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Aesthetic Rehabilitation of Anterior Teeth Using Composite Resin and Putty Index – A Case Report

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ABSTRACT

In today's world, the majority of the dental treatments that are performed are done with aesthetics as the major concern. Diastema is one of the most common forms of malocclusion. Along with midline diastema, there can be generalized spacing in anterior teeth. Some patients report fractured teeth due to trauma which commonly involves maxillary anteriors in children and adolescents. Correction of multiple diastema without much preparation of the teeth is challenging in clinical esthetic dentistry. It is important to ensure that restorations should restore not only function but also aesthetics. Restoration of palatal surfaces using direct techniques is difficult but can be simplified by using a template. This article presents a case report of esthetic management of spacing in maxillary anterior teeth including midline diastema and fractured incisor with composite resin restoration utilizing the putty index technique.

KEYWORDS: Diastema, Multiple Spacing, Tooth Fracture, Putty Index Technique, Palatal Guide, Custom Template, Composite Resin Restoration

INTRODUCTION

Traumatic dental injuries (TDI) have emerged as a significant public health problem and it is estimated that around a billion people have suffered from Traumatic dental injuries globally. Among the different types of Traumatic dental injuries, the uncomplicated crown fractures of the maxillary permanent central incisors are the most common. Since the anterior teeth form an integral part of an individual's appearance, any fracture or loss affects the self-image and poses a negative impact on social, emotional, and psychological development. Additionally, these uncomplicated crown fractures confined within the enamel and/or dentin can result in sensitivity pain or future pulpal complications and require immediate attention.¹

Diastema is described as a space that is more than 0.5 mm between the teeth. It is the most common form of malocclusion present commonly between the maxillary incisors than the mandibular incisors. In such cases, dark triangles can be observed. Causes for diastema may be an extremely wide dental arch, congenital tooth absence, discrepancies in jaw/tooth size, labial frenum hypertrophy, and high frenal attachments.²

In such cases of spacing in teeth and enamel and/or dentin fractures where a fractured fragment has been lost, the choice of treatment is restoration with light-cured composite resin. Recent advances in direct composite resins give the dental practitioner an advantage to perform direct bonding procedures with minimally invasive procedures on the tooth. Direct composite restoration can be done by the conventional free-hand layering, putty index, or custom template technique. The use of a silicone putty palatal index helps the clinician overcome challenges in anterior composite build-up. It is an imprint of the wax-up through which required information is transferred into the concerned region during restoration.³ Advantages of putty index are that exact palatal contour and form can be obtained, even in large defects.^{4,5} The following case report describes the aesthetic restoration of anterior teeth using the putty index technique.

CASE REPORT

A 28-year-old male patient reported to the Department of Conservative Dentistry and Endodontics, Government Dental College, and Hospital Chh. Sambhaji Nagar, with the chief complaint of multiple spacing in the upper anterior teeth and fractured teeth, desired to get them restored for aesthetic purposes. On clinical examination, diastema was observed in his maxillary anterior region involving the right and left central and lateral incisors. Ellis class II fracture was seen with 21 with normal response to the pulp vitality test. All the treatment options were explained, and he was ready for the closure of spaces with direct composite resin restoration by using the putty index technique.



Pre operative labial view



Pre operative palatal view



Pre operative right lateral view



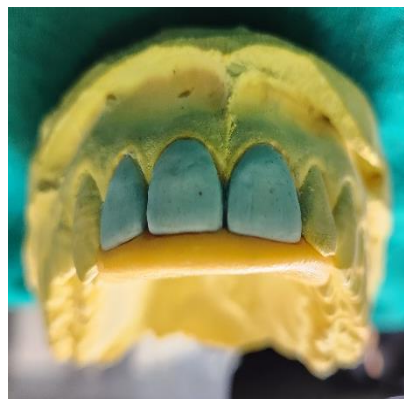
Pre operative left lateral view

At the first appointment, tray selection was done and preliminary impressions of the maxillary and mandibular arches were made using alginate and diagnostic casts were obtained. A diagnostic wax-up up done on the maxillary cast using inlay wax and a palatal putty index of the concerned region was made using additional silicone impression material. Excess material was trimmed using a scalpel. This will later serve as a reference guide and a rigid template to construct the palatal surface of the concerned anterior teeth.



Preliminary impression of maxillary and mandibular arches

Wax build up done with inlay wax



Palatal putty index was prepared

In the next appointment, the putty index was checked for its fit. After proper isolation, standard etching and bonding protocols were followed. Then index was removed and composite material {Omnichroma: single-shaded composite resin} was placed in the palatal portion of the index in a thin layer. Putty index was again placed into the patient's mouth and composite resin cured for 30 seconds. The putty index was then carefully removed, leaving behind a thin rigid layer of composite bonded to the tooth which served as a palatal reference guide for further composite build-up. Finishing and polishing were done using the composite polishing kit (Shofu, Kyoto Japan). He was instructed to brush and floss regularly and minimize intake of tea, coffee, and beverages that may cause staining of restoration. The patient was called for regular follow-up visits within 6 months.



Etching done with 37% phosphoric acid



Application of bonding agent



Palatal shelf build up using putty index



Proximal contact build up using sectional matrix bands.



Finishing and polishing done



Pre operative photograph



Post operative photograph

DISCUSSION

Fracture of teeth in the front region is a tragic experience for young patients creating a psychological impact on both the parents and children. Restoring this lost tooth form presents a challenge to the dentist as the tooth is to be reformed both functionally and esthetically. Various treatment modalities for such cases are available such as composite restoration, fixed prosthesis, re-attachment of the fracture fragment (if available) after post and core, laminated veneers, full-coverage restoration, etc. The choice of treatment depends on the remaining tooth structure, pulpal status, age, socioeconomic status of the patient, etc. In the present case, considering these all factors direct restorative procedure was planned.

Direct anterior composite restorative procedures have gained a lot of popularity in recent years due to their advantages such as immediate aesthetics, minimal invasion, cost-effectiveness, adhesion to tooth structure, and as a chair-side treatment modality.⁵ Freehand layering technique has been more commonly performed in clinical practice in a single appointment however; it is a skill-based procedure with no palatal guide or other reference. The Putty Index Technique on the other hand is done in two appointments, requiring an impression, lab procedures, and the creation of a palatal guide.

The putty index technique used in this case facilitates the reconstruction of the tooth structure by acting as a guide that enables the dentists to construct the shape, size, and inclination of the teeth with the best esthetic outcomes. It helps to reproduce the anatomic contours perfectly thus reducing polishing and finishing procedures, saving time., On the other hand, the conventional 'free hand technique' needs a long chairside time to restore a single tooth, and each restored tooth needs more trimming and polishing. The putty index also serves as a rigid plate that acts as a template to hold the restorative material.

CONCLUSION

The minimally invasive approach used in this case satisfied the patient's demands. Aesthetic dental practitioners have to familiarise themselves with more techniques that can provide more accurate results while taking less chairside time with the patient. One such technique that can be considered the best technique is using a putty index to restore anterior teeth.

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