

A Patient Centric Alternative Approach to Treating Large Diastemas: A Case Report

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Received: 29-10-2022 / Revised: 04-12-2022 / Accepted: 30-12-2022

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Conflict of interest: Nil

Abstract

The current case report discusses the morphofunctional rehabilitation of a large midline diastema and labially inclined teeth with the help of virtual smile designing and lithium disilicate restorations.

Key Messages: It is important to be aware of the etiology and the various treatment options available for the closure of diastemas. As a clinician, it is important to understand the unique challenges each case presents. It is the ability to translate acquired knowledge to suit the current situation that enables a clinician to provide the best possible treatment to their patients.

Keywords: Ceramics, Crown; Diastema, Smile Designing.

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Introduction

Facial expressions and appearances have always been crucial as they greatly affect interpersonal relationships [1]. A pleasing smile conveys serenity, safety, and success in the beholder [2]. Well-formed and aligned teeth are a vital aspect of a pleasing smile. Thus, dentistry incessantly seeks to meet the esthetic and functional harmony, mainly in the anterior area, which must be pleasant and natural, to boost both patient confidence and satisfaction. Maxillary anterior spacing is a common complaint in patients seeking aesthetic dental procedures [3]. Diastema

have a multifactorial etiology such as microdontia or agenesis, peg-shaped lateral incisors, mesiodens, midline cysts, habits such as finger sucking, tongue thrusting, and/or lip sucking, dental malformations, genetics, maxillary incisor proclination, dental-skeletal discrepancies etc [4,5]. The aim of any diastema closure is to improve esthetics while maintaining a natural appearance. The amount of diastema present, need for space redistribution and the width to length ratio of the teeth determines the treatment plan. Decisions such as the amount

of proximal reduction, the number of teeth to be treated, the placement of prominences and concavities to create illusions of height and width, and the decision for full-veneers or just adding to the interproximal are then made accordingly [6].

This case report discusses the closure of a large midline diastema along with redistribution of spaces to meet the patient's esthetic desires.

Case report

A 42-year-old lady reported to the dental clinic with the complaint of forwardly placed, fractured upper front teeth along with a large space between them. Being a public speaker, she was conscious of the appearance of her teeth and desired immediate correction. The patient gave a history of having a fall 3 years back which led to fracture of her front teeth. There was no associated history of pain, swelling or discolouration of the teeth. The patient's medical history revealed no systemic illness or disease.

Figure 1 shows the pre-operative smile of the patient. Intra oral examination (Figure 2) revealed no dental caries and Angle's Class 1 molar relation. A large overjet of 8mm (Figure 3) was seen along with a midline diastema of 7mm. Both 11 and 21 were labially tipped, with a distal inclination and Ellis Class II fracture. 21 appeared to be malformed and 1mm spacing was also observed between 12 and 11. A diastema measuring 0.5mm was observed between 41 and 31. All maxillary anterior teeth tested positive to pulp sensibility tests. There was no gingival display at rest and minimal display on smiling. A 0.5mm zenith discrepancy was noted between teeth 11 and 21. Blanch test did not demonstrate a presence of a high frenal attachment. No mesiodens or midline cysts were found radiographically.

The treatment plan presented to the patient consisted of orthodontic treatment to correct

the angulation of the teeth and to redistribute the spaces followed by restorative treatment to completely close the spaces. However, the patient was unwilling for a prolonged duration of treatment. Thus, after discussing with the patient, a different treatment plan was agreed upon. It consisted of endodontically treating teeth 12, 11 and 21 to facilitate angulation correction. Smile analysis and designing was carried out using Adobe Photoshop software to determine the redistribution of space and determine the final size of the teeth (Figure 4a). It was determined to increase the facial width of each central incisor mesially by 3mm while reducing 2mm from the middle-incisal thirds distally. 12 was to be reshaped and the width of 22 was to be increased mesially. The overjet was to be decreased by 6mm. It was decided to retain a 0.5mm midline diastema to prevent the central incisors from appearing abnormally broad. A digital mock-up of the proposed outcome was presented to the patient for her approval (Figure 4b). After endodontic treatment, tooth preparation was carried out according to the smile analysis and designing previously done (Figure 4c). Provisional acrylic crowns were provided to the patient for 10 days to get accustomed. Architectural gingival contouring [7] was carried out on the mesial aspect of the central incisors to provide a pleasing emergence profile to the permanent restorations. Feedback regarding any changes desired in the final restorations was also sought during this period. Subsequently lithium disilicate crowns were fabricated for teeth 12, 11 and 21, and a lithium disilicate veneer was fabricated for tooth 22 (Figure 5 and 6). Eccentric and protrusive interferences were corrected, and the restorations were bonded using a self-adhesive cement. Figure 7 shows 14 days follow up. Figure 8 shows the patient's final smile.

The patient was greatly appreciative of the fast and esthetic outcome.



Figure 1: Pre-operative smile



Figure 2: Pre-operative intraoral images



Figure 3: Pre-operative overjet



Figure 4: a. Smile analysis and designing (blue line- upper lip line, green line- smile line, white lines – tooth forms); b. Digital mock-up; c. Tooth preparation according to smile analysis and designing



Figure 5: Post operative intraoral images



Figure 6: Overjet after correction



Figure 7: 14 day follow up



Figure 8: Final smile

Discussion

Esthetics is adversely affected by the presence of diastema, malposed and malformed teeth. The present case report demonstrates the use of smile analysis and designing in treating large diastemas rapidly. Conventional treatment of large diastemas consists of fixed orthodontic therapy to realign the teeth and redistribute the space followed by a restorative phase as needed [8].

However, not all patients agree to a prolonged treatment duration. Such situations require knowledge and implementation of other techniques to meet the patients' needs and desires.

Smile analysis permits a clinician to analyse dentofacial, dentogingival and dental features harmoniously [9]. This information is then used to recreate an esthetically and functionally pleasing smile. Numerous tooth proportions have been advocated for use [10-12].

However, there is no “one fits all” strategy that can be made use of, and each case must be analysed thoroughly to achieve the best outcome. In the present case, an ideal line of treatment had been suggested to the patient which the patient did not agree to due to the prolonged treatment time. Due to the large diastema present and the unfavourable

angulation and positioning of the incisors, tooth proportioning according to the commonly used proportions without carrying out fixed orthodontic treatment was not ideal. It was thus decided to provide the most symmetric, esthetically pleasing, and closest to natural solution to the patient. Virtual smile designing and digital mock-ups (Figure 4) helped the patient understand the treatment and provide their inputs before proceeding.

Due to the large angulation correction needed to reduce the overjet, endodontic treatment prior to tooth preparation was required. Due to the favourable morphology and minimal correction required for closure of space between 11 and 12, it was decided to place a veneer on 12. In cases requiring drastic esthetic changes, use of provisional restorations is invaluable. These permit the patients to get used to the new look as well as convey to the dentist any changes they might desire in the final restorations. In the present case, the provisional restorations also helped carry out architectural gingival contouring to provide satisfactory rehabilitation without the need for added surgical procedures.

Conclusion

It is important to be aware of the etiology and the various treatment options available for the closure of diastemas. As a clinician, it is important to understand the unique challenges each case presents. It is the ability to translate acquired knowledge to suit the current situation that enables a clinician to provide the best possible treatment to their patients.

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