

Management of Mutilated Decayed Teeth: A Case Series

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ABSTRACT

Most often management of grossly decayed teeth is very difficult such teeth with extensive loss of structural walls often go to extraction. Clinicians in today era fail to understand the role of such comprehensive treatment plan in restoring such grossly decayed teeth. Over a period dentistry has been evolved with wide variety of materials and post designs by which one could restore such severely mutilated teeth. Use of divergent posts designs and secondary dentin replacement along with bulk fill composites helps in aiding retention and good stability to core material in turn helps to maintain such mutilated teeth for long period of time.

Keywords- Decayed tooth, Endodontic treatment, Post and Core

INTRODUCTION

Molars with extensive loss of structural walls or teeth which has undergone endodontic treatment and has been mutilated due to extensive caries and sometimes to the extent that all coronal walls are missing and radicular structure is remaining. These conditions are very tough to restore in clinical practice.

Over a period of time dentistry has evolved in wide variety of materials which helps to restore the mutilated teeth with extensive structural loss. Many studies in the past had used different methods in managing such cases as use of customized post and core, endocrown, fabrication of resin bonded fixed partial dentures, hemisections or root resections and use of endosseous implants.

Restoration of grossly decayed teeth is very challenging task and requires a comprehensive treatment plan. If the tooth has more than half of its crown structure loss the post and core can be required to restore such teeth. Teeth with extensive loss of structural walls, especially where no crown structure is remaining, the insertion of posts and different core material helps in retention of crown structure.¹

The case series presents on use of divergent posts and use of single post along with different core strength materials like secondary dentin replacement materials and bulk fill composites on post endodontic management of grossly decayed teeth.⁶ **FIGURE 1**

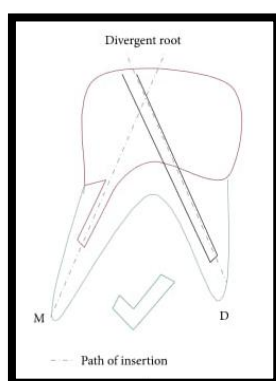


FIGURE 1: DIVERGENT POST DESIGN

Case presentation

Case 1 (Divergent post and core): A 35 year old female reported to SIMPLY SMILEZ DENTAL CLINIC with chief complain of pain in upper right tooth region since a year. On clinical examination patient gives history of throbbing pain which is gradual in

onset aggravates during night and on hot and cold stimuli relieves on using medication (analgesics).

Intraoral examination reveals grossly decayed maxillary premolar and molar (15 & 16). Tooth 15 and 16 was on tender on percussion, and both the teeth showed no signs of mobility and non-responsive to electric pulp testing. No evident signs of sinus tracts were traced.

FIGURE 2



FIGURE 2: Pre-operative view of tooth 15 & 16

On Radiographic examination radiolucency was observed on distal and palatal root of tooth 16, and tooth 15 was endodontically treated a year before. Secondary caries was seen involving tooth 15 on mesial and distal aspects.

On clinical and radiographical examination tooth number 16 was diagnosed as chronic periapical abscess and tooth 15 was diagnosed as chronic apical periodontitis.

A comprehensive treatment plan was made consisting of endodontic treatment for tooth 15 and 16 followed by restorative phase of post and core build up.

Endodontic phase

After complete excavation of caries on tooth 16. Access cavity was prepared using start x tips no. 1 & 2 (DENTSPLY). Working length was determined using PROPEX PIXI apex locator (Mesio Buccal 16mm; Mb2 16mm; Distal 16mm; Palatal 18mm). **FIGURE 3**

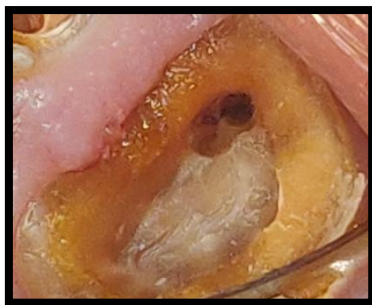


FIGURE 3: ACCESSOPENING OF TOOTH 16

Biomechanical preparation was completed using Mtwo files up to number 25 6% taper. During root canal preparation the irrigation was carried by 5.25% NaOCl then followed by 17% EDTA and final rinse was carried out by 40% Citric acid with subsequent rinses with cold normal saline (0.9% W/V) in between each irrigant use.

After BMP the canal were dried and triple antibiotic paste (ciprofloxacin 200mg, metronidazole 400mg, minocycline 100mg) was placed in the canals and patient was recalled after 2 weeks.

For tooth number 15 RE-ENDODONTIC treatment was carried out and refilled with triple antibiotic paste.

After two weeks second visit was carried out and both the teeth were asymptomatic; and no signs of tenderness was observed. Obturation was completed using Meta CeraSeal sealer and cold vertical condensation was done with 25% taper dentsply gutta percha. After obturation patient was recalled after a week for restorative phase.

Restorative phase

Peeso reamers 1-3 (1.1mm diameter) was used to create post space of length 6mm maintaining 13mm of remaining guttapercha in the canal. Similarly post space of 6mm was even created in distal canal of tooth 16 to facilitate the divergent post and core build up. And in tooth 15 post space was created in palatal canal up to 5mm. **FIGURE 4**



FIGURE 4: DIVERGENT POST SPACE CREATED ON DISTAL AND PALATAL CANALS

Following these teeth was prepared for ferrule preparation. After the preparation tooth was etched by 37% phosphoric acid for 20 sec. prime and bond universal adhesive (DENTSPLY) was applied on tooth structure and cured for 20sec and simultaneously bonding agent was even applied and cured to 3M fibre post.

Once everything was ready SDR FLOW + (DENTSPLY) was flowed on the palatal canals of 15 &16 and distal canal of 16 and the fibre posts are positioned divergently on the tooth structure followed by curing cycle of 40sec in each canal.

Once the posts were cured bulk fill composites BEAUTIFUL BULK (SHOFU) were used for core build up. Incrementally the bulk fills were cured and sequentially followed by crown preparation.**FIGURE 5**

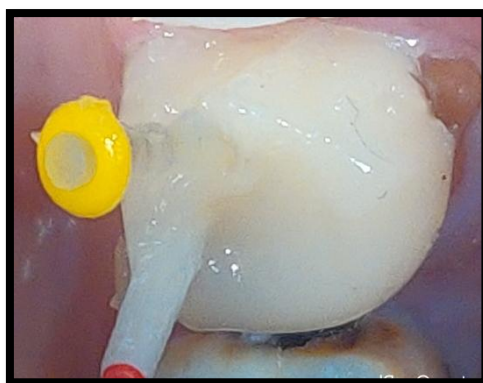


FIGURE 5: CORE BUILD UP WITH DIVERGENT POSTS

Crown preparation was done for zirconia crowns and all line and point angles were polished and finished.**FIGURE 6 & 7**

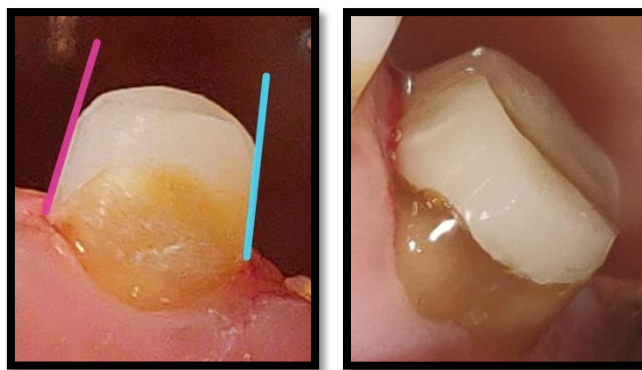


FIGURE 6 & 7: CROWN PREPARATION AND FERRULE DESIGN

Final step was cementation of zirconia crowns individually with **RMGIC (FUJI CEM)** and patient was recalled after 1 year 4 months for review. **FIGURE 8 & 9**



FIGURE 8: CEMENTATION OF ZIRCONIA CROWNS



FIGURE 9: 1 YEAR 4 MONTHS FOLLOWE UP

Case 2

A 72 year old patient reported to I SMILEZ DENTAL CLINIC with chief complaint of dislodge bridge in upper right back region since a week and gives history of pain in right maxillary first premolar and second molar areas. On clinical examination patient gives history of dislodgement prosthesis since a week and presents throbbing pain in first premolar and second molar areas.

Intra oral examination reveals severely mutilated teeth in 14 & 17 regions with signs of pulpal bleeding from tooth 17 and both the teeth showed signs of tender on percussion.

FIGURE 10 & 11



FIGURE 10: PREOPERATIVE VIEW OF TOOTH 17



FIGURE 11: SEVERLY MUTILATED 14

On radiographic examination the teeth 14, 17 was grossly decayed with pulpal involvement and has chronic apical lesions and tooth 13 and 15 was endodontically treated and metal ceramic crown was placed on 13. **FIGURE 12**



FIGURE 12: PREOPERATIVE OPG

On clinical and radiographic examinations the teeth was diagnosed as chronic periapical abscess and a comprehensive treatment plan was obtained to restore these teeth.

All the caries on the teeth were excavated and prepared for endodontic therapy. Access opening was performed using START X tips no.1 & 2 from DENTSPLY. Working length was determined using PROPEX PIXI (DENTSPLY).

Biomechanical preparation was carried out by NEOENDO S (ORIKAM) till number 25 6% taper. All the canals followed an irrigation protocol, each canal were properly cleaned and agitated with 5.25% NaOCl followed by 17% EDTA and finally by 40% Citric acid with subsequent rinses with cold normal saline to remove the residual irrigant from the canals.

After BMP the canals were dried and calcium hydroxide with iodoform (METAPEX PLUS) was placed in canals and patient was recalled after 10 days.

For teeth 13 and 15 Re root canal therapy was performed and canals were refilled with calcium hydroxide and recalled after 15 days.

Patient was recalled after 5 days and teeth 14 and 17 were prepared for laser crown lengthening with diode laser.

Laser crown lengthening was carried by diode laser (IMDS) with wavelength of 980nm on a continuous wave mode with power 3.8 watts and energy / pulse around 87uJ. Patient was recalled after 15 days again and carried out for obturations of 13, 14, 15 and 17. **FIGURE 13**

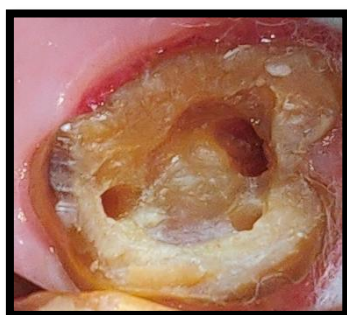


FIGURE 13: LASER CROWN LENGTHENING OF TOOTH 17

Once the crown lengthening was healed and obturations was completed, post space was created using peeso reamer 1-3 and fibre post (3M) was checked for passive fit. The tooth 17 was given a single post in palatal canal and 14 were given divergent posts on buccal and palatal canals with ideal post lengths of 6mm. Later on Ever X flow (G.C) was used in post space and cured for 40sec followed by bulk fill composites (SHOFU) as core build up material. Once build up was done the reverse crown preparation was carried out and finally impressions were recorded using elite HD+ (ZHERMACK). **FIGURE 14, 15& 16**



FIGURE 14: DIVERGENT POST CORE BUILD UP



FIGURE 15: CROWN PREPARATION OF TOOTH 17



FIGURE 16: PUTTY IMPRESSIONS RECORDED FOR FPD PROSTHESIS

DISCUSSION

Management of grossly decayed teeth is very skill oriented and challenging task. Most of the clinicians choose extraction as the option when dealing with such teeth.

Tooth was severely mutilated due to dental caries and has no furcation involvement decision of post and core build up should be opted instead of choosing extraction. Prefabricated post is an option for management of grossly decayed teeth but in our case series as all the walls of tooth were lost we opted for divergent post and core build-up concepts. The recommended post length was around 5mm with at least 4-5mm of apical gutta percha to maintain proper apical seal.²

Making single post in palatal or distal canal cannot give proper retention and creating long post space may lead to iatrogenic error like perforations. Bass suggested the use of two posts in divergent roots may not require much post length even shorter post may provide adequate retention.³

This key design of divergent two post system acts as a single unit and may help in resisting splitting forces on core by vertical and mesiodistal movements of tooth. Role of ferrule is most important concept because its primary function is resistance in root fracture and to some extent also provides retention also.⁴

The advantages of use of secondary dentin replacement material and bulk fill composites as core build up material has high compressive strength, high fracture resistance and tensile strength, and ability to “cure on demand” for immediate preparations. The shear bond strength is significantly higher than glass ionomer materials.

Use of such materials does not even need for preparation of undercuts, grooves, slots or pins for additional retentions this permits more conservative core preparation.⁵

This case series enlightens on how to manage such severely mutilated decayed teeth and what sort of post design is used and use of different resin modified composites materials helps survival of the tooth structure.

CONCLUSION

While there are lot of studies on several types of core materials and post designs in dentistry today, light cured materials like SDR and bulk fill composites (BEAUTIFUL BULK) offer more advantageous as demonstrated in this case series. Clinician has to prefer

to hand adapt to use such techniques in treating grossly decayed teeth than just opting for an extraction. On use of such post designs and restorative materials both the patient and clinician will be pleased with the results.

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