

Rehabilitating grossly decayed primary anterior teeth: how and why????

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ABSTRACT

Early childhood caries can lead to aesthetically unacceptable dentition with early loss of teeth which can affect a patient psychologically and socially. This trauma can be minimized by rehabilitation of grossly decayed primary anterior teeth with the use of intracanal retainers in the form of endodontic posts. Through this review the various options for retention of restorations in primary anterior teeth are described.

Key Words: Early childhood caries, Primary anterior teeth, Endodontic posts.

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INTRODUCTION

Dental caries is the most common dental disease affected in children and adolescents. According to the American Academy of Pediatric Dentistry, Early Childhood caries is defined “as the presence of one or more decayed, missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger”.¹

The clinical examinations of this disease have a distinctive pattern and the teeth mostly involved are maxillary central incisors, maxillary lateral incisors, and the maxillary and mandibular 1st primary molars. When children develop endodontic disease, the usual question is- Should these teeth be saved or extracted? In the last decade, the treatment option was limited to extraction of the affected teeth which results in loss of vertical dimension, reduced masticatory efficiency, development of parafunctional habits (tongue thrusting, speech problems), esthetic problems such as malocclusion and psychologic problems that can interfere in the personality and behavioral development of the child.² But nowadays, the concern has been shifted towards saving teeth rather than extraction.

Rehabilitation of primary anterior teeth in case of early childhood disease has been a challenge to the pedodontist. In the last few decades, the new materials like polycarbonate crowns, strip crowns, art glass crowns, veneered stainless steel crown etc were introduced 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.³ Thus, post and core systems were introduced which provide retentive features for the successful completion of endodontic therapy.

TYPES OF VARIOUS POSTS

The various posts available for rehabilitation of primary anterior teeth are Nickel chromium cast post with macro retentive elements, Stainless steel wire post, Prefabricated Gold post, Fibre post, Polyethylene fiber post (Ribbond), Composite short post, Ceramic post, Biological post etc.

Nickel Chromium Cast Post with Macro retentive Elements

Nickel chromium cast post is used for the rehabilitation of grossly decayed primary anterior teeth. These posts increase the resistance of the restored teeth to mechanical loading by bonding the intracanal retainer. The nickel–chromium cast posts, which have been utilized, are not only expensive but require an additional laboratory stage due to which numbers of appointments are increased.⁴

Stainless Steel Wire Post

Stainless steel wire post is used in various shapes like Omega shaped stainless steel wire post, alpha shape, gamma shape and question mark shape. These posts are inexpensive, quick, simple and efficient treatment option for severely mutilated primary anterior teeth. The technique of placing omega loops is simple, it involves the placement of an omega shaped stainless steel wire extension 3-4 mm into the entrance of the root canal and the projected portion of the loop is used for retention of the coronal restoration. The advantage of this post is that it does not cause any internal stresses in the root canal as it is incorporated mostly in the restorative material. It can be fabricated with minimal

chair side time.¹ The disadvantage of omega shaped stainless steel wire posts is that it need opaque resin because of inferior optical characteristics.

Prefabricated Gold Post

It is prefabricated metal post with gold plated cross head used to rehabilitate grossly decayed primary anterior teeth. These posts are used in reverse direction with head inside the cervical third of root. The head's line angles of metal post are beveled to reduce the stress at the dentinal walls. The reverse post is cemented into the canal upside down and threaded section is positioned out of the canal as a core for coronal restorations. Due to its quadrangle shape of its head it has good stability and retention but because of its high modulus of elasticity it causes more stress on apices during loading.⁵

Fibre Post

Different fibres such as carbon fibres, glass fibres, kevlar fibres, vectran fibres have been added to composite materials. **Carbon fibre posts** are made of continuous aligned unidirectional carbon fibers, embedded in an epoxy resin matrix. It has modulus of elasticity similar to dentine and is non corrosive and biocompatible in nature. It consists of passive retention slots instead of active cutting threads and is resistant to bending and torsion forces.⁶ The uses of glass fibers were established as an alternative to the dark color of carbon fibre posts with similar physical properties.⁷

Glass Fibre Post consists of glass interlaced filaments with densely packed silanated E glass fibers in a light curing gel matrix. The fibers are 7 to 10 micrometers in diameter and are available in a number of different configurations, including braided, woven, and longitudinal.

The advantages of this material are greater flexural strength (1280MPa), greater ease of handling, can be used in high stress bearing areas and can be bonded to any type of composites.²

Kevlar Fibres post increases the impact strength of composite and is the evolution of nylon polyamide. They are unaesthetic therefore, their use is limited.

Vectran Fibres post is synthetic fibre post made up of aromatic polyesters which is not easily welded. They have good impact strength, but are costly.²

Polyethylene Fiber Post (Ribbond)

Ribbond is anesthetic, translucent, bondable, biocompatible material consisting of ultrahigh-strength polyethylene fibers which disappears within the composite or acrylic. These fibres are highly resistant to stretch and distortion and far exceed the breaking point of fiberglass with absorption of less moisture than the dental resins.

Ribbond has patented leno weave pattern which provides excellent manageability characteristics and distinguishes it from the other fiber reinforcements. Ribbond is designed with lock-stitch feature that effectively transfers forces throughout the weave without stress transfer back into the resin.

Ribbond easily adapts to the contours of the teeth and dental arch. The fibers of Ribbond absorb water because of the "gas-plasma" treatment. This treatment reduces the fibers' superficial tension, ensuring a good chemical bond to composite materials. The impact strength of Ribbond fibres is five times higher than that of iron.⁸

Composite Short Post

Resin composites when used directly or indirectly, are an excellent choice for severely carious teeth due to their adhesive bonding and esthetic appearance. It has an advantage of high retentive strength with modulus of elasticity is same as of dentine and it has both mechanical and micromechanical bonding with tooth.⁹

Ceramic Post

Ceramic post is made up of zirconium oxide ceramic with cylindro-conical design. The advantage of this post includes its inability to stain the tooth structure, its resistance to corrosion, biocompatibility and good esthetics and in addition, the post can be used directly and indirectly using composite core and the heat pressed technique to achieve a ceramic core build up.¹⁰ The disadvantage of this post is that they have poor tensile strengths, they may fracture when subjected to shear stresses, so in order to prevent fractures, these posts are made relatively wide, thus requiring substantial removal of radicular tooth structure.⁷ These posts also have a feature of phase transformation at different temperatures, which causes change in volume and stress, being detrimental to zirconia physical properties. To inhibit these transformations, yttrium oxide is added as stabilizing agent.¹⁰

Biological Post

Biological posts are the natural post and crown which can fit into the treated root stumps and replace the coronal portion esthetically.¹¹ The term biological restoration was introduced to describe the technique that uses adhesive capabilities of material in combination with the strategic placement of parts of extracted human teeth taken from the human tooth bank. The biological restorations have two forms the autogenous and allogeneous. When fractured fragment or tooth is available from the same patient, it is known to be autogenous, whereas when it is available from donated extracted teeth it is allogeneous biological restoration.¹²

The biological post and crown restoration is less expensive and represents a feasible option for strengthening the root canal, as it preserves the internal

dentine wall of root canal, providing greater tooth strength and retention. It has some drawbacks like need for the tooth bank, agreement by donor and recipient of tooth fragment.¹²

CONCLUSION

Dental caries, although not life threatening but causes physical as well as psychological discomfort to pediatric patient. Through this review, the various posts are described for rehabilitation of grossly mutilated primary anterior teeth in children. Each endodontic post carries its own advantages and disadvantages. The selection of a particular procedure depends on the clinician's preferences and patient requirements.

REFERENCES

1. Kumar R, Sinha A. Restoration of primary anterior teeth affected by early childhood caries using modified omega loops- A Case report. *Ann Dent Speciality*. 2014;2(1):24-6.
2. Verma L, Passi S. Glass Fibre Reinforced Composite Post and Core Used in Decayed Primary Anterior Teeth: A Case Report. *Case Report Dent*. 2011:1-4.
3. R Rajesh, Baroudi K, Reddy BK, Praveen BH, Kumar SA. Modified Anchor shaped post core design for primary anterior teeth. *Case Report Dent*. 2014:1-4.
4. Wanderley MT, Ferreira SL, Rodrigues CR, Rodrigues Filho LE. Primary anterior tooth restoration using posts with macroretentive elements. *Quintessence Int*. 1999;30(6):432-6.
5. Eshghi A, Isfahan RK, Khoroushi M: Evaluation of Three Restorative Techniques for Primary Anterior Teeth with Extensive Carious Lesions: A 1-year Clinical Study. *J Dent Child*. 2013;80(2):80-7.
6. Carbon fibre post [Internet]. USA: Morita. Available from <http://www.morita.com/usa/cms/website.php?id=/en/product/s/dental/partner/auxiliaries/cfpost.htm>.
7. Hashim NSA, Moaleem MA, Attas HAA. Tooth Colored Post System: Review of Literature. *Int J Contemp Dent*. 2013;4(1):50-6.
8. Maden EA, Altun C. Use of Polyethylene Fiber (Ribbond) in Pediatric Dentistry. *Arch Clin Exp Surg*. 2012;1(2):110-5.
9. Memarpour M, Shafei F, Abbaszadeh M. Retentive strength of different intracanal posts in restorations of anterior primary teeth: an *in vitro* study. *Restor Dent Endod*. 2013;38(4):215-21.
10. Nasser SAH, Moaleem MMA, Hussain AAA. Tooth Colored Post System; Review of literature. *Int J Contemp Dent*. 2013;4(1):50-6.
11. Grewal N, Seth R. Comparative *in vivo* evaluation of restoring severely mutilated primary anterior teeth with biological post and crown preparation and reinforced composite restoration. *J Indian Soc Pedod Prevent Dent*. 2008;1(1):42-7.
12. Verma KG, Verma P, Goyal T. Recreation with biological restoration: A root canal reconstruction. *J Health Spec*. 2014;2(1):31-3.