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Dental Science

A CONSERVATIVE APPROACH IN RESTORING FRACTURED ANTERIOR TEETH

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ABSTRACT Anterior teeth are most susceptible to traumatic injuries resulting in fracture. Fracture of anterior teeth is commonly encountered in younger patients. Fractured anterior teeth can have a profound effect on not only the patient's function and esthetics, but also on his/her confidence and social capabilities. The constant developments in the treatment modalities have enabled dental practitioners to manage such cases with utmost precision and successful outcome. This case report describes a conservative approach to restore uncomplicated fractured maxillary anterior teeth with direct composite using a putty index

KEYWORDS : putty index, fracture

INTRODUCTION

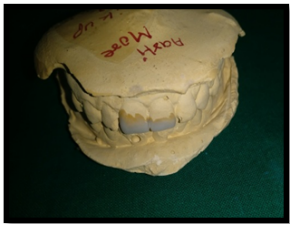
Upper central incisors are the most prone to coronary fractures and constitute one of the most frequent dento-alveolar trauma in the permanent dentition[1] Fractured central incisors are commonly encountered among younger patients due to many reasons such as physical activities, blunt trauma sports etc[2,3] The precise esthetic Class IV composite restoration of fractured incisal edges of maxillary central incisors is a challenging and technique sensitive procedure. Direct composite restoration offers a cheaper alternative to the other expensive treatment modalities. However its success is greatly influenced by the operator's skills and knowledge about the tooth form and esthetics. It is important that not only the anatomy is replicated, also the various shades are placed in accurate thickness and position[4] The operator must achieve the perfect blend of restorative shades to give the most natural, pleasing and esthetic outcome. The use of composite resins for class IV restorations is a procedure that demands the clinician to establish a proper restorative plan for correct execution, combining art and science using a minimal invasive approach that allows more tissue preservation with optimal aesthetic and functional outcome[5] The following case report demonstrates a conservative approach of restoring fractured upper central incisors due to trauma

CASE STUDY

A 32 year old female patient reported to the Department of Conservative dentistry and Endodontics at Y.C.M.M. & R.D.F's Dental college and Hospital, Ahmednagar, Maharashtra with the chief complaint of fractured upper front teeth and with slight sensitivity on having cold water. The patient presented a non contributory medical history. The patient gave a history of trauma due to bike accident that resulted in the fracture of the upper two teeth. Clinical examination revealed Ellis Class II (Uncomplicated) fracture with 11,21 as shown in Fig.1.

Figure 1: Pre operative photograph

Further examination revealed no suspected hard or soft tissue injuries to supporting structures. The tooth was asymptomatic and responded well to Electric pulp tester thereby eliminating the need of endodontic intervention. Radiographic examination confirmed the absence of pulpal or peri-apical pathosis. A restorative plan was carried out and was explained to the patient. Keeping in the mind the extent of fracture, it was decided to restore the fractured teeth using direct composite with a help of a putty index. A 45 degrees bevel was given to remove the unsupported enamel and increase the surface area to improve the bondability of the restoration. Diagnostic impressions of the upper and lower arches were made using fast setting alginate (Tropicalgin Zhermack) The impressions were poured with high strength dental stone to achieve study models. Mock wax up restoring the lost tooth structure was done and was checked for occlusal interferences(fig.2).



After the wax mock up, the cast was duplicated using polyvinyl siloxane putty impression material (Gc Flexceed Putty and Kit) loaded in a perforated tray. Only the region from canine to canine was recorded. The impression obtained was cut into two halves, labial and lingual using a sharp scalpel. The labial half was discarded while the fit of the lingual half was checked intraorally (Fig 3)

Proper shade selection was done using Vita shade guide. The beveled tooth surface was etched using 37% phosphoric acid.(Prime Dental Products) The etchant was rinsed and the tooth was adequately dried to initiate the bonding procedure. 5th Generation bonding agent (3M ESPE Adper Single Bond 2) was applied and cured for 30 seconds. After proper etching and bonding, the putty template was held in position to place the first layer of composite against the rigid support of the template. Shade A2 was used in the mid facial area and was shaped into three lobes of dentin to mimic the natural anatomy. After being light cured the proximal contact areas were restored using shade A1. Use of mylar strips at this point helped to achieve absolute control over proximal contacts and contours. Last increment was again A1 shade used for the remaining entire facial surface and light cured.

After ensuring complete polymerization of the placed composite, finishing and polishing procedures were initiated (Shofu composite polishing kit and discs). Presence of any occlusal interference was completely eliminated. Post operative instructions were given to the patient and was recalled for a follow up after one week

Figure 4: Post operative image

DISCUSSION

Fracture of anterior teeth is a catastrophic experience for young patients as these groups of patients are esthetically conscious for their appearance. Prompt correction of the broken teeth will help to restore patient's confidence and his/her abilty to perform social activities. Direct composite has always remained an economic alternative for restoring lost tooth structure and has proven to yield successful outcomes. Direct composite restorations demand skill, precision, knowledge of tooth anatomy and shade selection[6]. In the case discussed above, we chose to directly restore the fractured fragment as the procedure is minimally invasive and does not require unnecessary sacrifice of the remaining tooth structure for the retention of restoration. Due to the perpetual advances in the field of bonding and adhesives, the approach to conservative dentistry has evolved. Conservation of what remains is given utmost importance than replacement of what has been lost[7].

Advantages of the technique described above are[8],

1) Rigid matrix when used for restoring the palatal surface gives desired contour and length/extension of incisal edge, which in turn can guide and support the labial surface composite build up. And versatility of this technique it can also aid in moisture control for palatal surface.
2) Can be used even in difficult cases like, multiple teeth restorations, crowded teeth, and extensive defect restorations.

Limitations of this technique will be, restorations might require two appointments for patient and training in placing index together in initial stages of usage.

In this particular case, restoring the fracture tooth segment proved to be a challenge mainly due to its extent and for effective shade matching. It was observed that after polishing and finishing, the discoloration remained but did not become an esthetic failure. Lastly, the composite finishing and polishing protocol enabled a highly polished surface and resulted in a satisfied patient.

CONCLUSION:

The predictable esthetic restoration of broken incisal edge of maxillary central incisors is technique sensitive procedure. Its success is dependent on operator's skills and knowledge and also on adhering to a systematic and problem solving approach. The improvement in physical and chemical properties of dental composites has made possible extremely esthetic and long lasting restorations. A clinician with any level of experience can use this systematic approach and achieve great results

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