Rehabilitation of anterior teeth trough endorestoration

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Case Report

Rehabilitation of anterior teeth trough endorestoration

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ABSTRACT

Background: *Nowadays, people has considered the importance of dental health, both in terms of functional and aesthetic improvements. Complex caries lesion of anterior teeth are a major problems that require aesthetic management due to patient's confidence.* ***Purpose:*** *The aim is to present a case of anterior maxillary teeth with complex caries treated with endodontic and restoration treatment to recover its optimal function aesthetically.* ***Case:*** *A 18-year-old female patient with multiple caries on anterior maxillary teeth. She felt unconfidence about her performance. 13 class IV black caries lesion, 12 radicular tooth, 11 and 21 previously endodontic treated with metal post. 22 class V Black carieus lesion, 23 class III Black caries lesion.* ***Case management:*** *13, 12 and 22 were managed with root canal treatment and followed by fiber post insertion. 11 and 21 were previously endodontic treated and retreated with prefabricated fiber post. 23 with moderate caries was managed with crown. All anterior maxillary teeth had crown lengthening before. And all crown materials were made with Lithium Disilicate.* ***Conslussion:*** *Anterior maxillary teeth with severed multiple caries, successfully managed with optimal result. Restoring its function, form aesthetically and improve her quality of life.*

Keywords: *Caries, Complex Aesthetic, Anterior Teeth, Endodontic, Restoration*

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INTRODUCTION

Aesthetics and beauty can not be separated from social life. Everyone even can enjoy the aesthetics anytime since the aesthetics is part of human life. Many patients, thus, are really concerned with their anterior teeth because of aesthetic reason. Patients increasingly know about the availability of dental technologies that are both esthetically pleasing and biocompatible.[1]

Due to patient's aesthetic concern, dento-Facial esthetics has been used to describe the inter-relationship between the face, lips, gingival and teeth in obtaining an overall esthetic result.[2] Smile rejuvenation can positively impact a patient's self-esteem and emotional health through improved appearance. Excellent soft tissue health and correct tooth contours and emergence profiles are just as important as the actual color of the new restoration/adjacent teeth.[3]

Thus, all abnormalities in the terms of discoloration, malposition, or the anterior teeth with crown damage for more than one third or all part of crown lost due to caries or other causes are the most significant element disturbing the appearance. However, the teeth distruction still can be salvage by endodontic and restoration treatment. The aim of this case report is to presents management of multiple carious lesions on maxillary anterior teeth treated with endodontic treatment and indirect restoration.

CASE

A-18-year old female patient, came to RSGM UNAIR complained discolored anterior teeth, multiple cavities and damaged crowns. The crowns were treated 7 years ago at the Pediatric dentistry departement, about 2 years ago the crowns on the treated teeth were detached. Never been treated for cavities. Sometimes, patient complaint of spontaneous pain and the patient has taken the anti-pain drug Paracetamol. While patient coming to the RSGM, she had no pain. She had no systemic disorder.

The result of intraoral examination (Figure 1), tooth 13 with Class IV caries black classification, caries involves mesial area to the incisal area zand the EPT vitality test shows the number 5. Tooth 12 with gangren radix, nonvital and on the radiographic appearance it appears gutap percha remnants in the apical third area and radiolucent with diffuse borders in the apical area. Tooth 11 was previously endodontic treated, inserted metal post and restored porcelain Fused to Metal (PFM) crown.

Tooth 21 was inserted metal post with loose of crown. On radiographic examination there is a radiopaque appearance in the crown area area and radiopaque appearance at canal area (metal post at coronal third to middle third area and gutta percha at apical third area). Tooth 22 was filled with class IV composite restoration with depth of cavities very

close to the pulp. And there was caries V on the cervico labial area and the EPT examination shows number 3, the vitality is reactive. On tooth 23 there was class III caries on the mesial area and positif to vitality test. On examination of saliva, Hydration shows the number 45 seconds, bubbly viscosity, pH 6.8, Quantity 4.5 mm/5 minutes and buffer capacity shows the number 8.

Based on the subjective, intaoral and radiography examination (Figure 2), the diagnoses of those teeth were : 13 irreversible pulpitis with normal apical, 12 previously treated tooth with normal apical, 11 previously treated tooth with normal apical, 21 previously treated tooth with normal apical, 22 irreversible pulpitis with normal apical, 23 reversible pulpitis with normal apical.

CASE MANAGEMENT

The treatment plan consists of two stages, Endodontic Treatment and Restoration. Teeth 13 and 22 were treated endodontically, 12 was retreated endodontically. The metal post on teeth 11 and 21 were replaced with fiber post. Then crown lengthening was performed on teeth 13,12,11,21,22,23. Furthermore, the insertion of fiber post and all porcelain crowns on teeth 13,12, 11, 21, 22. And restoration of all porcelain crowns on teeth 23.

Because it was on pandemic, at the first visit, the patient was asked to swab for antigen and do a Covid-19 screening first. Operators use personal protective equipment (APD) level 3. Patient wear protective aprons and disposable nurse caps. Treatment was carried out in a negative pressure room with aerosol suction. The health protocol procedure during this pandemic is carried out at the beginning of each patient visit. The patient was instructed to gargle with Povidone Iodine 1% for 30 seconds. Furthermore, subjective, objective, supporting examinations such as panoramic rontgen and saliva tests are then carried out and a diagnose was straighten. Patients also get dental health education, and informationabout her dental health conditions and the treatment plan and also informed consent and informed to consent. The patient was taken impression for study model, profile photos, intraoral photos, colour shading use (Vita 3D Master 2M2) (Figure 3) and making a digital smile design (Figure 4). Smile design consist of Central Incisor Width/Height Ratio, Mesial Inclination, Midline Placement, Gum Line Margin Height, Gum line symetric, Flossing Contact Point, dan Old Dentistry.

On the second visit, after rubber dam isolation, one visit endodontic treatment was carried out on teeth 13 and 22. First access opening was performed using endo acces bur, glide path management using K-File #10 and rotary file (ProGlider) with root canal lubricant, obtained working length with apex locator (Tooth 13 : 21 mm and Tooth 22 : 19 mm) (Figure 5A). Furthermore, apical gauging was performed with K-File #30 on tooth 13 and K-File #25 for tooth 22. Then the root canal preparation was carried out using a pressureless crown down technique using a

Figure 1. Intaroral photo.

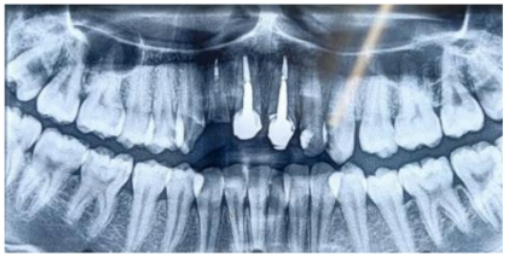

Figure 2. Panoramic radiography.

Figure 3. Colour shading.

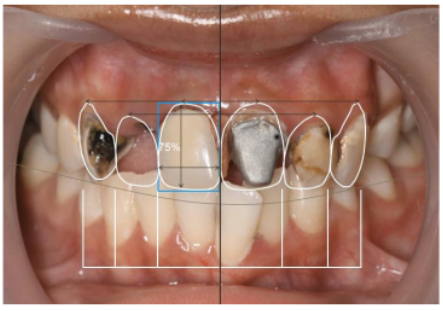

Figure 4. Smile design.

rotary protaper next file (X3: 30/.07) for teeth 13 and (X2: 25/.06) for tooth 22 (Figure 5B). Followed by irrigation with Sequence of irrigation (5.25% NaOCl - sterile distilled water - 17% EDTA - sterile distilled water) using 1 side-vent 30G needle syringe and activted of sonic agitation. The root canals were dried and followed by obturation using the single cone technique using gutta percha points (X3: 30/.07) tooth 13, (X2: 25/.06) tooth 12, resin-based sealer paste and restored temporary with Cavit temporary filling (Figure 5C).

Still on the second visit, Tooth 12 was retreated endodontically. Remaining gutta percha was removed using guttap solvent and headstrom file. The canal was irrigated with 5.25% NaOCl - sterile distilled water - 17% EDTA - sterile distilled water using a syringe with 1 side-vent 30G needle and activated sonic agitation. Next, a glide path was performed using K-File #10 and a rotary file (ProGlider) with root canal lubricant, the working length was obtained with the apex locator (Gigi 12: 15mm). Apical Gauging K-File #25. The root canal preparation was continued using a rotary protaper file next (X2: 25/.06) (Figure 6A). Sequence irrigation (NaOCl 5.25% - sterile distilled water - EDTA 17% - sterile distilled water - Chlorhexidine 2% - sterile distilled water) using a syringe with 1 side-vent 30G needle and activated sonic agitation (Figur 6B). The root canals were dried with endo suction and sterile paper points. Furthermore, Ca(OH)2 dressing and temporary filling were carried out.

At the 3rd visit, tooth 12 was obturated. Tooth 12 was evaluated, the patient had no complaints. Oral extras had no abnormalities, on percussion (-), the temporary filling still intact. Next, a rubber dam is installed. The temporary filling was taken, then irrigated with Sequence irrigation (2.5% NaOCl - sterile distilled water - 17% EDTA - sterile distilled water) using a syringe with a 30G needle 1 side-vent and activated sonic agitation. The root canals were dried with endo suction and sterile paper points. Filling the root canal of tooth 12 using the single cone technique using gutta percha point X2 (25/.06) with resin-based sealer paste (Figure 7). The cavity is closed with a temporary filling. Then the patient was referred to a periodontology department for crown lengthening.

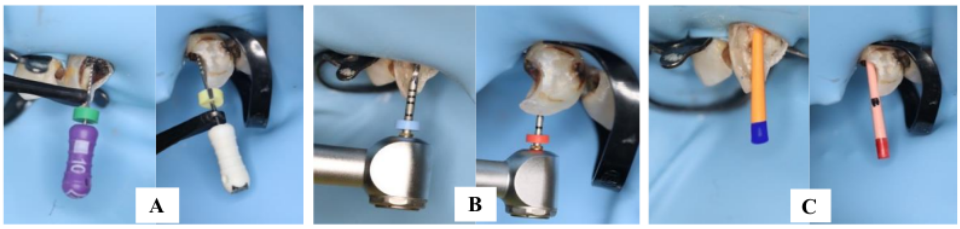

Figure 5. (A) Working Length Measurement. (B) Root canal preparation 13 dan 22. (C) Guttap percha trial.

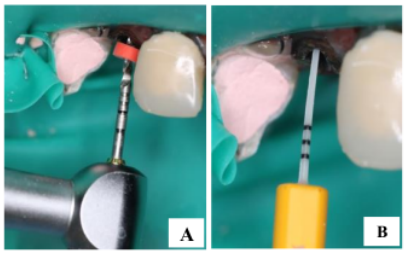

Figure 6. (A) Preparation on tooth 12. (B) Activation.

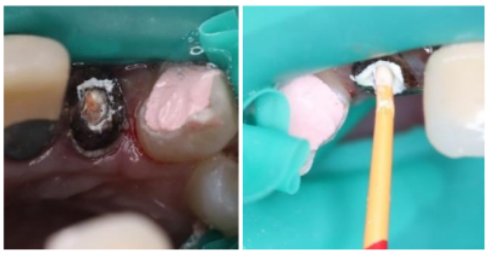

Figure 7. Obturation.

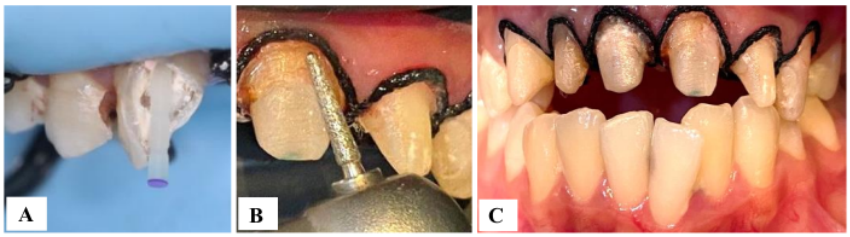

Figure 8. (A) Fiber Post Trial. (B) Core Build Up. (C) Gingival Retraction.

Figure 9. After cementation.

The 4th visit was carried out a week after the crown lengthening. During this visit, metal post on tooth 21 was removed, and post and crown preparations were carried out. After isoaltion using rubber dam, tooth 21 metal post were removed using ultrasonic. Coronal midle third of gutta-percha was removed with post drill on tooth 13, 12, and 22. The guttap percha that removed in teeth 13 was 16mm, in tooth 12 was 12mm, tooth 22 was 13mm, and Fiber post trial on those regio include 21 (Figure 8A). Cementation of fiber posts with self-adhesive cement. The core build up uses a dual cured core built up resin. All porcelain crown preparations for teeth 13, 12, 11, 21, 22, and 23 used round end tapered fissure diamond burs converging towards the incisal with chamfered preparation endings. The preparation was smoothed using a fine finishing bur (Figure 8B). Gingival management using a retraction cord (Figure 8C). Taking impression with two-step technique using double impression (putty and light body) and taking impression for antagonist regio with alginate. Making bite registration using polyvinyl siloxane. Creating temporary crowns for teeth 13, 12, 11, 21, 22, and 23.

At the 5th visit, control was carried out, the patient had no complaints. Extra oral examination was normal, temporary crown was in good condition, nothing was dislodged, percussion test (-), bite test (-), gingiva in the region of each tooth was normal. During this visit a crown was inserted.

Rubber dam isolation, temporary crown taken. Next, try to install an all porcelain (lithium disilicate) fixed crown. Anatomical adjustment and color resemblance, occlusion and articulation, proximal contact, restoration adaptation to surrounding tissue. After everything was in good condition, continued etching on the crown (9% buffered hydrofluoric acid) for 90 seconds then rinsed, dried and covered with silane and left for 60 seconds. Apply self-etch adhesive to the tooth surface, spray with light air and light curing for 20 seconds. Insertion of all porcelain crowns on teeth 13, 12, 11, 21, 22, and 23 using dual cured cement resin (Figure 9).

DISCUSSION

The restoration of Endodontic Treated Tooth with different post and core systems is a topic that is extensively studied and yet remains controversial from many perspectives.[4] The main function of a post is to build up and securely retain a core for crown retention, but this post does not strengthen or reinforce ETT17-21. The choice of appropriate post and core restorations is often complicated and should be guided by knowledge of their physical properties, indications, advantages and disadvantages, as well as the amount of coronal structure missing and aesthetic case need.[5]

In this case, The post wich used for supporting is prefabricated fiber post. Prefabricated fibre post systems have some advantages over cast post and cores:Best aesthetics; a white or tooth-coloured dowel prevents the “shine-through” effect that occurs with metal dowel systems and improves the translucency and appearance of all-ceramic crowns. Uninterrupted bonding at all interfaces and adhesive integration between 5 components of the fibre-reinforced composite resin system.[6] Fibre posts are also more flexible, require less dentin removal to accommodate a shorter and thinner dowel, and lead to lower susceptibility to root fracture44,45. Involve less-time consuming chairside procedure and Requires 1 appointment to complete the restoration.[7]

The crown material that used for this case is lithium discilicate. Besides due to the thickness, color stability of the Lithium disilicate (E-max press) based crowns, it is unnecessary to use the try-in paste prior to cementation to simulate the cement color. E-MAX ceramic crowns are preferable type of crowns due to their esthetic appearance and high strength of 470 MPa. They are translucent in color, which ensures the closest match of light properties of natural teeth and eliminate the ugly metal band around the gum line that is characteristic of metal ceramic crowns.[8] Bacterial plaque accumulation has also been reported to be less on porcelain margins as compared to metal margins.[9] On another hand Dental porcelain must be glazed or highly polished[10]

This case report demonstrates the successful aesthetic management of maxillary anterior teeth with endodontic treatment, fiber post and lithium dishilicate full crown. The complexity of treatment can improve aesthetics and create satisfying result for the patient

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