

ESTHETIC MANAGEMENT OF DIASTEMATA USING PARTIAL PORCELAIN VENEERS: A CASE REPORT

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ABSTRACT:

Diastemata are common esthetic problem, where the space can occur either as a transient malocclusion or due to developmental, pathological and iatrogenic factors. For the management of diastemata, various esthetic restorative procedures such as composite resin build-up and ceramic veneers are available. The use of composite veneers has limited application due to high wear rates and colour instability. On the other hand, full ceramic veneers have proven color stability and high wear resistance. In the case of all ceramic crowns extensive tooth preparation is mandatory. Advancement of material science with newer technologies recommends conservative tooth preparation in the field of esthetic dentistry. The advent of partial porcelain veneers has not only created a major breakthrough but also added new dimension to esthetic dentistry. This article highlights on the management of generalized spacing of maxillary anterior teeth using partial porcelain veneers, without tooth preparation.

Key words: Diastemata, Partial Porcelain Veneers, Esthetics.

INTRODUCTION:

Restorative dentistry faces new challenges in adopting emerging

technologies related to dental materials and in meeting patient demands for esthetic restorations.^[1] Esthetics, in

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dentistry, is the philosophy that deal with beauty and the beautiful, especially with respect to the appearance of a dental restoration, as achieved through its form and/or color. A normal and healthy dentition is an absolute prerequisite for a pleasing and esthetic appearance. Thus the introduction of esthetic restorative materials contributed to the major breakthrough in modern dentistry. Currently available choices of esthetic material for anterior restorations include direct and indirect resin composite, porcelain/ceramic.^[2]

Adhesive dentistry evolved with the acid etching of enamel. Subsequent development of composite resin restorative material evoked an overwhelming surge in dental care due to the potential for changing smiles without compromising tooth structure. However, this unique conservative approach, which started with bonded resins, exhibited discoloration, fractures, and also was a time consuming procedure.

In the early 1980s, etched porcelain laminate veneer restorations were introduced as a solution to the esthetic deficiencies associated with composite resin. Ceramics offer a colour and translucency close to those of the natural tooth as well as excellent biocompatibility when compared to that of composites. The full porcelain veneer evolved into the partial veneer, involving only a minimal portion of the tooth, a conservative alternative to conventional crown preparation.

Maxillary anterior spacing or diastemata is a common aesthetic complaint of patients and is frequently seen in children especially in the mixed dentition stage. The continuing presence of a diastemata between the maxillary anteriors in adults often is considered an esthetic or malocclusion problem.^[7] Maxillary midline diastema occur in approximately 50% of children between 6-8 years of age but decrease in size and prevalence with age.^[4] For patient who consider a diastema unacceptable, active treatment is available.^[8] However, not all diastemas can be treated the same in terms of modality or timing.

Different treatment modalities for midline diastema include removal of etiology and simple removable appliances incorporating finger springs or split labial bow.^[3] Gleghorn reported a direct composite restoration technique to correct unesthetic diastema.^[4] Munshi reported extraction of mesiodens subsequently followed by the space closure utilising simple fixed orthodontic therapy.^[5] Nakamura reported a ceramic restoration of anterior teeth without proximal reduction.^[6]

This case report highlights fabrication of partial porcelain veneers to correct the anterior spacing without tooth preparation, is an ultra conservative approach – a paradigm shift.

CASE DETAIL:

An 18 year old male patient reported to the Department of Conservative Dentistry and Endodontics with the complaint of

spacing in the upper front teeth (Fig 1). On examination, the amount of spacing present was approximately 2mm between each tooth. The patient had mild gingivitis in relation to the anterior teeth (Fig 2). The patient had no contributing medical history and this was his first dental visit.

The various treatment options for this diastemata closure was discussed with the patient. The choices given to him for correcting the space were (a) orthodontic space closure, (b) direct composite resin restoration (c) Porcelain veneers and (d) Partial Porcelain veneers.

Patient was not willing to undergo orthodontic tooth correction since the time taken for the completion of treatment is too long. Composite restoration was undesirable due to the staining nature, wear, marginal fracture and lack of longevity. Preparation of the tooth for full Porcelain veneers was not elected by the patient. Hence No-tooth preparation technique of diastemata closure with partial coverage veneers was convincing and accepted by patient too.

TREATMENT:

The treatment procedure was carried out in 4 phases.

Phase 1:

Smile analysis, preliminary shade selection, and photographs were taken. Oral prophylaxis was carried out on the same day. Patient was recalled after a week and the study models were prepared. (Fig 3) Using a study cast model, a diagnostic wax-up was fabricated and

the occlusion was evaluated. The study model served to plan the thickness and shape of the ceramic restoration.

Phase 2:

Patient was recalled after one week. No tooth preparation was done. Gingival retraction was done with the retraction cord and the elastomeric impressions were made using polyvinyl – siloxane material.

Shade selection was made with Vita Shade Guide and final impressions were made. The partial Porcelain veneers were processed using heat-pressed ceramic system using the lost-wax technique.

Phase 3:

Ten proximal veneers were fabricated to correct the diastemata, involving the mesial and distal surfaces of central and lateral incisors and only the mesial surface of canines. (Fig 4) Correct fit, form and colour of the veneers were verified both on the master cast and in the patient's mouth. (Fig 5) The teeth were cleaned with slurry of pumice and etched with 37% phosphoric acid for 30 seconds, followed by the application of bonding agent. The luting surface of each slip veneer was treated with 10% hydrofluoric acid followed by two coatings of silane coupling agent. Dual cure resin cement was used for bonding veneers to the etched tooth surfaces and were cemented using Variolink cement. Excess cement was removed and was followed by light curing. Gross finishing done with

ultrafine diamond burs and a carbide bur was used to remove any remaining excess of luting material. For the proximal surfaces, finishing abrasive strips were used and were then checked with unwaxed dental floss. Occlusion was checked in both centric and eccentric positions and adjustments were made.

Phase 4:

Final finishing and polishing was done after 24 hrs, and end-treatment, photographs were taken. Final polishing was performed with a diamond polishing paste. Final photographs were taken and the required post-operative instructions were given to the patient. (Fig 6)

Post-operative instructions were given to the patient concerning oral hygiene relevant to veneers and avoidance of habits such as nail biting which causes trauma to veneered teeth.

The patient was followed up after 3, 6 and 12 months to check the stability of the veneers and periodontal status. Both parameters were good and no abnormality was detected.

DISCUSSION:

The extent and the etiology of the diastemata must be properly evaluated. Due to the potential for multiple etiologies, the diagnosis of diastemata must be based on a thorough medical/dental history, clinical examination and radiographic survey. Diagnostic study models may be necessary for analysis and measurement of the spacing. Veneering the spaced

teeth with porcelain veneers is one possible management option.

The introduction of a stronger, leucite reinforced ceramic system which could be accurately pressed as opposed to the conventional ceramic build up, presents new avenues as a remarkable treatment modality beyond esthetic enhancement.^[3] However, restoration of crowns using ceramic demands removal of excessive tooth structure. It is also reported that, ceramic veneers where only the labial reduction is needed requires 3% to 30% removal of the coronal tooth structure.^[7] In other words, 0.3 to 0.5 mm (in thickness) removal of labial enamel and not extending into dentin, provides excellent retention of these thin ceramic veneers to acid-etched enamel.^[9] Properly made, etched ceramic placed over etched enamel simply does not come off. In cases of accidental breakage or subsequent dental caries, such veneers are extremely difficult to remove and must be cut from the acid etched enamel. The ability to press specific small fragment with an intimacy of fit permitted incisal edge restoration without requiring full veneer or diastemata closure without full labial coverage.

Whenever possible, clinician should avoid placing thick ceramic veneers bonded to deeply cut dentin surfaces to prevent post operative tooth sensitivity and increase the veneers longevity. There are techniques that allow laboratory technicians to make thin ceramic veneers that are beautiful, strong

and long-lasting and that dentists can seat them with confidence over properly acid-etched enamel surfaces. These thin veneers have predictable, long-lasting strength; have life-like esthetic qualities; or associated with almost non-existent post operative tooth sensitivity, and involve minimal trauma to tooth structure.^[10]

If the adherent surface of the ceramic restoration is properly treated by a silane coupling agent, the restoration's adhesive strength to tooth structure can be substantially improved. The concept of partial veneers for the closure of diastemata has gained importance due to the fact that veneers can be applied to the etched surface without any tooth preparation.

CONCLUSION:

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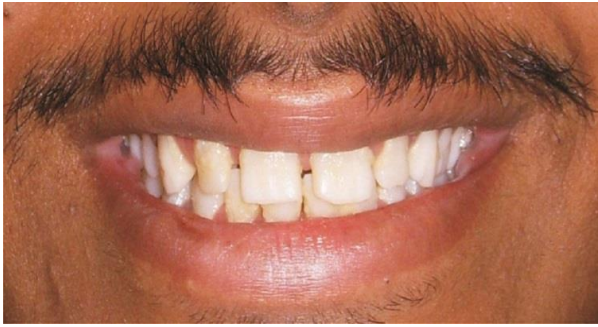


Figure 1

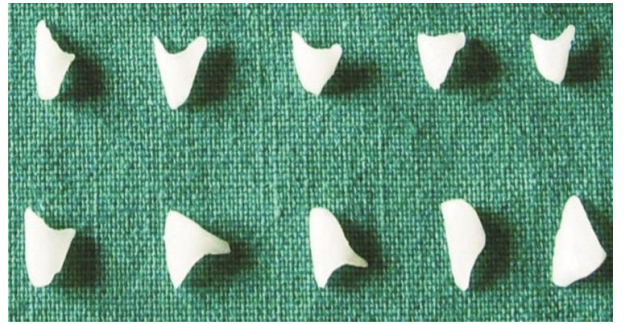


Figure 4



Figure 2



Figure 5



Figure 3

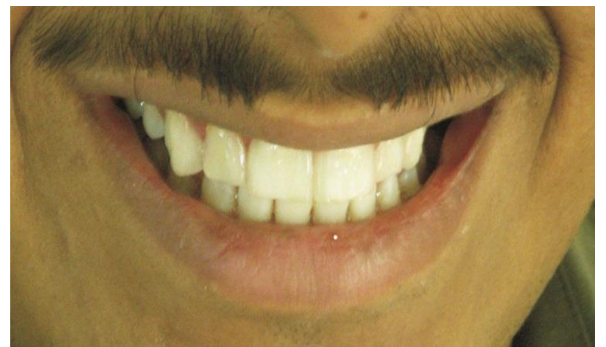


Figure 6