistry, Digital aesthetic Rehabilitation, Thinners, Smile Designing, Adhesive Restorations

Introduction: .

With rapid increase in patient's need for aesthetic correction of anterior teeth and advances in technology of bonding porcelain to enamel, porcelain veneers are now seen as a modern aesthetic solution to aesthetic rehabilitation.¹

Direct composite restoration when used as an alternate therapy have several disadvantages such as marginal, incisal edge fractures and discoloration. Therefore, composite veneers require frequent replacement.² Porcelain veneers when bonded with proper adhesive technique and proper maintenance of oral hygiene have proven to confirm excellent durability and success of the restoration.³

Case selection plays key role in material selection and tooth preparation to improve function and aesthetics.⁴ Materials indicated include sintered feldspathic porcelain and pressable ceramic which can also be milled using computer-aided manufacturing technique.⁵

The following is a detailed case report, including recent advances in material and minimal tooth preparation to attain highly aesthetic results.

Case History:

Case Presentation

A 23-year-old young male patient reported to the Department of Prosthodontics, at D.Y Patil University, School of Dentistry, Nerul, Navi Mumbai

The patient complained of fractured anterior tooth 21, which had been restored with composite restoration. The patient also complained about improper size and colour of the tooth. The Patient requested for a more aesthetic and permanent solution for the same.

A comprehensive examination was conducted including caries detection, periodontal probing, intraoral soft tissue and extraoral TMJ examination. Intra oral examination revealed fractured 21 with unesthetic composite build-up

Intra oral and extraoral pictures were taken for aesthetic evaluation of the patients smile.

(Fig 1a, Fig 1b)

Smile line and gingival zeniths were assessed according to Facial and dental analysis of the patient. A treatment plan according to patients' esthetics was proposed to the patient, which involved lamination of 6 anterior teeth due to disproportion in shape and size along with gingival recontouring. However, patient agreed only for lamination of tooth with composite chip off and the neighbouring tooth for a more harmonious smile.

As per clinical situation, it was decided to make IPS Emax press Ceramic thinners with respect to 11 and 21. These thinners have the advantage of preserving most of the natural tooth structure while achieving all the cosmetic aids. They can be prepared as thin as 0.3mm.

CLINICAL EVALUATION AND MOCK UP TRANSFER

Oral prophylaxis using prophylactic paste Aster Prophy (Prime Dental, India) was performed prior to onset of treatment. Using an intraoral scanner, the patients upper and lower arch were scanned.

A digital mock-up was done for 11 and 21 to visualize the outcome. Gingival recontouring was done with respect to 21 to match the zenith of 11 using diode laser Biolase EPIC X.

The mock up was then transferred intraorally using Acrytemp A2 shade (Zhermack, Germany) (Figure 2 a).

The temporaries were modified intraorally using composite resin polishing discs (Sof-lex disk; 3M ESPE, Saint Paul, MN, USA) to give a more harmonious appearance.

PREPARATION

Zenith was altered by periodontal surgery and the mock up was transferred, minimal (0.3 mm) preparation was done through the temporaries, this maintained the preparation within enamel which enabled better bonding. Subgingival margins were prepared (Figure 3 a). A wrap around preparation was done with respect to 21 and a window preparation was achieved with respect to 11 (Figure 3 a).

The preparation was verified using putty index to check labial preparations. (Figure 4 a)

IMPRESSION

The impression was carried out in two steps, with heavy and light addition silicone (Hydrorise, Zhermack, Germany) (Figure 5 a) and sent to dental laboratory for fabrication of IPS e.max Press thinners with respect to 11 and 21.

The following are pictures of thinners sent from dental laboratory on cast. The thinners were measured to be 0.3mm using metal gauge. (Figure 6 a)

CEMENTATION PROTOCOL

Try in of thinner was performed using Variolink N Try in paste (Ivoclar, vivadent) (Figure 7a,7b). to check marginal adaptation, fit and shade. Try in paste is removed with water spray and the restoration dried with water and oil free air

Absolute isolation of patient using Optra dam plus (Ivoclar Vivadent, Germany) was done. The cementation was done using Variolink N which is a dual -/light- curing composite system for the adhesive luting of glass ceramic, lithium disilicate glass ceramic and composite restorations.

Pre-treatment of thinner surface

-Etch with 5% hydrofluoric acid (IPS Ceramic etching gel) for 20 seconds. Its then rinsed thoroughly with water spray and dried with oil free air.

- Monobond -S single component silane coupling agent (Ivoclar Vivadent, Schaan, Liechtenstein) is applied with micro brush to pre-treated surface for 60 seconds and dispersed with strong steam of air

Pre-treatment of tooth surface

- using matrix band or Teflon in proximal regions inhibit proximal tooth etching

- N-Etch (37% phosphoric acid) was applied to prepared enamel and left for 15-30 seconds. All etchant is then vigorously removed using water spray and excess moisture removed.

-Excite F DSC is then applied with micro brush applicator and air dried

- Variolink N Base and Catalyst in shade transparent are mixed in 1:1 ratio on mixing pad for 10 secs and applied on thinner surface, it is then placed on tooth surface with slight pressure and incisal to cervical orientation excess was removed with applicator brush. Apply glycerine gel or liquid strip on margin, It is then tap cured for 5 seconds, excess removed with blade and then completely cured for 60 secs. Occlusion was verified with 100 micron and then 40 micron articulating paper.

Patient was highly satisfied with the aesthetics (Figure 8a ,8b).Instruction to maintain oral hygiene with water flossing were given. Patient did not complain of any postoperative sensitivity or pain on recall appointment after 7 days.

Discussion:

It is the clinician's responsibility to understand the limitations and application of veneers in aesthetic rehabilitation. Aesthetic assessment prior to initiating treatment is critical to achieving the best outcome. Case selection, a comprehensive diagnosis, treatment planning and a proper execution of the treatment plan play a vital role in achievement of desired results.⁶

Use of digital aids make it easier to communicate treatment plan with the patient.⁶

Each ceramic system is unique to its optical properties and thus case specific.⁶

Feldspathic veneers are created by layering glass-based (silicon dioxide) powder and liquid materials. Glass ceramics has improved mechanical properties like increased fracture resistance, resistance to erosion and thermal shock resistance. Increased strength in glassy ceramics is achieved by adding appropriate fillers that are uniformly dispersed throughout the glass, such as aluminum, magnesium, zirconia, leucite, and lithium disilicate.¹

The microstructure is similar to that of powder porcelains; however, pressed ceramics are less porous and can have a higher crystalline content. The ceramics reinforced by lithium disilicate are true glass ceramics, with the crystal content increased to approximately 70% and the crystal size refined to improve flexural strength. For aesthetic veneers, ceramics reinforced by leucite and lithium disilicate are commonly indicated for their optical properties and because they are acid-sensitive.¹

Many studies show that the bond strength of resin cements to dentin is much lower than bonds to enamel. Enamel provides most predictable surface to bond porcelain, which is why maintaining an enamel periphery is essential.⁷

The combination of hydrofluoric acid etching with a silane coupling agent is considered superior for conditioning the intaglio surfaces of the glass ceramic laminate veneers in comparison to other methods

It was even demonstrated that adhesion of resin cements on hydrofluoric acid etched and silanized ceramic had higher bond strength than the same luting cement bonded to enamel.⁸

This combination is stable after long term water strength and thermocycling.⁸

The success of treatment with ceramic veneers can be assured if the dentist follows a defined protocol with each patient.

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FIG 1A INTRA ORAL VEIW OF THE PATIENT

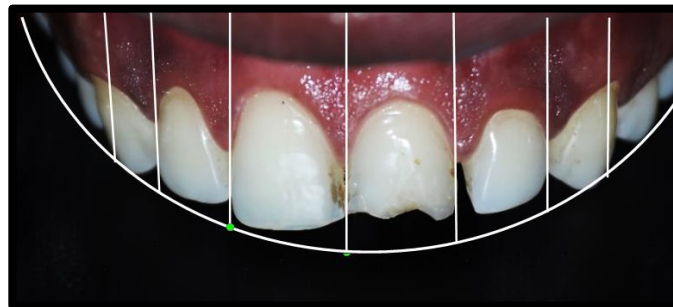


FIG 1B AESTHETIC EVALUATION OF PATIENTS SMILE USING GOLDEN PROPORTION



FIG 2 MOCKUP TRANSEFERED INTRAORALLY AND MODIFIED ACCORDING TO PATIENT AESTHETICS



FIG 3A A wrap around preparation was done with respect to 21 and a window preparation as achieved with respect to 11



FIG 4A PREPARATION VERIFICATION USING PUTTY INDEX



FIG 5A FINAL IMPRESSION USING LIGHT BODY AND PUTTY

FIG 6A The thineers were measured to be 0.3mm using metal gauge



FIG 7A Cementation done using Variolink N dual -/light- curing composite system



FIG 7B THINEER TRY IN



FIG 8A Postoperative intra oral view



FIG 8B Postoperative smile view