



Received on 05 March 2020; received in revised form, 18 May 2020; accepted, 24 November 2020; published 01 December 2020

AN AESTHETIC RECONSTRUCTION OF GROSSLY DECAYED PRIMARY ANTERIOR TEETH – A CASE REPORT

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Keywords:

Early childhood caries,
Glass fiber Reinforced composite
Resin, Post and core

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ABSTRACT: Background: Early childhood caries is a rapidly progressing type of dental caries in children. It can lead to partial or complete loss of crown structure. Grossly decayed anterior teeth often lead to discomfort, and the child may face psychological, aesthetic, functional, and phonetic problems that affect the quality of life of the child, and it poses a challenge for the dentist to preserve the teeth until the eruption of succedaneous teeth. **Case Description:** This case report discusses the aesthetic reconstruction of grossly decayed primary maxillary incisors using Glass Fiber- Reinforced Composite Post and Core in a 5-year-old female patient. Placement of intracanal posts in pulpectomy treated teeth improves the retention of a coronal restoration. This technique of Glass Fiber- Reinforced Composite Post and Core restoration has shown promising results in the literature and has presented children's dentist with an alternative treatment option for preserving the grossly decayed primary anterior teeth.

INTRODUCTION: Early childhood caries is one of the most prevalent diseases in children¹. It has been shown to have a multifactorial aetiology, which involves several factors like diet, host, bacteria, time, and personal factors like oral hygiene practices, which leads to the initiation and progression of the lesion². According to the American Academy of Paediatric Dentistry, early childhood caries (ECC) is defined as the presence of one or more decayed (non-cavitated or cavitated), missing (due to caries), or filled tooth (DMFT) surfaces in any primary tooth in a child 71 months of age or younger³.

In extreme cases, ECC can even lead to complete loss of the crown structure. ECC affects the dentition immediately after the eruption of teeth causing early tooth loss, reduced masticatory efficiency, loss of vertical dimension, tongue thrusting, speech problems, malocclusion, space loss, and psychological problems⁴.

Various treatment modalities for the restoration of grossly decayed anterior primary teeth are available and used in the literature, such as placement of anterior stainless steel crowns, ceramic-based crowns, and composite strip crowns. Strip crowns have been preferred and have performed well in spite of their limitations like decreased stability, retention, and marginal adaptation⁵. Restoration of grossly decayed teeth with minimal coronal tooth structure uses the placement of post in the root canal, which provides stability and retention to the reconstructed crown⁶. This case report presents the use of Glass Fiber-Reinforced Composite Post and

<p>QUICK RESPONSE CODE</p> 	<p>DOI: 10.13040/IJPSR.0975-8232.11(12).6514-17</p> <p>The article can be accessed online on www.ijpsr.com</p>
<p>DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.11(12).6514-17</p>	

Core for the aesthetic reconstruction of grossly decayed primary anterior teeth in a 5-year-old female patient.

Case Report: A 5-year-old male child presented to the Department of Paediatric and Preventive Dentistry with the chief complaint of multiple decayed anterior teeth accompanied by pain. And they informed that decayed teeth were getting chipped off. The patient's medical history was non-contributory. One significant finding was the child's diet consists of a high amount of cariogenic substance. Patient's mother gave a history of breastfeeding for 1 year, after which the child was bottle fed for 2 years. Following this, a clinical examination was done, which showed grossly decayed 51, 52, 61, and 62 **Fig. 1**. Radiographically, all anterior maxillary teeth showed caries affecting pulp with a root that has not started resorbing.



FIG. 1: PREOPERATIVE INTRAORAL PHOTOGRAPH OF THE PATIENT

Thus, after assessing the clinical and radiographical condition, it was decided to preserve the teeth by pulpectomy and reconstruct the teeth using Glass Fiber-Reinforced Post and Core. The child's parents were informed about the treatment plan, and the written consent was obtained. Treatment was done in two phases, where phase 1 was pulpectomy of 51, 52, 61, and 62, and stage two was the coronal restoration. Initially, caries was removed with a no. 330 round carbide steel bur. Unsupported enamel was not removed so as to preserve the tooth structure as much as possible. Access opening was done in 51, 52, 61, and 62 followed by working length determination. Biomechanical preparation was done using pediatric rotary files, and they were dried using absorbent paper points. Then obturation was done using Metapex till the apical closure **Fig. 2**. The access opening was sealed by glass ionomer

cement. The patient was scheduled for his final coronal restoration after 1 week for the second phase of treatment. The patient was asymptomatic on the second visit.



FIG. 2: PULPECTOMY TREATED 51, 52, 61 AND 62

For the placement of the post, space was created in these obturated canals of 2-3 mm using thin straight fissure bur with a high-speed handpiece. Next, a trial fit of the post (Glass Fiber Post, 3M, ESPE) was done into the canals to check for proper fitting and proper length, which was then confirmed by taking a radiograph. The teeth were dried and isolated with cotton rolls. Thirty-seven percentage orthophosphoric acid was applied on the root canal walls using applicator tip and etched for 15 sec, washed and dried **Fig. 3**.



FIG. 3: ETCHANT APPLICATION USING 37% ORTHOPHOSPHORIC ACID

The dentin bonding agent was applied using a micro-brush and then gently air-dried to evaporate the solvent and cured. The Glass Fiber-Reinforced Post of predetermined thickness and length was placed to a distance of 3 mm into the canal and 2 mm outside the canal along with luting resin (RELY-X U 200, 3M ESPE) and cured for 40 seconds **Fig. 4**. For the reconstruction of the crown structure, composite resin build-up was done around the post with the help of celluloid strip crowns **Fig. 5**.



FIG. 4: GLASS FIBER- REINFORCED POST PLACEMENT

The excess composite was removed through small holes punched in the palatal surfaces of the crown. After polymerization for the buccal, palatal, and incisal surfaces, the celluloid crown form was removed by the sharp tip of an explorer. Occlusion was checked and finished and polished with carbide finishing burs **Fig. 5**. The patient is under follow-up.



FIG. 5: POSTOPERATIVE INTRAORAL PHOTOGRAPH OF CHILD AFTER PLACEMENT OF STRIP CROWNS

DISCUSSION: In early childhood caries, there is early involvement of pulp and severe destruction of maxillary anterior primary teeth. When most of the coronal tooth structure is lost, the post placed inside the canal after pulpectomy will give good mechanical retention and stability to the reconstructed crown as well as withstand the occlusal masticatory forces ⁷.

Metal posts are also indicated for deciduous teeth but because of their color, they are not aesthetic, and may cause problems during the course of natural exfoliation ⁸. Composite based posts are highly aesthetic but sometimes possesses the risk of fracture due to polymerization shrinkage⁹. Glass Fiber-reinforced composite material has been used in restoring fractured and grossly decayed teeth and for a fixed partial denture and direct-bonded

endodontic posts and cores, orthodontic fixed lingual retainers and the space maintainer ¹⁰. Many varieties of FRC posts have been used recently in the literature for primary teeth, including prefabricated metal posts, customized metal posts like alpha, gamma, omega, half omega, modified anchor stainless steel wire posts ¹¹, polyethylene fiber post, glass fiber post, composite post and biologic post ¹².

Prefabricated posts are easier to use, cheap, and result in shortened treatment duration, but these do not adapt well to the root canal. FRC posts have been used recently as an alternative to prefabricated metal cast posts to restore grossly destroyed primary and permanent teeth. The progress in the technology of fiber-reinforced materials addressing the structure, shape, and optical properties of the posts has led to the development of materials that have overcome some of the limitations of metallic posts concerning the aesthetic appearance, mode of failure, and clinical performance ⁸. Glass Fiber-reinforced composite posts provide good marginal adaptation to the root canal, better bonding, good strength, and low risk of root fracture. The ideal post material should have physical and mechanical properties that are similar to those of dentine.

The properties of fiber-reinforced posts are dependent on the nature of the matrix, fibers, interface strength, and geometry of reinforcement. The advantages of this material over the older fibers are greater flexural strength (1280 MPa) and over 650 MPa of the older fibers, greater ease of handling can be used in high stress-bearing areas and can be bonded to any type of composites. Scanning electron microscopic (SEM) evaluation has shown clearly the formation of a hybrid layer, resin tags, and an adhesive lateral branch. These posts are placed in the cervical one-third of the canals to avoid interference with the process of permanent tooth eruption ¹³.

Such posts together with flowable composite resin, form a firmly attached restoration and minimize the wedging effect of post ¹⁴. When compared to other fibers, they are almost invisible in the resinous matrix. Due to these reasons, they are the most appropriate and the best aesthetic straighteners of composite materials ¹³.

Resin-bonded composite strip crowns are the first choice of many clinicians for the restoration of primary anterior teeth, mainly because of the superior aesthetics and the ease of repair¹⁵. Glass fibers have been shown to adapt well to composite, facilitating crown reconstruction. In the case presented here, the grossly decayed maxillary anterior teeth were restored using Glass Fiber-reinforced composite post and celluloid strip crowns.

CONCLUSION: Restoration of deciduous teeth after pulpectomy is important in pediatric dentistry to preserve the teeth until exfoliation. Post and core treatment followed by composite strip crowns offer an effective approach towards the aesthetic restoration of grossly decayed primary anterior teeth. Coronal restoration using Glass Fiber-Reinforced Post and Core is simple, effective, and presents a promising alternative for reconstruction of grossly decayed and has shown increased success rate and showed excellent aesthetic and functional results.

ACKNOWLEDGEMENT: Authors would like to thank parents for their guidance and support.

CONFLICTS OF INTEREST: The author declares that there is no conflict of interest.

REFERENCES:

1. Meyer F and Enax J: Early Childhood Caries: Epidemiology, Aetiology, and Prevention. *Int J Dent* 2018; 2018: 1415873.
2. Anil S and Anand PS: Early Childhood Caries: Prevalence, Risk Factors, and Prevention. *Front Pediatr* 2017; 5: 157.
3. Logigian JL and Okuji DM: Prevalence of early childhood caries among children at two community health centers in Hawaii: *J Dent & Oral Disord* 2017; 3(5): 1072.

4. Zou J, Meng M, Law CS, Rao Y and Zhou X: Common dental diseases in children and malocclusion: *International Journal of Oral Science* 2018; 10(1): 7.
5. Gugnani N, Pandit IK, Gupta M and Nagpal J: Esthetic rehabilitation of primary anterior teeth using temporization material: a novel approach: *Int J Clin Pediatr Dent* 2017; 10(1): 111-14.
6. Chaudhary S, Rathod AA, Yadav P, Talwar S and Verma M: Restorative management of grossly mutilated molar teeth using endocrown: A novel concept: *J Res Dent* 2016; 4: 97-100.
7. Mittal N, Bhatia HP and Haider K: Methods of intracanal reinforcement in primary anterior teeth-assessing the outcomes through a systematic literature review: *Int J Clin Pediatr Dent* 2015; 8: 48-54.
8. Monticelli F, Grandini S, Goracci C and Ferrari M: Clinical behaviour of translucent-fiber posts: A 2-year prospective study: *International Journal of Prosthodontics* 2003; 16: 593-96.
9. Dacic S, Miljkovic M, Mitic A, Nikolic M, Igic M and Jovanovic M: Reduction of polymerization shrinkage in adhesive restorations. *Acta Facultatis Medicae Naissensis* 2019; 36(4): 334-42.
10. El-Patal MA, Asiry MA, AlShahrani I, El Bayoumy SY, Ahmed Wakwak MA and Mohamed Khalil MA: The effect of fiber-reinforced composite versus band and loop space maintainers on oral *Lactobacillus acidophilus* and *Streptococcus mutans* levels in saliva: *J Indian Soc Pedod Prev Dent* 2018; 36: 301-7.
11. Sharaf AA: The application of fiber core posts in restoring badly destroyed primary incisors: *International Journal of Clinical Pediatric Dentistry* 2002; 26(3): 217-24.
12. Sahana S, Vasa AA and Sekhar R: Aesthetic crowns for primary teeth: A review: *Ann Essences Dent* 2010; 2(2): 87-91.
13. Zarow M, Ramirez-Sebastian A, Paolone G, de Ribot Porta J, Mora J, Espona J, Durán-Sindreu F and Roig M: A new classification system for the restoration of root filled teeth. *Int Endod J* 2018; 51(3): 318-34.
14. Kapoor AK, Thakur S, Singhal P, Chauhan D and Jayam C: Esthetic rehabilitation of severely decayed primary incisors using glass impregnated fiber post as post and core: A treatment option: *Indian J Dent Sci* 2017; 9:198-201.
15. Mittal GK, Verma A, Pahuja H, Agarwal S and Tomar H: Esthetic crowns in pediatric dentistry: a review. *International Journal of Contemporary Medical Research* 2016; 3(5): 1280-82.

How to cite this article:

Subramanyam D: An Aesthetic reconstruction of grossly decayed primary anterior teeth – a case report. *Int J Pharm Sci & Res* 2020; 11(12): 6514-17. doi: 10.13040/IJPSR.0975-8232.11(12).6514-17.

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