



Case Report

BIOMIMETIC ESTHETIC REHABILITATION OF ANTERIOR TEETH USING THE PUTTY INDEX TECHNIQUE – A CASE REPORT

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ABSTRACT

Aim and background: Traumatic injuries to the anterior teeth and malocclusion such as midline diastema pose a serious aesthetic problem. Other than aesthetics, it is associated with difficulty in speech, phonetics and also hinders the oral hygiene maintenance. Direct composite restorations using putty index have become increasingly popular in recent years because of the following benefits like immediate aesthetics, minimal invasion and cost effective. **Case report:** A 25-year-old male patient reported to the department with a chief complaint of fractured upper front tooth and spacing between them and desired to get them restored for aesthetic purposes. Clinical examination revealed an uncomplicated crown fracture with 11 and 21 (Ellis class II fracture) involving only enamel and dentin. Spacing was also noted between 11 and 21 (1mm). It was decided to perform a direct composite restoration using putty index. **Conclusion:** This case highlights the aesthetic rehabilitation of fractured anterior teeth and the spacing present between them with direct composite resin material using putty index.

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INTRODUCTION

For many years, functional requirements have been a top priority. However, as the frequency of caries have decreased dramatically in the past few years, people's preferences have shifted towards aesthetic dentistry. When it comes to evaluating the dental aesthetics, maxillary anterior teeth play a significant role as they are typically seen when a person smile.¹

A number of factors contribute to aesthetic dissatisfaction, including trauma to the anterior teeth and diastemas. Simple crown fractures to permanent teeth have a profound impact on speech and function in addition to the patient's look. Contrarily, diastemas are among the most prevalent type of malocclusion which is characterized by dark gaps that are spaced apart from one another and lack a contact region.²

The patient's age, socioeconomic status, and intraoral state can affect the treatment objective. There are several treatment options for management of fractured tooth, including composite restoration, fixed prosthesis, Laminate veneers, reattaching the fractured fragment and using post and core.³ Both Midline diastema and uncomplicated crown fracture can be restored at the same time with Direct composite restoration using putty index. This method provides precise palatal contours for large defects.^{4,5}

In order to restore the form and function of the teeth, this case report outlines a method that utilizes the direct composite

restorative materials to mimic the palatal contour utilizing a custom-made putty index.

CASE REPORT

A 25-year-old male patient reported to the department of Conservative dentistry and Endodontics, Sri Siddhartha dental college and college, with the chief complaint of fractured upper front right tooth and spacing between them and intended to get them restored for aesthetic reason. The patient disclosed a history of trauma that occurred 6 months prior, following a bicycle fall.

Clinical examination revealed an uncomplicated crown fracture with relation 11 and 21 (Ellis class II fracture) involving only enamel and dentin. Additionally, spacing was also observed between 11 and 21 (1mm) (Fig.1). Percussion tests were negative. When the tooth was examined with an electric pulp tester to determine its vitality, it responded normally in comparison to the adjacent and contralateral teeth. On radiographic examination of the affected teeth, there was no discernible periapical pathology visible. A direct composite restoration utilizing the putty index technique was designed according to the findings of all of these evaluations.

In the first appointment, after tray selection, preliminary impressions of the maxillary and mandibular teeth were made using dental alginate from which diagnostic casts were obtained (Fig.2). A diagnostic wax up was done on the maxillary cast using mock-up wax (Fig. 3) and a palatal putty index of the concerned region was created (Fig. 4), and any

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excess material was trimmed using a scalpel. In future this will be used as a reference guide and to rebuild the palatal surface of the fractured teeth. In the next appointment, the putty index was intraorally verified for fit. The choice of shade was made in the presence of natural light. Bevels were then given on the labial aspect of the fractured tooth 11, 21 to remove unsupported enamel margin and to increase the surface area.



Fig.1 Pre – Operative Photograph

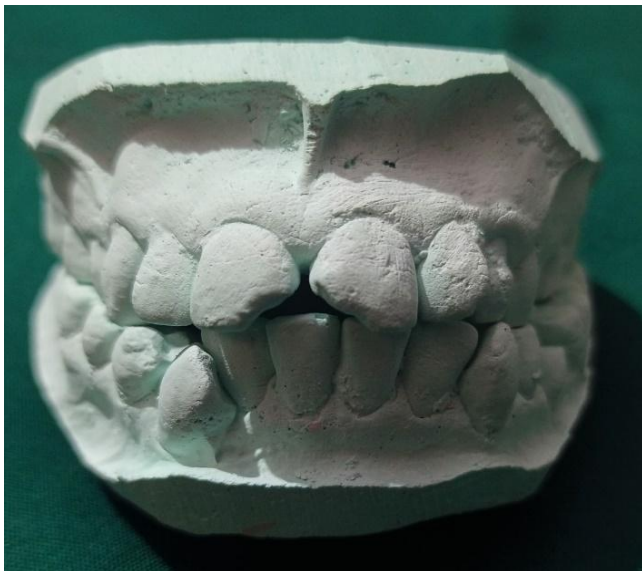


Fig.2 Diagnostic Cast



Fig.3 Diagno Stic wax up to Diagnostic wax up



Fig.4 Palatal Putty Index



Fig.5 Palatal putty index seated in the mouth



Fig.6 Post Operative View

After isolation, standard etching and bonding protocols were followed (Fig.5). The index was removed and composite material (IvoclarvivadentTe- Econom plus, hybrid composite kit) of the selected shade was placed in the palatal portion of 11 and 21 on the index in a thin layer after which it was again placed into the patient's mouth and cured for 30 seconds. After that, the putty index was carefully removed, leaving behind a stiff composite layer attached to the tooth that functioned as a palatal reference guide.

The tooth was restored by incremental layering of composite material. Mylar strips were used to replicate the mesial contours. To accomplish an aesthetically attractive final restoration and diastema closure, finishing and polishing were carried out utilizing composite polishing kit and paste (Shofu Inc. Kyoto Japan, Prime Dental Aster Compo, respectively) (Fig. 6).

DISCUSSION

Trauma to the central incisors is directly visible, so prompt treatment is necessary because postponing it could have serious consequences on the confidence of the patients. Similarly, midline diastema prevents a person from developing social and cultural confidence. Midline diastema is linked to a number of conditions, including peg-shaped laterals, microdontia, missing teeth, and tooth material-arch length disparity. In addition, a number of behaviors (such as thumb sucking and tongue thrusting) as well as midline pathologies (such as cysts, tumors, and odontomes) can result in midline diastema.⁶

There are several treatment options for management of fractured tooth, including composite restoration, fixed prosthesis, Laminate veneers, reattaching the fractured fragment and using post and core. Laminate veneers or full coverage crowns can be taken into consideration for the management of midline diastema. But they compromise the remaining tooth structure and they are non-economical.³ Direct anterior composite restorative procedures have been quite popular in recent years because they are minimally invasive, cost-effective, provides immediate aesthetics, adhesion to tooth structure and a chairside restorative option.^{5,6}

In the case presented here, the patient complained of aesthetic issues due to both uncomplicated crown fracture and diastemas in the anterior tooth region. In order to address the patient's primary concerns, composite resin was selected as the material of choice because it is a conservative option that is esthetically pleasing and inexpensive. In addition, these materials are nonabrasive to the opposing dentition and easy to repair in the event of a fracture.⁷

For direct composite restoration the practitioner must have technical and artistic expertise. The procedure is time-consuming and in addition this method does not always produce expected aesthetic results.⁹ Hence, a reference guide technique using a palatal putty index was used to ensure optimal outcome.

The palatal putty index created from the teeth reconstructed on a model by wax-up makes it possible for the clinician to increase the chance of success by planning the procedure in detail. The entire process can be completed in two quick clinical appointments, reducing the chair time. It holds the restorative material and facilitates its placement into the area that needs to be restored in addition to serving as a matrix for restoring the palatal anatomy of the teeth.⁸

In this case, we considered cotton-roll isolation instead of rubber dam to facilitate better visualization of the facial midline so that it coincides with the teeth. It is hard to adjust the palatal putty index precisely with a rubber dam. After finishing and polishing, the patient was satisfied with the result.

CONCLUSION

When treating traumatized or mal-occluded tooth structure, direct composite restoration is an efficient biomimetic restorative material. As restoring a fractured tooth is a complex procedure, this technique is simple and effective. A clinician with any level of experience can use this systematic approach to attain excellent outcomes.

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