

CASE REPORT

Multidisciplinary management of a Class I edge-to-edge malocclusion: A case report

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ABSTRACT

The most prevalent malocclusion is the Angle Class I malocclusion. Its edge-to-edge type has the lowest incidence which is characterized as a malocclusion in which the overjet and the overbite are both zero in a vertical and sagittal orientation. This malocclusion is corrected through orthodontic braces for orthognathic surgery. In this case report, a 26-year-old male patient asked to correct his Class I (edge to edge) Malocclusion and unaesthetic tooth forms and sizes of his upper and lower anterior teeth. The patient wanted to have a “natural-looking” makeover of the latter. The patient had undergone orthodontic treatment before to correct the malocclusion and was removed due to an unmet treatment goal. Re-treatment of orthodontic braces was proposed before any esthetic treatment procedure but due to the patient's foreign residency and limited time, the proposed treatment is not feasible. Considering the patient’s situation, the dentist presented an alternative treatment through Indirect Veneers using Emax, gum lift, and enameloplasty. The incorporation of these combined treatments was able to finally correct the patient's malocclusion and met the esthetic demand for a natural-looking makeover veneer.

Keywords Angle Class I malocclusion, cosmetic dentistry, dental veneers, Emax, dental porcelain, dental esthetics

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1| Introduction

The popularity of aesthetic procedures has increased recently. As the anterior teeth are the first to be exposed when you smile, aesthetic alignment is important.

Malocclusion is ranked as one of the top oral health conditions by the World Health Organization. According to studies, it affects children and adolescents with a prevalence that ranges from 39% to 93%.¹ The Angle classification, which was introduced in 1899, marked a significant improvement in orthodontics because it not only helped to classify malocclusions

but also provided a detailed description of what a normal occlusion for the natural dentition should look like.² The edge-to-edge bite is one example of this malocclusion. An edge-to-edge bite exposes all front teeth vulnerable to unwanted stresses, which could harm the periodontium.³ Edge-to-edge bites require orthodontic treatment to be corrected.⁴

One's expectations for the selection of materials have improved as new restorative materials have developed. The term indirect restorations refer to those made outside the mouth.⁵ An Emax veneer is made of "lithium disilicate," a fairly strong and fracture-resistant glass ceramic.⁶ Emax porcelain veneers are one of the most popular types of veneer that provides a natural appearance and is one of the most commonly recommended to patients. The Emax veneers are created and personalized so that all the teeth treated will match your natural appearance, shape, and color. Additionally, less enamel will be removed during treatment because the veneers' outer shell is thinner than regular veneers.

The proper clinical procedures must be used to get the desired outcome for the patient. This case will discuss the treatment techniques required before veneer installation to address various anatomical and occlusion irregularities and produce the best aesthetic demands and functionality results.

2 | Case presentation section

2.1. Chief complaint

A 26-year-old male patient presented to the clinic with a chief complaint of his edge-to-edge bite and unaesthetic forms and sizes on his upper and lower anterior teeth. He was self-conscious about his appearance and wanted his teeth to look and feel natural (figure 1).



Figure 1. Pre-Op photos indicating A) Right smile profile of patient B) Front smile profile of patient C) Frontal view of the retracted mouth of the patient showing maxillary and mandibular teeth D) Smile profile of the patient

2.2 Medical & dental history

A relatively healthy 26-year-old male patient with a noncontributory medical history. Oral hygiene was good

and there were no signs of caries and periodontal problems.

2.3 Diagnosis & etiology

Clinical examination and radiographic examination revealed that the patient has a Class I edge-to-edge malocclusion, peg lateral incisors namely tooth #12 and #22, abnormally sharp form lateral incisors (tooth #32 and #42), sharp canines (tooth #13, 23, 33,43). There was no mobility on the affected tooth and no apparent trauma to the tissues.

2.4 Prognosis

Good. The patient has no periodontal problems and very good oral hygiene and no contributing factor that would slow treatment.

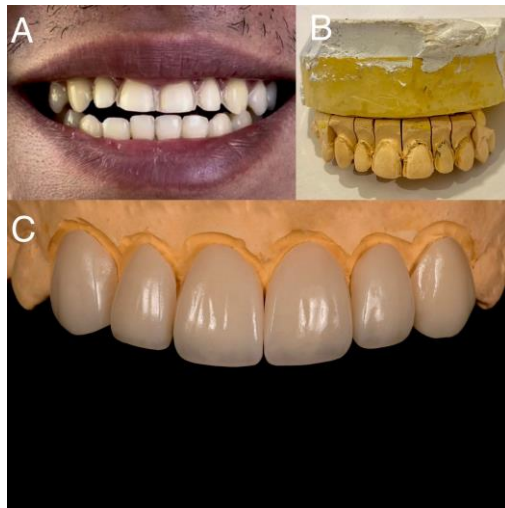


Figure 2. Treatment procedures. (A) Preparation and gingivectomy on tooth Numbers 13, 12, 11, 21, 22, 23 and enameloplasty on tooth numbers 33, 32, 31, 41, 42, 43. (B) Individual working cast of patient with prepared upper anteriors. (C) Final Indirect Emax veneers

2.5 Treatment

During the first appointment, treatment options were discussed with the patient. The first treatment plan proposed retreatment of orthodontic braces to address his Class I malocclusion (edge to edge case) before any esthetic treatment is done; however, the patient's limited time and foreign residency, the proposed treatment is not feasible. The second option was to opt for indirect Veneers along with gum lift on the Upper anterior and enameloplasty on the lower anterior. It is advised to use a stronger and more durable material such as E Porcelain Emax veneers due to its high durability, less possible fracture, and less staining. In this way, revisits will be impossible in case of fracture.

The second appointment was to prepare the patient's tooth numbers 13-23 and was subjected to bite registration and then cast mounting to get the correct bite and occlusion. Maxillary gum lift was done to improve the gum contour, crown lengthening, and zenith.

The third appointment was to install a plastic-connected temporary veneer while waiting for the porcelain veneers and the construction of a lower arch night guard. An enameloplasty procedure on tooth numbers 33, 32, 31, 41, 42, and 43 was done.

The fourth appointment is the installation of 6-unit Indirect Emax veneers using translucent choice 2 cement and BISCO Porcelain primer (pre-hydrolyzed silane primer). A1 shade was chosen which is a shade lighter than the patient's natural shade of (A2) to achieve esthetic results while maintaining a natural appearance. The patient was provided with a night guard for lower teeth for the protection of possible parafunctional habits to avoid fracture of veneers and abrasion from the porcelain's hard material that can significantly abrade the lower anterior.

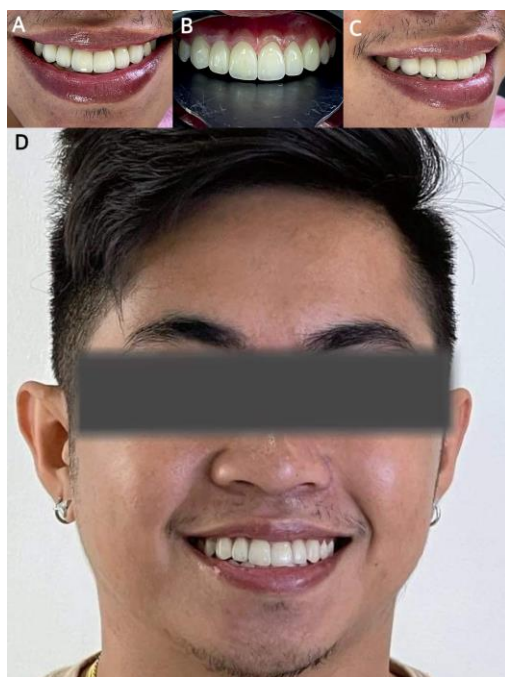


Figure 3. Patient's Post Op photographs.(A) Front Smile view. (B) 6-unit Indirect Emax Veneers installed (C) Patient's Right Profile. (D)Front Profile view of patient wearing 6-unit Indirect Emax Veneers.

3 | Discussion

The case involved a correction of Class I edge-to-edge malocclusion and aesthetic rehabilitation of both upper and lower anterior teeth shape and sizes of a 26-year-old male patient. The patient underwent an orthodontic treatment before but had it removed because it wasn't able to correct his malocclusion. Orthodontic braces are the ideal initial corrective approach in cases of malocclusions, however, orthodontics may not be sufficient to enhance the aesthetics in situations where the malocclusion is accompanied by variations in tooth size and shape, such as peg-shaped laterals and sharp canines which is present in this case.⁷

After a thorough discussion of the treatment options and considerations, in this case, Indirect veneers were the treatment choice that served as an adjunct to orthodontic treatment in the correction of the patient's malocclusion and overall aesthetics. As the patient is very concerned with the natural-looking result of veneers, Indirect Emax Veneers was used primarily for its excellent esthetics from the translucency of lithium disilicate material, good tooth-bonding ability, high fracture resistance, and high survival rate.⁸

Jacobson et al., reported in a study that Indirect Emax Veneers

cannot be used to treat atypical gingival esthetics, such as irregular gingival margins and unequal papillae, which are caused by abnormal tooth forms, shapes, sizes, and misaligned teeth.⁹ To achieve ideal gingival contours, a gingival lift procedure was done on the maxillary anterior where the veneers were installed. Application of gingival lift is necessary because gingival labial margin position in the maxillary anterior region is a crucial factor in achieving the perfect smile which means the relationship between the periodontium and the restoration is crucial if gingival health and aesthetics are to be achieved.¹⁰

In the mandibular region, abnormally sharp forms of lateral incisors and canines were corrected through an enameloplasty procedure. Enameloplasty-based cosmetic recontouring of natural teeth is a safe and conservative treatment strategy with aesthetic benefits, minimal biological cost, and good functional outcomes.¹¹ Aside from the aesthetic benefits of enameloplasty, this procedure enabled an overlap of the maxillary anterior teeth which resulted in the correction of the patient's class I edge-to-edge malocclusion and achieved a harmonious alignment of anterior teeth.

4 | Conclusions

The combined treatments of Indirect Emax veneers along with gum lift on

upper anterior teeth and enameloplasty on lower anterior teeth were able to satisfy the patient's aesthetic demand and corrected the patient's Class I edge-to-edge malocclusion. Contrary to the misconception that veneers are only a teeth-whitening treatment and for pageant smiles, veneers can be used as supplemental treatment in cases to correct and enhance tooth forms and sizes to the best possible aesthetic.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Southwestern University PHINMA School of dentistry.

Informed Consent Statement

Informed consent was obtained from the patient and the attending dentist. All methods have been exhausted to maintain the anonymity of the patient.

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Conflicts of Interest

The authors declare no conflict of interest.

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