Restoration of Permanent Central Incisors with Porcelain Laminate Veneers in a Paediatric Patient: A Clinical Report.

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ABSTRACT

School children often encounter traumatic injuries like a crown fracture. They create serious functional, esthetic and psychological problems. Achievement of promising restoration that preserves its aesthetics and strength is the greatest desire for both children and their parents and is a challenging task for the dentist. The restorative options in these cases usually include composite resin and porcelain laminate veneers. This article describes treatment of a paediatric patient with porcelain laminate veneers for restoring unaesthetic maxillary anterior teeth.

Keywords: Veneer, crown fracture, porcelain, paediatric patient.

INTRODUCTION

Healthy, but unsightly anterior teeth in paediatric patients have long been a problem for practicing dentists and their patients. Many forms of treatment have been devised to alleviate the problems encountered with stained, fractured, and malposed anterior teeth; however, the patient has always found it difficult to obtain an esthetic appearance. This is because dentists are often unwilling to cut or reduce perfectly healthy teeth simply to enhance aesthetics. Also, full coverage procedures have not been advocated as a routine mode of treatment for the anterior teeth of young patients.[1]

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Bonded restorations like composite and ceramics have increased conservative treatments of compromised anterior teeth. Direct composite resin restorations present some advantages, which include conservative approach, easy preparation, excellent aesthetics and cost-effectiveness. Nevertheless, it may not be a proper choice for restoring teeth with extensive structure damage[2] and problems such as material discoloration, fracture, recurrent caries, marginal defects and loss of restoration may be encountered.[3]

In 1975 the first porcelain veneers have been placed after testament of the connection with tooth structures.[4] A veneer is a layer of tooth coloured material that is applied to a tooth for aesthetically restoring localized or generalized defects or intrinsic discolorations.[5] Constructing a veneer (without regard to the material) and bonding it to etched tooth structure is referred to as "laminating" (Faunce FR).[6] The laminate veneer is a conservative alternative to full coverage for improving the appearance of an anterior tooth (Horn HR).[7] Development of Adhesive system has lead to creation of more stabile linkage between bonding surfaces and tooth structures. Indications for utilization of veneers are pretty large. There are evidences for their usage in tooth fractures, diastema, teeth with malformations, change of position, discolorations.[4] Veneers are also indicated in restoration of fractured permanent teeth at children for strength improvement and achievement of satisfied aesthetics.[8]

CASE REPORT

A 14 -year-old female patient was concerned about her smile; clinical examination revealed incisal

edge fractures of upper central incisors with a history of a minor accident a few years ago .[Figure 1 and 2] Electric pulp tests gave positive results so the treatment perspective was completely aesthetic. After a complete radiological [Figure 3] and photographic documentation was collected, Porcelain laminate veneers were selected as the restorative option for both permanent central incisors.

The least invasive preparation with maximal preservation of enamel was performed [Figure 4]. For the incisal edge preparation, incisal lingual wrap design was carried out [Figure 5]. It had three objectives. Firstly to increase resistance to incisal fractures, secondly to distribute the occlusal loads over a wider surface area, and finally to achieve an aesthetic incisal part of the porcelain veneer. An incisal lingual wrap preparation also helps to guide seating of veneers during placement. A light chamfer finish line was created at the level of gingival margin using a round-end diamond bur in a high-speed hand-piece. After placement of retraction cord (#000, Ultradent), the final impression was made using polyvinyl siloxane impression material (3M ESPE) with the two-stage impression technique [Figure 6]. At the end of the session, temporary veneers were made and fixed after spot etching of both central incisors.

Figure 1: Extra oral pre treatment photograph.

Figure 2: Intra oral pre treatment photograph.

Figure 3: IOPA Radiograph of maxillary Central incisors

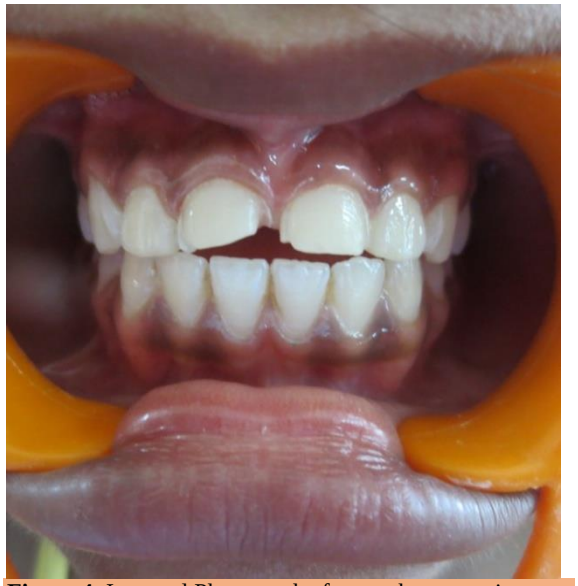

Figure 4: Intraoral Photograph after tooth preparation

Figure 5: Incisal lingual Wrap Ptreaparation

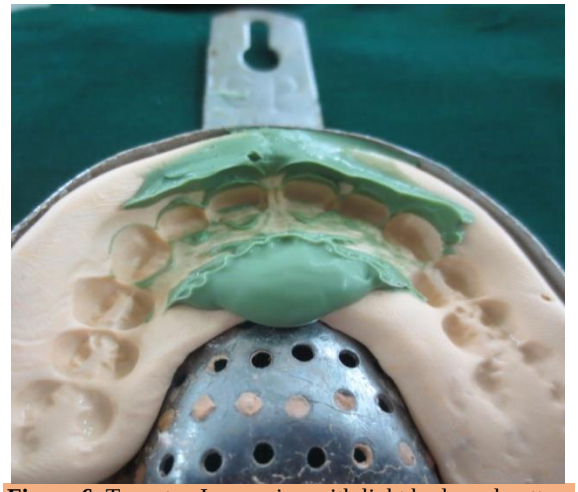

Figure 6: Two step Impression with light body and putty

After one week when the patient returned for placement of the final veneers, a try-in was carried out. The teeth were cleaned with pumice and dried and a transparent try-in paste was applied. The marginal adaptation was checked with a probe. As adaptation was found satisfactory, adhesive cementation was performed. The dental enamel surface and the inner veneer surfaces were etched before luting. The first one was etched with 38% phosphoric acid for 30 seconds , then a universal dental adhesive (Scotchbond Universal, 3M ESPE) was applied using a micro brush. The veneer surface was etched with 10% HF after which a silane coupling agent (ESPE-Sil, 3M ESPE) was used to facilitate the creation of high bond strength to the cement. After application of bonding agent , dual cure resin composite material was used as the luting agent (ParaCore, Colt`ene) and applied to the inner surface of veneers. Restorations were gently seated on their respective teeth preparations and pressure was applied in order to facilitate adaptation and flow of the luting agent. Excess resin cement was carefully removed using a sickle shaped scaler. The entire cementation procedure was performed in two steps: first on left central incisor and then repeated on the right central incisor. After photo polymerization was completed, a number 12 surgical blade and a dental probe were used to remove the residual remnants of cement the margins. Flossing was performed at the interproximal areas to confirm patency at the contact. Finally, occlusal adjustments were done in order to distribute light occlusal contacts on enamel portion of palatal surfaces of two central incisors in maximum intercuspation position and centric relation.

Extraoral views of the postoperative smile enhancement at the follow-up, one week after the cementation procedure, are shown in the figures [Figure 7 and 8]. The final result met the patient's expectations and the obtained gingival health status, along with the resolution of initial esthetic issues and nice integration of indirect restorations, confirmed the success of this anterior dentition rehabilitation.

Figure 7: Post treatment Extroral photographs

Figure 8: Post treatment Extroral photographs

DISCUSSION

The cosmetic improvement of the smile can be done with both direct[9] and indirect techniques[10]; the latter procedures might require more than one appointment but are preferred when multiple teeth are involved in the treatment plan and accurate tooth reshaping or colour matching is needed . Pre - visualization of the final esthetic result is possible only with the indirect techniques and is extremely useful so that desires and preferences related to the new smile can be discussed before carrying out irreversible teeth preparations.[11] .While in the past full-crowns were indicated in similar clinical scenarios, the improvement in adhesive technologies has given way to more conservative treatments. Composite veneers can stand unchanged from 2 upto 13 years in good hygiene and minimal harmful habits.[12] Micro filled

veneers tend to wear with time and lose their gloss . Some resin materials have included small bubbles that can appear on the surface and fill with food or plaque stains.[13]

Porcelain veneers are with best esthetic and mechanical properties and show low fracture degree. However unlike composite veneers they cannot be repaired.[14] Porcelain veneers do not chance their colour with time and have no leakage of water soluble dyes. Marginal adaptation and luting technique pay an important role for the degree and time after which a marginal discoloration will appear.[15] Patient's hygiene is of utmost importance and should be well conveyed to the patient. A disadvantage of porcelain veneers is their high price which is definitely a limitation for many patients**.**

CONCLUSION

Veneering of teeth with compromised aesthetics and function is a conservative method that improves appearance, and can be indicated for young patients with anterior crown fractures. However the long term clinical success of porcelain veneers depends on a careful case selection and diagnostic approach, as well as accurate and appropriate tooth preparation and adhesive bonding procedures.

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