

Use of polyethylene fiber in pediatric esthetics- clinical reports Of two cases

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Abstract:

Aesthetic requirement of severely mutilated primary anterior teeth in the case of early child hood caries has been challenge to pediatric dentist Among restorative treatment option pre fabricated crown, and biological and resin composite restoration either by means of direct or indirect technique are mentioned in the literature.. This article presents two cases of early child hood caries where Reinforcement fibers (poly ethylene fiber) has been used as an intra canal retainer . Polyethylene fibers appear to have best properties in elasticity, translucency, adaptability, tenaciousness, resistance to traction and to impact. Along with ease of application fiber can be used alternative to traditionally used materials in the management of early childhood caries .

Keywords: Early childhood caries, Esthetics, Hybrid Composite, Polyethylene Fiber

Introduction:

There is an old saying “Health is harmony disease discord”. This saying lays a foundation on which beauty rest. Hence healthy oral cavity is primary requisite for beautiful looks. Of all structure in the human body, the oral cavity is most sensitive biological indicator. This oral cavity comes into play and functionally active till the last days on the earth.

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Aesthetic requirement of severely mutilated primary anterior teeth in the case of early childhood caries (Wyne AH 1999, Ripa LW 1998) has been challenge to pediatric dentist. Among restorative treatment option pre fabricated crown, and biological and resin composite restoration either by means of direct or indirect technique are mentioned in the literature. Reinforcement fibers (poly ethylene fibers) were recently introduced and can be used as intra canal retainer associated to resin composite as an alternative option for reconstruction of primary incisors greatly damaged by extensive carious lesion(Rocha Rrachel de Oliveira et.al 2004). More recent approach have used composite alone or in combination with other reinforcement material and the use of fiber set in composite resin resulted in an increase in strength of restoration. (Shuman Ian E 2000)

Case report:

Four year old child showing extensive destruction of maxillary anterior (early childhood caries) had been to the Department of Pedodontics . (FIG-1). After clinical and radiographical examination and after attaining the consent from the parent, endodontic treatment was carried out(FIG-2). After endodontic treatment i.e. pulpectomy cervical third of each tooth was prepared for the placement of an intra canal retainer i.e. polyethylene fiber (Ribbond) – with 4 mm thickness. The necessary length of tape for each dental element was achieved by measuring internal length of each prepared root canal using millimeter periodontal probe. The fiber was cut approximately twice the height of future coronary core restoration. Acid etching of root canal was done with 37% of phosphoric acid (FIG-3) and fiber was double inserted in to the canal after it was immersed in the dental adhesives system (scotch bond, 3m) along thin layer of flowable (ESTHETICXFLOW, DENTSPLY) composite (FIG-4)and visible light

curing was done and finally teeth were restored with hybrid composite (FIG-5,6).Similar treatment was carried in a child of four and half years, reported to department of Pedodontics with extensive destruction of primary anterior teeth. Both patients were followed up for six months for retention of restoration.(fig-7,8,9,10,11)

Discussion:

With the introduction of fluorides, though the caries prevalence has decreased substantially, children still continue to present these problems. The caries make take a toll and may result in total destruction of the dental elements in cases like early childhood caries. The oral rehabilitation of these teeth is a great challenge to the pediatric dentistry.

As these carious lesions, presented in the anterior teeth are associated with problems like reduced vertical dimension, masticatory insufficiency, esthetics, development of parafunctional habits like tongue thrusting and psychological problems; it is necessary to restore them⁶. The necessity of re – establishing the integrity of primary teeth until their physiologic exfoliation led to the development of newer techniques and materials.



Fig 1: Photograph showing case of early childhood caries.



Fig 2: Photograph after endodontic treatment with 51,52,61,62



Fig 5: Photograph of final restoration with hybrid composite.



Fig 3: Photograph showing after etching done with 51,52,61,62



Fig 6: Post operative photograph



Fig 4: Photograph of fiber placement



Fig 7 Photograph showing second case with early childhood caries



Fig 10: Photograph of final restoration with hybrid composite.



Fig 8: Placement of fiber



Fig 9: Photograph showing restoration with hybrid composite



Fig 11: Post operative photograph

One of the latest techniques to restore these teeth, as described in this paper is the use of polyethylene fibres (Ribbond) and composite resin. Endodontic treatment associated with the use of intracanal retainers is necessary before building up the coronal restoration. After placement of these intracanal retainers, the remaining coronal tooth structure can be restored with direct or indirect techniques such as celluloid strip crowns, stainless steel crowns, composite resin, porcelain veneers etc. When treating anterior teeth, both esthetics and mechanical resistance to fracture both are obtained to achieve a long lasting result. Ribbond satisfies both the factors along with having adequate translucency, ease of manipulation, decreased chair side time etc.

Polyethylene fibres improve the impact strength, modulus of elasticity and flexural strength of composite materials. When compared to other fibres are almost invisible in resinous matrix. Due to these reasons, they are the most appropriate and the best esthetic strengtheners of composite materials⁸.

The use of this fibre is based on the clinical reports of tooth replacement by Bradenstein and Sperber, Marcus, Millerand Portilla among others⁷. This fibre has been described as being used for perio splints, strengthening removable prosthesis, prosthesis, post and core fabrication, provisional and permanent bridge, denture repairs and as a framework for composite onlays and crowns.

Conclusion :

The treatment described in the two case reports is simple and effective and represents a promising alternative for rehabilitation of grossly destructed or fractured primary anterior teeth. This combined technique of polyethylene fibres and composite resin does provide excellent functional and esthetic results⁶.

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