

Foster Tooth – An ingenious strategy

Abstract:

Clinically endodontic practices encounter traumatic injuries and its rehabilitation especially in anterior front teeth region of jaw. A novel approach known as “biological restoration.” tracks bonafide esthetic reconstruction of substantial damaged teeth via a donor tooth . This case report highlight esthetic and functional recuperation of ample vandalized maxillary central incisor by virtue of “biological post” preparation and its adhesive cementation in a young patient. Biological post gained after tooth extraction from another individual sounds cost effective and an elective strategy for the anatomic-functional reclamation of ample defaced anterior teeth.

Key-words: Biological post, Post and core, Tooth strength, Resilience

Introduction:

Anterior tooth trauma with accompanying fracture of a permanent incisor is regarded as disturbing experience both physically and psychologically bad for the patient.[1] The prevalence of anterior teeth fracture, as a result of traumatic dental injuries, occurs 8.1 in 1000.[2] Management of fractured teeth due to traumatic injuries depends upon the amount of teeth structure loss. Post and core is the only satisfactory treatment option when more than half of coronal structure loss.[3]

Santos and Bianchi introduced a term “Biological restoration” to explain a clinical approach substitute that make use of adhesive capabilities of materials in combination with strategic placement of parts of extracted human teeth.[4]

Biological or dentinal post made of human extracted tooth imparts resilience comparable to the natural tooth. It also provides good adhesion to the tooth structure by composite resin.[5] A biological post is a feasible option for the strengthening of the root canal, because being biocompatible, it reduces radicular dentin stress, preserves the internal dentin walls, adapts to canal configuration. Biological post favor greater tooth strength and greater retention of the posts as compared to metal, glass fiber pre-manufactured posts.[6,7]

Case Report :

A patient came to the Dental speciality with a chief complaint of broken tooth and pain in upper left front tooth region of jaw few years back. His medical history was not significant & dental history reported the trauma and fracture of maxillary left central incisor from a bike fall. The intraoral examination pictured the fracture of left maxillary left central incisor i.e., 21 and loss of natural tooth substance up to middle third of crown. On radiographic examination exposed root canal with open apex and widened periodontal ligamental space was revealed. In order to rehabilitate the fractured tooth to its normal physiological function, closure of root apex with a biocompatible material and to support the overlying crown, an intraradicular biological post was chosen. The tooth opted was freshly extracted maxillary central canine which was mechanically cleaned of its debridement, and autoclave sterilized and stored in normal saline until further use.

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For patient satisfaction, pros and cons of biological post was explained to him and other treatment modality like extraction of concerned tooth and implant was briefed to him. The patient gave its full consent to proposed treatment after signing the consent form. First of all, access opening was made with round, endoaccesss and endo Z bur (Dentsply/Maillefer, Ballaigues, Switzerland). After preparation of straight line access, working length was determined by introducing a size 60 K-file (Dentsply/Maillefer) as there was no tug back. An apical platform was created with a size 80 K file so as to give a seat to rest the apical closure restorative material. The root canals were irrigated with 1 mL of diluted NaOCl using an irrigating needle and dried with absorbent paper points.

For antibacterial action, dressing was done with calcium hydroxide paste and triple antibiotic paste so as to ensure satisfactory root canal disinfection and to avoid any tooth discoloration on subsequent visit. The canal was then dried with paper points. The MTA was manipulated according to manufacturer's instructions and subsequently placed up to the apex number of times till a desired thickness set MTA was achieved to create an apical plug. The plug position in the canal was verified by an intra-oral radiograph. In order to conserve the remaining dentinal thickness, minimal filing of remaining root canal wall space was done. For dimension of intraradicular dentin post, impression of the post space was taken with wax directly. This impression gave a layout for the contour, width and length of the post.

Procedure for Making a Biological (Dentin) Posts:

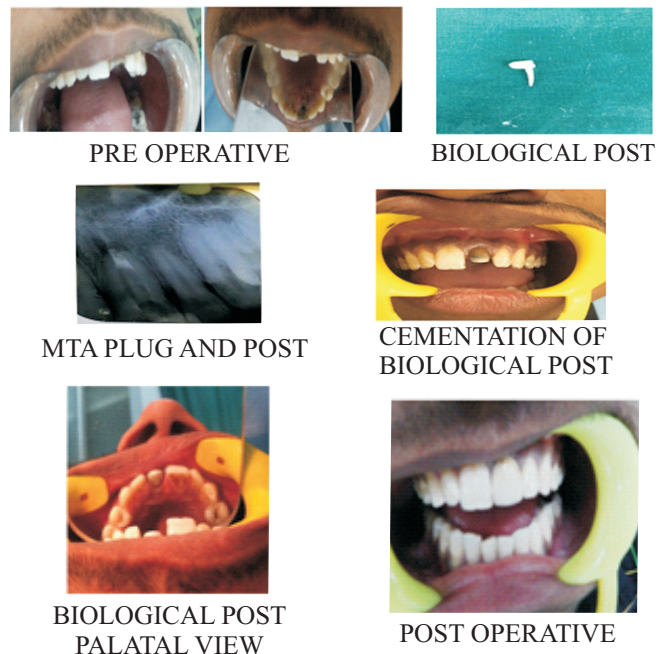
The freshly extracted canine collected from Department of Oral Surgery was autoclaved at 121°C for 15 minutes, for fabrication of biological posts. Mesiodistal and labiolingual thickness of dentin is maximum in maxillary canine in comparison to other single rooted anterior tooth so this tooth used for fabrication of biological post. After this, crown portion of canine was separated from a root by using a carbidedisk and the root was sectioned bucco-lingual direction along the long axis of the tooth. Each part of the root was cut in such a way so that it simulates wax pattern of root canal. The pattern served as a references for orienting the shape, thickness and length of the dentin post. When intraradicular posts had been cut and suitably adapted to the patient's root canal space by trial method; they were conditioned with 37% phosphoric acid for 30 seconds, followed by the washing, drying, application of the dual core resin cement and subsequently the inner portion of the incisor canal were conditioned with 37% phosphoric acid for 15 seconds.

Next, the bonding agent was applied and cured. Following the instructions of manufacturers using RelyX™U200 Self-Adhesive Resin Cement (3M ESPE) was applied to the inner portion of the canals with the help of a lentulo spiral and lightly applied to the surface of the posts, which were then inserted into the canals under constant digital pressure until the end of the cement polymerization. The Filtek™Z250 Universal Dental Restorative (3M ESPE) was used to adapt the core. The luted biological post into the root canal space 21 was checked for flash of cement used for luting and bonding. After one day the patient was called for all ceramic crown preparation. The crown preparation was done and impression was taken with light and heavy body putty material and sent to laboratory for crown fabrication. The prepared all ceramic crown was luted with a RelyX™U200 Self-Adhesive Resin cement (3MESPE) and occlusion was checked

Prognosis:

Patient was recalled after 1 week and the patient was kept on follow up over a period of a year. The tooth remarked satisfactory trio in functional, esthetic and structural aspects showed an adequate results both clinically and radiographically outcome. On follow up over a period of a year. The functional, esthetic and structural performance of the tooth showed an adequate results. Both clinical and radiographic outcome was good.

Biological Post-21



Discussion:

Biological dentin posts made from extracted tooth better adapts to the root canal without imparting undue stress to the

dentin, because such post has its own inbuilt biomechanical properties similar to the restored tooth dentin. i.e., modulus of elasticity, viscoelastic behavior, thermal expansion & compressive strength.[8,9,10] Biological post modulus of elasticity is equivalent to that of root dentin which permits post flexion to mimic tooth flexion. With this, post play a pivot role as a shock absorber, minimizing ratio of stresses placed on the tooth dentinal walls.[11] Vertical root fracture have been inferred from conventional post systems made from metal alloy because of higher elastic modulus than dentin.[12] Opposite fiber posts have lower elastic modulus but they too may face debonding menace.[13]

In nut shell Biological post presents advantages such as positive patient's self-assurance for life long natural tooth appearance, as it preserves dentin and that upshot appreciable forces dispersal along the root surface in grossly traumatized tooth. Moreover, its availability makes it, a feasible option in dental institution for the people of low socio economic background.

Conclusion:

This case report presents an effective management of a fractured tooth with endodontic therapy and a dentinal post. The availability of human extracted teeth may benefit the biologic restorations so as to unify patient's dentition integrity. Dentinal Posts attributes excellent aesthetic, functional, and psychosocial results. However, further studies are needed to evaluate fracture resistance, adhesion and long-term behavior of the dentinal post so as to get a clear picture of pros and cons of this technique and make it more admissible both for dentists and patients.

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