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Aesthetic Smile Makeover using Direct Composite Restorations: A Case Report of Interdental Spacing and Altered Passive Eruption

Abstract: Interdental space between anterior teeth is an aesthetic and a phonetic problem. While various treatment options are available, patients often have concerns regarding treatment invasiveness, duration of treatments, costs and long-term prognosis. This case report describes a step-by-step smile makeover with direct composite restorations in maxillary incisors and canines with interdental spaces, tooth size discrepancy and altered passive eruption.

CPD/Clinical Relevance: Minimally invasive dentistry is an integral component of contemporary clinical practice. With recent advances in innovative materials and improved clinical technique, attaining aesthetic results with a minimally invasive approach is highly achievable.

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Interdental spacing between anterior teeth is an aesthetic and a phonetic problem.¹ In the era of Facebook, Instagram and selfie photography, more patients are seeking aesthetic dental treatments. While various treatment options are available, patients often have concerns regarding treatment invasiveness, duration of treatments, costs and long-term prognosis.²

The appearance of a smile is influenced by the coronal proportion (width and length) and the teeth-smile-face relationship.³ This relationship must be considered when diastema closure is performed. Both the orthodontic and prosthodontic fields offer several treatment options for diastema closure, with several

differences between them. In cases of aesthetic defects and/or discrepancies in tooth size, orthodontic treatment alone will not solve the aesthetic problem.⁴

Within the prosthodontic field, the direct restorative approach is the most minimally invasive and cost effective. It is highly efficient and easily altered and maintained.⁵ Direct composite restorations permit changes of tooth size, shape, colour and inclination, and can be performed using a minimally invasive approach.⁶ Furthermore, when possible, original tooth structure may be preserved, making the treatment reversible.²

This case report describes a step-by-step smile makeover with direct composite restorations in maxillary incisors and canines with interdental spaces, tooth size discrepancy and altered passive eruption.

smile improvement. The patient's primary complaint concerned the 'gaps' between her maxillary incisors and canines that prevented her from smiling, making it difficult for her to work in the modeling industry (Figure 1).

Extra-oral examination indicated a gummy smile, high lip line and an asymmetric smile (Figure 1). At rest, incompetent lips revealed approximately 2 mm of incisor crown display.

Intra-oral examination of the maxillary arch revealed interdental spaces of approximately 1.5–2 mm between the maxillary incisors, canines and premolars, along with a discrepancy in coronal ratio stemming from altered passive eruption (pseudo-pockets), gummy smile, and enamel hypocalcifications (Figure 2). Tooth UL1 was slightly buccally placed, with a buccal enamel defect (Figure 3). The maxillary dental midline deviated 2 mm to the left (Figure 3). Vertical overbite of 4 mm was noted, and a horizontal overjet

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Case report

A 17-year-old female attended the clinic with aesthetic complaints and a request for



Figure 1.



Figure 2.



Figure 3.

of 2 mm was measured on tooth UR1 and 3.5 mm on tooth UL1.

Periodontal examination revealed probing depths of up to 3.5 mm and biofilm build-up on the maxillary anterior teeth as a result of the gummy smile, high lip line and incompetent lip.

Intra-oral examination of the mandibular arch revealed an incisal chip in tooth LL2



Figure 4.



Figure 5.

(Figure 3), not appreciable during smiling, and bilateral molars in an angle class 1 relationship.

Diagnostic impressions of both the arches were made to fabricate study models and interdisciplinary orthodontic, periodontal and prosthodontic treatments were offered to the patient. Owing to budget and time constraints from work, the patient requested a rapid treatment plan and minimal treatment costs, and ruled out the possibility of orthodontic treatment. Therefore, a gingivoplasty and direct restorative approach were offered and accepted by the patient and her mother.

Examination with a Vita colour guide (Vitapan classical, Vita Zahnfabrik, Germany) revealed A2 colour for the upper and lower anterior teeth. The teeth were whitened for 10 days to achieve the A1 shade using clear trays with 10% carbamide peroxide gel (Opalescence, Ultradent Products, USA).

Next, a gingivoplasty procedure for aesthetic crown lengthening was performed. A surgical key guide was created, based on the anterior teeth wax-up model, to perform the treatment procedure accurately, and approximately 1 mm of the free gingival margin from canine to canine in the maxilla arch was removed, while

maintaining an aesthetic gingival scalloped appearance, using No.15c and No.12 parker blades (Parker Blade, UK) (Figure 4). Minimizing the gingival sulci allows better maintenance of gingival hygiene⁴ and improvements to oral hygiene were discussed with the patient.

After a month, healing of the periodontium was confirmed, and a wax-up model (Figure 5) was made with two main goals:

1. Keeping the original transitional line angle morphology to create a narrow appearance of the clinical crown.
2. Minimally invasive, ie without mechanical preparation of the enamel, to minimize the amount of composite material needed for the procedure, especially on the buccal aspect, to achieve a natural appearance and reduce wear and tear in the future.

Following the wax-up demonstration of the aesthetic result, including tooth UL1 slightly prominent to the dental arch (Figure 5), and patient agreement, the wax-up model was copied to create a silicon index (Figure 6). The silicon index was used for the palatal aspect and to allow adjustment to the mesiodistal tooth dimensions.

Rubber dam was placed to isolate the teeth, followed by floss ligatures to retract the papillae laterally to enable management of the emergency profile of the restoration (Figure 7). The enamel surface of the anterior teeth was sandblasted with aluminum oxide powder (Al_2O_3) 27-micron (EtchMaster, Groman Inc, USA) to create retention for the restoration material without bur mechanical preparation.⁶

The enamel surface was etched with 37.5% phosphoric acid (Scotchbond Etching Gel, 3M, Germany) and bonded using a universal adhesive system (Scotchbond, Universal Adhesive, 3M, Germany). It should be noted that the sandblasting, etching and bonding were only applied on the proximal areas of the anterior teeth, except for tooth UL1 where the buccal defect was also treated (Figure 8).

Using the silicon index with a thin layer of nanofilled restorative material (Filtek Supreme Ultra Universal Restorative composite, shade EnamelA1, 3M, USA) created a palatal wall (Figure 9) and the composite on the buccal defect at tooth UL1. A sectional matrix was placed



Figure 6.



Figure 10.



Figure 7.



a



Figure 8.



b



a



Figure 12.



b

Figure 9.

vertically (lumiContrast sectional matrices, 0.025 mm, Polydentia, Switzerland) to aid restoration of the proximal wall with restorative material (Filtek Supreme Ultra Universal Restorative composite, shade BodyA1, 3M, USA) (Figure 10), A different colour was chosen for increased optical depth and a more natural appearance, with the final layer being the same shade as the first application (Filtek Supreme Ultra Universal Restorative composite, shade EnamelA1, 3M, USA). Glycerine was applied on the surface of the composite and cured (Figure 11).

The final procedure was contouring and polishing with silicon (Sof-Lex Extra-Thin, 3M, USA) and polishing discs, used at 2000rpm with no water, and then at 10,000rpm with abundant water, and a 1- μ m aluminum oxide paste (ENA Shiny, Micerium SpA, Italy). This gave the restorations a beautiful finish (Figure 12).

Summary

An interdisciplinary approach with minor periodontal treatment of the altered passive eruption and prosthodontic treatment with a no-bur preparation and direct composite restoration to the proximal surfaces, which closed the interdental space while preserving the original transitional line angle, was preformed to achieve a minimally invasive aesthetic result in minimal time and with minimal costs. There are several treatment options for interdental



Figure 13.

space closure and smile makeover. Proper treatment planning may lead to a minimally invasive, predictable, reversible and economical smile makeover.

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Compliance with Ethical Standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Informed Consent: Informed consent was obtained from all individual participants included in the article.

References

1. Romero-Maroto M, Santos-Puerta N. The impact of dental appearance and anxiety on self-esteem in adult orthodontic patients. *Orthod Craniofac Res* 2015; **18**: 143–155.
2. Bello A, Jarvis RH. A review of esthetic alternatives for the restoration of anterior teeth. *J Prosthet Dent* 1997; **78**: 437–440.
3. Claman L, Alfaro MA. An interdisciplinary approach for improved esthetic results in the anterior maxilla. *J Prosthet Dent* 2003; **89**: 1–5.
4. Ittipuriphath I, Leevailoj C. Anterior space management: interdisciplinary concepts. *J Esthet Restor Dent* 2013; **25**: 16–30. <https://doi.org/10.1111/j.1708-8240.2012.00515.x>.
5. Demarco FF, Collares K. Should my composite restorations last forever? Why are they failing? *Braz Oral Res* 2017; **31**(Suppl 1): e56.
6. Devoto W, Saracinelli M, Manauta J. Composite in everyday practice: how to choose the right material and simplify application technics in anterior teeth. *Eur J Esthet Dent* 2010; **5**: 102–124.