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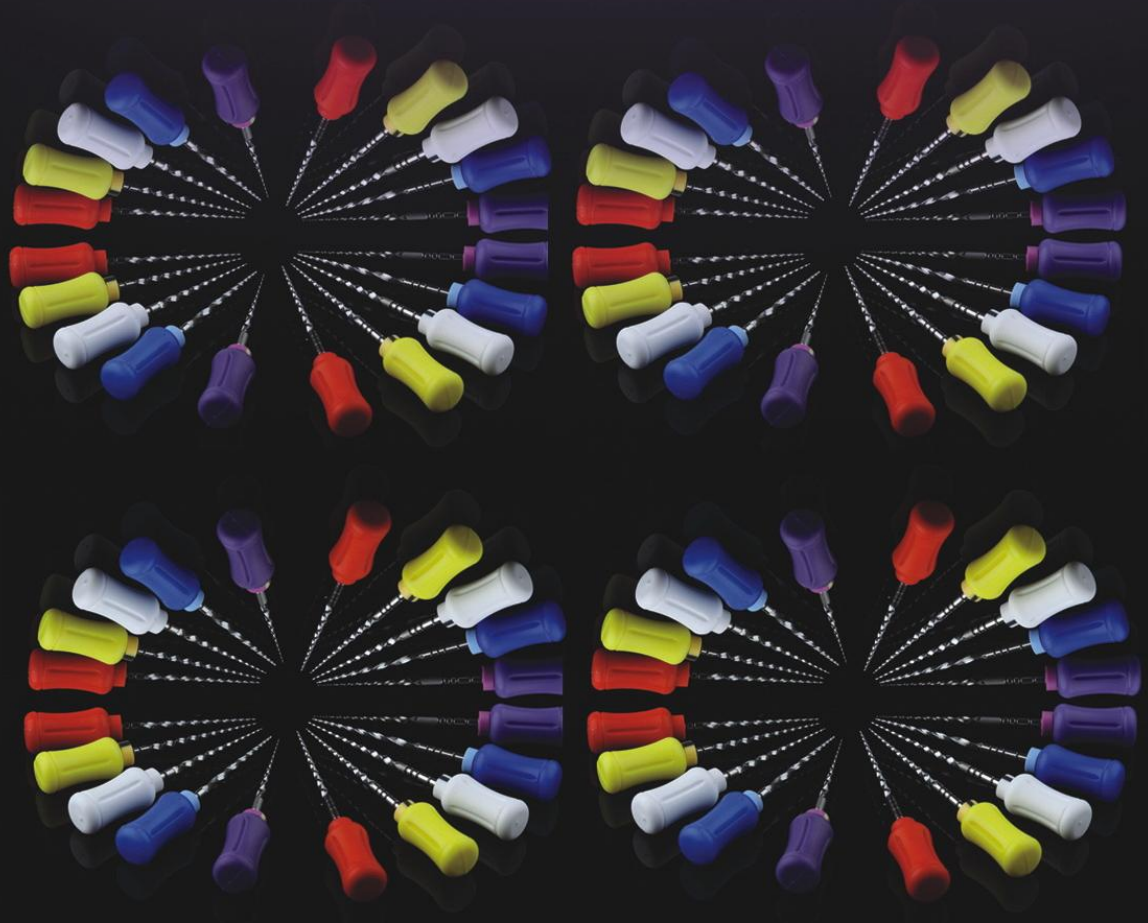

• The role of probiotic on alveolar bone resorption • Recent pharmacological management of oral bleeding in hemophilic patient • Anterior makeover on fractured teeth by simple composite resin restoration

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Case Report

Anterior makeover on fractured teeth by simple composite resin restoration

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ABSTRACT

***Background**: In daily practice dentists usually treat tooth fractures with more invasive treatments such as crown, veneer and bridges which preparation require more tooth structure removal. While currently there is trend toward minimal invasive dentistry which conserves more tooth structure. This is enhanced with the vast supply of dental materials and equipment in the market, including restorative materials. Provided with these supporting materials and equipment and greater patient's demand for esthetic treatment, dentists must aware of the esthetics and basic principle of conserving tooth which should retain tooth longevity. **Purpose**: This article showed that a simple and less invasive composite resin restoration can successfully restore anterior esthetic and function of fractured teeth which generally treated with more invasive treatment options. **Case**: A 19 year-old female patient came with fracture on 21 and 22. This patient had a previous history of dental trauma about nine years before and was brought to a local dentist for debridement and was given analgesic, the involved teeth were not given any restorative treatment. **Case management**: The fractured 21 and 22 were conventionally restored with simple composite resin restoration. **Conclusion**: Fracture anterior teeth would certainly disturbs patient's appearance, but these teeth could be managed conservatively and economically by simple composite resin restoration.*

***Key words**: Anterior makeover, fractured teeth, composite restoration*

ABSTRAK

***Latar belakang**: Dalam praktek sehari-hari pada umumnya dokter gigi merawat fraktur dengan restorasi invasif seperti mahkota, veneer dan jembatan yang semuanya memerlukan pengambilan jaringan gigi lebih banyak, sedangkan saat ini trend perawatan gigi lebih menuju kearah invasif minimal yang mempertahankan jaringan gigi sebanyak mungkin. Keadaan ini ditunjang oleh tersedianya berbagai macam bahan dan peralatan kedokteran gigi di pasaran, termasuk bahan restorasi. Dengan tersedianya bahan dan peralatan yang mendukung serta tingginya permintaan pasien akan perawatan estetik, dokter gigi harus mengetahui estetik dan prinsip dasar dari konservasi gigi yaitu mempertahankan gigi selama mungkin. **Tujuan**: Laporan kasus ini menunjukkan bahwa restorasi resin komposit sederhana yang tidak invasif dapat memperbaiki estetik dan fungsi geligi fraktur yang umumya dirawat dengan macam restorasi yang lebih invasif. **Kasus**: Seorang wanita berusia 19 tahun datang dengan fraktur pada gigi 21 dan 22. Pasien tersebut memiliki riwayat trauma pada giginya sejak sembilan tahun sebelumnya dan telah dibawa ke dokter gigi untuk debridemen dan pemberian analgesik saja, tanpa perawatan restoratif. **Tatalaksana kasus**: Gigi fraktur pada 21 dan 22 diperbaiki dengan restorasi resin komposit sederhana. **Kesimpulan**: Fraktur pada gigi anterior akan sangat mengganggu penampilan pasien, akan tetapi fraktur tersebut dapat dirawat secara konservatif dan ekonomis dengan restorasi resin komposit sederhana.*

***Kata kunci**: Perbaikan anterior, fraktur gigi, restorasi resin komposit*

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INTRODUCTION

In the past twenty five years, the focus in dentistry has changed. Years ago dentists were in the repair business, but now the demand for esthetic dentistry has grown vastly. Nowadays it is not only on prevention and treatment of disease but also on meeting the demands for better esthetics. This fact presents great challenges for dentists in fulfilling the basic requirements of restoring teeth to form and function as well as creating the appearance of naturally pleasing teeth using appropriate esthetic based dental materials.

Currently various new dental materials and equipments have been introduced to support dentists with their esthetic works. There are many restorative materials, including varieties of specialized composite resins with different filler types and compositions as tooth colored dental materials with a wide range of shades to make successful color matching and easier manipulation techniques. This is also supported by improvements in adhesive technology through various bonding generations and equipment such as polishing instruments and LED curing units for faster polymerization.[1–3]

In daily practice dentists usually treat tooth fractures with more invasive treatments such as crown, veneer and bridges which preparation require more tooth structure removal. While currently there is trend toward minimal invasive dentistry which conserves more tooth structure. This is enhanced with the vast supply of dental materials and equipment in the market, including restorative materials. Provided with these supporting materials and equipment and greater demand for esthetic treatment, dentists must aware of the esthetics and basic principle of conserving tooth which should retain tooth longevity.

When a makeover is planned for the esthetic appearance of a patient's teeth, the dentist must have a logical diagnostic approach that results in appropriate treatment planning.[4] Although new esthetically pleasing materials and technology were introduced, a dentist should consider not only the principle of conserving tooth structure but also the patient's financial capability and needs.[5] This article presents a clinical case about anterior makeover on fractured teeth by simple composite restoration.

CASE

A 19 year old female patient came with fractured teeth on 21 and 22 (Figure 1). This patient is an undergraduate student and starts to feel less confident with her fractured teeth since entering college. On anamnesis, the patient had a previous history of dental trauma about nine years ago and was brought to a local dentist for debridement and was given analgesic, the involved teeth were not given any treatment because based on the radiographic image, the apical were still in development and not constricted yet. The teeth were controlled by the previous dentist and no symptom was reported since then, but this patient never came back due to her parents' job mutation to Surabaya.

On clinical examination, it was found that the patient was healthy. The overall general condition was good to receive dental treatment, no drug allergy and no previous history of transmittable diseases. Posterior occlusion is within normal range with deep bite anterior relation. There were no carious lesions on other teeth. Overall oral hygiene is good. There was no calculus, only a slight staining on palatal side of anterior teeth extended from 13 to 23. The gingival margins were normal.

Teeth 21 and 22 were fractured almost half cervico-incisally. These teeth were responsive to thermal and supported by healthy gingiva. There was no abnormal tooth movement. There were no pulp exposures on each tooth. After thorough explanations, the patient approved and consented about the single visit anterior makeover procedure by simple composite resin restoration. The restoration planning was determined using microhybrid composite and total etch technique.

Figure 1. Pre-makeover anterior teeth condition.

CASE MANAGEMENT

After anamnesis, clinical examination, thorough explanation, and patient's consent about the makeover procedure, the involved teeth was cleaned and brushed with prophylaxis scrub (Consepsis Scrub, Ultradent) and made ready for shade selection. Shade selection was carried out on damp teeth with the provided composite shade guide from the manufacturer and shade A1 and PF were chosen for both teeth (Figure 2).

Figure 2. Shade selection was carried out to restore the teeth.

The teeth were prepared to form bevel surrounding the fracture part. This bevel was done by removing superficial enamel around the fracture part, including the proximal surfaces extending labially and lingually about 2 mm continuously. Then the prepared areas were etched with 35% phosphoric acid solution (Ultraetch, Ultradent) for 15 seconds, suctioned, rinsed, and blot dried. The 21 and 22 teeth were isolated using cotton roll and celluloid matrix strip (Svenska Dentorama) was applied on interdental between 11–21, 21-22, and 22–23. A thin layer of bonding agent (PQ1, Ultradent) was applied using micro applicator (Microbrush, SDI Australia) and cured.

The A1 body shade composite (Vitlescence, Ultradent) was applied layer by layer, while sculpting the mamelons until about one fifth incisally. PF enamel shade composite (Vitlescence, Ultradent) was applied over the surface and incisal of each tooth. This layering was finished by covering with a drop of T shade flowable composite resin (Vitlescence, Ultradent) on labial surface and disperse it with an artist's brush to create a smooth surface.

The restorations were then contoured and the excess composite resin was removed using fine finishing diamond bur (Sharpcut, Dentsply) and polished with diamond micro polisher (Pogo, Dentsply). The makeover showed better teeth hence changed the appearance and restore patient's self confidence (Figure 3). Patient follow up was done six months after treatment, there were no complaint, the composite restorations were still in good condition and the patient was happily satisfied with the result. The patient came for regular dental check up about two years later and the restorations were still in good condition and functional (Figure 4).

Figure 3. Teeth condition after anterior makeover.

Figure 4. Teeth condition on follow up (two years after makeover).

DISCUSSION

Crown fractures account for the majority of all traumatic injuries on permanent dentition and some of these fractures are minor while others are severe which can cause the loss of affected tooth and require more extensive management.[6] Dental makeover may involve restoring the esthetic and functional characteristics of anterior teeth predictably and reliably.[7] Makeover doesn't always come with complex and invasive treatments, but it can be done simply and predictably.

It is surprising to hear of patients' bad experience for leaving their previous dentist. This is happen because invasive care as seen by the patient is not limited to physical appearance but to treatment options given by the dentist who render care what the patient need and help them to feel trust and understanding. In daily practice, dentists face options of what treatment to recommend for a given clinical tooth condition. When those options are offered to patients with sufficient explanation, they usually prefer the simplest and least invasive treatments.[8]

Any given restoration must has a natural appearance which is harmonized with the remaining teeth, the patient's age and personality.[9] Based on this, composite restoration which includes the use of bonding agent was chosen in this case to minimize the amount of tooth structure sacrificed to achieve retention hence conservatively achieve good filling retention without significant loss of tooth structure.[10]

Composite resins are the material of choice for the restoration of conservative defects in anterior teeth because of their adhesive and esthetic properties.[11] Discussing about composite restoration cannot be separated from dental adhesives or generally called bonding agents which was used in this case. Bonding agents firstly introduced by Dr. Michael G. Buonocore in mid 1950s are solutions used to assist in bonding fillings by two main functions: retention of the filling and sealing of the tooth-filling interface to prevent leakage.[10] Current dentine bonding systems are efficient to bear normal mastication forces. Since application technique is critical for the success of the procedure; therefore manufacturer's guide should be followed carefully.

In this case, the teeth were prepared minimally to create a beveled labial and palatal area to facilitate acid etching therefore increasing the desirable bonding surfaces. The preparation technique and extent were relative to the enamel margins to assist the retention of composite restoration. This was coherent with minimal intervention dentistry, where conservation of tooth structure is of prime importance and to achieve this there needs to be a high level of visibility and an excellent tactile sense to avoid over-preparation and excess of tooth loss.[12]

Flowable and regular microhybrid composite resins were used in this case in order to combine their fine properties, such as providing strong restorations that can be finished and polished well.[13] Microhybrid composite was chosen because of its acceptable strength, although other

types of composite resins may also be used as long as they are indicated to bear mastication forces and esthetically acceptable. Flowable composite was used to create a smooth labial surface. In this case, the composite restorations' surfaces were finished and polished to improve their esthetic quality and protect them against the aggressive oral environment and the colonization by micro-organisms.[2]

One step diamond micro polisher was used for several reasons; practical and capable to produce acceptable gloss finish on microhybrid composite restorations.[14] Even though the cervical gingival lining in 21 was not equal to 11 (Figure 3), it was considerably accepted by the patient, realizing that the lip line could hardly reveal the cervical gingival lining when smiling (Figure 4). However, the patient was explained about gingivoplasty as an optional procedure. Patient's cooperation is mandatory in retaining dental makeover result, this include the awareness to maintain basic oral health and daily hygiene. Regular visit to dentist is also important to notice any changes on patient's overall teeth condition which support the longevity of the established restoration.

Satisfactory esthetic makeover doesn't always come with massive tooth structure removal during preparation or complicated advanced methods or expensive materials and equipments, but in contrary dentists as clinicians should try to do better on both simply and economically conserving the tooth structure while revealing the utmost esthetic, function and longevity out of it as well as appreciating what the patient wants and needs. In conclusion, fracture anterior teeth would certainly disturb patient's appearance, but there teeth could be managed conservatively and economically by simple composite resin restoration.

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