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FiRe-InCoRad – A NOVEL APPROACH FOR REHABILITATION OF SEVERELY MUTILATED PRIMARY ANTERIOR TEETH

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ABSTRACT Severe Early Childhood Caries progresses rapidly resulting in loss of complete tooth structure. The clinical condition along lack of cooperation from the child demands innovative techniques for rehabilitation of function and esthetics. 4yrs old child with early childhood caries reported with history of pain in the maxillary incisors. Clinical examination showed that maxillary incisors required pulpectomy followed by esthetic crowns. The clinical cooperation span of the child was minimal hence indirect restoration was planned. The case report describes a unique, innovative technique FiRe-InCoRad (Fibre Reinforced Indirect Corono-Radicular restoration) which is a method of indirect corono-radicular restoration.

KEYWORDS :

INTRODUCTION:

Primary teeth serve various functions such as mastication, phonetics, aesthetics, prevention of any deleterious habits and most importantly maintaining the arch integrity till the eruption of permanent teeth thereby contributing significantly to maintaining the quality of life of the child.[1,2]

To prevent the unfavorable outcomes resulting in functional and psychological imbalances it is essential to rehabilitate these teeth. Rehabilitation of these teeth poses an immense challenge especially when there is minimal or no coronal support.[3]

This kind of clinical presentation is commonly seen with Early childhood caries (ECC). The condition is characterized by rapid progression with multi-surface involvement.[4]

The management of early childhood caries should not only focus on alleviation of the pain but also should provide aesthetic and functional architectonics of the crown, re-establishing the occlusion and mastication thereby favoring the growth and development of the dental system. When rehabilitation of these extensively involved teeth is planned, it is essential to depend on radicular support for long-term clinical success.[5]

The restorations with radicular support in the form of posts provide necessary retention and support. They also increase the surface area of the severely mutilated tooth and thereby increasing the resistance to the mechanical load. Various methods and techniques have been used for fabrication of posts. However, the procedure may require elaborate steps and However, the chairside management of the extensively decayed primary teeth with corono radicular restorations requires significant cooperation from the child, as these procedures are technique sensitive. Indirect restorations provide various advantages over the direct methods, which can be particularly adapted in the management of very young children.[6]

This case describes a novel technique of indirect corono radicular restoration with the use of glass fiber reinforced composite which established the esthetics and function in a 4yrs old child with minimal chairside time.

Technique of fabrication of the Indirect restoration:

This technique described here has been referred to as **FiRe-InCoRad (Fi**bre **Re**inforced – **In**direct **Co**rono **Rad**icular Restoration)

This technique of rehabilitation of mutilated deciduous anterior teeth can be performed in young children with pulpectomy-treated teeth with sufficient root length, good periodontal support, good occlusal harmony, and good functional relationship. After completing the procedure of pulpectomy, 4mm of the obturating material should be removed from the coronal reference. Glass ionomer cement button of 1mm is placed over the root canal obturating material.[7]

Since this technique is an indirect approach, impressions are made at this point with putty impression material. The impression should be such that it records the details of the remaining radicular portion. The clinical replica (working model) is then made from the impression (Fig 1)

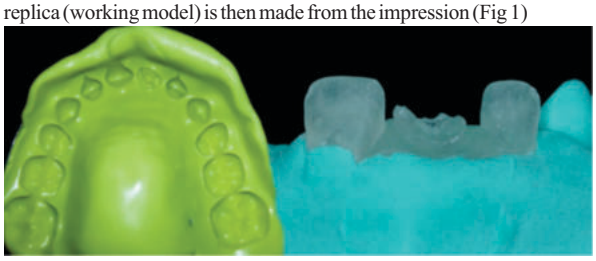

Fig 1: Rubber Base Impression And Clinical Replica

The intracanal post of glass fiber reinforced composite (Everstick) coated with flowable composite (G Aenial flow) is then placed within the canal for a depth of 3mm (Fig 2A & B). This depth ensures that the post provided sufficient support and at the same time does not interfere with the physiologic resorption of the deciduous teeth. The ideal depth for the posts used in deciduous teeth should be such that they are either apical to or at the inter crestal bone level.[8]

Once the post is cured in the radicular space, esthetic rehabilitation of the clinical crown is completed with packable composite of appropriate shade (Fig 3).

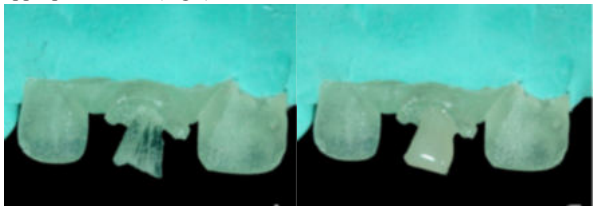

Fig 2: Placing Of The Everstick Coated With Flowable Composite Within The Canal

Fig 3: Complete Coronal Rehabilitation Of Crown

Once cured the indirect corono-radicular restoration cab be detached easily from the model and will have good conformity to the tooth for which it has been prepared. It can now be transferred clinically to be cemented to the tooth. After the initial try-in, the assembly can be cemented to the tooth with flowable composites (Fig 4 A& B).

Fig 4: Placement Of Flowable Composite In The Canal Followed By Cementation Of The Assembly

CASE REPORT:

Based on this technique the rehabilitation of deciduous anterior teeth was done in the 4 years old child with early childhood caries. The presented to the dental clinic with pain in the upper anterior teeth region. The child exhibited Frankl's behaviour rating 2 with reluctance to accept treatment, uncooperativeness, some evidence of negative attitude but not pronounced and very minimal chairside attention. The parents complained of difficulty in speech and were of high esthetic demand. Pulpectomy of all maxillary incisors was planned followed by esthetic crowns. However, there the remaining tooth structure was not sufficient enough to support any esthetic crown build up. More over any procedures that are technique sensitive would have a poor prognosis as the child's chair side time was too minimal. Hence rehabilitation was planned with an indirect technique (FiRe-InCoRad technique). Glass fiber reinforced composite was used in this case as glass fiber presented with various advantages. The use of this material was minimally invasive with minimum chairside as well as laboratory time. The elasticity of the material was also equal to that of dentin and fracture resistance was higher in the glass fibre reinforced composite. [9]

The steps involved in the technique were followed and the clinical case was performed. The esthetic outcome was excellent and there was immense patient satisfaction. Patient cooperation was good as there was minimal chairside time.

DISCUSSION:

Early childhood caries often present with clinical scenario requiring innovative treatment approaches as rehabilitation of severely mutilated teeth in very young children is often challenging. Various materials and techniques have been reported that may assist in the rehabilitation of severe cases. [10]

However, these approaches do not overcome the disadvantages of lack of child's cooperation. The technique described in the article provides a technique of indirect post with crown as a single assembly. FiRe-In Co Rad technique reduced the chairside time significantly and improved the longevity of the restoration. Glass fiber reinforced composite was used to provide corono radicular support due to the various advantages of this material over the other existing options. Glass fiber reinforcements are made of silanated glass fibers in thermoplastic polymer and light curing resin matrix. The interpenetrating polymer network (IPN) provides excellent bonding between fibers and composite. These properties lead to clinically enhanced applications that are excellent handing properties and fracture resistance. [11,12]

An additional property of Fiber reinforced composite is that the IPN structure can be reactivated again after final polymerization. This property is of particular benefit for the indirect restorations. [13]

They also have an additional property of translucency which makes it easier to adapt to the tooth color or to the shades of the restorative materials. [14]

All these properties of the glass fiber reinforced composite make it convenient to be used as a post material, thereby providing excellent resistance to fracture. In addition, the handling properties further contribute toward clinical success.

CONCLUSION:

The various challenges in the rehabilitation of severely mutilated primary teeth can be overcome with the application of a novel technique of indirect post system which has beneficial properties and contributes significantly toward clinical success.

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