

## Paediatric Dentistry

# Esthetic Rehabilitation of severely Mutilated Primary Incisors - A Case Report



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## Abstract

Healthy teeth are indispensable for beautiful smile. ECC is the most common chronic disease which affects children in their early stage of development. This leads to problems like, reduced vertical dimension, masticatory insufficiency, aesthetics, development of parafunctional habits like tongue thrusting and psychological problems. Losing anterior teeth at an early age results in psychological and emotional imbalance in the growth of the child. Restoration of severely damaged anterior teeth is a clinical challenge in paediatric dental clinic. This article presents the clinical sequence of rehabilitation of severely mutilated anterior teeth in a 4-year old child with severe early childhood caries.

### || Key Words

Early Childhood Caries, Rampant Caries, Ribbond.

## || Introduction

The American Academy of Paediatric Dentistry (AAPD) defines early childhood caries (ECC) as "the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger." Early childhood caries is a relatively new term that describes rampant dental caries in infants and toddlers. The decay pattern of ECC is characteristic and pathognomonic of the condition. The prevalence of ECC is 1-12% in developed nations and in India prevalence of 44% has been observed.<sup>[1]</sup>

The aetiology of early childhood caries is multifactorial. The main reasons are prolonged bottle feeding containing sweetened milk, fruit juice, honey dipped pacifier and improper oral hygiene.<sup>[2]</sup> The initial clinical sign of caries is the presence of white demineralised areas in cervical region of anterior teeth.<sup>[3]</sup> If not controlled, the process evolves to the appearance of cavities, which can lead to the destruction of the whole tooth crown and initiate infectious processes because of pulp involvement. ECC initiates on the cervical third of the labial surfaces of the maxillary anterior teeth and concomitantly affects the occlusal surface of the maxillary and mandibular first molars, maxillary and mandibular canines and second molars. At more advanced stages, it also affects the mandibular incisors.

An ideal post and core in primary teeth should be resorbable but provide adequate retention and resistance. One of the factors governing the retention of the restoration is the adaptation of the post and core to the inner dental wall which is, in turn, governed by adhesive and cohesive forces.<sup>[4]</sup>

A variety of materials are used for severely damaged anterior teeth such as metal, biological, pre-fabricated posts, orthodontic wire post, omega loop but recently polyethylene fibres have been used. This article reports a case of a 4-year-old male with severely decayed maxillary anterior teeth that were restored with polyethylene fibres composite resin posts (ribbond) which is a new generation fibre post.

## || Case report

A 4-year-old male patient reported to the department of pedodontics and preventive dentistry with a chief complaint of decayed upper front teeth. The patient's medical history was non-contributory. The patient's

mother gave a history of breast feeding for 1 year after which the child was bottle fed for 3 years. The patient's mother first noticed the discolouration of her child's teeth 1 year back which progressed rapidly. The child developed pus and swelling on his upper front gums since 2 days. Before this he never had any associated problem. Intraoral examination revealed a complete set of deciduous dentition. It was observed that 51,52,54,61,62,63,64,74 were affected by dental caries (fig 1 and fig 2).

Intraoral periapical radiographs revealed pulpal involvement w.r.t 52, 51, 61, and 62 (fig 3). Diet analysis, counselling and oral prophylaxis were done. Indirect pulp capping was done for 64, 74. Pulpectomy was done w.r.t 51, 52, 61, 62 followed by glass fibre-



Fig.1: Preoperative picture (maxillary arch)



Fig.2: Pre operative picture (mandibular arch)



Fig.3: IOPA w.r.t 51,52,61,62

reinforced composite resin posts and composite build-ups were done. Glass ionomer restorations were done w.R.T 54 and 63. The treatment plan was divided into 2 steps for 51, 52,61 and 62.

Step 1. Endodontic phase.

Step 2. Restorative phase.

**Step 1:** the endodontic phase - gross carious lesions were removed with a no. 330 Round carbide steel bur. Intraoral periapical radiographs revealed pulp involvement of 52, 51, 61, and 62. The pulp chamber was opened and biomechanical preparation was done using no.10–35 K-files. After irrigation with copious amount of 2.5% Naocl and normal saline, the root canal was dried using paper points. The canals were obturated with calcium hydroxide and iodoform paste (metapex) using incremental filling technique.(Fig 4).

**Step 2:** restorative phase—for restoring aesthetics the patient was recalled after 1 week and post space was prepared after the endodontic treatment was completed. The post space was created by removing metapex from the coronal 1/3<sup>rd</sup> of the root using a thin straight fissure bur. All visible metapex on the walls of the post space was removed. The prepared post space was then cleaned with saline, air dried and acid etched with 37% phosphoric acid for 15



Fig.4: Obturation wrt 51,52,61,62

seconds. This space was rinsed and air dried with oil-free compressed air. A light-cured bonding agent was brushed on the etched surface and uniformly dispersed by a compressed air blast. It was then light cured for 20 seconds. The polyethylene fibre resin composite post (ribbond) was then cured for 20 seconds in order to gain rigidity, before insertion into the post space. Light cured flowable composite resin was then placed into the canal chamber after which the polyethylene fibre resin composite post (ribbond) was inserted (fig 5,6,7). The fibre post and flowable composite were then cured together for 60 seconds.

The coronal enamel was then etched for 20 seconds, rinsed with water and air dried followed by application of bonding agent which was then light cured. The coronal post was then covered with the flowable composite for core build up, followed by light curing it for 60 seconds, and finally teeth were restored with hybrid composite. The final finishing and polishing was done with finishing burs. Occlusal interferences in both centric and eccentric occlusion were removed (fig 8,9,10,).



Fig.5: Ribbon inserted w.r.t 51,61



Fig.6: Composite build up w.r.t51,61 and ribbon inserted w.r.t 62



Fig.7: Composite build up w.r.t 62 and ribbon placed w.r.t 52



Fig.8: Post operative picture (maxillary arch)



Fig.9: Post operative picture (mandibular arch)

## || Discussion

Aesthetic restoration of primary teeth has long been a special challenge to paediatric dentists. ECC is a diet induced ailment established by early onset and rapid development.<sup>[5]</sup> Severe loss of coronal tooth structure results in unaesthetic smile and compromised masticatory function, which leads the child to have insufficient diet causing retarded general growth and development. For the reconstruction or replacement of primary anterior teeth, it is important to choose materials that have greater strength and have longevity to remain in place prior to the eruption of permanent teeth.

The use of posts after endodontic treatment will give retention, provide stability to the reconstructed crown, and withstand masticatory forces in function.<sup>[6]</sup> There are a variety of posts used in paediatric dentistry. Prefabricated posts are fast, cheap, and easy to use, but they do not take into account the individual shape

of the root canal. Although metal posts are indicated for primary teeth but because of their colour metal post do not meet the aesthetic requirement.<sup>[7]</sup>

Moreover, these may cause problems during the course of natural exfoliation. Composite post provides satisfactory aesthetics; however, there is a risk of loss of retention owing to polymerization shrinkage. The use of omega-shaped stainless orthodontic wire as an intracanal post is a simple and fast technique for reconstruction of primary anterior teeth.<sup>[8]</sup> However, the wire is unable to adequately adapt to the canal form, because it is not the exact copy of the canal. The development of the fibre-reinforced composite technology has brought a new material into the realm of metal free adhesive aesthetic dentistry. Different fibre types such as carbon fibres, kevlar fibres, vectran fibres, and polyethylene fibres have been added to composite materials. Carbon fibres prevent fatigue fracture and strengthen composite materials, but they have a dark colour, which is undesirable aesthetically. Kevlar fibres made of an aromatic polyamide increase the impact strength of composites but are unaesthetic, and, hence, their use is limited. Vectran fibres are synthetic fibres made of aromatic polyesters.<sup>[9]</sup> They show a good resistance to abrasion and impact strength, but they are expensive. Polyethylene fibres

improve the impact strength, modulus of elasticity and flexural strength of composite materials. When compared to other fibres, polyethylene fibres are most invisible in resinous matrix. Due to these reasons they are the most appropriate and best aesthetic strengtheners of composite materials.<sup>[10]</sup>

## || Conclusion

The number of endodontic procedures has increased steadily in the past decade with highly predictable results. Therefore, restoration of teeth after endodontic treatment is becoming an integral part of the restorative practice in dentistry. The treatment described in the case report is simple and effective and represents a promising alternative for rehabilitation of grossly destructed or fractured primary anterior teeth.

This technique of fibre-reinforced composite resin post and core has shown promising results and has presented the paediatric dental world with an additional treatment option. Considering the impact on the quality of life and the possibility to prevent, arrest or even treat ecc, it is of great importance that the dentists, especially paediatric dentists, are capable of diagnosing and treating this pathology, restoring oral health and aesthetics to these children.

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