

A Novel Technique for Intraradicular Rehabilitation Using Mta and Light Transmitting Fibre Post: A Case Report.

Abstract:

Restoring an endodontically treated teeth may become problematic due to inadequate sound radicular structure. In such cases where apices are flared ,its even more challenging to debride the canal and control the obturating material within the canal. Regarding rehabilitating the radicular structure; cast post have been used since older times. But it resulted in catastrophic root fracture with reduced remaining dentinal thickness, shadowing and graying of root and discoloration at the tooth's gingival margin. Hence This case report presents a clinical case where intraradicular rehabilitation is done using MTA and light transmitting fibre post.

Keywords - Intraradicular rehabilitation, light transmitting fibre post, MTA, flared canal

Introduction:

Intraradicular rehabilitation is a procedure in which the root canals with very little remaining dentin thickness are strengthened by the use of a material that bonds and reinforces the root structure.[1] In such cases where apices are flared, its even more challenging to debride the canal and control the obturating material within the canal. The flared canal, arising as a result of carious extension ,trauma to an immature tooth, pulpal pathosis, iatrogenic or endodontic misadventure, or idiopathic causes ,can present a difficult restorative problem to the practicing dentist.[2] Previously calcium hydroxide was the material of choice to induce calcific barrier. But calcium hydroxide shows certain drawbacks like the length of time, the number of dressings, the role of infection caused in the canal in between the appointments and the fracture resistance of the tooth [3]

MTA has the advantage over calcium hydroxide that it can be done in a single visit procedure. Apexification using MTA has several advantages as it neither gets resorbed nor weakens the root canal dentin and also sets in wet environment [4].The choice of posts has evolved from very rigid material to a material that closely resembles the properties of dentin ,so as to produce a mechanically homogeneous unit and result in

reduction of stresses in the root structure. The use of conventional cast posts would concentrate wedging forces ,further stressing the critically weakened coronal end of the post canal[5]. Teeth restored with intraradicular composite resin restoration have been shown to be [6] 50% more resistance to fracture. Hence such materials were introduced which would bond to the remaining dentin. This case report presents a clinical case where intraradicular rehabilitation is done using MTA and light transmitting fibre post

Case Report:

A 19 year old female patient reported to the Department of Conservative dentistry and Endodontics with the complaint of swelling in upper anterior tooth.History revealed a fall during her childhood. Clinical examination revealed discoloured and

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fractured maxillary left central incisor [fig 1]. Swelling was fluctuant and tender on palpation. Intraoral periapical radiograph[fig 2] revealed irregular radiolucancy over 21 and 11. It also revealed incompletely formed apex as well as thin dentinal walls in apical region in relation to 21.

Emergency access opening of 21 was done and abscess was drained[fig 3]. Cleaning and shaping was done with circumferential filing upto #90K file and calcium hydroxide dressing was placed for disinfection of root canal. On further visits the calcium hydroxide dressing was removed. An apical barrier of 4mm was established using MTA [fig 4].

A moist cotton pellet was placed over the MTA and access cavity was sealed with IRM. Patient was recalled after 24 hours. Tenax fibre trans light transmitting post (Coltene) were used for rehabilitation [fig 5]. Butt end of the fiber post was used in canal to build it with nanohybrid composite [fig 6]. Fiber post along with composite was taken out and cured and it was bonded into the canal using dual cure resin cement [fig 7]. Patient was then recalled after 3 weeks and a further follow up was maintained for 2 months.



Fig 1 : Pre- Operative Clinical Picture



Fig 2: Pre-operative Radiograph Showing Blunder Buss Canal And Thin Radicular Dentin.



Fig 3: Drainage Established on Access Opening



Fig 4 : 4mm Mta –Plug Placed



Fig 5 : Light Transmitting Fibre Post

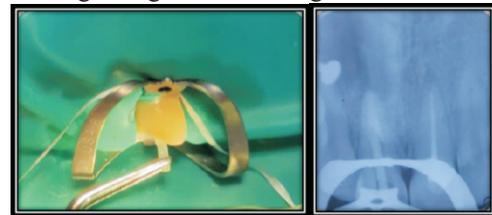


Fig 6 : Butt End Of Fibre Post Placed



Fig 7 : Light Curing Of Cemented Post



Fig 8 : Post-operative Radiograph

Discussion:

Although its challenging to restore a structurally weakened teeth but every effort must be taken to work within the anatomic confines of the particular situation, and to preserve critical and sound tooth structure in the dental arch[7]. During long apexification procedure, the root canal is susceptible to reinfection and the canal is susceptible to fracture during treatment[8]. MTA had been proved to show good sealing ability, good marginal adaptation and a high degree of biocompatibility. The introduction of materials capable of bonding to dentinal structure has created potential for rehabilitation of lost dentinal tissues to salvage severely damaged teeth that would otherwise be extracted. To restore the lost dentin, in 1987, Lui et al. advocated the use of composite resin as a lining of the root canal surface to reinforce the weakened canal walls[2]. Tjan et al. Also found that the retentive value of the composite reinforcement bonded to the root canal wall is significantly higher than that of a custom cast core luted to the root canal wall with zinc phosphate cement.[9] The main advantage of fiber post is the uniform distribution of forces in the root, which results in fewer catastrophic failures than metal posts if adequate ferrule is present. The reinforcement of intra-radicular tooth structure with a material that is compatible with dentin elastically is far better than a dowel [10]. Recently, clear light transmitting fibre posts were introduced to transmit light to polymerize composite resins placed deeply as a dentinal substitute to internally rehabilitate weakened roots. With the availability of low viscosity flowable composites, the packing of the composite into the root canals has become easier and aid in obtaining uniform thickness of the composite all around [fig 8].

Conclusion:

Previously, a tooth with flared canals would be deemed unrestorable and would be advised for extraction. But in recent times with advancements in adhesive techniques and materials restoration of even badly damaged teeth has become possible. Light transmitting post above all has allowed better control of the reinforcing resin during its placement. It also allows complete polymerization within the depths of the root canal. Therefore use of composite resin with a light transmitting post proves to be a conservative, simple and efficient approach for reinforcement of structurally weakened root.

References:

1. Vats AS, Vats A, Kothari P. Case Series of Intracanal Rehabilitation with Light Transmitting Posts. *Dental Journal of Advance Studies*. 2014 Apr;2(01):036-9.
2. Lui JL. Composite resin reinforcement of flared canals using light-transmitting plastic posts. *Quintessence international*. 1994 May 1;25(5).
3. Witherspoon DE, Small JC, Regan JD, Nunn M. Retrospective analysis of open apex teeth obturated with mineral trioxide aggregate. *J Endod*. 2008; 34:1171-6.
4. Komabayashi T, Spångberg LS. Comparative analysis of the particle size and shape of commercially available mineral trioxide aggregates and Portland cement: A study with a flow particle image analyzer. *J Endod*. 2008; 34:94-8.
5. Gade P, Gade HS, Gade N. A novel technique for intraradicular rehabilitation using MTA, fiber post and composite: A case report. *Int J Appl Dent Sci*. 2016;2(1):17-9.
6. Saupe WA. A comparative study of fracture resistance between morphologic dowel and cores and a resin reinforced dowel system in the intraradicular restoration of structurally compromised roots. *Quintessence Int*. 1996; 27:483-91.
7. Gutmann JL. Preparation of endodontically treated teeth to receive a post-core restoration. *J Prosthet Dent* 1977;38:413-419.
8. Apexification: a review. *Dent Traumatol*. 2005; 21:1-8.
9. Tjan AHL, Whang SB. Resistance to root fracture of dowel channels with various thickness of buccal dentin walls. *J Prosthet Dent* 1985;53(4):496-500.
10. Robert Lawley. Evaluation of ultrasonically placed MTA and fracture resistance with intracanal composite resin in a model of apexification. *Journal of Endodontics*. 2004; 30(3):167-172.