Long-term retention and improved aesthetics

Salman Siddiqi presents a case in which a patient's need for a minimally invasive approach for her brighter, more even smile was more than satisfied by a programme of aligners, whitening, edge-bonding and direct composite veneers

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Salman is an award-winning clinician who thrives on providing high quality, stress-free dental care. He has a particular interest in minimally invasive cosmetic and restorative dentistry and has carried out extensive postgraduate study in this field. He is a fully certified provider of Invisalign, Inman Aligner and Clearsmile aligners. He currently practises as an associate at the Burgess and Hyder Group.

ENHANCED CPD
GDC anticipated outcome: C
CPD hours: one
Topic: Orthodontics
Educational aims and objectives: To present an orthodontic restorative case that demonstrates the use of aligners, whitening, edge-bonding and direct composite veneers. This article qualifies for one hour of enhanced CPD; answer the questions on page 124 or scan the QR code.

A 22-year-old female patient presented at the surgery as she was unhappy with her crowded upper and lower teeth, in particular the upper left lateral incisor, which appeared 'set back' and looked missing in photographs (Figures 1 to 3). She was also becoming increasingly conscious of her teeth changing position.

CLINICAL EXAM AND PATIENT EXPECTATIONS

At the initial consultation, the patient explained she wanted a brighter smile with more even anterior teeth. It was important that she achieved a natural-looking aesthetic result with minimally invasive techniques.

She also expressed an interest in composite bonding after initial orthodontic treatment, to bring the smaller lateral incisors into correct proportion with the dominant upper centrals (Figures 4 to 7).

Following a thorough examination, it was noted that a previously treated root canal was failing on the lower left first molar (LL6).

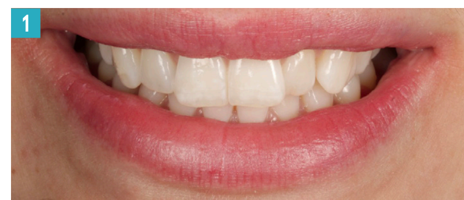
The patient's oral hygiene was otherwise good, and she was dentally stable. The orthodontic assessment revealed a class I incisor relationship on a class I skeletal base. There was mild crowding in the upper and lower labial segment. The UL2 was inclined palatally, and an overjet of 3mm and overbite of 30% were recorded.

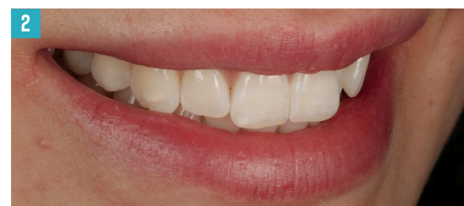
TREATMENT PLANNING

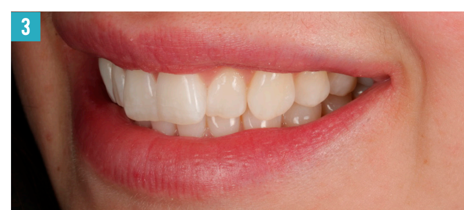
Three treatment options were discussed with the patient:

1. Doing nothing and accepting the presenting condition
2. Restorative treatment only, using direct composite or indirect porcelain veneers
3. Ortho-restorative treatment including alignment, bleaching, composite edge-bonding on the upper centrals, and direct composite veneers on the upper laterals.

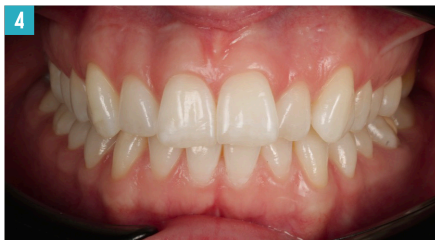
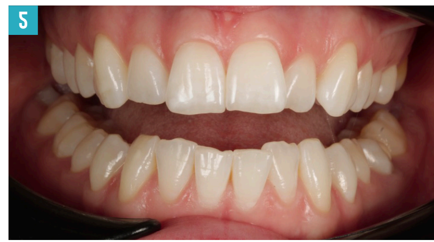
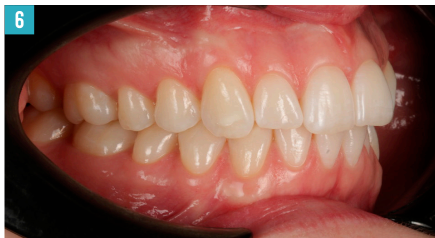
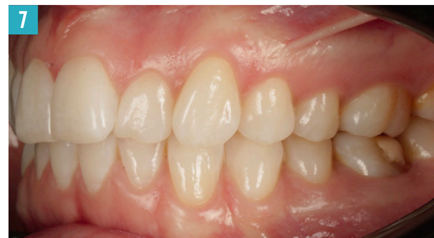
The second option was not recommended given the patient's occlusal challenges, restricted envelope of function and the risk of further relapse of the upper left lateral incisor (Figures 8 to 10). The biological cost of invasive preparations for



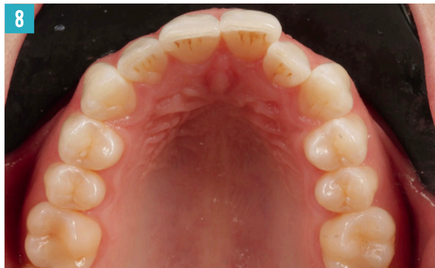
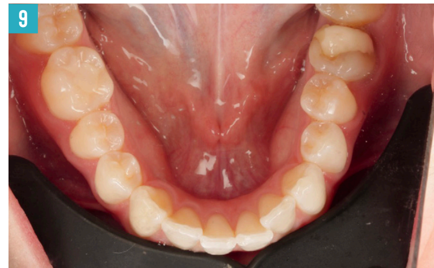
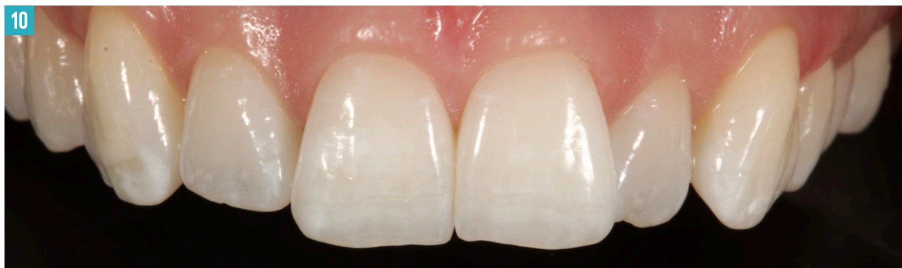




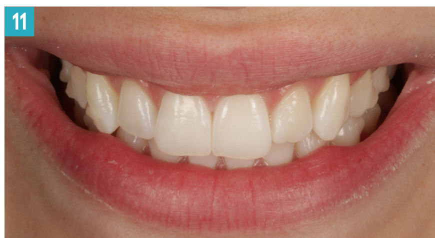
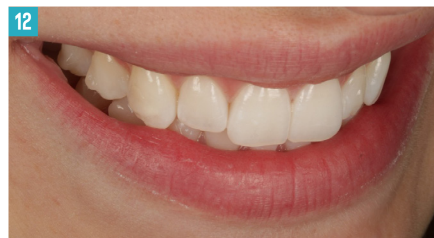
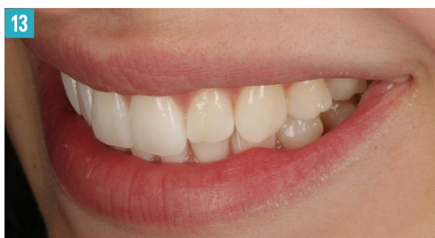
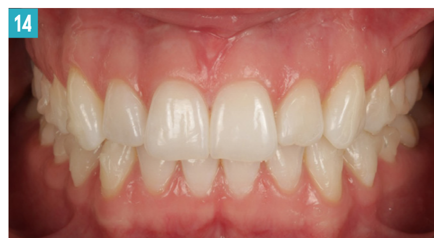
FIGURES 1, 2 *and* **3:** *The patient was unhappy with her crowded upper and lower teeth, and 'set-back' upper left lateral incisor*

FIGURES 4, 5, 6 and **7:** *She expressed an interest in composite bonding after orthodontics, to bring the smaller lateral incisors into correct proportion with the upper centrals*

FIGURES 8, 9 and **10:** *The patient had occlusal challenges and a restricted envelope of function*

FIGURES 11, 12, 13 and **14:** *Alignment took six months*

indirect veneers and a bulky-looking restoration on the UL2 would also compromise her future periodontal health.

The third choice was the optimal treatment plan. This would include a course of Invisalign aligners to correct the crowding, followed by tooth whitening, composite bonding to restore the worn edges of the upper centrals, and direct veneers on the upper laterals to improve the outline shapes and general proportions. The patient chose this plan, as it most closely conformed with her goals. She was also able to grasp the need to treat the restricted envelope of function to achieve long-term stability.

ALIGNMENT AND BLEACHING

The failing root canal on LL6 was retreated and a lithium disilicate ceramic crown was placed prior to the alignment commencing. An intraoral scan was carried out, followed by customisation and planning with the Clincheck software. A 3D visualisation was shared with the patient to obtain full, informed consent.

Invisalign clear aligners were produced, and at the following appointment the patient was provided with the first in a series of 25 aligners for approximately six months of treatment (Figures 11 to 14).

Interproximal reduction was carried out at the initial fit stage and at planned intervals throughout the treatment. Some predictive proximal reduction was also performed for contact shaping and creation of the ideal future contact point.

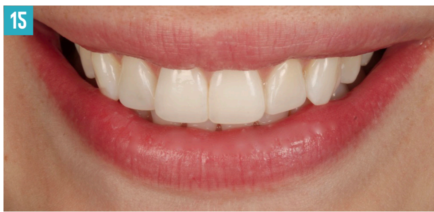
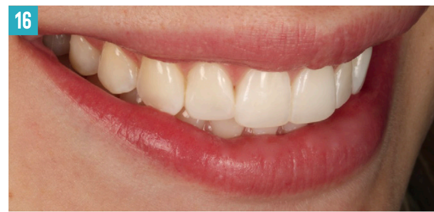
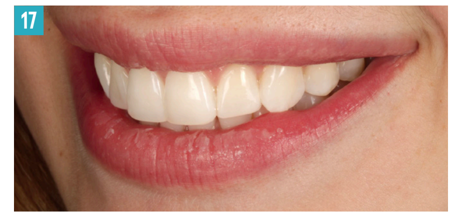
Alignment was followed by whitening to achieve the patient's desired tooth shade. Impressions were taken for production of the whitening trays. At the fit appointment, she was given a four-week course of home whitening and instructed to carry out the treatment using well-fitted trays worn overnight with Whitewash Professional 10% carbamide peroxide gel. B1 was recorded on the Vita shade guide following the bleaching course.

Physical and chemical alteration may occur in enamel immediately after whitening, thereby reducing the enamel-to-resin bond strength (Topcu et al, 2017). Accordingly, the composite restorations were carried out on the upper central and lateral incisors two weeks after whitening (Figures 15 to 17).

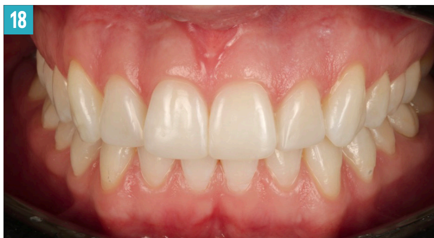
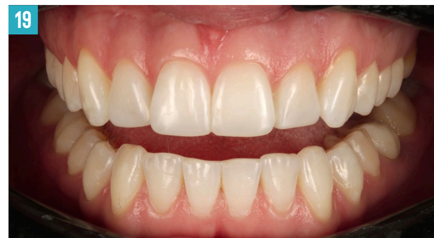
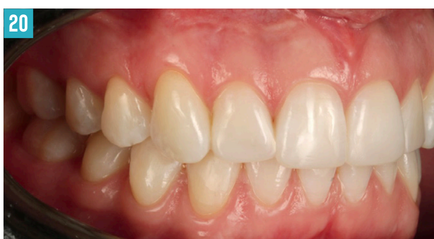
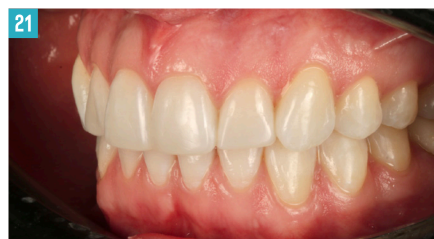
STRENGTH AND STABILITY

The composite chosen for the edge-bonding and direct veneers was Kulzer Venus Pearl. The material's nano-hybrid properties offer strength and stability with a low risk of fracture, and deliver a lasting lustre after polishing.

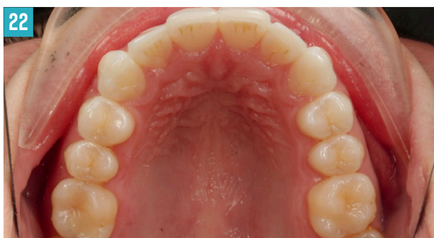
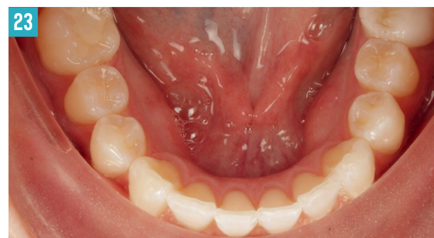
The ease of handling and shade matching with a simplified Vita shade system make it

FIGURES 15, 16 and **17:** *Composite restorations were carried out on the upper central and lateral incisors*

FIGURES 18, 19, 20 and **21:** *Composite was placed at the central incisor edges to achieve the desired form and shape. Direct composite veneers were built for the lateral incisors*

FIGURES 22 and **23:** *The crowding has been treated to prevent further relapse*

an incredibly straightforward material to work with. Edge-bonding was carried out initially on the upper central incisors, with Venus Pearl BL shade applied in a layered technique, followed by restoration of the upper lateral incisors under rubber dam isolation.

A full-mouth ultrasonic scale and Airflow prophylaxis procedure was carried out to achieve a clean working field and remove any surface biofilm.

The teeth were etched and Kulzer Ibond Universal was applied and light-cured in accordance with the manufacturer's instructions.

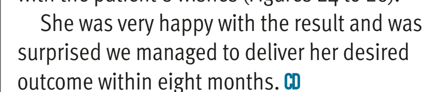
Increments of composite were placed at the edges of the central incisors to achieve the desired form and shape (Figures 18 to 21). Kulzer Signum liquid helped to sculpt the composite and prevent the instruments from sticking or dragging material, thereby aiding perfection of the margins.

The direct composite veneers were built for the lateral incisors. Initially, a palatal shell was made using a Mylar matrix strip behind each tooth, placed at the desired incisal length with Venus Pearl incisal translucent shade CL. The interproximal sections were built up aided by a TOR VM posterior matrix placed vertically in the contact point. The final labial layer was caried out freehand with a single quantity of Venus Pearl BL shade. Initial finishing was performed with abrasive discs and strips. The easy-to-use, two-step Kulzer Venus Supra polishing system transformed the restorations into a high lustre.

MINIMALLY INVASIVE OUTCOME

A good outcome was achieved, as the patient's crowding has been treated to prevent further relapse (Figures 22 and 23). Concerns about the appearance of UL2 were fully addressed. Rather than appearing 'set back', the tooth is now aligned with the rest of the upper anterior dentition. Long-term retention and improved aesthetics were accomplished, in accordance with the patient's wishes (Figures 24 to 26).

She was very happy with the result and was surprised we managed to deliver her desired outcome within eight months. CD



REFERENCES

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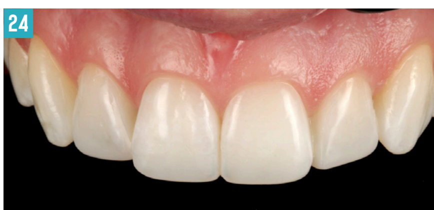
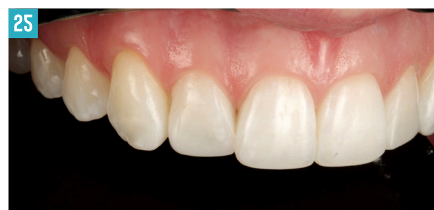
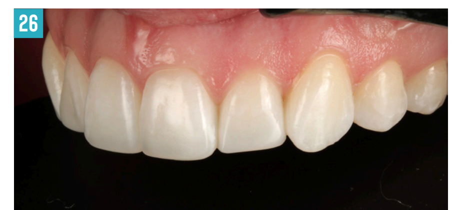
PRODUCTS USED

Ibond Universal, Signum, Venus Supra, Venus Pearl Kulzer
Invisalign system Align Technology
Clincheck Invisalign
Whitewash Professional Whitewash Laboratories
Airflow EMS Dental

FIGURES 24, 25 and **26:** *Long-term retention and improved aesthetics were accomplished with minimally invasive techniques*