

Case Report

Management of anterior teeth damage caused by complex caries through aesthetic endorestitution

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ABSTRACT

Background: Dental caries is a microbiological disease that result in localized dissolution and destruction of the calcified tissue. It is multifactorial, therefore prevention must be based on a multifactorial approach. The damage of anterior teeth due to complex caries, for certain person may interfere their performance and decrease their self confidence aesthetically. Restoration of tooth form and function, especially on anterior teeth is highly valuable. **Purpose:** To present a case of maxillary anterior teeth with complex caries, through endorestitution treatment for recovering its original function and aesthetic. **Case:** The 21 years old male patient with complex carries on maxillary anterior teeth number 12, 11, 21, 22 and 23. The patient felt bad about his performance and affect his self confidence. The patient visited the clinic to repair his teeth and to get its form and function aesthetically. **Case management:** The endorestitution treatment was performed for carious teeth through pulpectomy followed by insertion of post retention and porcelain fused to metal crowns. **Conclusion:** Anterior teeth with severed complex caries can be managed through endorestitution treatment to recover its performance and function aesthetically.

Key words: Complex caries, anterior teeth, aesthetic, endorestitution treatment

ABSTRAK

Latar belakang: Dental karies adalah penyakit infeksi yang berakibat kerusakan jaringan kalsifikasi dan bersifat multifactorial. Oleh karena itu pencegahan dilakukan dengan pendekatan multifactorial. Kerusakan gigi anterior karena karies kompleks untuk orang-orang tertentu mungkin berdampak pada penampilan dan penurunan kepercayaan diri karena factor estetik. Perbaikan gigi anterior dari berbagai kerusakan baik dalam hal bentuk maupun fungsinya sangat besar nilainya. **Tujuan:** Untuk menunjukkan kasus gigi anterior rahang atas karena karies kompleks melalui perawatan endorestorasi untuk mengembalikan fungsi gigi asli dan estetik. **Kasus:** Laki-laki usia 21 tahun dengan karies kompleks pada gigi anterior rahang atas 12, 11, 21, 22, dan 23. Penderita datang ke klinik untuk perawatan tentang giginya dan mengembalikan bentuk maupun fungsi estetikanya. **Tatalaksana kasus:** Perawatan endorestorasi dilakukan untuk gigi karies melalui pulpektomi, insersi pasak dan mahkota porselen fuse to metal. **Kesimpulan:** Gigi dengan karies kompleks yang berat dapat diperbaiki melalui perawatan endorestorasi untuk mengembalikan penampilan dan fungsi estetikanya.

Kata kunci: Karies kompleks, gigi anterior, estetik, perawatan endorestorasi

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INTRODUCTION

In today's era of globalization, the development of science and technology of instruments and materials used in dentistry have already been improved. As a result, the need of community for oral health services even is also increasing. For instance, the number of people who need dental care, especially the one with caries on anterior teeth is increasing. It means that people now become more aware with the importance of dental care, especially for preventing their anterior teeth from any dental caries, since the anterior teeth can support their physical appearance.¹

However, almost all people have ever suffered from dental caries which can occur on one or more dental surface. Dental caries is actually a multifactorial disease, but still can be prevented. Preventive efforts must be based on a multifactorial approach. Dentine caries, deriving from Latin which means cavities, is caused by the progressive destruction of enamel and dentin due to metabolic activity of bacterial plaque. Fortunately, the prevalence of dental caries in developing countries is very large and reaches more than 90%.^{1,2} Dental caries can be classified based on the degree of severity or speed of attacking, involving the number and the location of teeth. According to Pickard *et al.*,³ dental caries can actually be classified into following categories: mild caries, if it only attacks on teeth with most vulnerable surfaces, such as pit and fissure on the occlusal area; moderate caries, if it attacks on occlusal and proximal surfaces of posterior teeth; and severe caries, if it attacks on anterior teeth. And, the term of complex dental caries can be interpreted as dental caries attacking on more than one dental surface.

Dental caries can not only attack the smooth surface of enamel which normally occurs around the cervical of molars and premolars, but can also attack the surface of cervico- labial of incisive teeth. Dental caries on the labial and cervical surfaces, moreover, often occurs in maxillary and mandibular incisive teeth. But, if gingival recession occurs, dental caries will often occur on dentino enamel junction, which then can disturb the enamel. If this condition is not treated, the dental caries will be more severe, and then fractures can occur in the cervical area of anterior teeth.^{3,4}

Anterior teeth decay due to dental caries will usually show several symptoms in the later stages, such as pain; visible discoloration, changing into brown or black color; visible hole on teeth that can not only be felt and touched by tongue, but can also be seen when laughing. Severe pain is caused by pulpitis and advanced propagation of caries. If this condition is not treated, it will cause the death of dental pulp, increase the fragility and the teeth will easily fractured.^{3,5} Therefore, the prevention and treatment of dental caries are important to be conducted according patient's need, especially in terms of restoration of dental function and aesthetics. Dental esthetics is an important part of patient's self-appearance. Natural and appropriate appearance is an aesthetic form most widely

expected. Similarly, aesthetics in dentistry is considered as a philosophy closely related to self-appearance created by a restoration process that can be achieved through color and natural shapes.⁶

In dentistry, especially in dental aesthetic conservative dentistry, aesthetic treatments are usually needed by people who suffer tooth decay, including active dental caries, tooth discolorations due to the death of pulp (after endodontic treatment), fractures, anomaly of tooth, malposition, crowding, central diastema, abrasion, attrition, and dental erosion. Moreover, if all of those abnormalities occur in anterior teeth, they may reduce patients' confidence when smiling since anterior teeth is the most prominent element when laughing. Besides that, since interesting and pleasant smile can make someone more acceptable in society, people do not only demand for their anterior tooth aesthetics, but also motivate to obtain good dental and facial cares.^{7,8}

Maxillary anterior teeth decay due to complex dental caries can reduce the patients' confidence, this condition can still be solved by conducting endorestitution treatment to restore the form, function and aesthetic of those teeth in order to be seen like the original teeth.⁹ It means that endodontically treatment teeth can get another treatment which is restoring their roots and crowns with retentive and stable crown cast, so it can be used as long as possible. The success of the restoration is determined by some factors, such as retention, stability, aesthetics (especially the anterior teeth), and biological aspects.³

For those reasons, the following case of maxillary anterior teeth with complex dental caries which has gotten endorestitution aesthetic treatment would be reported. The purpose of this case report is to provide information that teeth with severe dental caries (complex dental caries) do not need to be removed, but they can still be treated and maintained through endorestitution treatment, which is endodontic treatment followed with the insertion of cast core and the porcelain fused to metal jacket crowns.

CASE



Figure 1. The initial condition of the patient's teeth, 12, 11, 21, 22, and 23 before treatment.

The patient is a 21 year old man suffering from complex dental caries on his maxillary anterior teeth, 12, 11, 21, 22, and 23 (Figure 1). As a result, he felt less confident because

of his dental appearance. Thus, he desperately needed a dental treatment that could not only improve the aesthetic defects, but could also eliminate the psychological disorder that he had suffered for long time. In other words, the patient wanted that those of his teeth could not only regain their normal form and aesthetics, but could also have their original tooth function.

In the first visit, intra-oral examination was conducted on the patient's teeth, 12, 22, and 23 which suffered from severe dental caries causing some parts of his teeth, started from the entire surface of their tooth crown to the entire layer of their enamel, lost and black.¹¹ Based on the result of the intra-oral examination, it was then known that the tooth 11 suffered not only from class V of dental caries, especially in its cervical, but also from class III of dental caries, especially in its proximal distal. It was also known that the tooth 21 has perforation caries. Panoramic and periapical x-rays were also conducted for making the diagnosis and treatment plan. There was radiolucent on the periapical area of those teeth 12, 21, 22, and 23; and they were diagnosed as irreversible pulpitis. Tooth 11 got reversible pulpitis. However, all of those teeth were in vital condition. Therefore, the dental treatment plan for those teeth, 12, 21, 22, and 23, was endorestitution treatment involving pulpectomy by using cast post-core as retention, and also by making porcelain fused to metal jacket crowns, as restoration.

CASE MANAGEMENT

When the patient came at the first time, the intra oral and extra-oral examinations were directly conducted. And then, the printed images of his teeth, 12, 11, 21, 22, and 23 which front, left and right sides suffering from dental caries, were taken both before and after the treatment. Next, the anatomical impression of the maxillary and mandibular teeth were made in order not only to get study models and dental records, to know the occlusion and relation, but also to prepare the temporary jacket crown that would be insert on those teeth, so that the dental aesthetics would not be reduced during the treatment.

Moreover, the tooth 11 with a diagnosis of reversible pulpitis would be restored with class V and class III of composite resin which preparations were simultaneously conducted. The preparation of class V composite restorations was then conducted on enamel with an undercut additional retention. After that, Kidney-shaped cavity was prepared with a depth up to the dentin and with color adjusted with shade guide of restorative materials. Next, etching and bonding processes (generation 6) were conducted, and curing process then was conducted for 20 seconds with visible light (according to the factory instruction). Afterwards, it was filled with microfilled composite resin by using aluminum cervical matrix, and then curing process was conducted for 20 seconds with visible light. Similar procedures were also conducted in the class III, but only

the location and shape of dental preparation were different. It is because the location and the form of the class III preparation must be adjusted to the size of caries occurred in the distal proximal.

The endorestitution treatment was conducted on those teeth, 12, 21, 22, and 23, involving endodontic and restoration treatments, which are pulpectomy with crown down technique root canal preparation, by using Pro Taper until the file # F2 (the teeth no. 12, 21, and 22), and until file # F3 (the tooth no. 23), based on the working length. On the next stage, the impression of those teeth that had already been treated with endodontic treatment were made by using elastomers, in order not only to make both their cast post and core reinforcing, but also to make their temporary jacket crowns adjusted to their normal position in the good dental arch. The purpose of making these temporary jacket crowns was not only to protect the cast core that had been inserted during the treatment, but also to be used as a description of the normal anterior tooth position in a good dental arch with normal overbite and overjet.



Figure 2. The insertion of cast post into the core of teeth, 12, 21, 22, and 23.



Figure 3. The condition of teeth, 12, 11, 21, 22, and 23, after the treatment.

The insertion of cast post and core was conducted one by one into the root canal of teeth 12, 21, 22, and 23 with zinc phosphate cement. After that, the repair of inserted cast post and core preparation were conducted in order to obtain the good position and alignment so the insertion of porcelain fused to metal jacket crowns can be easily done (Figure 2).

The impression of the teeth 12, 21, 22 and 23 with double impression materials as well as the description of the bite registration was conducted in order to make them as same as the original ones. Next, those teeth were covered by

the temporary jacket crown. The maxillary and mandibular models accompanied with its information then were sent to the dental laboratory in order to make the porcelain fused to metal jacket crowns.



Figure 4. Photo of the patient's teeth, 12, 11, 21, 22, and 23, one year after the treatment.

The final stage of this treatment was to try the porcelain fused to metal jacket crowns. on the teeth 12, 21, 22, and 23. Since during the trial the initial fit was looked good, the form and color were matched, and there was also no premature contacts, the permanent insertion with glass ionomer luting cement then could be conducted (Figure 3). Finally, the patient was asked to have controls 1 week, 1 month, 6 months and 1 year after the treatment in order to be evaluated (Figure 4).

DISCUSSION

Dental caries is a microbiology dental infectious disease causing the multifactorial destruction and breakage of tissue calcification. Therefore, its prevention efforts must be based on a multifactorial approach. However, dental caries still becomes one of the most common disease largely infecting humans. The prevalence of dental caries in developing countries could reach more than 90%. The management of those complex anterior tooth damages caused by dental caries can be solved by endorestitution treatment.²

Generally, patients who suffer from severe dental caries on teeth, 12, 11, 21, 22 and 23, require aesthetic treatments to repair anterior teeth which entire surface of their crown is looked almost black color. As a result, this condition makes the patients feel both ashamed with their physical appearance and less confident, especially when they laugh. Then, patients will expect optimal results from the aesthetic treatments that they take, as a result, the form and function of their anterior teeth can become normal again. Actually, according to Antune *et al.*,¹⁰ maxillary anterior teeth can be functionally and aesthetically rehabilitated to restore a good smile and increase self-confidence.

One visit endodontic treatment was conducted on the teeth 12, 21, 22, and 23 aimed to prevent the spread of the disease from the pulp to the periapical tissue; or if it occurred, the treatment would be aimed to change or return the periapical

tissue into its normal condition. The treatment also provides benefits of not only reducing the risk of infection possibly occurred among the visits, saving time, but also reducing the risk of infrequent flare-up.⁷ The root canal preparation then was conducted on the teeth 12, 21, 22, and 23 by using crown down technique with Pro Taper instruments. This technique is very beneficial not only because most of the microorganisms located in 1/3 coronal and 1/3 center has been drawn before entering into the apical area, but also because the irrigation is more perfect in 1/3 apical.¹¹

Endodontic treatment teeth need to be restored both root and crown of the tooth by using retentive and stable cast and core crowns, so it is not easily removed and can be used in the oral cavity as long as possible as the original teeth. However, the internal moisture of teeth that have undergone the endodontic treatment is getting reduced so it becomes brittle, relatively easy to fracture (broken), and subject to color changing. It also makes the remaining tooth structure weak as a result of the reduction of dentin during the endodontic treatment. Therefore, the comprehensive cast must be conducted not only by using both casts, post and core, but also by making porcelain fused to metal jacket crowns in order to make those teeth get no fractures.¹² In this case, the teeth 12, 21, 22 and 23 would use cast post and core since those casts could make both cast post and core unify, and then could closely follow the form of root canal preparation. The application of cast post is aimed to repair and form the position, so it can be in accordance with the normal anterior tooth position in a good dental arch with normal overbite and overjet.¹³

The success of the use of cast post and core is about 90.6% in an average, and it needs six years for the foundation of a restoration.¹⁴ The insertion of cast post and core on teeth 12, 21, 22, and 23 must be conducted one by one in the same time. It is aimed to get not only the shape and size that are in accordance with the normal ones, but also the anterior dental arch with normal overbite and overjet, as a result, the good and harmonic aesthetic form can hopefully be accepted.

In conclusion the anterior teeth decay caused by complex dental caries can be treated by endorestitution aesthetic treatments followed with both the application of retention, such as cast post and core, and the application of the final restoration, such as porcelain fused to metal jacket crown.

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