



ISSN Print: 2394-7489  
ISSN Online: 2394-7497  
IJADS 2018; 4(3): 86-88  
© 2018 IJADS  
www.oraljournal.com  
Received: 15-05-2018  
Accepted: 16-06-2018

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## Rehabilitation of grossly decayed primary anterior teeth using different types of post and core: A case report

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#### Abstract

Rehabilitation of severely mutilated primary anterior teeth poses a special challenge to pediatric dentist. Primary anterior teeth are crucial to the esthetics as well as functional requirements like phonetics, mastication and neuromuscular balance in the child. This paper describes the restoration of severely decayed primary maxillary incisors using various types of posts followed by acrylic crowns in a 4 year old patient. Such a treatment modality restores the lost form and function and provides retention to the coronal restoration.

**Keywords:** Metal posts, omega shaped stainless steel wire posts and recently, fibre core posts, acrylic crowns

#### Introduction

Dental caries is a predominant cause of tooth loss. Early childhood caries (ECC) is a rapidly developing and progressing type of dental caries with distinctive pattern most commonly involving maxillary central incisors, lateral incisors, and the maxillary and mandibular first primary molars [1]. 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 problems [2].

The advent of novel materials like strip crowns, art glass crowns, zirconia crowns etc. effectively restored carious teeth with sufficient tooth structure. But in cases where there is a loss of crown structure, these treatment modalities fail to withstand the occlusal forces.

Hence, the use of an intracanal post in endodontically treated teeth improves the retention for a longer lasting restoration [3]. A variety of materials can be used for this purpose, such as prefabricated metal posts, resin composite, orthodontic wire posts, omega shaped stainless steel wire posts and recently, fibre core posts.

A case of 4-year old child is being presented here who had lost most of the coronal tooth structure of his maxillary anterior teeth due to ECC. The treatment performed was pulpectomy followed by placement of prefabricated metal post, half omega stainless steel wire post and fibre post in canal and core build up using composite resin material and finally restoring with acrylic crowns.

#### Case Report

A 4-year old male patient accompanied by his parents reported to the Department of Pediatric & Preventive Dentistry, PGIDS, Rohtak (Haryana), with the chief complaint of decayed upper front teeth. Patient's medical history was noncontributory. Patient's mother gave a history of breastfeeding for 1 year after which the child was bottle fed (including nighttime bottle feeding) till 3 years of age. On intraoral examination, a complete set of deciduous dentition was observed. 51, 52, 54, 61, 62, 64, 74 and 84 were found to be carious. Intraoral periapical radiographs revealed pulp involvement in relation to all the above mentioned carious teeth. All the primary 1<sup>st</sup> molars were indicated for pulpectomy followed by stainless steel crowns. All maxillary incisors presented with the remaining crown structure of 1 mm above the gingival margin with firm remaining tooth structure. Diet analysis, counseling and oral prophylaxis

were performed. The child’s parents were informed about the treatment plan, its advantage and shortcomings, other treatment alternatives and consequences if treatment was avoided.

The treatment goal was to eradicate infected pulp and restore function and esthetics by reconstruction of tooth architecture. Based on the clinical & radiological examination, the treatment plan was divided into following 2 steps for maxillary incisors:

**Phase I: Restorative & endodontic phase**

Gross carious tooth structure was removed with no. 330 round carbide steel bur. The pulp chamber was opened and working length was determined with a no. 10 K-file and IOPA. The root canals were cleaned with subsequently larger K files followed by copious irrigation using 0.5% NaOCl and normal saline. The root canals were dried with absorbent paper points and were obturated with metapex which was condensed with endodontic pluggers. The teeth were then sealed with GIC (Ketac Molar, 3M, ESPE, Minnesota, USA) [Figure 1(A)]

**Phase II: Esthetic rehabilitation phase**

During the second appointment, 1 week after the commencement of endodontic treatment, post space was prepared by removing 4 mm (approx.) of met apex using slow moving straight fissure bur followed by post space radiograph [Figure 1(B)]. A 1 mm of GIC was placed to isolate the obturation material. The prepared post space was then cleaned with saline, air dried and etched with 37% phosphoric acid for 15 seconds. The etchant was then rinsed and post space was air dried. A light cure bonding agent was applied on etched surface, uniformly dispersed by compressed air and then light cured for 20 seconds. Prefabricated metal post and reverse metal post of appropriate size were placed in relation to 62 and 61 respectively. Customized half omega metal post and fibre core post were inserted with respect to 51 and 52. All the posts were cemented using flowable light cure composite (Nexcomp Flow, Meta Biomed, Korea) with a curing cycle of 60 seconds and a coronal extension of 2-3 mm [Figure 3(B)]. An IOPA was taken to verify the position of posts. Core build up was then carried out using composite restorative material [Figure 1(C)]. Acrylic crowns were cemented as final restorations [Figure 3(C)]. Post-operative instructions were given and the child was recalled after 3 months.



A. Radiograph showing obturation

B. Preparation of post space

C. Post placement

Fig 1



Fig 2: Post patterns



A. Pre-operative

B. Post Placement

C. Acrylic crowns

Fig 3

## Discussion

Esthetic rehabilitation of primary anterior teeth has long been a challenging task for the pediatric dentist. Restoration of tooth with minimal coronal tooth structure utilizes the intracanal placement of post which provides stability and retention to the reconstructed crown and resistance to masticatory forces. Various types of posts can be used for primary teeth including prefabricated metal posts, customized metal posts like alpha, gamma, omega, half omega, modified anchor stainless steel wire posts <sup>[4]</sup>, polyethylene fibre post, glass fibre post, composite post and biologic post <sup>[5]</sup>.

Prefabricated posts are easier to use, cheap and result in shortened treatment duration, but these do not adapt well to the root canal. Although, metal posts are also meant for primary teeth, they do not provide the optimum esthetics owing to their colour and also create an obstacle during natural exfoliation <sup>[6]</sup>. However, composite posts fulfill the esthetic requirement, but these pose a risk of loss of retention owing to polymerization shrinkage <sup>[7]</sup>. The use of Omega loop as intracanal retainer was introduced by Mortada and King <sup>[8]</sup>. Omega shaped posts adhere mechanically to the dentinal walls. The wire adaptation to the internal walls is inadequate, leading to compromised retention, and radicular fracture due to excessive masticatory forces <sup>[9]</sup>. GFRC provides good adaptation to the root canal, better bonding, good strength and low risk of root fracture. Such posts together with flowable composite form a firmly attached restoration unit and minimize the wedging effect of the post. But the disadvantage is that it is expensive <sup>[10]</sup>. Biological posts and crowns were also tried but have a disadvantage of lack of availability from tooth bank.

## Conclusion

The rehabilitation of primary anterior teeth has become an integral part of pediatric dentistry. Post and core treatment followed by acrylic resin crowns offer an effective approach towards the esthetic restoration of grossly decayed primary anterior teeth. This technique has shown promising outcome and presented a magnificent treatment option to the pediatric dental world.

## Conflict of Interests

The author declares no conflict of interests.

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