Diestema Closure Using Porcelain Bonded Restoration- A Case Report.

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ABSTRACT

The restorations of anterior teeth with diestema usually present an aesthetic and functional problem. Such defects are usually treated with orthodontic tooth movement, composite resin restoration, full coverage crowns and porcelain veneers. We could save many teeth that were destroyed by over jealous tooth preparation for receiving crowns if veneers were the chosen treatment modality. The purpose of this article is to show how porcelain veneers can change the esthetics of the patient with minimal tooth preparation if properly executed.

Keywords:crown, diestema, orthodontic, porcelain veneers.

INTRODUCTION

The midline diestema is common feature seen in anterior teeth. These diastemas usually distort the pleasing smile by diverting the viewer's attention to these spaces instead of overall composition of facial features.

One of the well-defined indications of porcelain bonded restorations is diestema closure. Veneers can make a dramatic improvement to the appearance in the smile with undersized teeth in an oversized arch.[1] But a difficult esthetic situation arises for a prosthodontist when only one or two anterior teeth are to be restored, an acceptable esthetic result is relatively easy to achieve when all anterior teeth are to be restored because all restored teeth will match each other.[2]

Well controlled bonded porcelain restorations can produce beautiful results, if the guidelines for good smile design and tooth preparation are combined, veneer can look, feel and function like healthy natural teeth.[1]

The purpose of this article is to present a case with midline diestema to show how with careful planning, soft tissue management, preparation design and excellent porcelain work a prosthodontist can not only close diestema but make it appear naturalistic.

CASE REPORT

A 22 years old female patient presented with aesthetic treatment of midline diestema in maxillary anterior teeth. Figure 1&2 show the patients smile before and after treatment. She was very much concerned with the progressive enlargement of diestema and she wanted to get it closed without orthodontic treatment.

Following a detailed clinical examination and digital photography was used to record and evaluate parameters of patient's smile, figure 3. The treatment plan was formulated to close midline diestema between 11 and 21.

Patients concerns could be addressed with porcelain veneers. As the veneers have the advantage of preserving the natural tooth structure while achieving the cosmetic goals.

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It is important for the clinician and the patient to visualize and agree upon the final result prior to commencing the treatment. To accomplish the visualization, mock ups were made to find the fine balance between length, width and position of each tooth to be prepared.

Figure 1: Patient's smile before treatment

Figure 2: patient's closeup after treatment

The relationship between the lips and teeth in functional movement, rest position and phonetics was tested with mock ups. Based on the composite mock ups, a diagnostic wax-up was made and discussed with the patient and laboratory technician. An index in addition silicon putty was made and sent to lab. Tooth reduction began by using a 0.5mm depth cutting bur on the facial wall, starting from the gingival level to the incisal edge. A long tapered chamfer ended diamond bur was used to reduce the facial wall, creating the definitive gingival and inter proximal finish line angles. The chamfer was taken slightly into the interproximal areas to allow the veneers to cover all the visible aspects of the teeth. Here figure 4 shows completed tooth preparation for laminate.

Figure 3: closeup showing midline diestema between 11&21

Figure 4: close-up showing tooth preparation for receiving porcelain laminate veneer

Next step was to make the impressions. Gingival retraction was done using retraction cord and putty wash impressions were made using addition silicone putty and light body. This particular patient was very much esthetic concerned so temporization was imperative.

A vacuum formed shim was made over a stone model made by duplicating a preoperative wax-up of the desired form. The facial surfaces of the prepared teeth were spot etched with 37% phosphoric acid gel for fifteen seconds then rinsed and dried. The vacuum formed shim was filled with micro filled composite resin and placed over the prepared teeth. A curing light was used to harden the composite resin material and the shim was removed from the patient's mouth.

At the laboratory refractory stone models of the prepared teeth were made and two veneers from feldspatic porcelain were fabricated. A major challenge to be encountered at this stage was veneers should not make the appearance of the two central incisors broad or long.

The apparent size of the tooth is identified primarily by reflective surface, that is, the

surface that reflects light back into the eye of the viewer. It does this because that surface is perpendicular to the line of sight and directs the light straight back to the viewer and appears brighter. The deflective surfaces direct the light away from the viewer's eye and cause that part of the surface area to recede. In this case the actual height to width ratio is 1.0:0.9 on the centrals but the reflective surfaces are 1.0:0.7. Controlling light this way makes these central incisors appear narrower than they actually are.

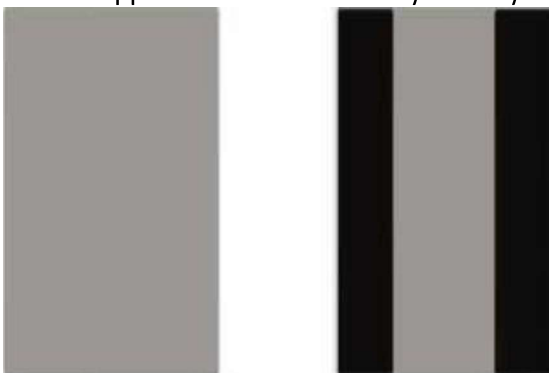

Figure 5: the teeth can be made to look narrower by decreasing the area of the reflective surfaces

Another way to make the rectangle look narrower is to physically take parts away. Rounded incisal angles create an optical illusion that causes the tooth to appear narrower by drawing the eye toward the centre of the tooth. Also, the tooth is actually narrower in the incisal region, which helps to reduce excessive bulkiness. To make the tooth look narrower, the incisal edge has been tapered in to a ratio of 0.7:1.0.

Figure 6: the teeth can be made to look smaller and narrower by tapering the incisal angles towards the tooth and opening the embrasure

The two veneers were tried in using a try in glycerin medium (variolink-try in kit, vivadent) and the most acceptable shade was chosen and veneers were sent to lab for final glazing.

Retraction cord was placed to prevent gingival fluids from contamination the teeth during the bonding process. The teeth were pumiced and rinsed. The prepared surfaces of the teeth were acid etched with 37% phosphoric acid gel and then thoroughly rinsed and left slightly moist for wet bonding procedure. Finally ceramic veneers were bonded to the prepared teeth with self adhesive resin cement (Rely X; 3M). Carbide finishing burs were used to remove excess cured resin at the margins and aluminum oxide polishing strips were used to smoothen these areas. Figure 7 present the two ceramic veneers from facial retracted view after cementation. The patient smile can be seen in the close up view.

Figure 7: after cementation of porcelain laminate venners

Figure 8: Patient's smile after completion of treatment

DISCUSSION

Bonded porcelain veneers have a number of significant advantages over metal-ceramic or all ceramic crowns.[2, 3] One of the most important advantages is that they are extremely conservative in terms of tooth structure. Conservation of tooth structure is a major factor in determining the long term prognosis of a restorative procedure.

Another remarkable advantage of porcelain veneers is their durability. As long as sufficient tooth structure remains to provide adequate support for the bonded porcelain the incidence of fracture is very low. This durability allows minimal reduction resulting in decreased potential pulpal involvement. The periodontal response is outstanding. The restoration can blend imperceptibly with the cervical tooth structure, allowing the cervical margins to be kept in a supragingival position. These cervical margins should be placed in enamel; however, with contemporary dentin bonding systems, margins can be successfully placed on the dentin/cementum when necessary.[4]

Like every procedure in dentistry, the success of porcelain veneers depends upon understanding the principles involved in their fabrication and application. The success of treatment with ceramic veneers can be assured if the dentist follows a defined protocol with each patient to ensure that all factors such as smile design, margin placement , material and shade selection are considered. Communication between patient, dentist and technician must be rigorously controlled as well.[6] When utilizing anteriorveneers the current evidence suggests that when all of these factors are thoroughly considered, prosthodontist can achieve predictable results which are satisfactory to their patients.[7]

The patient is often the final judge of restoration in aesthetically driven treatment. If the clinician and patient do not have the same results in mind, there is the possibility that the patient will not approve of the definitive restorations. Thus it is critical to provide sufficient visualization to the patient before finalization.[8, 9]

CONCLUSION

This article describes the treatment of two maxillary anterior teeth with porcelain veneers using a practical approach that allows the dentist and the patient to agree on the appearance of final restorations. Though restoring one or two teeth with ceramic laminate veneer is a difficult task, it can be carried out with a careful treatment planning. Excellent esthetics can be achieved with minimal reduction because of the cover ability of the porcelain used, and the scattering effect of luting agent.

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