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Case Report

Management of Anterior Traumatized Teeth By An Interdisciplinary Approach – A Case Report

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ABSTRACT

The case report describes the interdisciplinary approach of traumatized teeth in young patient by endodontic-periodontic and prosthodontics endeavour to address all of the patient's concerns. This insured that the traumatic occlusion was corrected, appropriate esthetics was restored and normal speech and function was regained. All signs of trauma were recognized, every treatment step was documented, and appropriate follow-up was provided throughout the recovery period.

Introduction

Traumatic crown fractures, which are caused from dental injuries, are a serious dental problem.[1] A majority of the crown fracture involves the maxillary anteriors[2], which is a tragic experience for the young patients and creates psychological impact.[3] Hence, Re-establishment of proper esthetics and function is quite important for the patient.[4] Restoration of traumatized teeth is complex. But, Modern dentistry always aims at conservation of remaining tooth structure. So, in such cases interdisciplinary approach is necessary to evaluate, diagnose and resolve the esthetic problems along with ensuring long term survival.

The prognosis of endodontically treated teeth depends not only on the treatment itself, but also on sealing the canal and minimizing the leakage of oral fluids and bacteria into periradicular areas by prompt placement of coronal restorations.[5] This treatment includes the decision of whether or not posts should be used. Previously posts were believed to reinforce and strengthened tooth structure.[6] Currently, posts are believed as an element supporting a core foundation when there is an insufficient clinical crown.[7]

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Fig-1(a) Pre- operative view

Fig-1(b) post-obturation radiograph

Fig 2A (a) gingival enlargement w.r.t. 12

Fig 2A (b) Gingivectomy done w.r.t. 12

Fig 2B (a)Healed gingival tissue with post preparation

Fig 2B (b) postspace radiograph

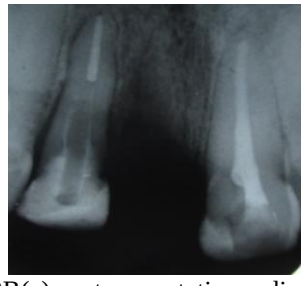

Fig 2B(c) post cementation radiograph

Surgical crown lengthening has been proposed as a means of facilitating restorative procedures and preventing periodontal injuries in teeth with structurally inadequate clinical crowns or exposing tooth structure in the presence of deep, subgingival pathologies which may hamper the access for proper restorative measures.[8]

As a result of the successful use of ceramic crowns and patient demands for metal-free, tooth-colored restorations, ceramic systems for anterior fixed partial dentures (FPDs) have become available.[9]

This case report describes the management of anterior traumatic teeth by Endodontic – periodontal and prosthetic approach to restore proper form, function and esthetic for successful outcome and patient's satisfaction.

CASE REPORT

A 26 Years old female reported in the department of conservative dentistry and endodontics with history of trauma in anterior region of teeth due to a road traffic accident 6 months back.

Patient reported with the loss of tooth in upper right anterior region. Extraoral examination revealed no dentoalveolar fractures and neither any TMJ trauma with normal vital signs.

Fig 3(a) Crown preparation done in relation with 12 &21

Fig 3 (b) All Ceramic crowns fabricated in laboratory

Fig 3(c) All Ceramic crown cemented

Intraoral examination revealed missing 11 (history of avulsion after trauma) and fractured 12 and 21.

Tenderness was present with 12 and 21 along with tender alveolar mucosa. There was Gingival overgrowth at palatal aspect in relation to 12. Sensitivity tests revealed non- vitality with 12 and 21.

The Treatment Plan Includes :

PART – I: Root canal treatment with 21 & 12,- (Endodontics) Fig 1(a) & 1 (b)

Access opening was done with 12 and 21. Working length was determined by apex locator and then confirmed with radiographs. The lengths were 24 mm w.r.t. 12 and 25mm w.r.t. 21. Biomechanical preparation was done using step back technique, enlarged upto # 60 K- file. 5.25% NaOCl and saline used as irrigants. Calcium hydroxide was used as an intracanal medicament. Obturation had been done w.r.t. 12 and 21 by using AH PLUS sealer with lateral condensation method

PART – II (A) Gingivectomy of 12 -(Periodontics) Fig 2A (a) & 2A (b)

Patient was then taken to the department of periodontology. Clinically it was found that there was less then 3mm of soft tissue between the bone and gingival margin. Hence, Gingivectomy was planned with palatal aspect of 12 and done under local anaesthesia to maintain the biologic width of the tissue and proper fit of restorative component.

Part – II (B): Fiber post and Composite core built up with 12.- (Endodontics) Fig 2B(a), 2B(b) & 2B(c)

After Gingivectomy and proper healing of soft tissues post preparation was done. Two-thirds of the total canal length was used for the post space. Gutta purcha was removed by Gates Gidden drills. Post space prepared using paeso-reamers. Canal was enlarged upto Paeso reamer #4. #80 K-Reamers was used to refine the post space . The post was selected accordingly and was placed into the canal. The preferred adhesive technique is dual-cure resin cementation of the post and the composite core built up. The working field was isolated, the root canal surface and then the post was etched with 37% phosphoric acid solution for 15 seconds, rinsed thoroughly with distilled water with syringes, and dried with paper points. A thin, uniform coat of bonding agent was applied over the post. The bonding

agent in the canal then cured with light transmitting post for 20 seconds using light cure gun (unicorn QTH) having intensity of 1000 mW/cm^2. Equal parts of Base paste and Catalyst of the dual-cure resin cement were mixed and inserted into the post space preparation with lentulo spiral. The post was placed in the canal and stabilized. Once the post was stabilized, all the accessible areas of the post for 20 seconds each, were light cured with visible light curing unit. Additionally the gaps between the core and the tooth structure were filled with a core buildup material. Post cemented with dual cure resin cement. Core built up done with 12 and 21 with composite restoration

PART – III: All Ceramic Bridge - (prosthodontics) Fig 3(a), 3(b) & 3(c)

The restored teeth were then prepared for the planned all-ceramic restoration. Tooth preparation was done with 12 and 21. After the core was built up and teeth preparations, gingival retraction was done with #000 size and impression was made with condensation silicon, putty + light body impression. All ceramic crowns were fabricated in the laboratory. Once the marginal integrity, fit, occlusion and esthetics were verified the all ceramic bridge was cemented with dual cure resin.

DISCUSSION

Fracture of an anterior tooth is the most traumatic incident for a young patient. It demands immediate treatment and aesthetic rehabilitation to overcome this psychological trauma. Various treatment approaches have been indicated for fractured teeth such as fragment removal followed by restoration, fragment reattachment, crown lengthening, forced surgical extrusion, vital root submergence, extraction followed by surgical implants or fixed partial denture. The treatment option chosen depends upon site of fracture, size of fracture, periodontal status, pulpal involvement, maturity of root formation, occlusion and invasion of biological width.[10]

David F. Levine stated that improper management of the periodontal tissues during restorative procedures is a common, but often overlooked, cause of failure.[11] When a restoration is placed, the preservation of an intact, healthy periodontium is necessary to maintain the tooth or teeth being restored.

Predictable long-term restorative success requires a combination of restorative principles with the correct management of the periodontal tissues. Cast posts and cores are commonly used because of their superior mechanical properties. However, if a ceramic crown is chosen as the final restoration, the color and opacity of the post may lead to discoloration and shadowing on the gingival and cervical areas of the tooth. [12] According to M***arcco et al*** 14% of failures were found for cast post after 4 years of clinical service. It can cause early root fractures, most frequently due to the excessive tooth structure removal and direct transmission of masticatory loading forces from the post on the tooth root.[13] To solve this problem, fiber post systems were introduced; have light transmission characteristics similar to natural teeth, approximate flexural strength and modulus of elasticity (30-40GPa) to dentin (15-25GPa) resulting in a biomechanical homogenized unit inside the root canal.

Fiber posts in combination with adhesive materials (luting cement and restorative material) can form a structurally and mechanically homogeneous complex with dentin,[13] whose aesthetics and durability is remarkable.

The crowning of anterior teeth incisors is a demanding procedure., all-ceramic systems exhibit potential for more shade matches than metal ceramic systems.[15] it provides more pleasing esthetic appearance to the patient.

SUMMARY

According to the obtained results by this *endo-perio-prostho* endeavor it can be very well appreciated that comprehensive treatment approach requires multidisciplinary team work for successful rehabilitation leading to conservation of the tooth and its permanent restoration with excellent aesthetics. In this case report an attempt was made not only to rehabilitate destroyed tooth structure of the oral cavity but also to rejuvenate facial aesthetics and smile which provides confidence, solace and comfort to the patient.

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