

Management of complicated anterior maxillary crown root fracture with everstick post rehab & zirconia crown - with 1 year follow up

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Abstract

Trauma can be because of falls, collision, road traffic accidents & sports injury. Trauma can vary from enamel fracture to avulsion. Teeth undergone trauma are often left with little or no coronal structure. In such cases, coronal restoration has to be retained with metal post & core. Now in recent past new soft, flexible, adaptable unpolymerized lass fiber post have been introduced called Everstick. The fibers are 0.9 to 1.5 mm in diameter & are impregnated with polymethacrylate (PMMA) & 2, 2 bis hydroxyl 3-methacryloylxypropoxy. A 20 year old male patient reported to department of Conservative Dentistry & Endodontics with chief complaint of pain, swelling &

fractured tooth 1 day back. Reduced mouth opening, swelling & extreme exaggerating pain adds challenges to perform endodontic treatment. H file was used to extirpate all the pulp tissue. . Questions related to trauma, when, where, how, previous history of trauma, previous treatment done, avulsed tooth & fragment of tooth present was asked. Step back technique of bio mechanical preparation was done. The Everstick post even though expensive than its counter parts reduces lot of chair side time with minimal root morphologic modifications. Also zirconia crowns give clinicians perfect esthetic restoration with high flexural strength.

Keywords: complicated crown root fracture, zirconia crown, Everstick post, trauma, cbct

Introduction

Fracture of anterior tooth in teenage & adolescents are very common owing to trauma of various kinds. Trauma can be because of falls, collision, road traffic accidents & sports injury. Trauma can vary from enamel fracture to avulsion. Maxillary central incisors are most prone to fracture followed by maxillary lateral incisors & mandibular central incisors. The treatment should mostly focus on re assuring the patient & trying to save the tooth.

Teeth undergone trauma are often left with little or no coronal structure. In such cases, coronal restoration has to be retained with metal post & core. Now in recent past new soft, flexible, adaptable unpolymerized lass fiber post have been introduced called Everstick to overcome the disadvantages of pre-fabricated fiber post (rigidity & root fracture, excessive root preparation). Due to its chemical composition it acts as a good electrical insulator. The root dentin is also preserved in this thus abiding to new MID principles as it's fibers easily adapt to shape & form of root canal.

It's modulus of elasticity is similar to dentin & attains high flexural strength after light curing. The fibers are 0.9 to 1.5 mm in diameter & are impregnated with polymethacrylate (PMMA) & 2, 2 bis hydroxyl 3-methacryloylxypropy. The micromechanical bonding allows post to hold the resin composite as well as root dentine along with strong unidirectional fiber bundle.

Case Report

A 20 year old male patient reported to department of Conservative Dentistry & Endodontics with chief complaint of pain, swelling & fractured tooth 1 day back. On thorough history elicitation, patient's family gave a history of road traffic accident one day back. There was no medico-legal case registered & the same was

confirmed with local police. The patient had visited a general physician & had got the extra oral wounds cleaned & medicated along with tetanus toxoids injection. There were no extra oral sutures. But the patient presented with extra oral swelling on upper lip & lacerations to maxillary anterior gingiva. Questions related to trauma, when, where, how, previous history of trauma, previous treatment done, avulsed tooth & fragment of tooth present was asked. The patient was monitored for any signs of drowsiness, mental confusion to check for head injury. There was normal opening & closing of TMJ with no deviation to either of side though patient had limited mouth opening due to swelling & pain. Lips lacerations were checked for any broken pieces of tooth. The patient was re assured, spoken with him in his mother tongue & was kept at ease. This was followed by thorough intra oral examination. Gingivitis was seen with 12, 13. Fracture involved only enamel in 11, while fracture involved enamel, dentin, pulp in 12, 13. The patient hadn't carried any fractured fragment for an attempt for re attachment. Periapical radiographs were taken with 90 degree horizontal angle which revealed the same, Ellis class 1 fracture with 11 & Ellis class 3 fracture with respect to 12, 13. OPG was taken to rule out trauma to TMJ & floor of mouth & nose. A CBCT was advised with affected tooth 12, 13. EPT & cold test were positive for 11. 12 & 13 were diagnosed as irreversible pulpitis & endodontic treatment was initiated.

A written consent was obtained from patient & family. Local anesthesia was administered. Reduced mouth opening, swelling & extreme exaggerating pain adds challenges to perform endodontic treatment. H file was used to extirpate all the pulp tissue. Step back technique of bio mechanical preparation was done. The patient was recalled after a week. Obturation was done using lateral compaction method. CBCT report revealed multiple craze

& crack lines on root surface of 12, 13. A palatal fragment of 12 was removed as it was mobile & de attached from sub gingival area. Vitality of 11 was checked again which revealed vital status.

Patient was recalled after a week. Oral prophylaxis was carried out. Everstick post was decided to be used for 13 as it requires minimal root canal preparation & there were already cracks present on root surface which we didn't wanted to propagate. Gutta percha was removed with a peeso reamer no 2 without enlarging the canal leaving 5mm of gutta percha apically. Canal was rinsed with saline & dried with paper points. Estimation was done of total height of tooth including coronal structure. Everstick post of 0.9 diameter was removed from foil bag. Required post length was cut with scissor & the foil was closed. Post was inserted into canal with tweezer & fit was checked at length 20 mm. It was taken out & light cured for 10 seconds. Further the canal was coated with resin cement with an applicator tip & Everstick post was inserted slowly. Coronal part of post showed fan shaped appearance which acted as core. Once properly fit it was light cured for 40 seconds. Further, 13 was etched, bonding agent was applied & composite core build up was carried out.

Patient was recalled after a week. Pre-fabricated fiber post was used for 12. The crack lines present on 12 were minimal. Gutta percha was removed with peeso no 2 & canal was enlarged to fit the fiber post. 5mm gutta percha was left behind. Canal was rinsed & dried with paper points. Size 2 pre-fabricated fiber post was optimally fitting in 12 without need of further alternations in root canal morphology. So the length was measured for post required including the core & the excess was cut with help of slow speed micro motor. The canal was coated with resin cement with help of an applicator tip & fiber post was slowly inserted. Any excess was swiftly removed & it

was light cured for 40 seconds. Further, 12 was etched, bonding agent was applied & composite resin core build up was done.

As the patient had esthetic concern, instead of composite restoration zirconia dioxide crown were decided. Crown preparation was done & impression were recorded. Temporary acrylic crowns were given on very same day for esthetic purpose. Zirconia crowns were delivered after a week. The patient was happy with the form & function of tooth. Also there was no change in pulp status of 11 even after 5 weeks, though a 1 year follow was carried out which revealed the same. There was no crack propagation in root surface or crown dislodgement after 1 year.

Discussion

Trauma has not only physical but also a psychological setback for patient.. Along with tooth structure loss patient presents with swelling & lacerations. So even extra oral examinations becomes important in such cases. Clinical photographs & radiographs form an important source of documentation especially in such cases. A common thing noted in patient with trauma is crack. Thus a CBCT helps to identify the exact extend of crack & lets the clinician know the prognosis in advance. Teeth under gone trauma mostly have loss of coronal part. The fiber reinforces composite post composed of glass fiber, quartz fiber, carbon fiber embedded in the matrix. So Everstick post by GC was used in this case with respect to 13.

Everstick post is resin impregnated, uncured glass fiber having an inter-penetrating polymer network that can be cured to anatomic shape of crown. This resin impregnated unpolymerized glass fiber adapts to root canal morphology which doesn't leave any void & empty space providing good support to core. The glass fiber can be reactivated even after polymerization leading to desired shape of tooth crown. Thus the stress is distributed evenly across the root surface & reduces the chance of root

fracture due to crack propagation. Interpenetrating network of glass fibers helps to strengthen the bond between post & resin with less chances of microleakage & adhesive failure giving a “monoblock” type of restoration. Fan shaped core helps to bond the core with the post.

Zirconia crowns were placed taking into account patients desire & physiologic needs such as form & function. Zirconia crowns have exceptional physical & biologic properties. It also provide high strength along with better esthetics & are corrosion resistant. Also it has high wear resistance & marginal accuracy with internal fit. The patient was happy & satisfied with the treatment provided & had a 1 year follow up with regular intermittent visits. He had no complaint about esthetics neither function of tooth.

Conclusion

The Everstick post even though expensive than its counter parts reduces lot of chair side time with minimal root morphologic modifications. Also zirconia crowns give clinicians perfect esthetic restoration with high flexural strength.

Disclaimer

Some of the clinical photographs have been tilted & cropped. But no other digital editing has been done on any of photographs. The authors of this article certify that they have no proprietary, financial, or other personal interest of any nature or kind in any product, service, and/or company that is presented in this article

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Legend Figure



Figure 1: Pre Op



Figure 2: Extracted Lingual Tooth Fragment 13

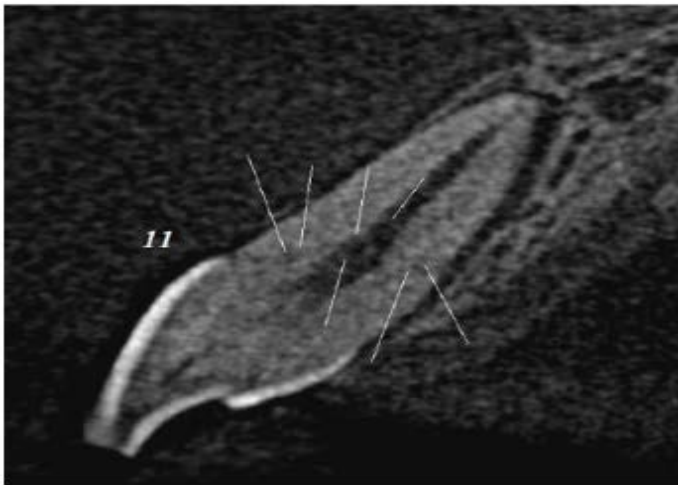


Figure 3: CBCT Showing Fracture Line



Figure 4: Intra Oral Pre Op



Figure 5: Manipulated Everstick



Figure 6: Everstick Placed



Figure 7: Post Op