

Post-Endodontic Reconstruction of Mutilated Deciduous Anterior Teeth using Different Intracanal Retainers

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ABSTRACT

Rehabilitation of severely decayed primary teeth in case of early childhood caries presents a special challenge to pediatric dentist. Numerous techniques are available to restore coronal structure. However, we have to choose the option which best suits the patient, not only aesthetically but also, functionally, psychologically and financially. The following case report presents the clinical sequence of rehabilitating mutilated primary incisors using different type of metallic posts as intracanal reinforcement.

INTRODUCTION

Early Childhood Caries is the most common disease affecting deciduous dentition.^{1,2} And, by the time, child visits the dentist, most of the coronal portion of the primary incisors would have been lost. Until recently, extraction of the extensively damaged primary teeth was a common treatment option with its inevitable consequences like decreased masticatory efficiency, compromised aesthetics and difficulty in pronouncing consonant and labial sounds. Other implications of premature extracted primary incisors are reduced vertical dimension, development of parafunctional habits (tongue thrusting, mouth breathing) subsequently leading to malocclusion. Moreover, it could interfere with the psychological development of the child.³

With increasing awareness among parents regarding importance of maintaining these teeth in functional state and advent of new materials like strip crowns, acrylic crowns and veneered stainless steel crowns, there has been a paradigm shift towards non extraction treatment modalities.^{4,5,6} But due to loss of major portion of coronal tooth structure and consequently lesser surface for bonding, direct adhesive restorative materials do not always give satisfactory results.⁷ Hence, some retentive components are often required in the post obturation reconstruction to provide durable crown reconstruction. Therefore, intracanal retainers were introduced to impart additional support to the final aesthetic restoration.

Various retentive components used in primary teeth are either prefabricated or customised which can be further categorised into metallic and non-metallic. Prefabricated metal posts include threaded, non-threaded and reverse metal post. Custom made metal posts are alpha, gamma, omega and anchor shaped post. Ceramic, carbon fibre, glass fibre and polyethylene fibre post are some of the prefabricated non-metal post which provide better aesthetics in deciduous teeth. Whereas, composite posts and biologic posts are listed under customised non-metal post. Although, non-metallic posts provide satisfactory aesthetics but deficient retention is a risk owing to polymerisation shrinkage.⁸ The following paper describes the rehabilitation of severely damaged deciduous maxillary incisors using different types of metallic posts as intracanal reinforcements.

CASE REPORT

A four-year old male patient accompanying his parents reported to the department of pediatric and preventive dentistry with the chief complaint of decayed upper front teeth since many months. The child was medically fit. On intraoral examination 52,51,61,62 was found to be grossly decayed (figure 1). Intraoral periapical radiograph revealed good root length of these teeth. Therefore, pulpectomy followed by post and core placement was planned. Detailed explanation of the procedure with possible risks and benefits was provided to the parents and written consent was obtained.



Figure 1:- pre operative clinical view

Pulpectomy was performed in 52,51,61,62 under local anaesthesia and obturation with Metapex (Metabiomed). Thereafter, 4 mm of coronal portion of root canal filling was removed using a small spoon excavator to create space for intracanal post (figure 2). A thin layer of Glass Ionomer Cement was applied over the remaining Metapex to separate obturating material from resin restoration.

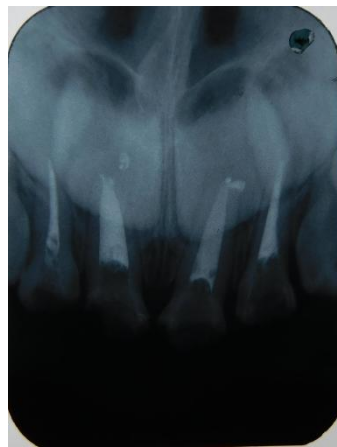


Figure 2:- post space preparation

0.9 mm stainless steel orthodontic wire was bent in question mark shaped post using universal orthodontic plier. Then, post was placed in the prepared root canal of 52 such that its loop projected 2-3 mm above the remaining tooth structure and checked for adaptation and any possible occlusal interference. Before final placement of the post, internal tooth structure was etched with phosphoric acid (37%) for 30 seconds followed by washing and drying with compressed air. Conditioning was done and dual cure resin was used to fill the root canal space. Post was then inserted in it using a pair of tweezers. Resin was then light cured for 40 seconds.

Prefabricated metal post was planned for 51. Short post was chosen and four line angles of quadrangle core were semi-bevelled to avoid stress to the root post was examined in the prepared post space. Then post was placed using reverse metal post insertion technique using dual cure resin cement.

Omega-shaped post was fabricated using 0.9 mm stainless steel orthodontic wire with the help of universal orthodontic plier. This customised post was then cemented in post space of 61 using dual cure resin cement. Short preformed metal post was planned for 62 and it was placed in opposite direction as that of 51 (figure 3).



Figure 3:- metal post placement

After placement of intracanal retainer, core build up was completed with composite using incremental technique. Thereafter, Impression of maxillary anterior region was taken and acrylic crowns were fabricated for individual incisor which were then cemented using luting Glass Ionomer Cement (figure 4). Recall visits at 3 and 6 months have shown satisfactory retention with no marginal discoloration and fracture of teeth.



Figure 4:- post operative view

DISCUSSION

Restoration of badly mutilated teeth in adults as well as in children is a difficult task but somehow this rehabilitation is far more challenging in paediatric patients. Decrease in surface area due to smaller dimensions of the crown and change in the histology of enamel and dentine in primary teeth results in decrease in the bonding thereby increasing the failure rate. For sufficient retention and stability of such reconstructed crowns, use of intracanal retainers after endodontic therapy is needed.

Post and crown for restoring primary anterior teeth was first described by Rifkin.⁹ But it was not widely accepted due to long wire extending into the root interfere with physiologic root resorption. Therefore, pulpal end of the retainer should not extend beyond 3-4 mm into the root canal.

The nickel chromium cast posts require additional laboratory procedures along with posing problems during natural tooth exfoliation.¹⁰ Composite resin posts provide better esthetics, but polymerisation shrinkage is a disadvantage which results in frequent dislodgment of the assembly.¹¹ Prefabricated non-metallic post such as glass fibre, polyethylene fibre post, ceramic posts have been considered as an acceptable treatment option owing to various advantages like good adaptation, enough retention and stability.¹² But, excessive cost, technique sensitivity and longer working time are some limitations which make their use dicey in pediatric population.

In this case report, customised and prefabricated metal posts were used in innovative ways so as to overcome the above said disadvantages to some extent. A simplified and effective technique for rehabilitating severely destroyed deciduous teeth was introduced by Mortada and King.¹³ Following this approach, stainless steel orthodontic wire was customised in form of omega having overall length of 5 mm with 3mm open ends into root canal and remaining projected portion of the loop provided retention to the coronal restoration.

A short prefabricated metal post was used as reverse metal post. The post was inserted upside down so that the 3mm head into the canal and remaining 2 mm of the threaded section was positioned outside the canal as a core for coronal restoration. Beveling of the head portion of the post should be done to reduce the stress concentration at dentinal walls. Another approach used was the modification of orthodontic wire in form of question mark in which serrations were added to increase the surface attachment of restoration thereby increasing the long term prognosis of aesthetic restoration. Prefabricated metal post having 5 mm length was placed in usual manner in one tooth to serve as a control to these newer techniques. In multiple severely destroyed primary anterior teeth, especially in young children, these procedures are easy to perform and economical with good aesthetics and retention outcomes.

CONCLUSION

The choice of type of post and/or technique is based on restorability of the tooth, finances and clinician as well as guardian's preference. Modified intracanal reinforcements and techniques used in this case report demonstrated good retentive and cosmetic results. However, further studies are required to investigate the long term success of these modifications.

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