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*RESEARCH ARTICLE*

# UNVEILING THE POST AND CORE WONDERS IN PRIMARY TEETH-A SERIES OF CASE REPORT

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## Abstract

Pediatric dentists face significant challenges when dealing with the aesthetic concerns of severely damaged primary anterior teeth due to early childhood caries, which is the most common chronic disease among preschool children. The cases presented here involves children under 4 years of age with severely decayed maxillary anterior teeth. Following pulp therapy treatment, various posts including modified omega posts, glass fiber posts, and prefabricated post and core systems were used to reinforce the primary maxillary incisors, followed by composite restoration to rebuild the teeth. This technique provides a straightforward and efficient approach of restoring severely decayed primary anterior teeth, restoring their shape, function, and aesthetics effectively.



## Introduction:-

The most prevalent chronic condition observed since childhood is dental caries, notably early childhood caries (ECC), which manifests as carious lesions in very young children, exhibiting a distinct clinical pattern.[1] ECC progresses rapidly, resulting in the loss of crown structure during early childhood, primarily affecting the maxillary central and lateral incisors, as well as the maxillary and mandibular first primary molars. This deterioration can lead to aesthetic, psychological, and speech impairments.[2]

According to guidelines from the American Academy of Pediatric Dentistry (AAPD), immediate therapeutic intervention is crucial to halt further decay and prevent subsequent health complications.[3]Dental treatment aims to restore lost tooth structure, maintain functional integrity, and prevent psychological stress, which poses a challenge due to children's limited cognitive development during early childhood. Extracting support from the remaining tooth structure, sometimes only root stumps, is necessary to reconstruct the coronal portion of the tooth.[4]

Another significant concern for pediatric dentists is trauma to the primary maxillary anterior teeth, often resulting in severely broken teeth with only root stumps left behind.Complete rehabilitation may be hindered due to parents' inadequate knowledge and awareness of various treatment modalities available in pediatric dentistry.[3] Conservative treatment approaches, such as anterior teeth restoration using glass ionomer cement and composites are viable only when sufficient tooth structure remains. However, restoring primary incisors with extensive carious lesions leading to gross loss of tooth structure remains clinically challenging.[5]

Traditionally, extraction was the primary treatment for extensively damaged primary teeth, leading to issues such asspeech, esthetic problems, and psychosocial impacts and reduced masticatory efficiency. [6]The focus has now

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shifted towards preserving teeth, with various materials and techniques introduced for rehabilitation, including polycarbonate crowns, strip crowns,art glass crowns, veneered stainless steel crown etc which restore the carious teeth with sufficient tooth structure. But in cases where the teeth are severely damaged with loss of crown structure, these materials fail to withstand the occlusal forces.In severely mutilated incisors where there is the involvement of pulpal tissue, pulpectomy has to be carried out and intracanal retention is necessary which allows building a post and core and then cementing an artificial crown .[7]

An ideal post and core for primary teeth should provide adequate retention and resistance without causing radicular fracture or secondary infection. Placement of the post in the coronal third of the root, approximately 3–4 mm, helps prevent obstruction to erupting permanent teeth while enhancing retention and resistance.[2]Various methods and techniques are employed to create coronal build up using different post and core systems.[8]

A series of case reports are presented to create an awareness on anterior teeth rehabilitation in children using different post and core system in primary teeth.

**Case 1**

A 4-year-old child presented to the Department of Pediatric and Preventive Dentistry with severely decayed upper front teeth. The childs behavior was rated as positive according to the Frankel behavior rating scale. Intraoral examination revealed severe damage and loss of coronal tooth structure in teeth 51, 52, 61, and 62, with pulpal involvement(figure 1).Following parental consent, diet analysis, counselling, and oral prophylaxis were conducted.

Pulpectomy procedures were performed on teeth 51, 52, 61, and 62 using Metapex obturating paste. A custom-made half omega-shaped post[4] was created using 0.9 mm stainless steel orthodontic wire (no. 130), with serrations made to enhance stability and mechanical retention of the core.Length of the root was 9mm wrt 51,61 and 9mm wrt 52,62. Approximately 5 mm of Metapex was removed from the coronal end of the root canal, and 1 mm of glass ionomer cement (GIC) was placed. The incisal end of the wire was extended 3-4 mm above the radicular aspect to coronal aspect of the teeth.

Once the GIC had set, the canal was etched with 35% phosphoric acid for 20 seconds, followed by the application of a bonding agent, cured for 20 seconds. The free end of the loop was placed in the post space prepared and flowable composite was inserted into the prepared post spaceand light-cured for 40 seconds( figure 2).The crown (core) was reconstructed using composite material, and finishing and polishing was performed using Soflexdisc after occlusion checks(figure 3).

**Case 2**

A 4-year-old patient presented at Department of Pediatric and Preventive dentistry with complaint of dental pain in the anterior maxillary teeth, prompting their parents to seek treatment to alleviate the discomfort and restore the aesthetic appearance. Upon examination, severe destruction of the anterior maxillary teeth was observed, with retained roots noted in relation to tooth 52 and dental caries in teeth 51, 61 and 62 (figure 4).

The dentist opted to perform pulpectomy for teeth 52, along with the placement of a fiber post for tooth . Labial and palatal infiltration anesthesia was administered for teeth 52, and a pulpectomy procedure was conducted using Metapex obturating paste and temporary restoration was placed.The patient returned for a follow-up appointment after one week to proceed with the fiber post placement procedure for tooth 52.

Preparation of the fiber post space involved removing 4-5 mm of obturating paste from the canal and cleansing the area with saline, followed by drying with air. The spaces designated for the post was acid-etched, rinsed, and dried, after which a light-cured bonding agent was applied to the etched surfaces. Flowable composites was then inserted into the post space before introducing the fiber post, and later both components were light-cured for 40 seconds.( figure 5)

Subsequently, the coronal area was etched, washed, and bonded using a light-cured adhesive. The crown was reconstructed using composite material wrt 52,composite restoration was done wrt 51,61,62 and finishing and polishing procedures were carried out using Soflexdisc after occlusion checks (figure 6).

**Case 3**

A 3-year-old male patient presented at the Department of Pediatric and Preventive Dentistry with a chief complaint of loss of tooth structure in the upper front teeth. The child's behavior was assessed as definitely negative based on the Frankel behavior rating scale. The patient's mother reported a history of breastfeeding for one year, followed by bottle feeding with sugary milk for two years, during which the child often fell asleep with the bottle in his mouth. Intraoral examination revealed a complete set of deciduous dentition, with root stumps noted in relation to teeth 51, 52, 61, and 62. Intraoral periapical radiographs confirmed pulp involvement in these teeth (figure 7).

The treatment plan commenced with initial diet analysis, counselling, and oral prophylaxis. Teeth 51, 52, 61, and 62 were scheduled for pulpectomy, followed by the placement of self-fabricated glass fiber posts with composite cores. The treatment plan was divided into two phases for teeth 51, 52, 61, and 62: Phase 1 - the endodontic phase, and Phase 2 - the construction of aesthetics.

Since the child was uncooperative, a self-fabricated glass fiber posts with composite core crownwas constructed.For the fabrication of the core portion of the post-core, mold of primary dentition was used (figure 8).

Preparation of the fiber post space involved removing 4-5 mm of obturating paste from the canal and cleaning the area with saline, followed by air drying. The designated spaces for the posts were then acid-etched, rinsed, and dried, after which a light-cured bonding agent was applied to the etched surfaces. Flowable composites were inserted into the post spaces before introducing the self-fabricated glass fiber post with composite core crown. Both components were light-cured for 40 seconds. As the crown was prefabricated, no additional reconstruction was necessary(figure 9).

**Case 4**

A 3-year-old female patient presented at the Department of Pediatric and Preventive Dentistry with a chief complaint of loss of tooth structure in the upper front teeth. The child's behavior was assessed as definitely negative based on the Frankel behavior rating scale. The patient's mother reported a history of fracture with respect to anterior front tooth, since the child keeps falling. Intraoral examination revealed a complete set of deciduous dentition, with Ellis class IX fracture wrt 52,51,61,62. Intraoral periapical radiographs confirmed pulp involvement wrt 62 and fracture involving dentin wrt 51,52,61(figure 10).

The treatment plan commenced with initial diet analysis, counselling, and oral prophylaxis and composite restoration of teeth wrt 51, 52, 61. Pulpectomy was scheduled wrt 62, followed by the placement of self-fabricated glass fiber post with composite core. Pulpectomy was performed wrt 62 and placement of self-fabricated glass fiber post with composite core(figure 11).

## Discussion:-

Restoring the esthetic appearance of primary anterior teeth presents a significant challenge for pediatric dentists, impacted by factors such as small crown size, caries pattern, and patient behavior.[1]Successful treatment frequently necessitates a retentive post to support the coronal crown on the treated canal, but selecting the appropriate post can can be challenging. Among available options, omega posts and glass fiber posts have demonstrated favorable retention and esthetic outcomes, withthem being commonly utilized in pediatric dentistry.[3]

Other most commonly used posts such as nickel-chromium cast posts have limitations in meeting esthetic requirements and adapting to canal shapes. Direct resin composite post buildup has also shown insufficient long-term retention. In contrast, omega posts though they have shown limitation in meeting aesthetic concern ,it has the greatest advantage is that the wire does not cause any internal stresses in the root canal and it can be fabricated with minimal chair side time.[4]However it has to be noted that, the omega post placed in case 1 had dislodged at 3 month follow up, which was refabricated and upto 6 months follow up it has shown good clinical results.

Similarly glass fiber posts offer superior flexural strength, ease of application and handling, suitable for high-stress areas, esthetic acceptability, and compatibility with composite bonding.[5]A study conducted by Afraa S et al., has shown excellent long-term retention within the canal, making glass fiber posts preferable for primary anterior teeth.[6]

Considering these advantages, a self-fabricated glass fiber post with a composite core was fabricated as presented in case 3 and case 4, particularly for children with definitely negative behavior, as remaking the core and crown would be challenging.[1]

In the present study, good clinical result was seen at 6 months follow up wrt glass fiber post(case 2,3,4).The outcomes of such treatments have resulted in parents expressing high levels of satisfaction, improvements in aesthetics, speech, and most importantly, the preservation of primary teeth until the eruption of permanent ones. This preservation has been achieved without compromising the child's appearance, leading to enhanced psychological well-being.

## Conclusion:-

Enhancing children's aesthetics has become a major concern for both parents and children alike. Improving root canal post selection for treated teeth contributes to successful coronal crown restoration, with promising implications for future treatments of traumatic or carious anterior primary teeth.[8]

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**Annexures:-**

**Figure 1:-** Case 1:Preoperative.

**Figure 2:-** Case 1:Cementation of Omega Post.

**Figure 3:-** Case 1:Postoperative with Composite Build Up.

**Figure 4:-**Case 2:Preoperative.

**Figure 5:-**Case 2:Cementation of Glass Fiber Post.

**Figure 6:-**Case 2:Postoperative with Composite Build Up.

**Figure 7:-** Case 3:Preoperative.

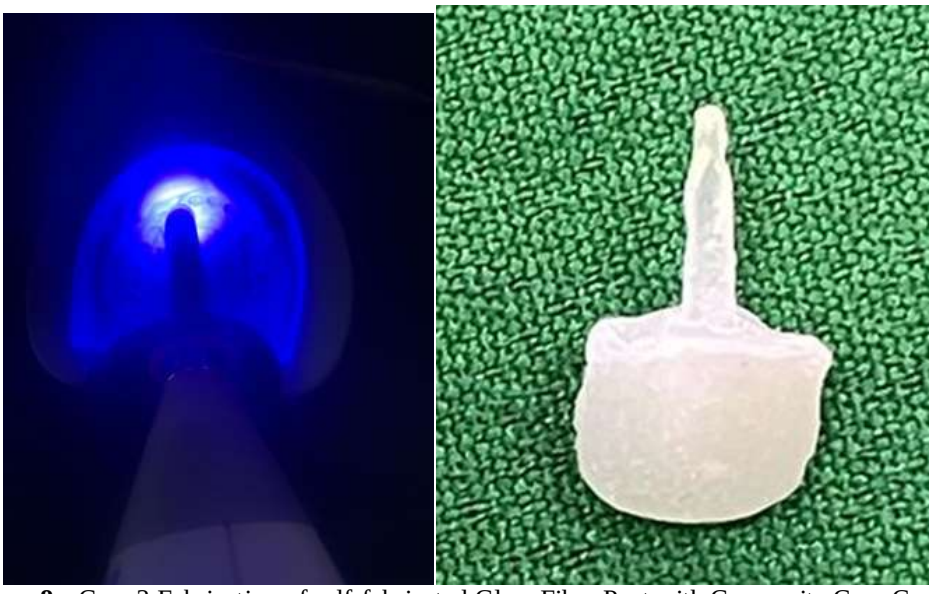

**Figure 8:-** Case 3:Fabrication of self-fabricated Glass Fiber Post with Composite Core Crown.

**Figure 9:-** Case 3:Postoperative.

**Figure 10:-** Case 4:Preoperative.

**Figure 11:-** Case 4:Postoperative.