

A Novel Technique in Restoring Fractured Anterior Teeth

RAJAVARDHAN K.¹, A.J. SAI SANKAR², TANVEER AHMED SHAIK³, NAVEEN KUMAR V.⁴, RAJ KUMAR K.⁵

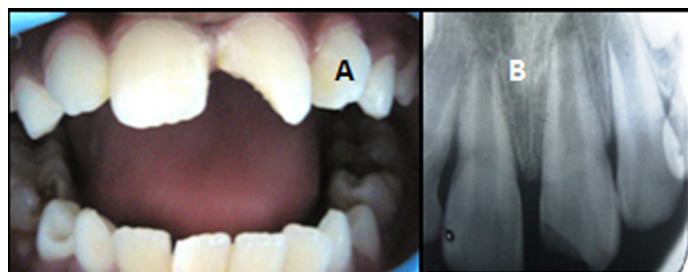
ABSTRACT

Trauma to the anterior teeth is a common phenomenon in young children and in adolescents. Uncomplicated crown fracture to the permanent teeth has an intense effect not only on the patient's appearance, but also on function and speech. This case report describes a novel technique in restoring an uncomplicated fractured maxillary anterior tooth in a young patient with direct composite, which is economical and requires less chair side time.

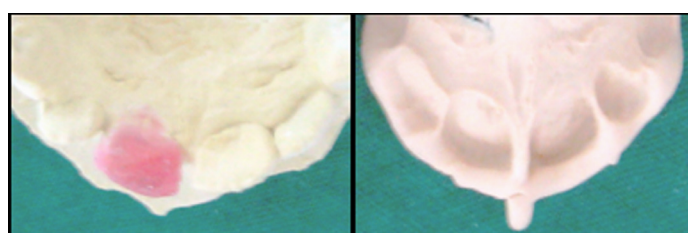
Keywords: Composite restoration, Fractured tooth, Polyvinyl siloxane, Template

CASE REPORT

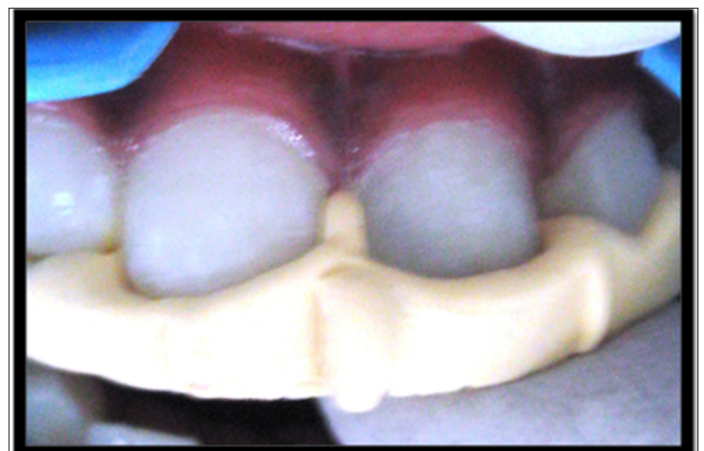
A 10-year-old boy was reported to the Paediatric Dental Department for the treatment of fractured upper front tooth with esthetic concern. Patient gave history of trauma 6 months back due to fall from a bicycle. Clinical examination revealed Ellis class II (uncomplicated) fracture in 21 [Table/Fig-1A]. The tooth was asymptomatic without any associated soft or hard tissue injuries to the supporting tissues and responded to EPT. Intraoral periapical radiograph confirms the absence of pulpal or periapical pathosis [Table/Fig-1B]. So, it was planned to restore the fractured segment using direct composite restoration technique. A 45° bevel was given to remove the unsupported enamel and increase the surface area. Preliminary impression of the upper and lower arches were made using fast setting alginate (Algitex; DPI, Mumbai, India) and dental stone study models were achieved. Mock preparation of the lost tooth structure was done using modelling wax and further checked for occlusal interference. After crown build up, the cast was duplicated by using Polyvinyl siloxane putty impression material (AFFINIS, COLTÈNE ADHESIVE AC) by using a disposable custom tray [Table/Fig-2]. Labial surface of the putty template was removed up to middle third of the crown, to aid in the reconstruction of the lost tooth structure. A clinical try-in of the template was done to ensure adequate fit [Table/Fig-3]. After appropriate shade selection of the composite material, this crown former was used to restore the fractured tooth quickly with minimal post-restoration finishing [Table/Fig-4].



[Table/Fig-1A]: Pre-operative photograph; [Table/Fig-1B]: IOPAR in 21



[Table/Fig-2]: Wax build-up followed by PVS template preparation



[Table/Fig-3]: Trial fit of the template



[Table/Fig-4]: Post-operative photograph

DISCUSSION

Fracture of a permanent incisor is a tragic experience for young patient and creates psychological impact on both the parents and in children that make him target for teasing and ridicule by other children [1,2].

Management of patient's with anterior tooth fracture provides great challenge to the clinicians both from a functional and an esthetic perspective. Treatment objectives may vary depending on the age, socio-economic status of the patient and intraoral status at the time

of treatment planning [3]. There are various treatment modalities for restoration of fractured teeth like composite restoration, fixed prosthesis, reattachment of the fracture fragment (if available) followed by post and core supported restorations [1,4,5]. Common restorative treatments such as laminated veneers or full-coverage restoration may be considered after multiple fragment rebonding/composite resin restorations have been done and this option is no longer functional. They also tend to sacrifice the healthy tooth structure and challenges the clinician to match with the adjacent un-restored teeth [6].

Under esthetic point of view fragment reattachment is one of the best options, provided the tooth fragment is available. However, there are concerns regarding their longevity because of its tendency to fracture/debond [6]. E Stellini et al., [7] found reattachment of coronal fragments didn't restore resistance to fracture to the value of intact teeth and moreover is influenced by the type of composite resin utilized whereas Singhal R found fracture resistance of reattached teeth varied from 24-51% of that for an intact tooth. Even though fixed prosthesis is another option available, extensive tooth preparation compromises the remaining tooth structure leading to greater the risk of mechanical or biological failure [8].

Considering the age of the patient in the present case where the fractured tooth is in its active eruption phase, an esthetic direct composite restoration was planned. Various techniques were considered to restore the tooth with composite restoration which includes direct technique; free hand composite restorations; indirect technique; usage of preformed crowns/ thermoplastic moulds as templates. Even though usage of preformed crowns/thermoformed templates gave good results, there are certain drawbacks like requirement of specialized instruments like vacuum former, availability, time consuming and most importantly proper incremental layering of the composite material is not possible thus in the present case a novel method which includes both direct and indirect method of restoring was designed by using Polyvinyl Siloxane (PVS) Rubber base impression material (putty) as template. This method is simple,

quick and economic when compared to other invasive procedures. The usage of the PVS template allowed incremental layering of the composite material; optimal depth of cure; accurate reproducibility of the anatomic contours and minimal polishing and finishing procedures [3,9,10]. The patient was reviewed after six months for any minimal adjustments to the restoration. However, there are certain concerns regarding the interference of the constituents of PVS with the polymerization of the composite material.

CONCLUSION

As restoring a fractured tooth is a complex procedure, this technique can prove as a simple, effective and appropriate technique that will fulfill all the requirements of dental personnels.

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PARTICULARS OF CONTRIBUTORS:

1. Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Sibar Institute of Dental Sciences, Guntur, Andhra Pradesh, India.
2. Professor, Department of Pedodontics and Preventive Dentistry, Sibar Institute of Dental Sciences, Guntur, Andhra Pradesh, India.
3. Private Dental Practitioner, Guntur, Andhra Pradesh, India.
4. Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Sibar Institute of Dental Sciences, Guntur, Andhra Pradesh, India.
5. Senior Lecturer, Department of Pedodontics and Preventive Dentistry, St. Joseph Dental College and Hospital, Duggirala, Eluru, Andhra Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Rajavardhan K.,
15-11-74, Navabharat Colony Guntur, Andhra Pradesh, India.
Phone: 09985067090, E-mail: vardan.k@gmail.com

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