Case study

Management of severely decade primary maxillary anterior teeth: A case series

Abstract: The exquisite concern of fiercely mutilated primary deciduous anterior teeth in the case of early childhood caries has always been a venture to pediatric dentist.

Aim: The aim of this case series was to illustrate the different posts and core build in severely damaged primary maxillary anterior teeth. So here we presents the case report series of three different post systems that is omega shaped post, prefabricated metal post, composite resin post followed by using varies esthetic crowns.

Conclusion: The technique which we have described here offers a straightforward and manageable method for restoring severely decayed primary anterior teeth that reinstate shape, function, and esthetics. The patient and their parents were instructed on proper dietary and hygiene habits and advised to come for regular check-up in intervals of 6, 12, and 18 months.

Keywords: Early childhood caries,omega post, prefabricated metal post,composite post.

Introduction: Dental caries is the most common chronic disease of the contemporary, which is primarily preventable. Dental caries occurring in a very young children is known as early childhood caries and is one of the most common chronic diseases in children.[1] According to American Academy of Pediatric Dentistry in the year 3003, 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 almost years of age or younger.[2] The most severely affected teeth are maxillary primary incisors with deep carious lesions with or without pulpal involvement. In some extreme cases, early childhood caries can also cause total loss of the crown structure. Until very recently, the only treatment option for severe coronal destruction in early childhood caries has been the extraction of the affected primary anterior teeth. The reduced vertical dimension, masticatory efficiency, develops various parafunctional habits such as tongue thrusting, esthetic functional problems such as malocclusion, psychological problems, and speech problems that can interfere in the behavioral development and personality of the child are the results of early loss of primary anterior teeth.[2]

in the case of severely decayed teeth, before crown reconstruction, endodontic treatment and placement of some retentive features are necessary.[3] in the last few years the advent of new crowns substances like polycarbonate crowns, art glass crowns, composite crowns, and veneered stainless steel crowns carious teeth with efficient tooth structures are being restored esthetically and successfully. this has made a gradual shift from extraction to non-extraction treatment modalities.[4-7]

CASE PRESENTATION

Case Report-1: A 3 and half years old male patient has reported to the K.D Dental College and Hospital, Mathura in the Department of Pediatric and Preventive Dentistry with a chief complaint of decayed upper front teeth region since 1 year. Patient had no relevant dental and medical history. Both the extra oral and intra oral examination were done. In extra oral examination, no abnormalities were detected while intraoral examination revealed a complete set of primary dentition. It was observed that 54, 52, 51, 61, 62, 64, 74, and 84 were affected by dental caries (Figure 1. a). Intraoral periapical radiographs revealed pulp involvement in respect to 52, 51, 61, and 62. Diet counseling, and oral prophylaxis were done. 54 and 64 were restored with pit and fissure sealent. 74 and 84 were restored with glass ionomer cement. 52, 51, 61, and 62 were grossly decayed & indicated for pulpectomy, followed by omega shaped posts and composite buildups.

Pulpectomy Phase: Access opening were made with respect to 52,51,61,62 under local anesthesia, gross carious lesions were removed with a no. 330 round carbide steel bur. Working length determination were made and the pulp tissue was extirpated using barbed broach files. After irrigation with copious amounts of 2.5%

NaOCl and normal saline, the root canal was dried using paper points. The canal were obtutared with Metapex followed by glass ionomer cement restoration with respect to 52,51,61,62. The Construction of post and core: Omega shaped post was constructed with. 0.9 mm stainless steel orthodontics wire. The pulpal ends extended approximately 3mm into the root canal so as to improve the overall retention of the wire and the incisal end or loop of the wire projected 2-3 mm above the remaining root structure. The omega shaped post space was prepared one week after the pulpectomy treatment was completed. The Omega shaped post space was created by removing approximately 3- 4 mm of Metapex material using a thin straight fissure bur. All visible Metapex on the walls of the post space was removed. The prepared post space was then cleaned with saline, air dried, and acid etched with 37% phosphoric acid for 15 seconds. This space was rinsed and air dried with oil-free compressed air. A light-cured bonding agent was brushed on the etched surface and uniformly dispersed by a compressed air blast. It was then light cured with for 20 seconds. The omega shaped post was then cured for 20 seconds in order to gain rigidity, before insertion into the post space. Light cured flowable composite resin was then inserted into the canal chamber after the insertion of omega shaped post then cured them together for 60 seconds (Figure 1. b & c). Crowns were reconstructed using PNM crown. Finishing and polishing were performed using so flex tips after checking the occlusion (Figure 1. d).

Case Report-2: A 4 years old male patient has reported to the K.D Dental College and Hospital, Mathura in the Department of Pediatric and Preventive Dentistry with decayed upper front teeth region since 6 months. In intraoral examination revealed a complete set of deciduous dentition. Grossly decade with respect to 52, 51, 61,

62, (Figure 2 a.). Intraoral periapical radiographs revealed pulp involvement in respect to 52, 51, 61, and 62 with the diagnosis of early childhood caries. Diet analysis, counseling, and oral prophylaxis were done. 52, 51, 61, and 62 were indicated for pulpectomy, followed by prefabricated metal post and core buildup. Rubber dam isolation was performed under LA, caries was removed and pulp tissue was extirpated. The canal was prepared under constant irrigation with sodium hypochlorite followed by saline, BMP was done then, dried with paper points, and obturated with Metapex followed by glass ionomer cement. After a week, three millimeters of the coronal part of the canal was prepared for the replacement of post. Generally, the core length of prefabricated metal posts is 3-4 mm. The sharp four line angles of quadrangle core of the post were then semi-beveled to not exert stress to the root and the post was examined in the prepared canal. Subsequent to occlusion evaluation, 1 mm end of the post which interfered with the occlusion was cut (Figure 2 b.). The post was then cemented into the canal. After initial setting of the cement, etching with 37% phosphoric acid and rinsing, the screws of the post were covered with one layer of flowable composite resin and the coronal restoration was reconstructed incrementally using composite resin (Figure 2 c.). The crown was reconstructed with the Porcelain non metal crown. Finally, the occlusion was adjusted using articulating paper; finishing and polishing was carried out using fine diamond burs (Figure 2 d & e.). The patient and his parents were instructed on proper dietary and hygiene habits and advised to come for regular check-up. In intervals of 6, 12, and 18 months.

Case Report-3: A 4-year-old male patient reported to the K.D. Dental college and hospital in the Department of Pediatric and Preventive Dentistry with a chief

complaint of decayed upper anterior teeth. Patient had a history of bottle fedding. Intraoral examination revealed 52, 51, 53, 61, 62, 63, 74, 75, 84, 85, 54, 64. were affected by dental caries (Figure 3 a.). Intraoral periapical radiographs showed pulpal involvement with 53, 62, 63, 54, 64 (Figure 3 b.). Diet analysis, counseling to the parents were done, 74, 75, 84, 85 were restored with composite and oral prophylaxis were done.54, 64 indicated for pulpectomy, followed by composite posts. Pulpectomy with metapex obturation was done irt 53, 62, 63. The post space was prepared 7 days after the pulpectomy. The post space was created by removing approximately 3mm of obturating material using a thin straight fissure bur. The prepared post space was then cleaned with sodium hypochlorite followed by saline, air dried, and acid etched with 37% phosphoric acid atleast for 20 seconds. The space was rinsed and air dried followed by application of bonding agent. It was then light cured for 15 seconds. Making of composite post a small amount of packable composite was fabricated as a 3 mm cylindrical post. The post was then cured for 20 seconds in order to gain rigidity, before insertion into the post space (Figure 3 c.). Light cured flowable composite resin was then inserted into the canal chamber after which the composite post was inserted. The composite post were then cured with together for 60 seconds. The coronal enamel was then etched for 20 seconds, rinsed with water and air dried followed by application of bonding agent which was then light cured. The coronal post was then covered with the flowable composite for core build up, followed by light curing it for 60 seconds, and finally teeth were restored with composite.Finishing and polishing was done.(Figure 3 d.).

Discussion: The preserving primary teeth is mainly to maintain arch length, healthy oral environment, functions of chewing, and speech. The treatment of preschool

children and restoration of primary anterior teeth with the severe loss of tooth structure is a challenging task for the pediatric dentists. When there is severe loss of coronal tooth structure, the use of posts placed inside the canal after endodontic treatment will give retention, provide stability to the reconstructed crown, and withstand masticatory forces in function.[2] The stiffness and flexibility depends on the selection of specific post, which functions in the tooth reflection of the post, the lateral forces of the post, the amount of remaining tooth structure, and the fatigue strength of the post.[3]

There are a variety of posts used in pediatric dentistry like- composite post, biological post, metal post, omega loop post etc. One of the factors governing the retention of the restoration is the adaptation of the post and core to the inner dentinal wall which is in turn governed by adhesive and cohesive forces. As here we are using omega post, it shows better adhesion between Omega wire and dentinal wall as it is mechanical. If the wire adaptation to the internal walls is inadequate, then leads to dislodgement and simultaneously excessive masticatory forces cause radicular fracture. Although there are some advantages for omega post like the free end has two arms crisscrossing to the opposite side which adapt to the walls of the roots and gives extra retention. The curved end provides strength to the coronal structure, adaptation, and can be enhanced by compressing at the curved end which opens up the arms at the free end.[7] The conventional prefabricated metal post is widely being used as it is low-cost, fast to use, easily available, not technique sensitive and simple. Because of their budding interference with physiologic resorption of the primary teeth it is not commonly used in pediatric dentistry. Therefore though this post system is an easy to perform and economical procedure

with adequate retention but not widely accepted in the field of pediatric dentist. Moreover, after long-term function, the post also has the possibility of cleft root, especially in children with heavy occlusion or para-functional habits.[9] Composite resin post gives result of finish satisfactory esthetics, but has the property of owing to polymerization contraction. Meanwhile has enough retention, good adaptation to the canal walls by the application of composite resin and stability are advantages of the treatment; but some disadvantages such as technique sensitivity, cost effective for pediatric dentistry, and time consumption due to multiple steps in a kid patient who is rather uncooperative make this alternative treatment luxurious. The wedging effect of the post within the root canal will be minimized by applying bonding agent successfully. It accommodates a shorter and thinner post because of which, requires the less dentin removal, and leads to lower susceptibility to tooth fracture.[10] Furthermore, there is an enough composite material throughout the core part of the post system of the composite, added delicate, of course not metallic show through the restoration is being observed, and shade adaptation is acquired.

It seems in cases with multiple severe decayed primary anterior teeth, especially in small children with rampant caries, the presented technique is simple, economical and easy to perform and practical for all dentists.

Conclusion: The number of endodontic procedures has increased day by day with highly predictable results. Therefore, restoration of teeth after endodontic treatment is becoming an integral part of the restorative practice in dentistry. So this case report proves that post and core is simple and effective and represents a promising alternative for rehabilitation of grossly destructed or fractured primary anterior teeth in pediatric restorative dentistry. But, longterm clinical studies are needed to

evaluate the clinical successes, investigate the advantages and disadvantages of this new technique and failures of the teeth restored with the above-mentioned method.

CONSENT (WHERE EVER APPLICABLE)

Nil

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

Nil

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APPENDIX: Legend of figures

Figure 1. a: Preoperative Intraoral Photograph

Figure 1. b: Intraoral Photograph after Omega shaped Post placement

Figure 1. c: IOPAR after Omega shaped Post

Figure 1. d: Porcelain Non Metal Crown

Figure 2. a.: Preoperative Intraoral Photograph

Figure 2. b.: Intraoral Photograph after placing Metal Post

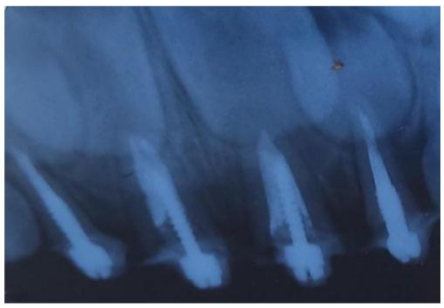

Figure 2. c.: IOPAR after Omega shaped Post

Figure 2. d.: Porcelain Non Metal Crown.

Figure 3. a: Pre Operative Intraoral Photograph

Figure 3. b: Pre Operative Radiograph

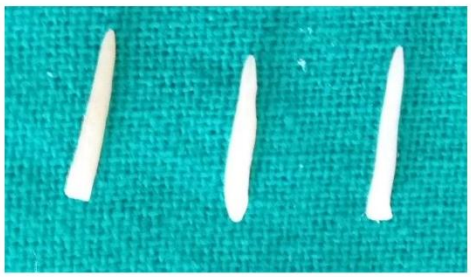

Figure 3. c: Composite Post

Figure 3. d: Post Operative Photograph