Case study

Treatment of primary maxillary anterior teeth that have been extensively damaged: A case series

Abstract: The exquisite bother of fiercely mutilated deciduous anterior human teeth in the case of early childhood caries has always been a matter of interest to pediatric dentistry.

Aim: The objective 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.

Omega post performed better gluing of wire & dentinal walls as they bond mechanically. If the adaptation of wire in between the internal walls is insufficient, then leads to expulsion and simultaneously immoderate masticatory forces cause radicular fracture of the tooth.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.

Composite resin post gives result of finish satisfactory esthetics, but has the property of owing to polymerization contraction.

Conclusion: The technique which we have recounted here gives a straightforward with manageable method for restoration of severely decayed primary anterior teeth that reinstate their uses, shapes, and aesthetics. The patients and their parents or guardians were urged to follow a healthy diet and maintain good cleanliness. They were also urged to come in for frequent check-ups at 6, 12, and 18-month intervals..

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

Introduction: Dental caries is the most frequent and persistent ailment of the contemporary, which is primarily preventable. Dental caries occurring in very young children is called as Caries in children's early years. It is among the most frequent childhood chronic disorders[1]. Early childhood caries is described by the American Academy of Pediatric Dentistry in 2003 as the presence of one or more decaying, missing (due to caries), or filled surface inside any primary tooth in a child aged almost a year or younger..[2] The most severely affected teeth are maxillary primary incisors with deep carious lesions with or without pulpal involvement. In some severe cases, early childhood caries may also cause entire dropping of crown component.. The extraction of high-flown primary anterior teeth is now the sole treatment option for severe coronal damage in early childhood caries. The reduced masticatory efficiency, vertical dimension, leads to the development of various parafunctional habits which including tongue thrusting, aesthetic functional disorders like malocclusion, psychological problems, as well as speech problems, all of which interfere with the child's behavioural and overall personality development..[2]

In case of severely decayed teeth, before crown reconstruction, endodontic therapy and arrangement of some retentive characteristics are required.[3] In the few back years the invention of new crowns substances such as art glass crowns, polycarbonate crowns ,composite crowns and veneered stainless steel crowns have seen and by usin them, the teeth with efficient tooth structures were being restored esthetically and successfully. These has made a gentle shift from extraction to non-extraction therapy modalities.[4-7]

CASE PRESENTATION

Case Report-1: A three and half years aged male patient was referred to the K.DDental College and Hospital, Mathura in Pediatric and Preventive Dentistry Department with primary symptoms of degraded upper front teeth region since 1 year. Patient had no relevant medical and dental history. Both the exterior oral and interior oral examination were done. In exterior oral examination, no abnormalities were detected while interior oral examination diagnosed with the entire set of primary dentition. It was found that 54, 52, 51, 61, 62, 64, 74, and 84 were deteriorated by dental caries (Fig 1a). Interior oral periapical radiographs showed pulp involvement in respect to 52, 51, 61, and 62. Dietary advisory 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 & recommended for pulpectomy, followed by omega shaped posts and composite buildups.

Pulpectomy: Access opening were made in relation to 52,51,61,62 under local anesthesia, with no. 330 burrs made of carbide steel, gross carious lesions were

removed.. Working length determination were made and the pulp tissues were rooted out by barbed broach file. The root canal was dried with paper points after treatment with large volumes with 2.5 percent NaOCl and saline solution (normal). The canals were obdurate with Metapex followed by glass ionomer cement restoration in relation to 52,51,61,62. Omega shaped post was constructed with 0.9 mm stainless steel orthodontics wire. The pulpal ends were pushed 3mm further into the root canal to promote wire retention, and the wire's loop or incisal end protruded 2-3 mm from the remaining root structure. One week following the pulpectomy therapy, the omega-shaped post space was created. With the use of a thin straight fissure bur, the Omega shaped post space was created by removing roughly 3- 4 mm of Metapex material. After 15 seconds, the prepared post gaps were washed with saline, airdried, and acid mixed with 37 percent phosphoric acid. After that, the areas were cleaned and dried using oil-free compressed air. Using a compressed air blast, a light cured bonding compound was rubbed over the etched surface and uniformly blended. After that, it was exposed to light for 20 seconds to cure it. Before being inserted into the post slot, the omega-shaped post was cured for 20 seconds to gain rigidity. Flowable light-cured after placing the omega shaped post, composite resin was poured in the chamber of canal, and the two were cured together for 60 seconds. (Figure 1. b & c). Crowns were reconstructed using PNM (Porcelain non metal)crown. Polishing and Finishing were done using so flex tips after scrutinizing the occlusion (Figure 1. d).

Case Report-2: Since 6 months, a four-year-old male patient with deteriorated upper front teeth has been referred to the K.D Dental College and Hospital, Mathura in Department of Pediatric & Preventive Dentistry. A complete set of deciduous

dentition was discovered during an intraoral examination. When it comes to the numbers 52, 51, 61 and 62, they're all over the place (Figure 2 a.). With the diagnosis of early childhood caries, intraoral periapical radiographs indicated pulp damage in teeth 52, 51, 61 and 62. We performed a analysis of diet, counselling, and oral prophylaxis. Pulpectomy was advised in cases 52, 51, 61 and 62, followed by prefabricated metal post and core construction. Under local anaesthetic, the rubber dams was isolated, caries were removed, and also pulp tissue was removed. The canal was processed with sodium hypochlorite and saline under continual irrigation, followed by biomechanical preparation, drying with paper points, and obturation with Metapex and glass ionomer cement. After a week, 3mm of the canal's coronal section was prepped for post replacement. Prefabricated metal posts typically have a core length of 3-4 mm. Following that, the quadrilateral core of the post's acute four line angles were semi-beveled to avoid overstretching the root, and the post was evaluated in the prepared canal. Following occlusion evaluation, the post's 1 mm end that interfered with occlusion was removed (Figure 2 b.). Finally, the post was cemented into the canal. After initial cement setting, etching with 37 percent phosphoric acid, and rinsing, the post's screws were cemented with a single layer of flowable composite resin, and the coronal repair was gradually redesigned by composite resin (Figure 2 c.).The porcelain non-metal crown was used to reconstruct the crown. Finally, articulating paper was used to correct the occlusion, and fine diamond burs were used for polishing and finishing (Figure 2 d & e.).

The patient and his guardians were counselled on correct food and cleanliness practices, and they were urged to return for frequent check-ups at 6, 12, and 18-month intervals.

Case Report-3: A 4-year-old boy was referred to the K.D. Dental College and Hospital's Departments of Pediatric & Preventive Dentistry with decaying upper anterior teeth as his main complaint. The patient had previously been bottlefed. Dental caries affected 52, 51, 53, 61, 62, 63, 74, 75, 84, 85, 54, 64, according to an intraoral examination (Figure 3 a.). With 53, 62, 63, 54, and 64, intraoral periapical radiographs revealed pulpal involvement (Figure 3 b.). Diet analysis, parent counselling, and composite restoration of 74, 75, 84, and 85 were all completed, as well as oral prophylaxis. Pulpectomy is indicated at 54 and 64, followed by composite posts. With 53, 62, 63, pulpectomy with metapex obturation was performed. Seven days following the pulpectomy, the post space was properly prepared. Using a thin straight fissure bur, roughly 3mm of obturating material was removed to produce the post space. The produced post space was then washed with sodium hypochlorite, saline, air dried, then acid etched for at least 20 seconds with 37 percent phosphoric acid. After rinsing and air drying the area, a bonding agent was applied. After that, it was exposed to light for 15 seconds to cure it. A modest amount of packable composite was formed into a 3 mm cylindrical post for the composite post. After that, it was cured for 20 seconds to achieve rigidity before being inserted inside the post space (Figure 3 c.). After that, a light-cured flowable composite resin was injected into the canal chamber, followed by the composite post. After that, the composite post was cured for 60 seconds. After that, the coronal

enamel was etched for 20 seconds, rinsed with water, and air dried before bonding agent was applied and light cured. After covering the coronal post with flow able composites for core build up and light curing it for 60 seconds, the teeths were rebuilt with composite. Finishings and polishing have been completed. (See Figure 3d.)

Discussion: Primary teeth are largely cared for to preserve arch length, a healthy oral environment, chewing, and speech. The treatment of little children and the repair of primary anterior teeth with significant dental structure loss is a difficult task in paediatric dentistry. The uses of posts implanted into the canal then after endodontic therapy results in retention, provides stability to the repaired crown, and resists masticatory stresses in function when there is a major loss of coronal tooth structure. [2] The stiffness and flexibility of the post are determined by the post's tooth mirroring, lateral forces, aggregate of residual tooth structure, and fatigue strength.[3] There are different varieties of posts used in pediatric dentistry such as - composite post, biological post, metal post, omega loop post etc. The adjustment of the post and core to the inner dentinal wall, which is regulated by adhesive and cohesive forces, is one of the most important factors influencing the restoration's retention. Because we're employing an omega post, there's a better mechanical bond between the omega wire and the dentinal wall. If the wire adjustment between the internal walls is insufficient, the wire will get dislodged, and high masticatory forces will result in radicular fracture. Although the omega post has some advantages, the free end has two arms crisscrossing to the other side, which adjust to the roots' walls and provide more retention. The curved end gives the coronal construction strength and adjustability, and it can be improved by compressing 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 simple to use and economical steps 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, basically in children with heavy occlusion or para-functional patterns.[9]Composite resin post gives result of finish satisfactory esthetics, but has the property of owing to polymerization contraction. Meanwhile, while the therapy has enough retention, good adjustment to the walls of canal by using composite resin and also stability, some drawbacks such as technique sensitivity, cost effective for paediatric dentistry, and time lapsed because of multiple steps in a child patient who is rather unhelpful make this alternative option therapy luxurious. By successfully applying bonding agent, the post's wedging effect inside the root canal will be reduced. It allows for a shorter and thinner post, which necessitates less dentin removal and increases tooth fracture vulnerability at the bottom.[10] Furthermore, there is always composite material throughout the core section of composite post systems, which is inserted delicately, with no metallic show through the restoration, and shade adaption is acquired.

It is observed that in situations involving many critical decaying primary anterior teeth, primarily in little children with rampant caries, the procedure presented is very straightforward, cost-effective, and easy to understand, making it suitable for all dentists.

Conclusion: The quantity of endodontic treatments has gradually increased, with excellent results. As a result, restoration of teeth following endodontic therapy is an important aspect of dentistry's restorative practise. So, in paediatric restorative dentistry, our case study demonstrates that post and core is a simple, efficient, and promising alternative for mending highly disintegrating or broken primary front teeth. Additionally, long-term clinical investigations are required to assess clinical success, explore the benefit and downsides of this innovative approach, and investigate the flaws of teeth restored using the above-mentioned method.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

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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

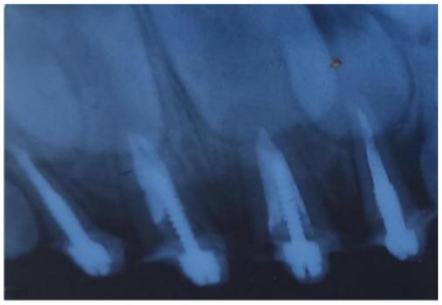

Figure 2. c.: IOPAR after Omega shaped Post

Figure 2. d.: Porcelain Non Metal Crown.

Fig. 3 a: Pre Operative Intraoral Photograph

Fig. 3 b: Pre Operative Radiogra[h

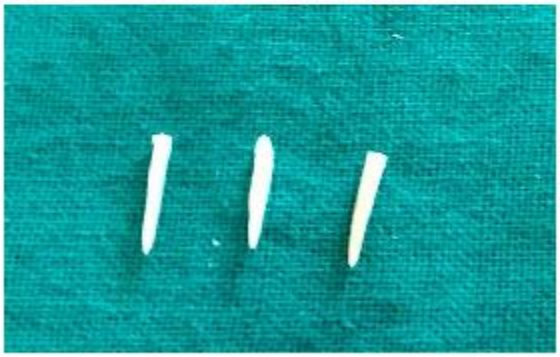

Fig. 3 c: Composite Post

Fig. 3 d: Post Operative Photograph