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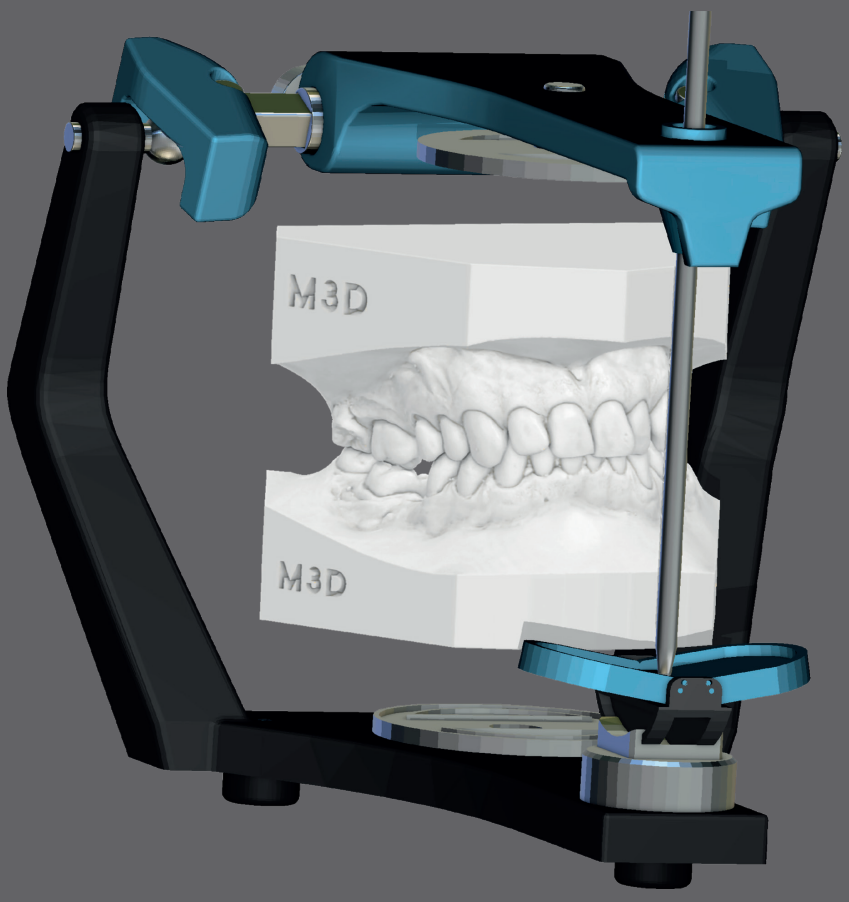

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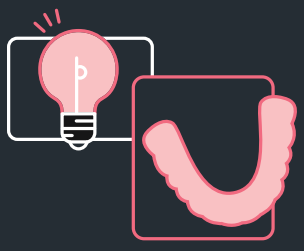

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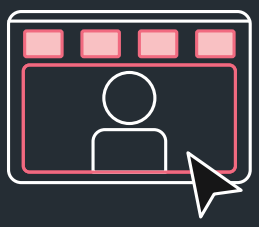

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The align, bleach and bond (ABB): its beginning and future

After practicing for only a few years my career nearly ended mid-1990s when I was desperately unhappy as a dentist. Why? Because in the British NHS a dentist, trying to do his best for his patients would occasionally on explaining why they needed treatment, hear the question "Is that because you want a Porsche?" This had a slowly grinding effect on me. There typically was little explanation to the public by British representative bodies about what quality dentistry meant or cost, so this was normal. At one point, I nearly left the profession, but the purchase of a basic dental intra-oral camera in 1997 changed my mind. From that point on, visual communication became a critical part of my practice. I moved towards aesthetic and cosmetic dentistry, and in the late 1990s, I started taking many courses and discovered that patients, once they could visualise their teeth, wanted to deal with aesthetic issues. One of these issues was tooth position and the need for orthodontics. This had a profound effect on the parameters of smile design. I learned of course how to 'cut" teeth to a correct position, but this made me uncomfortable, so we referred many patients to the orthodontist. But many rejected this offer, and for those who went, it was rare for them to proceed, because at that time, only comprehensive treatment was typically offered by the specialists. The concept of "limited objective orthodontics" was not widespread thus, patients often returned rejecting 1 year+ orthodontic treatment and requested veneers. For a while I did these veneers. This discomfort prompted me to experiment with spring aligners focused on the anterior zone (2003). I helped patients understand what I was going to align, and what I was leaving untouched, understanding ideal vs. compromised goals. This worked amazingly on a few initial cases, and suddenly within a few weeks, these aligners fixed smile design parameters that normally needed heavy preparation to resolve. I contacted 20+ patients who had previously refused comprehensive orthodontics and had planned veneers. Every single person accepted limited objective treatment (2 to 3 months of aligning the anterior teeth). Then, with simultaneous bleaching, I found an important thing happened: every patient who initially wanted veneers, after straightening and whitening, just wanted to know what I could do about the "irregular edges". I fixed this with "reverse triangle edge bonding", a concept I developed to mask joins and make the process simple. "Progressive smile design using align, bleach and bond" without doubt changed the approach of many practitioners in the UK and Europe. Of course, some orthodontists felt that orthodontics should not be something a general dentist performs, and some in cosmetic dentistry feared that this could have an impact on the number of veneers they would place.

With 30 years in one single practice, it is patently clear that early interceptive treatment in cases where bites are deepening, guidance lost, teeth crowding, dentine getting exposed and envelopes of functions constricting – result in much better outcomes for patients you treat versus those you don't. The latter often end up needing far more complex, expensive treatment later in life. ABB setup for functional and occlusion driven outcomes is the perfect blend of treatment for many of these cases. In my practice, over 30 years, no patient ever went on to develop the need for full-mouth rehabilitation, because I have always used a combination of early interceptive bonding and orthodontics to restore teeth, on patients that I have educated through the use of intra- and extra-oral cameras.

I am hoping that, in the future, research proves this and starts to change our approach to dentistry to a long-term, holistic view of what we can prevent functionally and orthodontically.


page 06


page 38


page 64

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Laser-assisted orthodontic treatment of a dilacerated impacted maxillary incisor

Drs Kazem Dalaie, Samin Ghaffari & Mazir Mir, Iran & Germany

Introduction

Impaction of the permanent teeth is commonly seen in mixed dentition, especially impaction of maxillary incisors. Disturbance in the eruption of anterior teeth will cause serious aesthetic problems. Given the high importance of treatment of impaction of maxillary central incisors and considering the many advantages of laser application for surgical exposure and acceleration of orthodontic tooth movement, the aim of this paper is to describe the successful treatment of an impacted maxillary central incisor via laser application for surgical exposure and orthodontic traction.

Case presentation

A 10-year-old boy presented with the chief complaint of delayed eruption of a maxillary anterior tooth. Clinical and radiographic examination revealed impaction of the maxillary right central incisor (Fig. 1), which was horizontally positioned with a dilacerated root. The maxillary dental midline had deviated owing to drifting of adjacent teeth, especially the maxillary right lateral incisor, into the area of the unerupted tooth.

Treatment procedure

In the first phase, brackets were bonded on all permanent teeth. After levelling and alignment of the maxillary arch and providing enough space for the eruption of the impacted tooth, a relatively rigid stabilising archwire was placed. Periodontal surgery was then performed for exposure of the tooth. The crown of the tooth was impacted within soft tissue, so there was no need for removal of bone. The procedure was conducted using a 975 nm pulsed laser (LaserHF standard, Hager & Werken) at 3 W and with a duty cycle of 50% and a fibre diameter of 0.4 mm (Fig. 2). The irradiation time was 150 seconds. After removal of the soft tissue, an attachment with a ligature tied to it was bonded to the facial surface of the

Fig. 1a: Intra-oral photograph revealing impaction of the maxillary right central incisor.

Fig. 1b: Panoramic radiograph revealing impaction of the maxillary right central incisor.

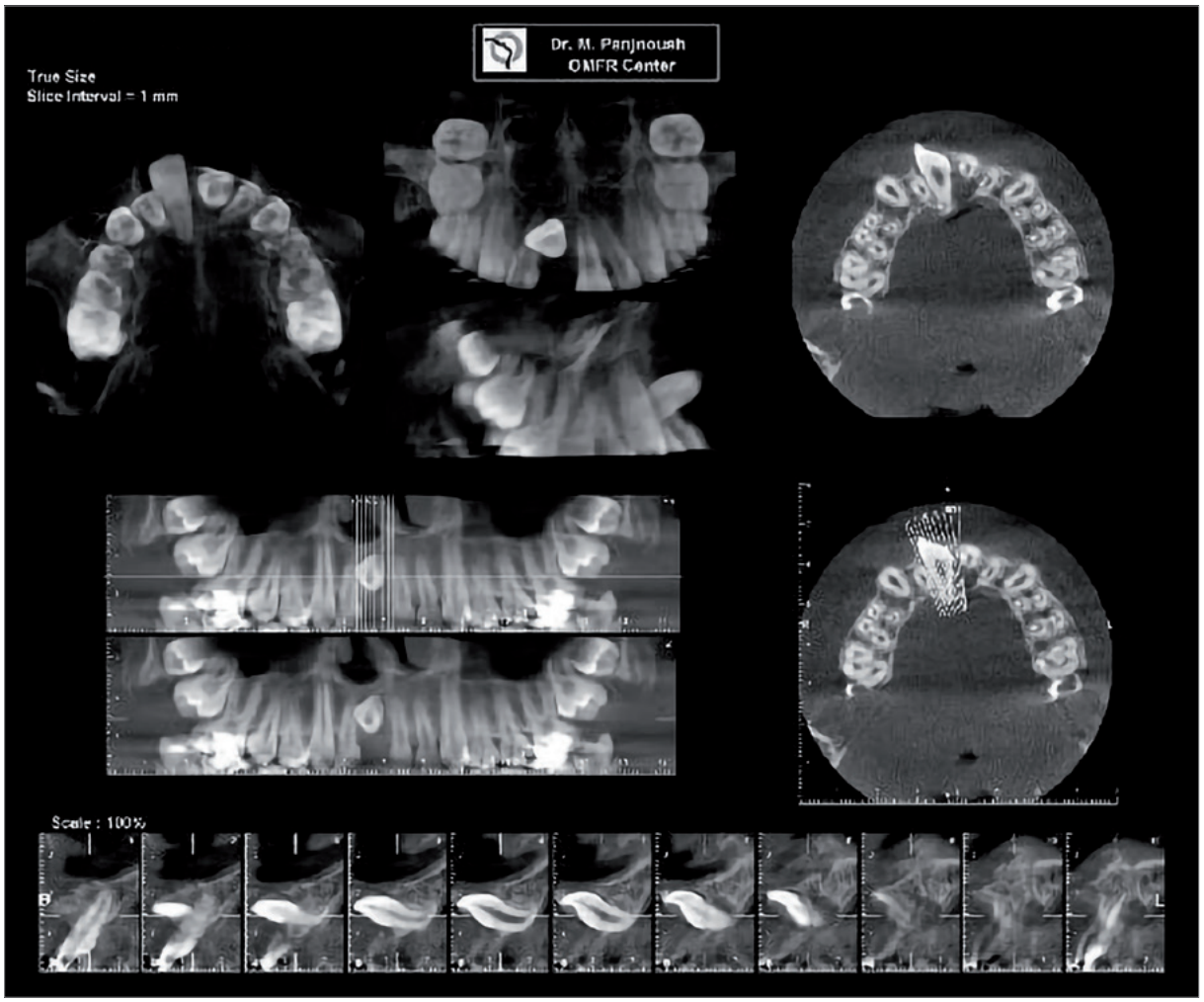

Fig. 1c: CBCT scan revealing impaction of the maxillary right central incisor.

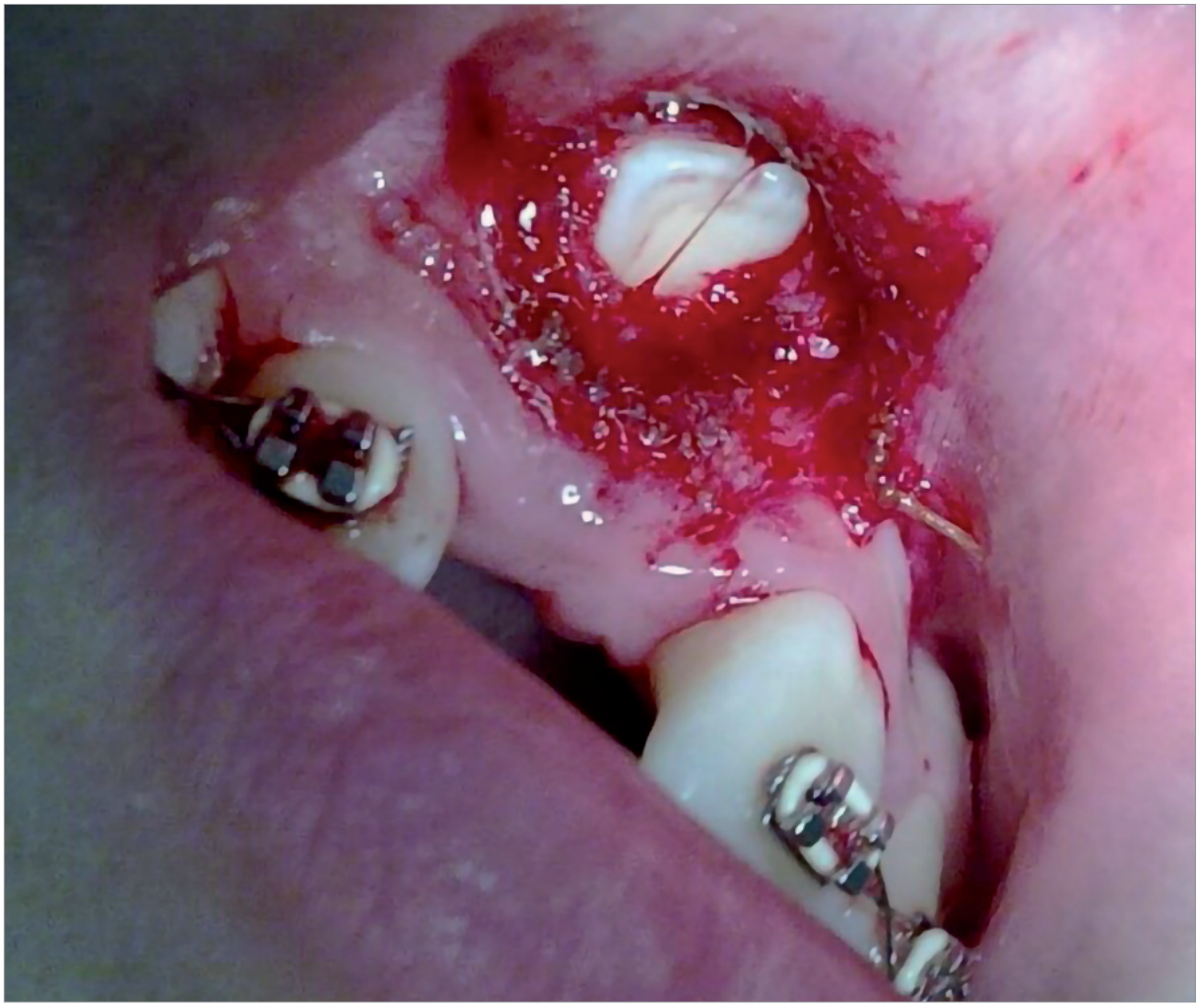

Fig. 2: Laser-assisted surgical exposure of the impacted tooth.

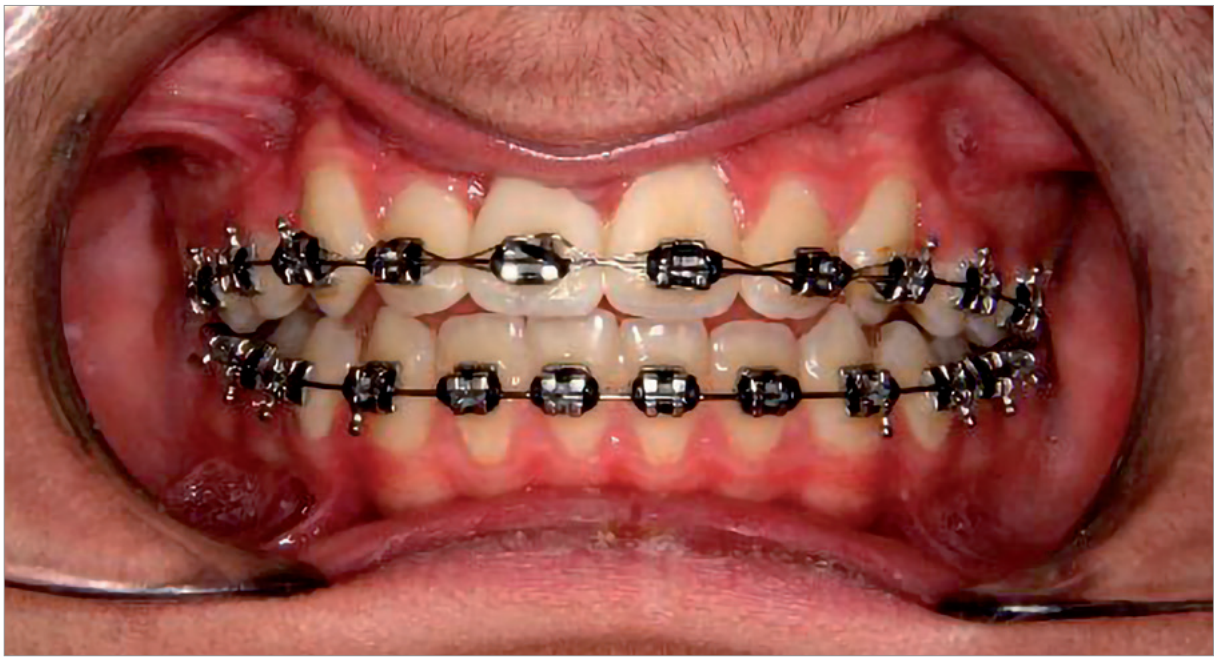

Fig. 3: Successful eruption and levelling and alignment of the impacted tooth after 15 months.

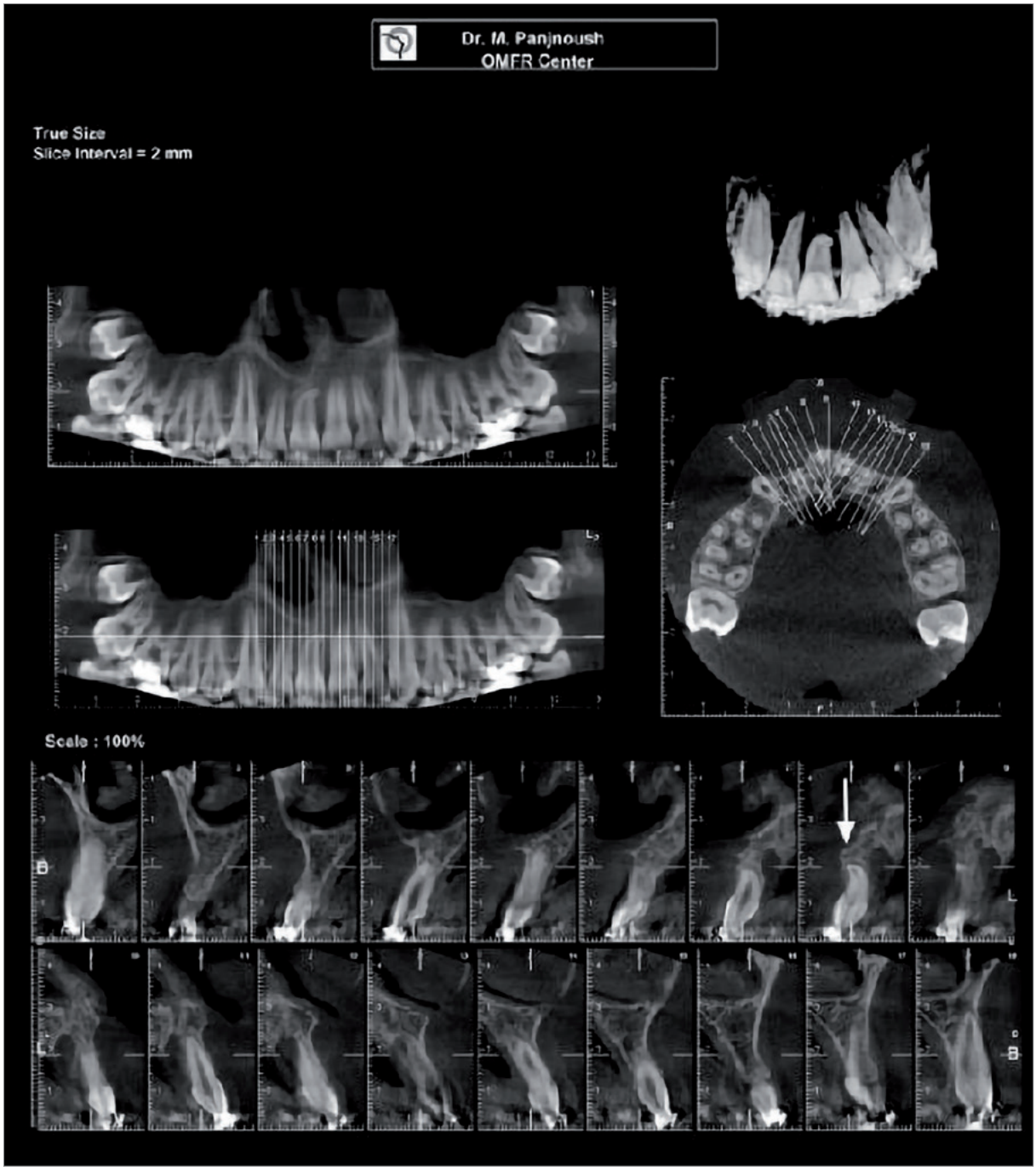

Fig. 4a: CBCT scan showing the proper position of the impacted tooth with a favourable gingival margin, minimal root resorption and an acceptable amount of surrounding bone.

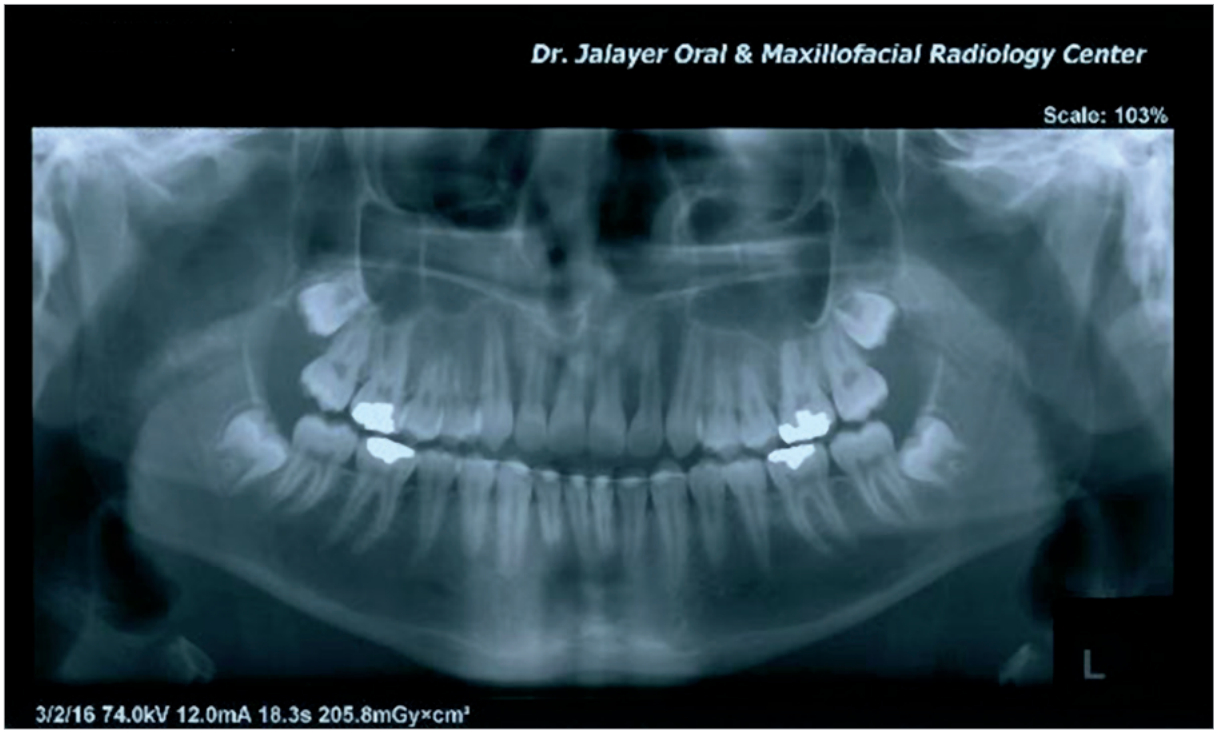

Fig. 4b: Panoramic radiograph showing the proper position of the impacted tooth with a favourable gingival margin, minimal root resorption and an acceptable amount of surrounding bone.

Fig. 4c: Intra-oral photograph showing the proper position of the impacted tooth with a favourable gingival margin, minimal root resorption and an acceptable amount of surrounding bone.

impacted tooth. There was no bleeding, oedema or pain after surgery, and the patient reported no discomfort. After surgery, the patient returned for three sessions every month to eliminate overgrowth of gingiva and soft tissue over the crown using the same laser used for surgery. Immediately after exposure, light extrusive force was applied by an elastomeric chain attached to the ligature extension.

The 975 nm wavelength was primarily used for surgical exposure. This wavelength has limited depth of penetration and is traditionally not used for biostimulation. However, each surgical laser has a halo of decreasing light intensity, and in the periphery, biostimulatory effects may occur. The main low-level laser therapy (LLLT) effect, however, was achieved with the pulsed 100 mW, 660 nm laser probe at a distance from the soft tissue. The aper-

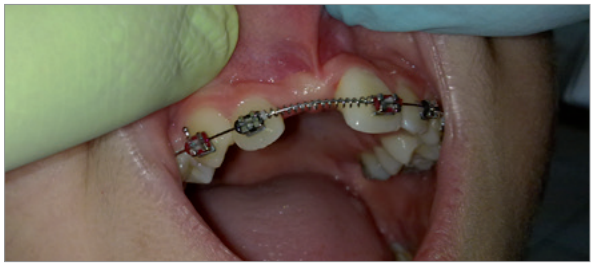

Fig. 5a: Before laser surgery.

Fig. 5b: Final photo.

Fig. 5c: Final radiograph.

ture of the probe was 0.125 mm^2 (diameter of 0.4 mm), and the slowly scanned area was 7 cm^2 at the labial and lingual sides, irradiated for 150 seconds at each visit, resulting in an energy of 15 J and an energy density of about 17 J/cm^2. The patient received LLLT monthly until the desired movement of the impacted tooth was achieved, and this was attained in six sessions. Therefore, a combination of the 975 nm (more than 25 J/cm^2) and 660 nm wavelengths (12–18 J/cm^2) was received by the tissue at the time of surgery and all monthly recalls. The impacted tooth was largely in the proper position after seven months (Fig. 3). The active treatment took 18 months. The final levelling and alignment were obtained with 0.018 × 0.025 in. stainless-steel archwires.

Finally, the patient's smile was dramatically improved, and the final appearance of the anterior teeth and their gingival margins was aesthetically pleasing (Fig. 4). Also, a CBCT scan taken at the final stage revealed no bone resorption and minimal root resorption.

Conclusion

Combining laser irradiation for surgical exposure of an impacted tooth and LLLT for acceleration of tooth movement may provide a successful approach for treating impacted teeth, especially with dilacerated roots, and provide good prognoses for these teeth. Improved periodontal, occlusal and aesthetic results might be achieved, especially in young patients.

Acknowledgment:
The authors would like to thank Dr Mina Mazandarani for her help, Patrik Hager for sending us the HF laser from Germany and Dr Mehrdad Khanbani for giving us the chance to install the laser is his clinic in Tehran, to do laser surgery and therapy.

Note: Written informed consent was obtained from the patient and his parents for publication of this case report and the accompanying images.

about

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Dr Samin Ghaffari is postgraduate student in orthodontics at the Dentofacial Deformities Research Center of the Research Institute of Dental Sciences at the School of Dentistry of Shahid Beheshti University of Medical Sciences in Tehran in Iran.

Easy clear aligner workflow: A case report

Drs Ujjwal Pyakurel & Manish Bajracharya, Nepal

Background

Numerous authors have described the importance of physical attractiveness, and others have discussed the primary role of the face in overall attractiveness. Modern society demands beautiful faces and smile. This has led many consumers to seek treatment to improve their smiles. Individuals with beautiful facial aesthetics may tend to be assessed as having higher value as reproductive partners, given more job opportunities and regarded as trustworthy.[1] Handsome people are regarded as having nicer personalities as well.[2, 3] Chuk et al. found that, of two common facial recognition patterns regarding eye movement, the analytic eye movement pattern, looking at the eyes and centre of the face, including the mouth, was preferred.[4] It was also found that this method was better at facial recognition performance, and this was consistently the case in different cultures and age groups. Thus, a beautiful face and smile are important factors for a better first impression.

Kesling first introduced the concept of clear orthodontic appliances to move misaligned teeth in 1946.[5] Align Technology introduced Invisalign as the first clear aligners in 1998. The initial cases were minor crowding or spacing. With the development of powerful software and much research, in due course, the treatment result with clear aligners has become increasingly effective, on par with that of conventional appliances. Now, not only cases of minor crowding but also cases of moderate to severe crowding can be treated with clear aligners. With the support of a good CAD software program and proper knowledge of biomechanics, tooth movement is easier than before to achieve. Besides, these days, apart from perfect results, the demand for more comfortable, invisible orthodontic treatment is high.

This case report is focused on how powerful and user-friendly software can provide more control in tooth movement and give a good result if proper knowledge of biomechanics is applied in the planning of orthodontic treatment in a relapse case. We used Maestro 3D software (AGE Solutions) for the design and planning of this case and would like to share how the versatility of the software can be a boon for achieving the perfect result.

A 25-year-old female patient came to our office complaining of the excessive spacing between her maxillary and mandibular teeth that had been under treatment for three years. She had already undergone orthodontic treatment twice before and was completely against wearing fixed appliances again. On examination, it was found that there was generalised spacing of the maxillary anterior teeth and minor spacing of the mandibular anterior teeth. A fixed retainer was still in place (Figs. 1–5).

All the treatment planning and processing were done with Maestro 3D Version 5.2, and this case discussion is focused on how powerful, user-friendly software can make things easy. All steps are described in detail wherever possible.

To proceed with the case, we divided the workflow into five major steps, which would organise and ease our workflow:

1. preparation of the model (study and work models);
2. measurements and analysis;
3. segmentation and virtual planning;
4. preparation of transition models; and
5. export.

Preparation of models

Putty wash impressions were taken to obtain accurate details of the teeth. Bite registration was also done. The impressions were poured in stone and scanned to obtain the digital data, in the form of STL files. This data was imported into the Maestro 3D software (Fig. 6).

The STL files for the maxillary and mandibular arches were imported together. Jaw orientation tools, found on the toolbar, were used for minor occlusal correction. After importing the STL files into the software, local origo function was used to orient the occlusal plane. Though various methods are available, we feel that it was easier to use the occlusal plane, employing three point registrations in the maxillary arch for ease. The three points considered are on the buccal cusp of posterior teeth (maxillary first molar) on either side and the incisal edge

Figs. 1–5: Pretreatment records.

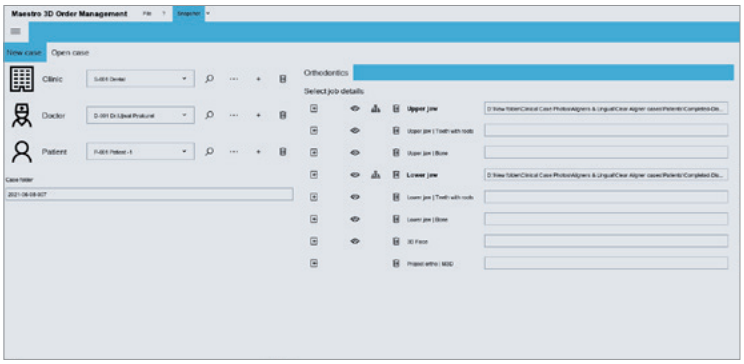
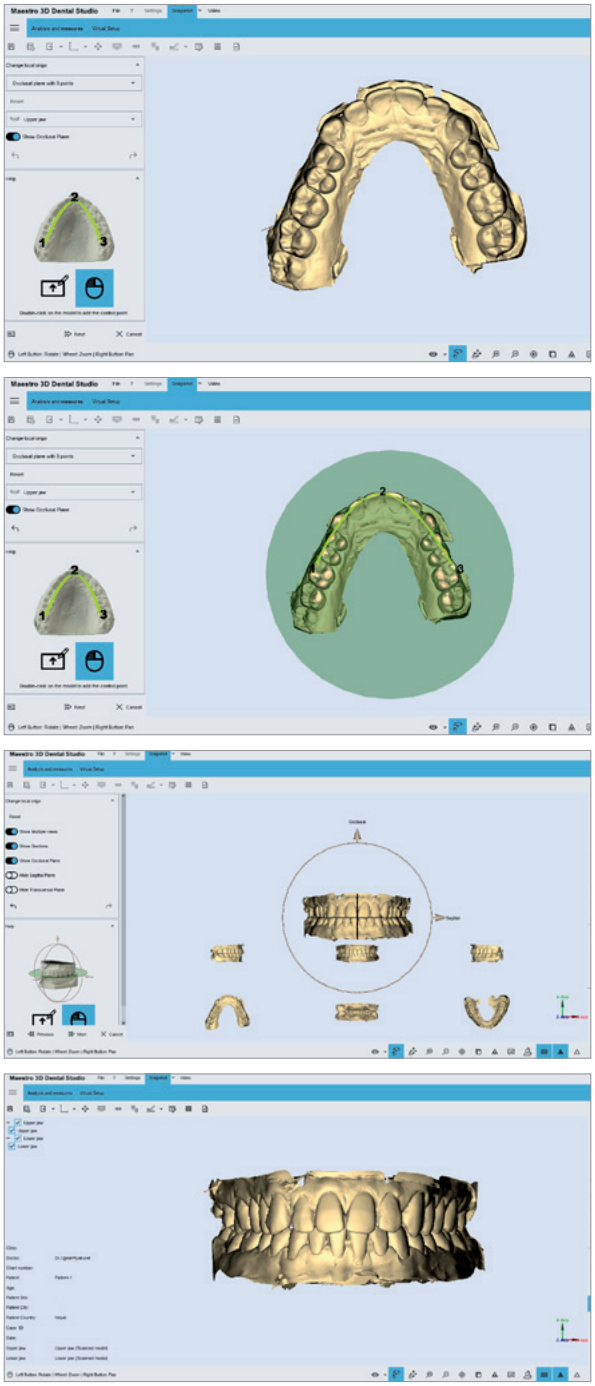


Fig. 6: Preparation of models.



Figs. 7–10: Preparation of models.

of an anterior tooth (either maxillary central incisor). The occlusal plane was adjusted with the manipulator for minor changes (Figs. 7–9).

This created STL files of the unprepared maxillary and mandibular arches on the main dashboard (Fig. 10), and these files need to be prepared for a study model or a working model. The software offers several buttons on the interface to prepare the model, such as add, remove or smoothing tools. We can use these buttons to prepare a model according to our need. We recommend saving the study model before proceeding to the next steps, as a back-up for future reference. The prepared scanned model was cut into a horseshoe-shaped dental model before the segmentation process, to save on resin during 3D printing (Figs. 11–21). The model was then characterised with the patient's name to be able to identify the model (Fig. 22).

Measurement and analysis

The next step was to perform the measurements and analyse the model. For this, the analysis and measures toolbar and the tooth measurement tab were used (Fig. 23) to obtain the Bolton's ratio. We also realised the arch length using the arch length measurement tab and used other tools, like space and crowding analysis. With the help of cross-section tools, we measured the overjet and overbite in different sections with great precision, as well as registered the occlusal bite (Figs. 24–28). However, these measurements can also be performed in the set-up model after tooth segmentation, instead of the scanned model.

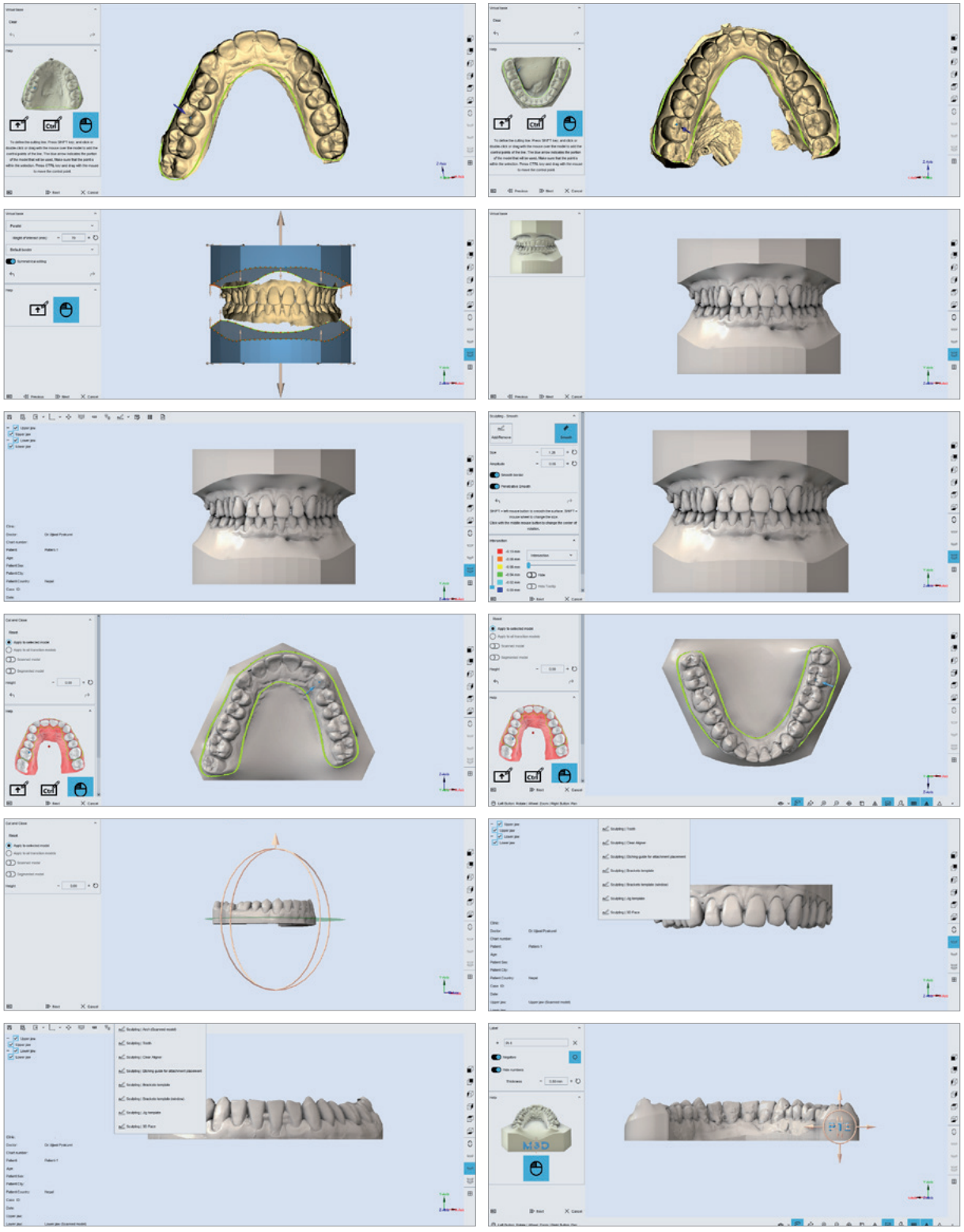
Segmentation and virtual planning

Segmentation

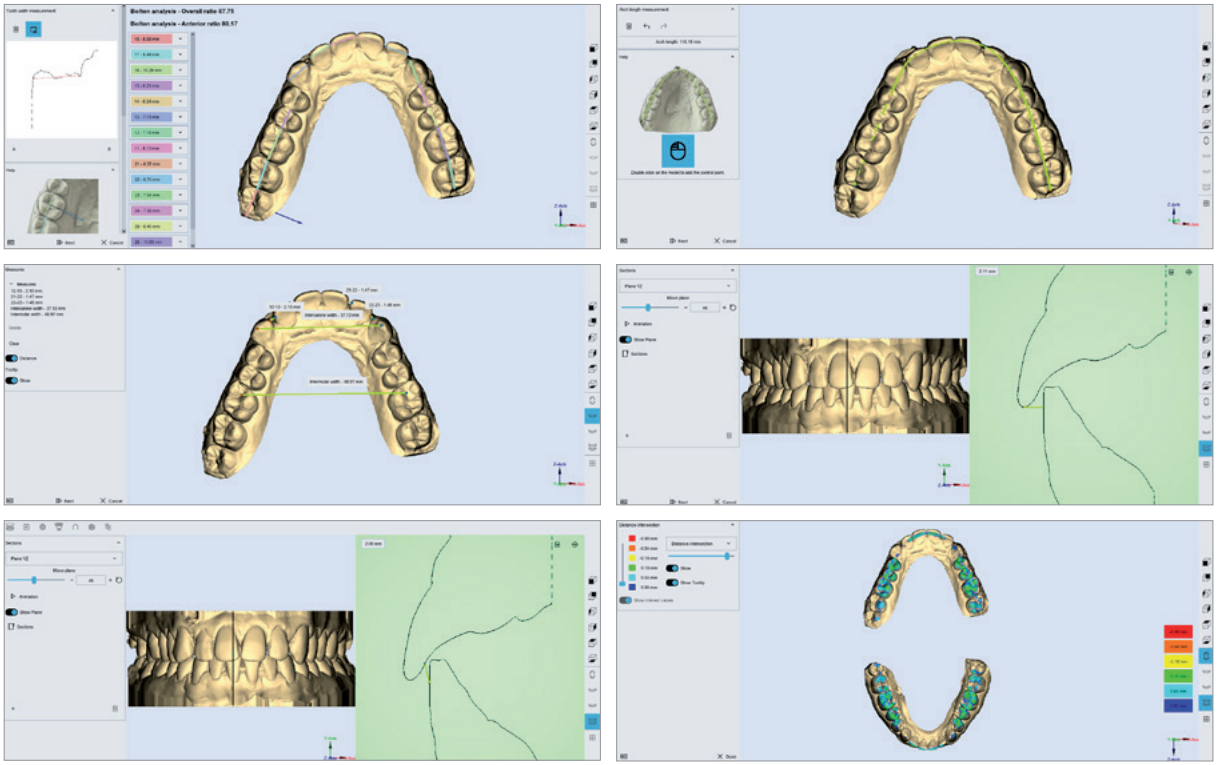
The next step was to perform the tooth segmentation. It is necessary to define the lines around each tooth separately, to section them virtually (Fig. 29). Once the segmentation of all the teeth was done, the cutting line was defined (Fig. 30). Though all steps are important, we think that tooth segmentation is particularly critical and requires careful manipulation, as this step will determine the size and shape of all the teeth, which in turn will affect the outcome of the tooth movement. In determining the correct axis of the tooth, the show root tab was of great help to calculate the facial axis and the facial axis of the clinical crown of the tooth (Figs. 31–35). We deactivated the show root tab once all the axes had been determined, to proceed to the next step (Fig. 36).

Virtual planning

The next step was to perform the virtual planning. For this step, though the software provides the possibility of



Figs. 11–22: Preparation of models.



Figs. 23–28: Measurement and analysis.

opening four views at a time, we felt comfortable working with two different views at a time (Fig. 37). During virtual set-up planning, we imported the 2D smiling photograph of the patient to evaluate the patient's smile digitally (Figs. 38–40). Once the final virtual plan had been finalised for the necessary tooth movement, we divided the tooth movement using the clone option. This step, also known as staging, was performed in different layers. An overview was generated for each tooth movement in a summary chart (Figs. 41 & 42). The interproximal reduction, placement of attachments and tooth numbering were all done in this step (Fig. 43). The model's name was engraved and embossed with the patient identity and model number, for easy identification and future records (Fig. 44).

Preparation of transition models

Once the segmentation and virtual planning had been performed, the models were divided into subset models for the 3D printing and thermoforming and pressure moulding of the aligners. The configuration for the individual tooth movement values of each stage was determined with the help of the model builder tab (Fig. 45). These steps were repeated for every layer in both the maxillary and mandibular models. The comparison was done between the initial and final positions of the teeth on the dashboard, just to ensure that all steps were flawless (Fig. 46).

Export

PDF

A PDF report consisting of all the measurements and tooth movements carried out, interproximal reduction performed and treatment progress was exported for our clinical records. The 3D models in the PDF report could also be viewed (Fig. 47).

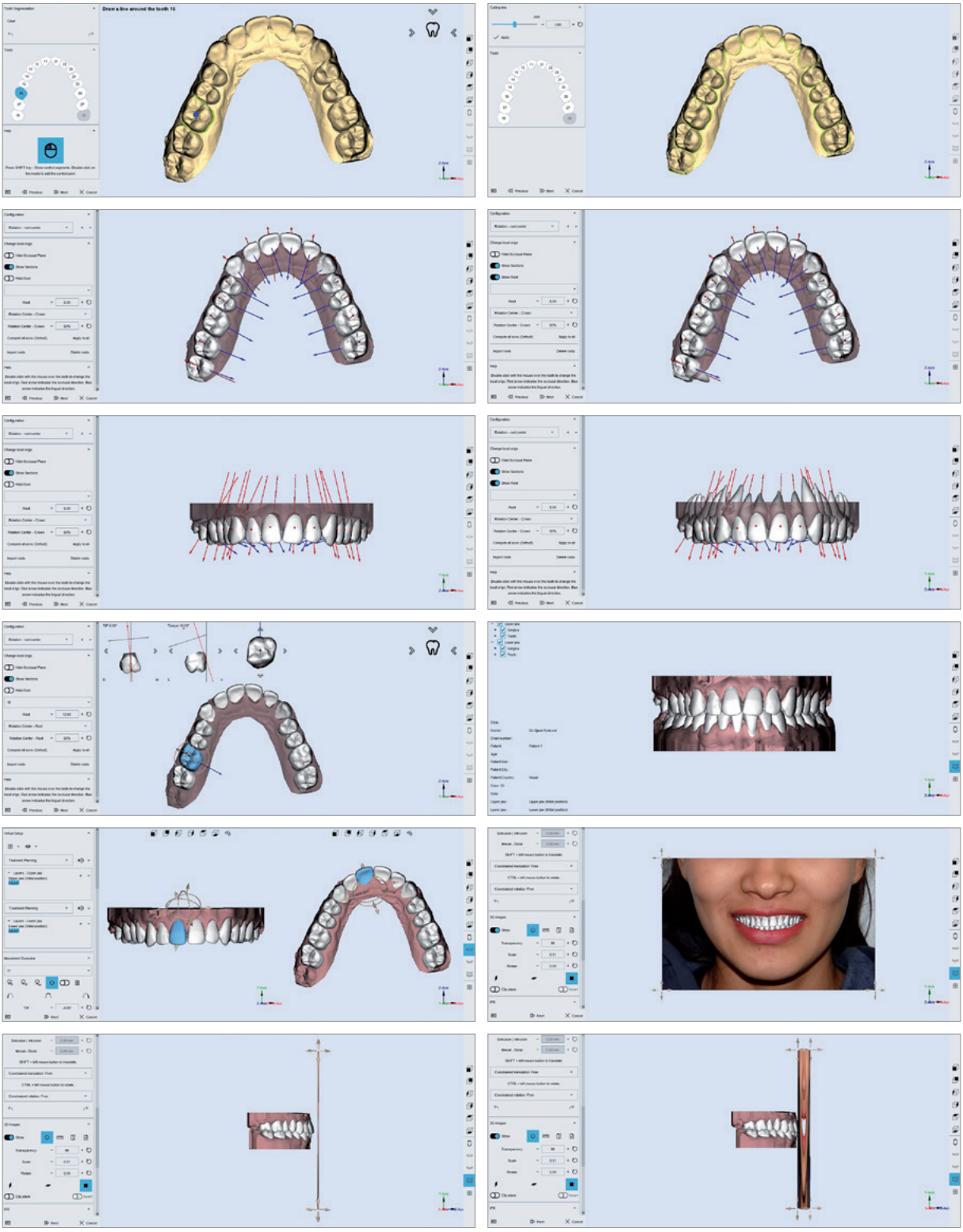
Video

The video was exported to counsel the patient and discuss any modifications based on the patient's expectations (Fig. 48).

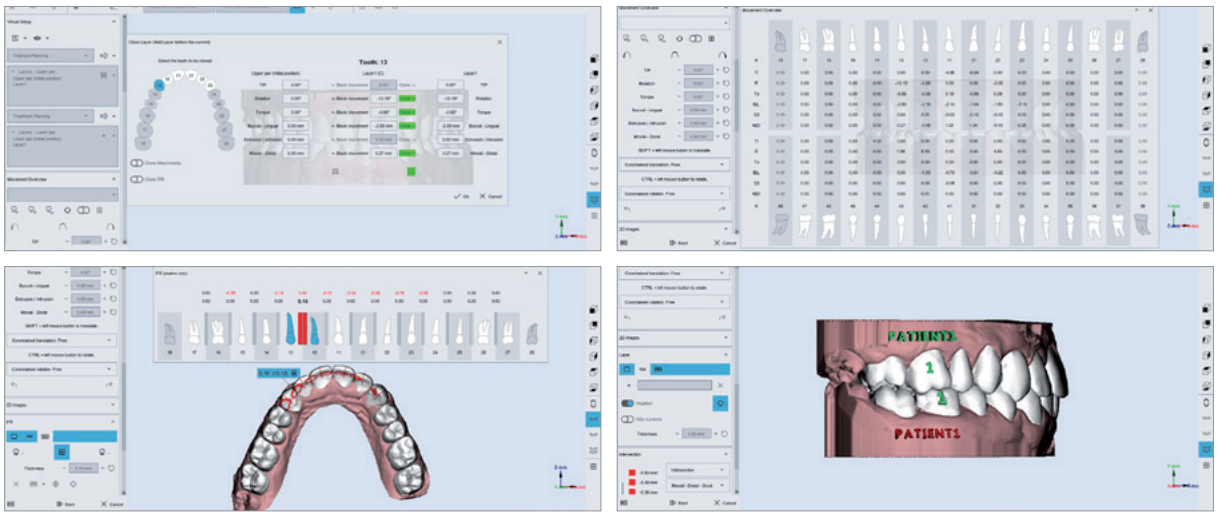
Transition models/clear aligners/etching guide for attachment placement

All the models built with the model builder were exported in an individual model for 3D printing. For every 3D-printed model, vacuum forming and pressure moulding were performed to manufacture the aligners. For any attachments present in the virtual treatment plan, the etching guide could be exported for the 3D printing. Such a guide helps to identify the etching area easily, and this could prevent unnecessary decalcification of enamel. However, in our case, no attachments were planned.

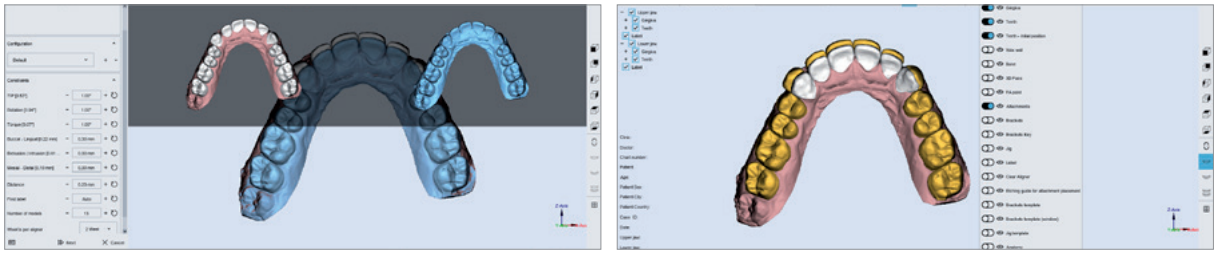
A current trend in orthodontics is the use of directly printed aligners, and we can directly export the design. How-



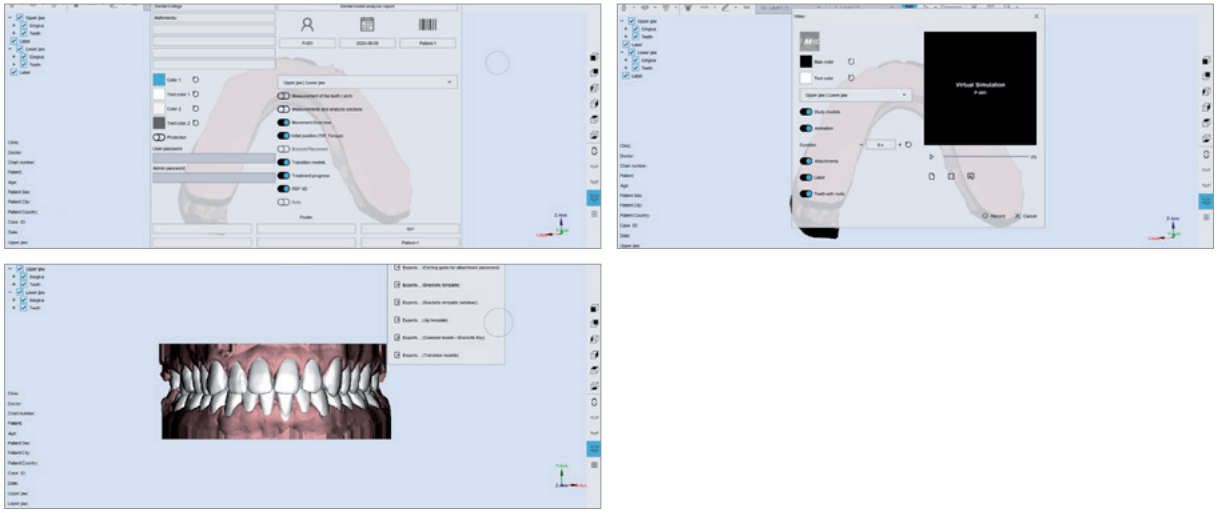
Figs. 29–40: Segmentation and virtual planning.



Figs. 41–44: Segmentation and virtual planning.



Figs. 45 & 46: Preparation of transition models.



Figs. 47–49: Export.

Figs. 50–54: Post-treatment records.

ever, directly exporting the design of clear aligners and an etching guide for placing the attachments is optional for manufacturing the aligners (Fig. 49).

The first aligner sets were provided, and the patient was recalled after one week to identify any discomfort or adjustment needed. The patient was asked to change the aligners every 14 days and was instructed to wear them 22 hours a day. The aligners were fabricated from 0.75 mm thermoforming sheets. The case was completed with 12 sets of maxillary aligners and four sets of mandibular aligners (Figs. 50–54).

Conclusion

Clear aligner treatment results can be obtained with the proper knowledge of biomechanics and the use of powerful, user-friendly software with ease and precision. With technologies rapidly evolving, we hope to be able to use artificial intelligence for automatic tooth segmentation, be able to import DICOM data and have other useful features to make the workflow easier and faster, which could further reduce the planning and chairside time in the future.

about

Dr Ujjwal Pyakurel obtained his BDS from B.P. Koirala institute of Health Sciences in Dharan in Nepal in 2005 and his MDS from Sichuan University in Chengdu in China in 2013. He works as an assistant professor at Kantipur Dental College Teaching Hospital and Research Center, affiliated with Kathmandu University, in Kathmandu in Nepal and practises orthodontics in various clinics in Kathmandu, in addition to owning his own private practice, Shangrila Dental Clinic in Kathmandu. His areas of interest include clear aligners, digital orthodontics, lingual orthodontics, research related to orthodontics, and computer-aided medical and dental designs and applications using 3D printing. Recently, he has also developed a growing interest in learning application and incorporating artificial intelligence and virtual reality into orthodontics. He was trained in Invisalign orthodontics and received a certificate in clear aligners in 2013, as well as in various CAD software programs. He has also partnered in the development of his own lingual orthodontics system, named POSIVLE (Pyakurel Orbegoso Smart Invisible Lingual System).

Dr Manish Bajracharya obtained his BDS from B.P. Koirala Institute of Health Sciences in Dharan in Nepal in 2005 and his MDS from National Academy for Medical Sciences (NAMS) in Kathmandu in Nepal in 2011. He received his fellowship training in craniofacial orthodontics at the Chang Gung Memorial Hospital in Taiwan in 2019. He has received various imaging and guide design training in the US (2016) and in Germany (2018). He works as an associate professor and programme coordinator for the postgraduate orthodontics programme at NAMS, in addition to owning his own private practice, Perfect Dental Care Center in Lalitpur in Nepal. He also serves as general secretary of the Orthodontic and Dentofacial Orthopedic Association of Nepal, an executive member of the Asian Pacific Orthodontic Society and an editor of the *Orthodontic Journal of Nepal*. His areas of interest include craniofacial orthodontics, orthognathic surgery, clear aligners and digital orthodontics.

References:

1 Little AC. Facial attractiveness. Wiley Interdiscip Rev Cogn Sci. 2014 Nov;5(6):621–34. doi: 10.1002/wcs.1316.
2 Cunningham MR, Barbee AP, Pike CL. What do women want? Facialmetric assessment of multiple motives in the perception of male facial physical attractiveness. J Pers Soc Psychol. 1990 Jul;59(1):61–72. doi: 10.1037//0022-3514.59.1.61.
3 Cunningham MR. Personality and the structure of the nonverbal communication of emotion. J Pers. 1977 Dec;45(4):564–84. doi: 10.1111/j.1467-6494.1977.tb00172.x.
4 Chuk T, Chan AB, Shimojo S, Hsiao JH. Eye movement analysis with switching hidden Markov models. Behav Res Methods. 2020 Jun;52(3):1026–43. doi: 10.3758/s13428-019-01298-y.
5 Kesling HD. Coordinating the predetermined pattern and tooth positioner with conventional treatment. Am J Orthod Oral Surg. 1946 May;32:285–93. doi: 10.1016/0096-6347(46)90053-1.

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KEYNOTE SPEAKERS

Treating teen athletes with ClearCorrect aligners and DentalMonitoring to minimise office visits

Dr Melissa Shotell, US

Introduction

In orthodontic practice, a challenge many clinicians encounter is the phenomenon of over-scheduled patients, especially adolescents with substantial non-academic activities. These scheduled school and extramural activities throughout the day make it exceedingly difficult to attend regularly scheduled orthodontic appointments. This dilemma leads to many parents seeking alternatives to traditional orthodontic visits that allow their children to be seen less frequently and complete treatment faster. In addition, the recent world events associated with the global pandemic have led to patients desiring to reduce and/or limit office encounters.

Clear aligner therapy has become a growing aspect of orthodontic practice for a variety of reasons, including aesthetics, simplicity and enhanced orthodontic control for select cases. In addition to the aforementioned advantages, development of artificial intelligence and remote monitoring technology, in combination with teledentistry, has rapidly pushed clear aligner therapy into the modern age. This case report highlights a clinical case in which clear aligner therapy and remote monitoring were able to facilitate orthodontic treatment for a patient with scheduling time constraints and limited ability to return for multiple office visits.

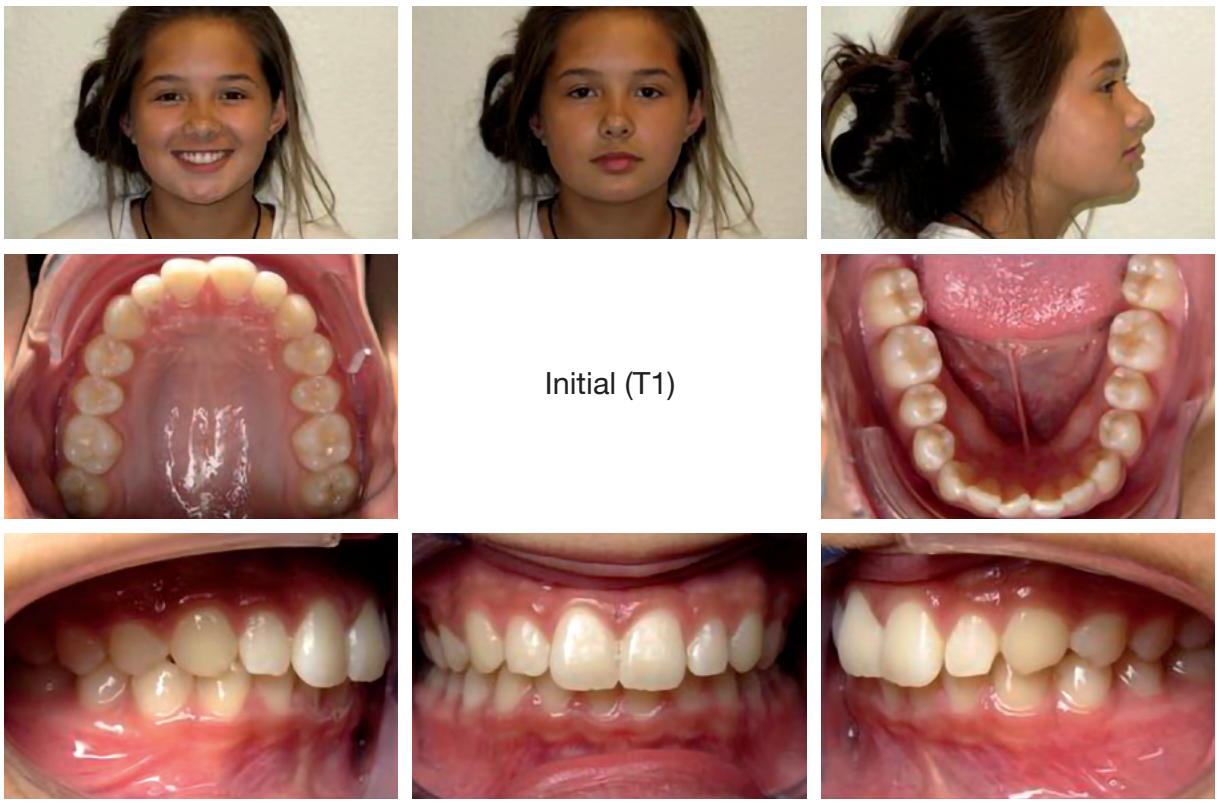
Case report

A 14-year-old female patient presented for orthodontic consultation with the chief complaint of pain in her mandibular incisors. The patient and her mother reported a history of parafunction, of grinding and clenching, with ongoing pain in the mandibular incisors. The patient and her mother described that she was a serious athlete participating in competitive soccer and that she had concerns of injury to her teeth and lips if treated with traditional fixed appliances, owing to the high contact nature of the sport. Both the patient's mother and the patient herself expressed a strong preference for clear aligner treatment and were looking to minimise office visits, owing to the demanding schedule of both school and soccer. They were also interested in limiting the time in treatment with limited goals to resolve crowding and decrease the pain and pressure sensation on the anterior teeth.

Upon clinical examination, the patient's occlusion was classified as Angle Class II subdivision left, moderate overbite of 60% and excess overjet of 4 mm (Figs. 1a–h). There was mild crowding noted in both the maxillary and mandibular arches. The maxillary midline was centred and coincident with the midline of the face, and the mandibular midline was 1 mm to the left. The occlusion was stable, and there was no shift between centric relation and centric occlusion. The maxillary lateral incisors were small in size, creating a tooth size discrepancy with mandibular excess.

Radiographic examination with a CBCT reconstructed panoramic radiograph and lateral cephalogram showed a complete and healthy dentition for the patient's age and regular root morphology. It was noted that the mandibular third molars had not developed (Figs. 2 & 3). The lateral cephalogram showed a balanced skeletal Class I relationship, and the panoramic radiograph showed a fully erupted adult dentition from second molar to second molar. The temporomandibular joints were well corticated on the radiographic examination, with no signs of temporomandibular joint pathology.The patient was periodontally healthy and demonstrated excellent oral hygiene for orthodontic treatment.

After discussing the findings of the clinical examination with the patient and her mother, we reviewed their limited goals for treatment and the desire to complete treatment



Figs. 1a–h: Pretreatment photographs showing the patient's initial smile aesthetics and malocclusion.

Fig. 2: Pretreatment panoramic radiograph.

Fig. 3: Pretreatment cephalometric radiograph.

quickly. Treatment options to correct the tooth size discrepancy with mandibular arch interproximal reduction or bonding of the maxillary lateral incisors were presented. Additional treatment options to correct the Class II malocclusion on the left side and reduce the excess overjet were also presented. The patient and her mother both wanted to avoid bonding of the maxillary lateral incisors owing to long-term maintenance of the restorations, and they both wanted to minimise interproximal reduction (IPR). The patient was not concerned with addressing the Class II occlusion on the left side and was primarily looking for an aesthetically pleasing smile.

With patient- and parent-limited goals for treatment in consideration, a treatment plan with the following treatment goals was established:

1. Resolve crowding.
2. Resolve excess overbite.
3. Improve overjet.
4. Improve mandibular midline.
5. Improve smile aesthetics.
6. Reduce office visits utilising remote monitoring.

In addition to CBCT, other orthodontic records were taken, including photographs and intra-oral digi-

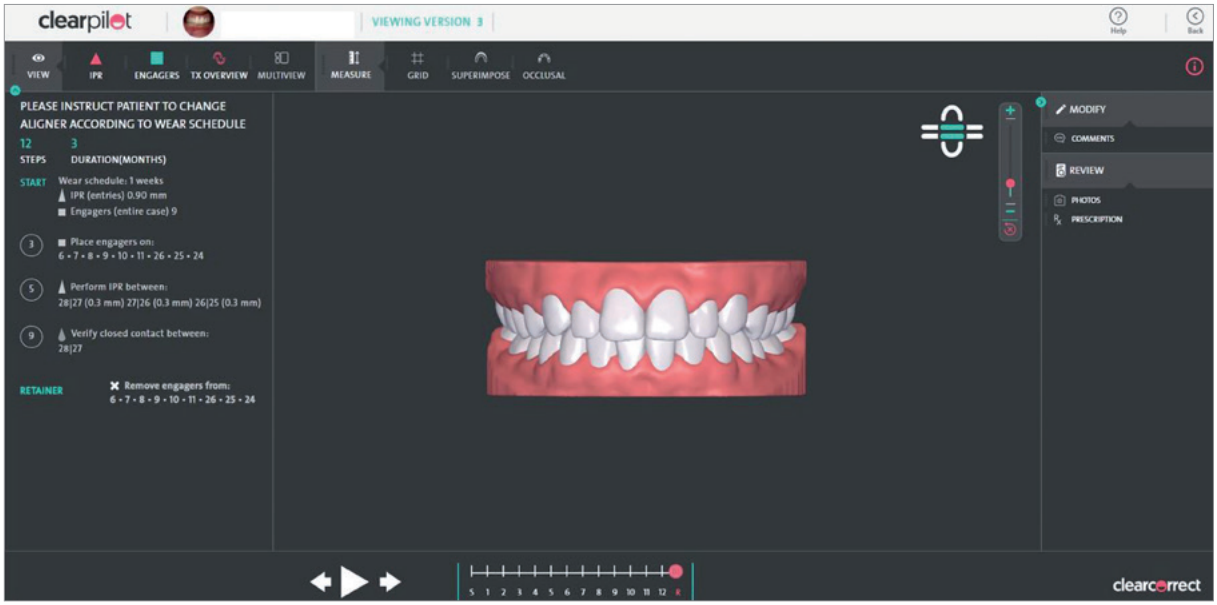


Fig. 4: Initial treatment set-up with treatment details in ClearCorrect's ClearPilot software.

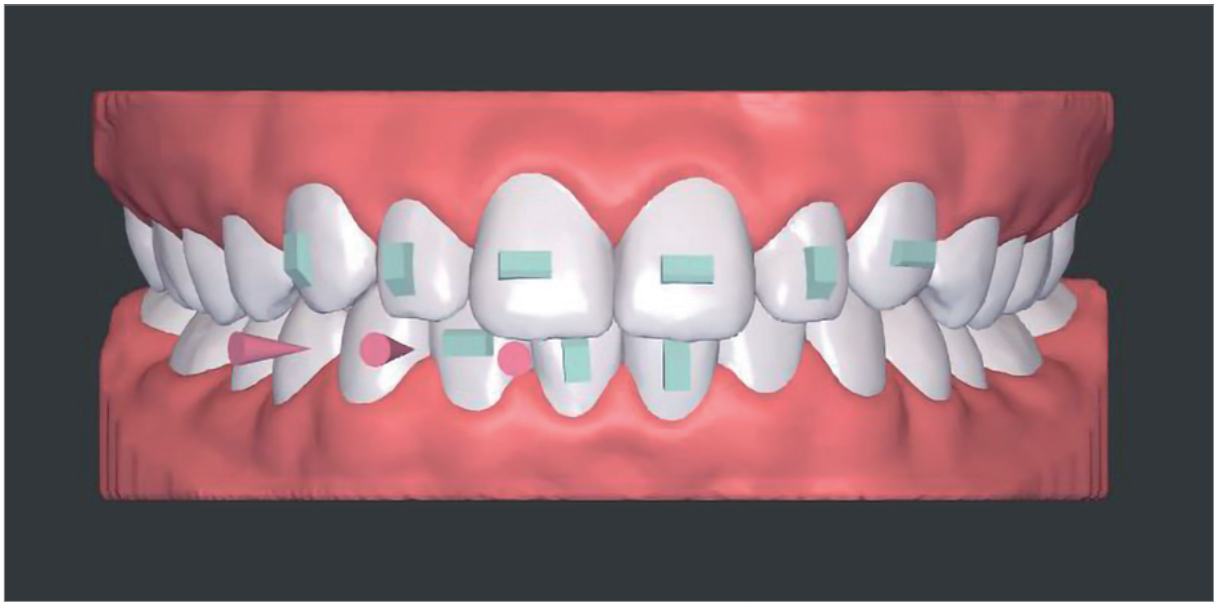


Fig. 5: Initial treatment set-up with engagers and location of interproximal reduction.

tal impression scans. The records were submitted to ClearCorrect to create a treatment set-up (Fig. 4). The first set-up included 12 treatment steps and utilised engagers on the maxillary and mandibular anterior teeth, to aid intrusive and rotational movements (Fig. 5). Interproximal reduction (0.9 mm in total) was planned on the mandibular right to relieve crowding and to aid in shifting the mandibular midline to the right and resolve crowding of the mandibular incisors. The aligners were planned to be worn for ten to 14 days per aligner.

Aligners were delivered to the patient with home care instructions, and the DentalMonitoring app was introduced for remote monitoring (Fig. 6). Patient treatment was monitored using the DentalMonitoring app (Fig. 7), and the patient was instructed to take her remote monitoring scan every ten days to check the fit of each aligner. The patient was instructed to move to the new aligner if the current aligner was fitting correctly (Fig. 8). This reduced the time of wear for each aligner from an arbitrary time instruction to a custom timeline for the patient.

The patient completed the initial set of 12 aligners in four and a half months and only two office visits in comparison with six months of treatment and four visits without the DentalMonitoring app. The patient was seen in the

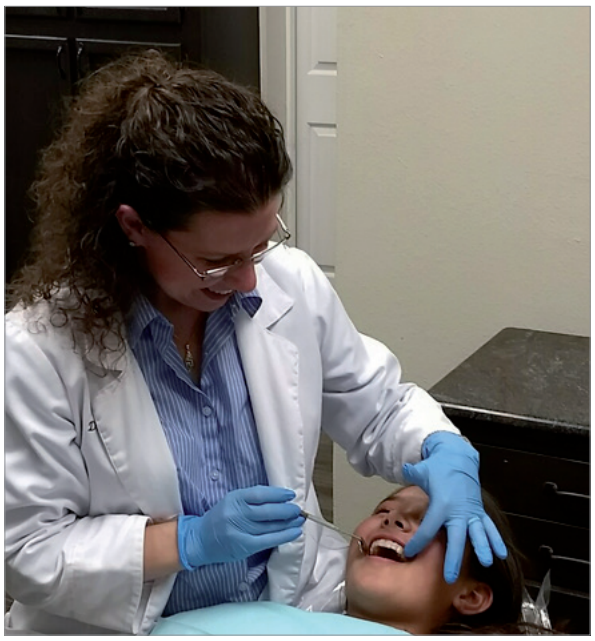


Fig. 6: Delivering ClearCorrect aligners.

Fig. 7: Introducing and demonstrating the DentalMonitoring app.

Fig. 8: DentalMonitoring remote monitoring of treatment progress.

office for evaluation of treatment progress at her third office visit. At this visit, it was determined that additional improvement in tooth position could be achieved, including midline correction, additional correction of mandibular arch crowding, and improvement of canine guidance. The engagers were removed, and progress records were taken, including photographs (Figs. 9a–h) and new intra-oral digital impression scans. The progress records were sent to ClearCorrect, and a treatment revision was requested. A total of four additional aligners with attachments on the canines were planned, to aid extrusion for improved canine guidance (Fig. 10). IPR of the mandibular central incisor contact point was planned to resolve rotation of the mandibular right central incisor and to improve the mandibular midline.

It was agreed that the patient would discontinue use of the DentalMonitoring app during the treatment revision owing to her demanding schedule, but would stay very consistent and compliant with her ClearCorrect aligners. The patient completed her revision aligners in six weeks and was not seen during the revision aligner sequence. An office visit was scheduled at the completion of the revision aligner sequence, and at this visit, the engagers were removed and the patient was placed into final retention with retainers made by ClearCorrect (Figs. 11a–h).

Treatment results

Treatment was completed in a total of six months and a total of 16 sets of aligners, and the patient came to the office only five times from the initial consultation to final retention. While her appointments to the office were minimised, her progress was tracked throughout treatment on an individual basis using the DentalMonitoring app. The final treatment results addressed the patient's chief complaint and fulfilled the goals and expectations of both the patient and her mother. The crowding and excess overbite were relieved, and the patient reported that the discomfort in her mandibular anterior teeth was resolved. The patient indicated that her aesthetics were greatly improved and that she was incredibly pleased with her overall treatment results and experiences of using both clear aligners and remote monitoring technology.

Figs. 9a–h: Progress photographs taken after the initial set of 12 aligners.

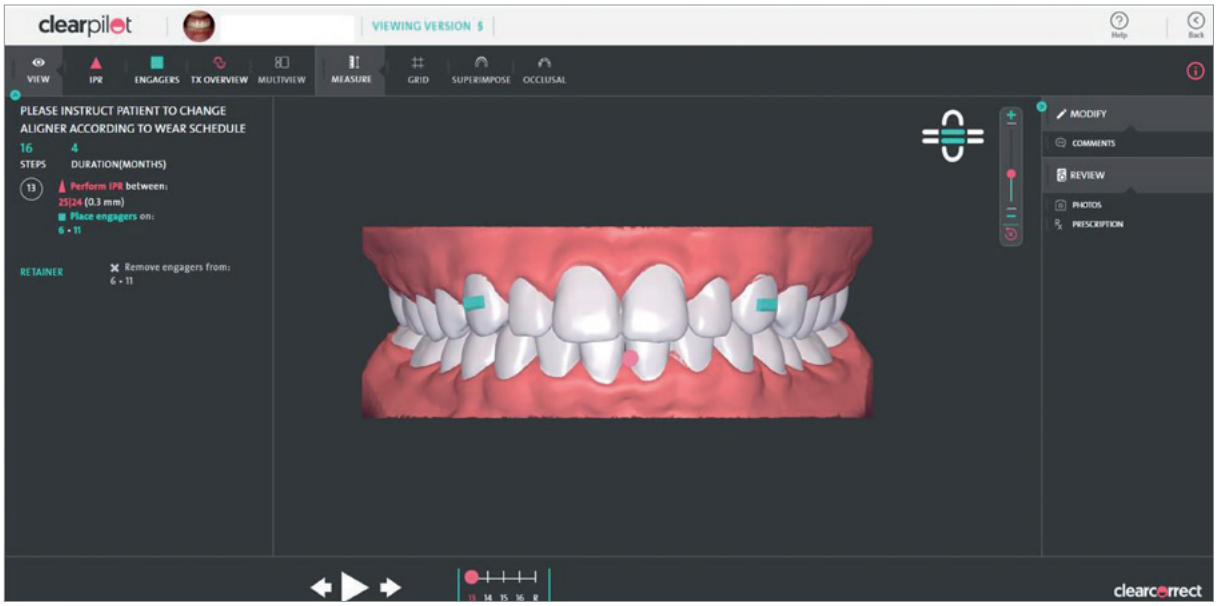


Fig. 10: Treatment revision set-up of four aligners with engagers and interproximal reduction.

Figs. 11a–h: Final photographs at the completion of treatment.

Conclusion

ClearCorrect aligners were able to deliver the treatment results that the patient and her mother were expecting in a limited amount of time. The use of ClearCorrect aligners allowed the patient to avoid injury to the teeth during contact sports that can be caused when wearing traditional fixed appliances. The use of the clear aligners in combination with attachments and IPR was able to resolve the crowding and provide excellent incisor intrusion to reduce the excess overbite and relieve the traumatic occlusion causing the patient's initial discomfort. The use of selective IPR was also able to correct the mandibular midline. There was an overall improvement in smile aesthetics. The high level of patient compliance with the aligners and the use of the DentalMonitoring app to customise the aligner wear schedule allowed the patient to complete treatment more quickly than initially anticipated, exceeding the expectations of both the patient and her mother.

about

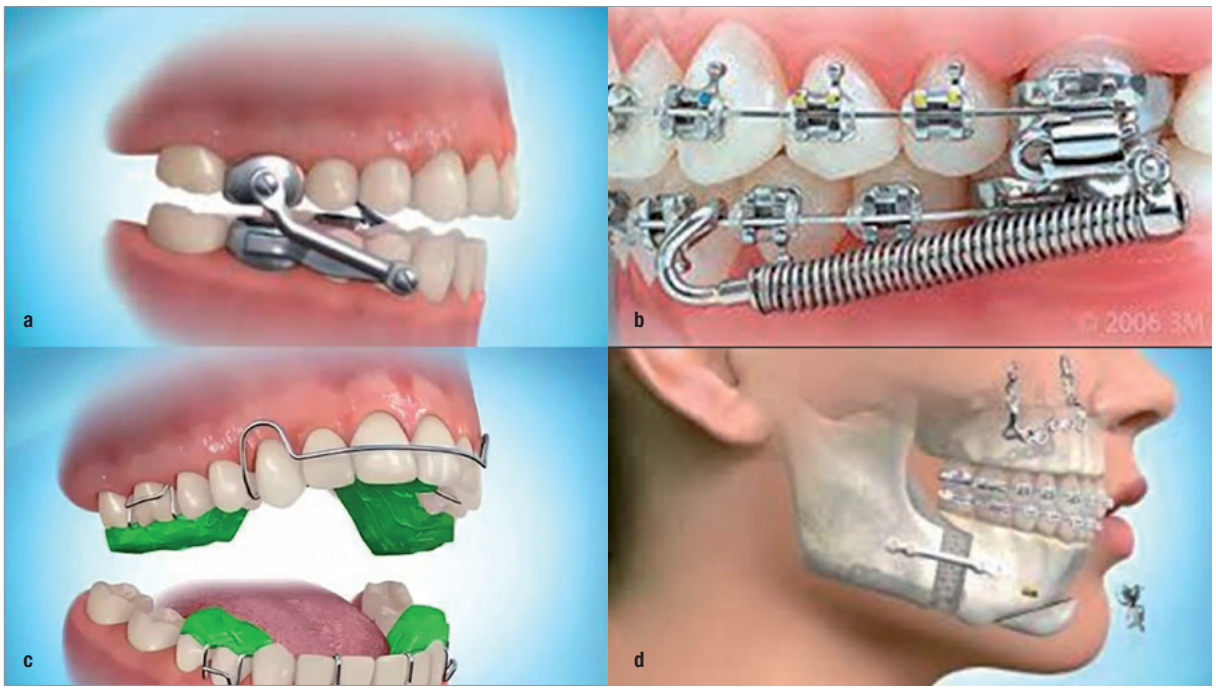
Dr Melissa Shotell is a board-certified orthodontist and practises in a multi-specialty practice in Sonora in California in the US focusing on the interplay of orthodontics and restorative treatment. She received all of her dental training in the US. Dr Shotell received her DMD at Nova Southeastern University in Florida in the US and a general practice residency certificate from the Ohio State University in Columbus in Ohio in the US. After spending years in general practice treating a broad range of patients, Dr Shotell completed a certificate and master's degree in orthodontics at Loma Linda University in California. There, she focused her training on cutting-edge 3D imaging technology for diagnosis and treatment planning for interdisciplinary dentistry. Dr Shotell considers education to be her passion and regularly consults and lectures on dental technology, clear aligner therapy, orthodontics, in-office clear aligners, office efficiency and workflow, and teamwork. She shares tips and tricks on orthodontics and clear aligners on social media as alignerbee.

Mandibular advancement with clear aligners: Indications and treatment protocols

Dr Rafi Romano, Israel

Class II with mandibular retrusion due to the small size of the mandible and/or the posterior position of the condyle is one of the most common malocclusions after Class I malocclusion. A systematic review claims that 19–23% of the population suffer from Class II malocclusion and 20% have increased overjet.[1] The timing of treatment is crucial, since the posterior position of the mandible often creates a deep bite, which may limit or block mandibular growth; proclination of the maxillary incisors, which contributes to the risk of trauma to the incisors; and two planes of occlusion, which is more difficult to correct as the patient grows. Repositioning of the condyle to a more anterior position is controversial, but many articles recommend using this treatment modality during the growth period,[2] although some articles find positive condylar changes after orthodontic treatment with mandibular advancement.[3]

There are many appliances to correct Class II malocclusion and advance the mandible. Some of them are fixed, such as the Herbst[4] and Forsus appliance;[5] some are fixed and functional using intermaxillary elastics, such as the Carriere Motion appliance;[6] and some are purely functional, such as the twin block appliance.[7] Orthognathic surgery is, of course, a valid option if the advancement option is not possible or not recommended. Elastics have been used in combination with clear aligners for some years with reasonable efficiency but with minimal skeletal effect (Figs. 1–3). The main problem with most of the appliances mentioned is the need to divide the treatment into phases. The alignment of the teeth is not possible if twin block or Carriere is used. Herbst has many emergencies, and elastics are dependent on patient compliance.



Figs. 1a–d: Various appliances to correct Class II malocclusion and advance the mandible: (a) Herbst appliance, (b) Forsus appliance, (c) twin block appliance and (d) orthognathic surgery.

Fig. 2: Carriere Motion appliance.

In the last few years, another option has become available for Class II malocclusion: Invisalign with mandibular advancement (MA) integrated into it (Align Technology; Fig. 4). Articles published on this new device claim that Invisalign Teen with mandibular advancement and twin block appliances shared similar clinical outcomes for most of the parameters measured, but that there were significant differences between the groups regarding appliance wear and management, discomfort and function.[8] I had the privilege of being included in the beta test group for the MA appliance and finished many cases in the last four years since it was launched. The following case presentation will give tips and guidelines for the treatment of Invisalign with MA.

Fig. 3: Clear aligners with intermaxillary elastics.

Case presentation

A 13-year-old patient came to the clinic with skeletal Class II Division 2 malocclusion, severe crowding, retroclination of the maxillary central incisors, buccal inclination of the maxillary lateral incisors, deep bite with 90% coverage of the mandibular incisors and two planes of occlusion. Tooth #55 was still in the mouth (Fig. 5). Radiographic examination revealed mesial crown angulation of tooth #15, a retruded maxilla and mandible, and skeletal Class II malocclusion with an ANB angle of 8° (Fig. 6).

The treatment plan included alignment of the teeth, expansion of both arches and MA. The clinician must determine which part of the tooth movement should be done prior to the MA phase and which part can be done in conjunction with the tooth movement. The clinician should send very detailed instructions to the Invisalign technician to stage the movement accordingly. As shown

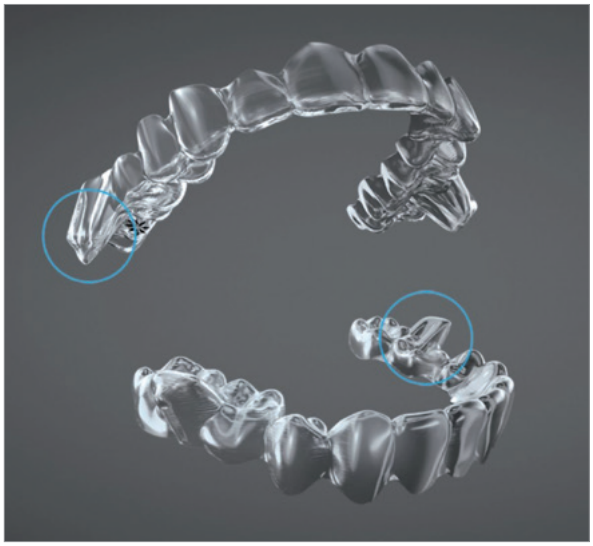
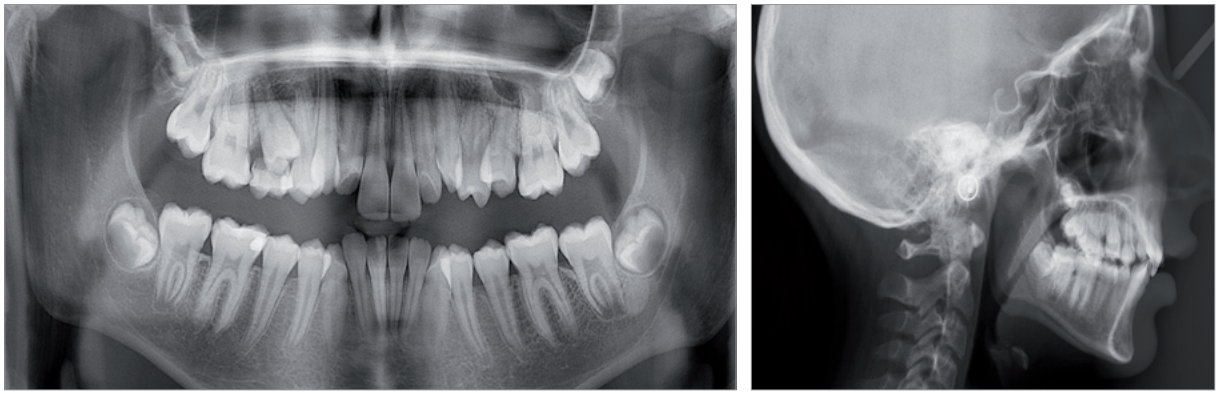


Fig. 4: Invisalign with mandibular advancement.

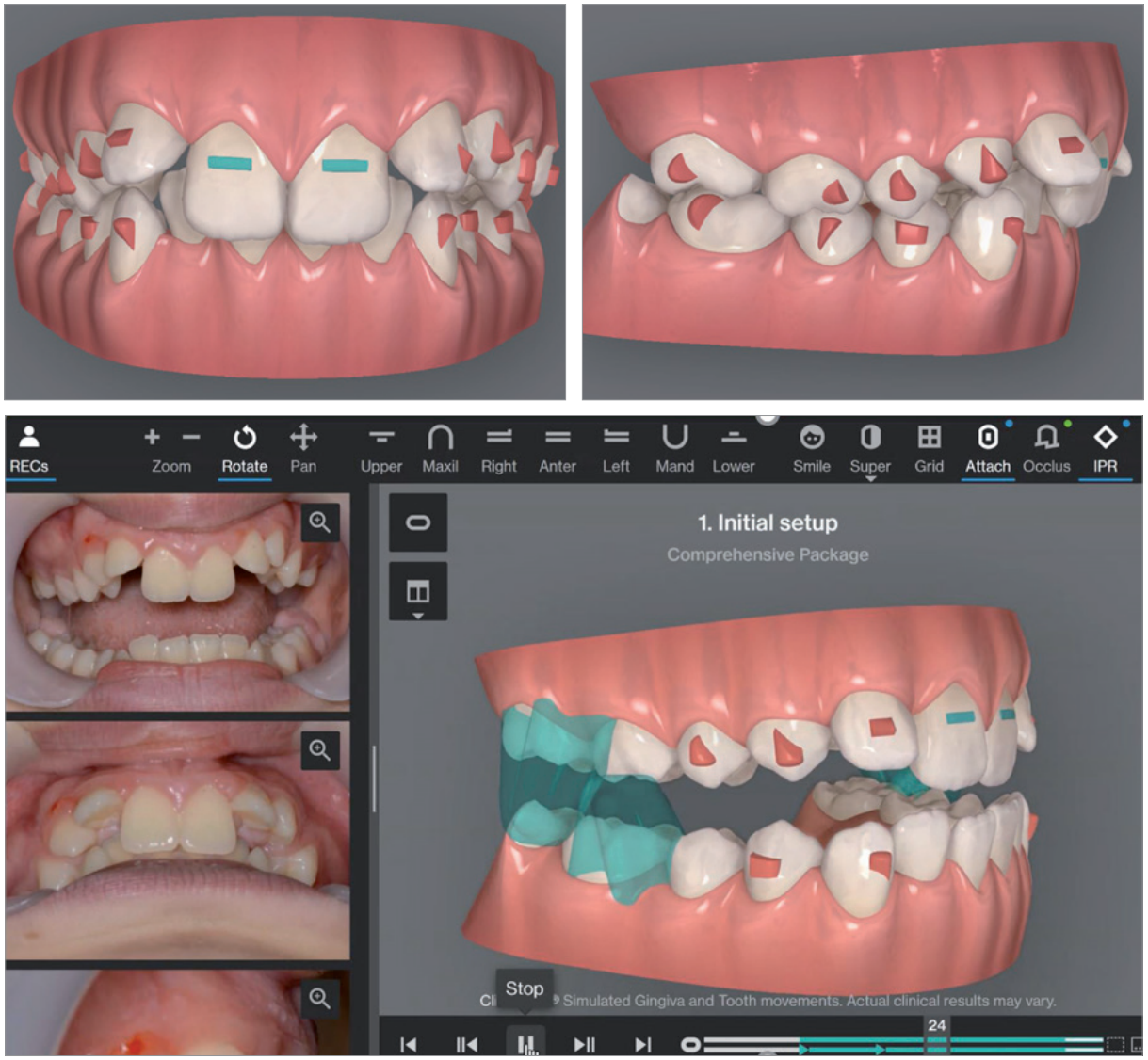
Figs. 5a–f: Patient at the consultation appointment. Note the Class II Division 2 malocclusion with retruded maxillary central incisors and buccally inclined lateral incisors, deep bite and severe crowding.



Descriptor	Type	Mean	Sd	Patient	Graph	Comment
SNA	Deg	82.0	2.0	78.25	-(*|)+	Maxilla retruded
SNB	Deg	80.0	2.0	70.38	-(* |)+	Mandible retruded
ANB	Deg	2.0	2.0	7.87	-(| *)+	Class II relationship
POGONION	mm			1.43	-( )+	
ANGLE CONVEXITY (DOWNS)	Deg	180.0	5.0	165.28	-(*|)+	Maxilla forward to mandible (Convex)
WITS	mm	0.0	1.0	6.24	-(| *)+	Class II Skeletal problem

Figs. 6a–c: Radiographic examination revealed mesial crown angulation of tooth #15. The patient had a retruded maxilla and mandible and skeletal Class II malocclusion with an ANB angle of 8°.

in Figure 7, the magnitude and the direction of tooth movement will determine the shape and position of each attachment. It is essential that each attachment is reviewed and analysed, since most of them will be chosen by the Invisalign algorithm and using artificial intelligence. Modifications of these attachments should be made carefully and only after full understanding of the nature of each planned movement, together with the biomechanics and the anchorage that are needed for each stage. The MA involves precision wings that may cause prob-

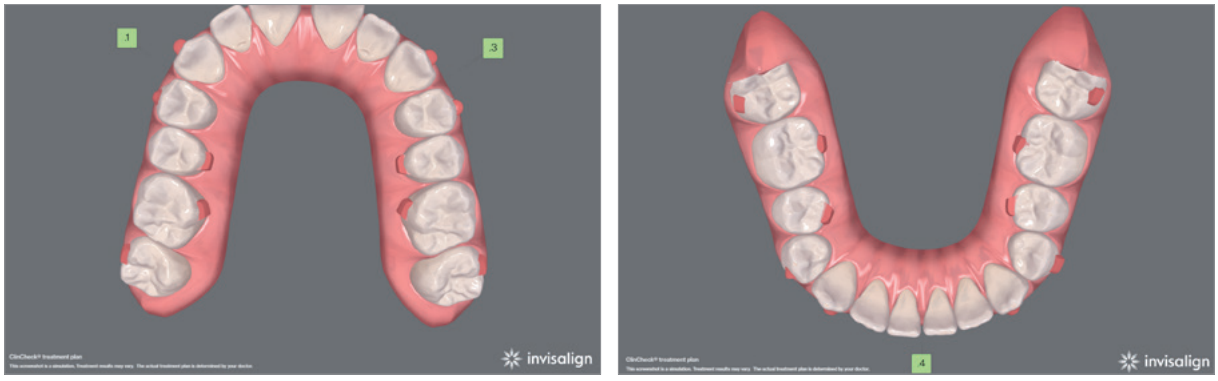


Figs. 7a–c: ClinCheck plan with different optimised attachments, pressure points (for root torque) and precision wings to incorporate mandibular advancement.

lems in retention of the aligners owing to the need to remove the attachments. Attachments can be placed on the lingual or palatal surface on the teeth that will have the MA wings, and in doing so, the need to remove them prior to the MA phase will be obviated (Fig. 8).

The staging of the treatment is one of the most important parts of the treatment plan (Fig. 9). Patients have aesthetic demands and wish to resolve the crowding at the beginning of the treatment, but sometimes the alignment can take a long time, and it is essential to incorporate MA, which may affect the anchorage and the control the clinician will have on the tooth movement. Clinicians can guide the Invisalign technician to move teeth in groups (such as anterior teeth only with good posterior anchorage of non-moving step). The MA can be achieved in one step or in segments of 2 mm of mandibular advancement, every eight aligners (Fig. 10). Stepwise MA might be more appropriate because it produces greater skeletal change and less dental compensation than single-step advancement.[9, 10] The patient should be guided about how to use the MA appliance. If asymmetric advancement is instructed to correct midline deviation, it is crucial to ensure that the patient does not bite on the wings and rather advances the mandible until the precision wings firmly hold the jaw correctly on both sides (Fig. 11).

After 40 aligners and nine months of treatment, the arches were fully aligned, and the overjet and overbite were within normal range. Posterior open bite on both sides was visible and had to be addressed now.



Figs. 8a & b: The attachments on the teeth with mandibular advancement are bonded on to the lingual or palatal surface to avoid the need to remove them prior to the mandibular advancement phase.

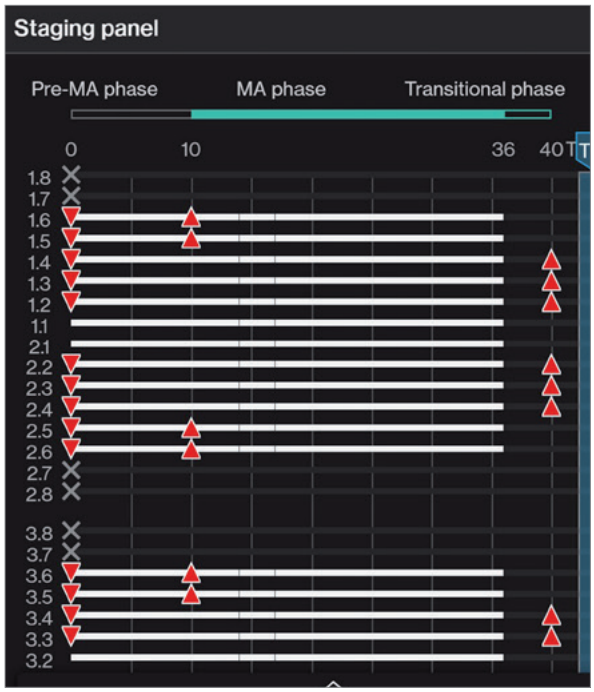


Fig. 9: The staging of the treatment is one of the most important parts of the treatment plan. The treatment is divided into a pre-mandibular advancement phase, a mandibular advancement phase and a transitional stage, during which the mandibular advancement appliance is removed and the teeth are settling into the final occlusion.

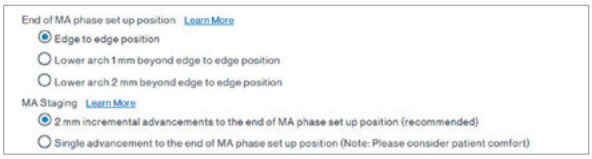


Fig. 10: The clinician should choose between stepwise and single-step advancement of the mandible and determine the occlusion of the anterior teeth (edge to edge or 1–2 mm overjet).

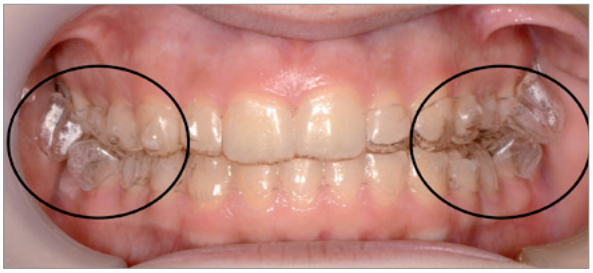


Fig. 11: The asymmetric advancement causes improper use of the mandibular advancement appliance. Note the difference between the right and left sides. On the left, the patient is biting *on* the wings and does not advance the mandible until the precision wings are firmly holding the jaw correctly on both sides.

Often, MA includes posterior extrusion which occasionally does not follow the movement of the anterior teeth or the alignment of the teeth in the arches (Fig. 12).
At this stage, the clinician has few options:

1. Bond buttons on to the maxillary and mandibular posterior segments and apply intermaxillary elastics to close the bite.
2. Order additional aligners with extrusion attachments and consider supplement of anchorage, such as mini-implants.
3. Wait.

One of the most important principles presented by Wick Alexander[11] is to let the plan work and express itself. The initial plan included good posterior occlusion, which eventually did not happen or has not happened *yet*. Now the clinician is facing the challenge of holding the teeth in their current positions and simultaneously letting them settle in with proper guidance to the planned occlusion. Buttons and elastics and additional aligners can subsequently be used if the option of waiting, which will be described in detail, does not have the desired effect.

Figs. 12a–d: The patient at the end of the treatment with 40 aligners, which were initially planned by the clinician with the ClinCheck software. Note the alignment of the maxillary and mandibular arches, the normal overjet and overbite, the correction of the deep bite and the retroclination of the teeth. The posterior open bite is visible on both sides. The bite is more open towards the posterior, which is one of the expected results of mandibular advancement.

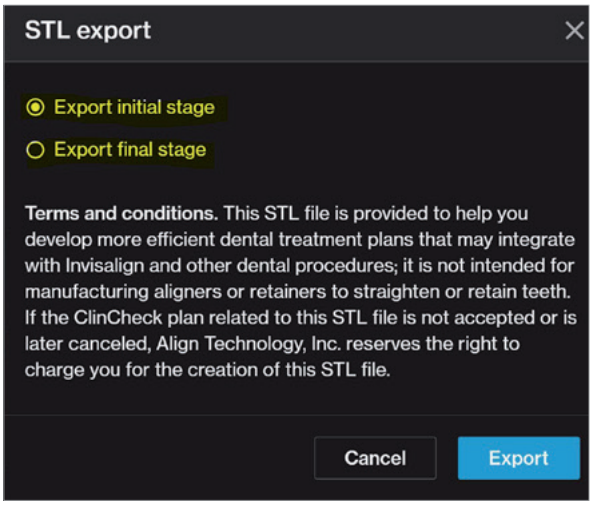


Fig. 13: The ClinCheck software is used to export the STL files of the maxillary and mandibular arches from the final aligner.

Active retention

The clinician must re-evaluate his or her plan and analyse whether the posterior open bite is due to inaccurate planning, lack of anchorage, loss of control or insufficient time for the planned movement to occur. The best protocol is to give the patient active retainers for a few months in which the teeth are in their planned positions. This way, the teeth can erupt guided to the desired positions and not just remain free to form a randomised occlusion.

MA in a variety of techniques will create a posterior open bite that should be corrected with anterior intrusion and/or posterior extrusion. Extrusion of posterior teeth is less predictable and takes longer, and therefore I use the following protocol in many MA cases:

1. Export the final STL file from the ClinCheck software (Fig. 13).
2. Print 3D models from the STL file.
3. Create in-office aligners (0.75 mm Zendura, Bay Materials) for nightwear only (Fig. 14).
4. Preferably, if the anterior teeth are well aligned, bond a fixed canine–canine retainer in the maxilla and mandible.
5. Follow up the patient every two months, for no less than six months.

This protocol, which I use in almost all cases, helps to maximise the initially planned movements and obviates the need for additional aligners. As can be seen in Figure 15, the occlusion became spontaneously firm and tight, and the aesthetics and functionality were achieved.

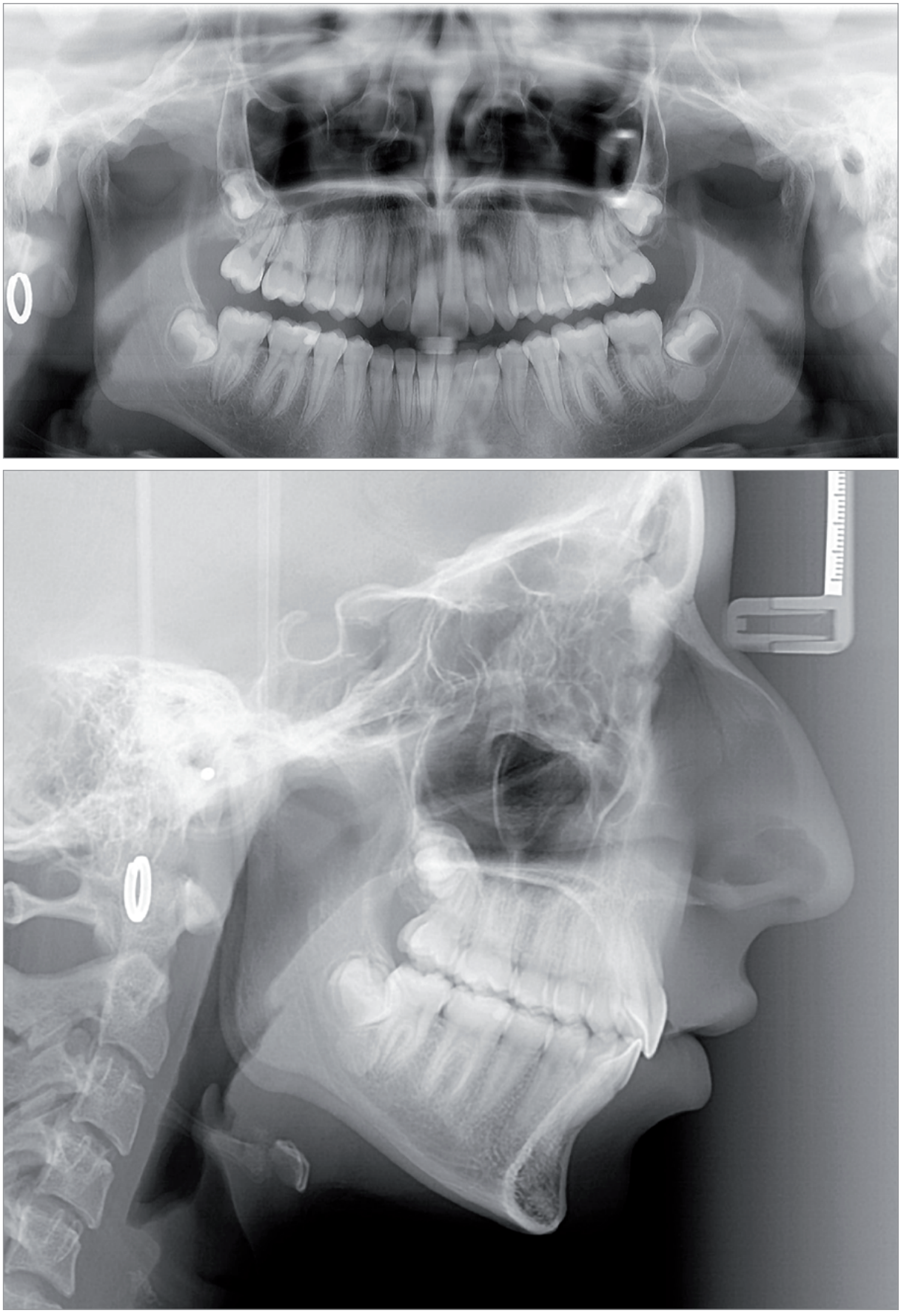
The protocol is very useful because, even if additional aligners are needed, it will be easier for both patient and clinician when done at this stage and not earlier. After the treatment reaches its final goal, the patient is scanned and Vivera ordered for lifetime retention. The patient is instructed to wear the retainers every night during the first year after treatment and a minimum of two nights a week thereafter.

Cephalometric superimposition

When the situation before and after treatment with MA is compared, one can see that MA is almost purely skeletal, with slight proclination of the maxillary and mandibular incisors, which was expected in this case owing to the retroclination of the teeth prior to treatment (Fig. 16).

Figs. 14a–d: (a) The Form 3 (Formlabs) is used to print (b) the 3D model. (c) The MINISTAR S (SCHEU-DENTAL) is used to fabricate (d) the in-office aligners.

Figs. 15e–g: After six months of active retention, the posterior occlusion was firm and tight. All treatment goals were successfully achieved, and the patient continued to wear Vivera retainers at night.



Figs. 16a & b: The panoramic and cephalometric radiographs at the completion of the active retention period.

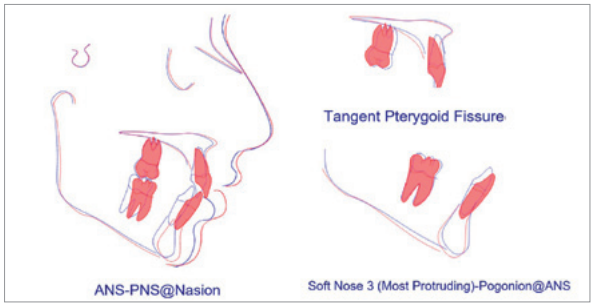


Fig. 16c: The superimposition of the cephalometric radiographs before and after shows mandibular advancement with good control of the incisal torque.

about

Dr Rafi Romano is a graduate of the Hebrew Hadassah University Faculty of Dental Medicine in Jerusalem and a specialist in orthodontics and dentofacial orthopaedics. He maintains a private practice in Tel Aviv in Israel limited to orthodontics and focusing on adult and aesthetic orthodontics, and he is an Invisalign diamond provider. He lectures worldwide on aesthetic orthodontics and multidisciplinary adult orthodontic treatment and conducts courses in lingual orthodontics around the globe. He is the editor of the books *Lingual Orthodontics* (Decker, 1998), *The Art of the Smile* (Quintessence, 2005), *The Art of Treatment Planning* (Quintessence, 2009), *Lingual & Esthetic Orthodontics* (Quintessence, 2011) and *The Art of Detailing* (Quintessence, 2013). Dr Romano serves on the editorial board of the *International Journal of Esthetic Dentistry* and on the advisory board of Align Technology. He is former editor-in-chief of *Orthodontics: The Art and Practice of Dentofacial Enhancement* and former editor of the journal of the Israel Orthodontic Society. He is an active member of the European Academy of Esthetic Dentistry, American Association of Orthodontists, World Federation of Orthodontists, European Aligner Society, Digital Dentistry Society and European Academy of Digital Dentistry. Dr Romano is an American Association of Orthodontists ambassador representing the Israel Orthodontic Society.

References:

1 Alhammadi MS, Halboub E, Fayed MS, Labib A, El-Saaidi C. Global distribution of malocclusion traits: a systematic review. Dental Press J Orthod. 2018 Nov–Dec;23(6):40.e1–40.e10. doi: 10.1590/2177-6709.23.6.40.e1-10.onl. Erratum in: Dental Press J Orthod. 2019 Aug 01;24(3):113.

2 Voudouris JC, Kuftinec MM. Improved clinical use of twin-block and Herbst as a result of radiating viscoelastic tissue forces on the condyle and fossa in treatment and long-term retention: growth relativity. Am J Orthod Dentofacial Orthop. 2000 Mar;117(3):247–66. doi: 10.1016/s0889-5406(00)70231-9.

3 Fiorelli G, Merlo P, Dalstra M, Melsen B. Le repositionnement mandibulaire: une alternative à la chirurgie chez des patients adultes? Un suivi sur deux ans [Mandibular repositioning in adult patients. An alternative to surgery in some patients? A two-year follow-up]. Orthod Fr. 2018 Jun;89(2):123–35. French. doi: 10.1051/orthodfr/2018013.

4 Al-Dboush R, Soltan R, Rao J, El-Bialy T. Skeletal and dental effects of Herbst appliance anchored with temporary anchorage devices: a systematic review with meta-analysis. Orthod Craniofac Res. 2021 Jun 19. doi: 10.1111/ocr.12510. Epub ahead of print.

5 George AS, Ganapati Durgekar S. Skeletal and dentoalveolar contributions during Class II correction with Forsus™ FRD appliances: quantitative evaluation. J Orofac Orthop. 2021 May 7. English. doi: 10.1007/s00056-021-00297-z. Epub ahead of print.

6 Barakat D, Bakdach WM, Youssef M. Treatment effects of Carriere Motion appliance on patients with Class II malocclusion: a systematic review and meta-analysis. Int Orthod. 2021 Jun 11:S1761-7227(21)00077-2. doi: 10.1016/j.ortho.2021.05.005. Epub ahead of print.

7 Sarul M, Nahajowski M, Gawin G, Antoszewska-Smith J. Does daily wear time of twin block reliably predict its efficiency of Class II treatment? J Orofac Orthop. 2021 May 7. English. doi: 10.1007/s00056-021-00300-7. Epub ahead of print.

8 Zybutz T, Drummond R, Lekic M, Brownlee M. Investigation and comparison of patient experiences with removable functional appliances. Angle Orthod. 2021 Jul 1;91(4):490–5. doi: 10.2319/050520-393.1.

9 Chen Z, Chen Q, Fan X, Li Y, Mo S. Stepwise versus single-step mandibular advancement with functional appliance in treating Class II patients: a meta-analysis. J Orofac Orthop. 2020 Sep;81(5):311–27. doi: 10.1007/s00056-020-00229-3.

10 Aras I, Pasaoglu A, Olmez S, Unal I, Tuncer AV, Aras A. Comparison of stepwise vs single-step advancement with the Functional Mandibular Advancer in Class II Division 1 treatment. Angle Orthod. 2017 Jan;87(1):82–7. doi: 10.2319/032416-241.1.

11 Alexander RG. The principles of the Alexander Discipline. Semin Orthod. 2001 Jun 1;7(2):62–6. doi: 10.1053/sodo.2001.23536.

Canine substitutions: Protocols for predictable excellence

Dr Robert "Tito" Norris, US

Maxillary lateral incisors are some of the most commonly missing teeth, second only to mandibular premolars.[1] When a lateral incisor is missing, there is a high aesthetic requirement to make the replacement tooth look natural, owing to its location in the aesthetic zone. Currently, there are four options for replacing a missing maxillary lateral incisor:

1. removable partial denture (RPD);
2. fixed partial denture (FPD);
3. dental implant; and
4. canine substitution.

All options necessitate precise orthodontic treatment so that the replacement tooth for the lateral incisor is approximately 80% of the size of the maxillary central incisor in both width and length. Most maxillary central incisors are between 8 mm and 9 mm in width. Therefore, the appropriate width for a maxillary lateral incisor should be 6.4–7.2 mm. Most maxillary central incisors are 10–11 mm in length. Therefore, the appropriate length of a maxillary lateral incisor should be between 8.0 mm and 8.8 mm.

An advantage of an RPD is that fabrication is relatively inexpensive. An RPD can be as simple as a resin pontic tooth affixed to an acrylic or slip cover retainer. However, this style of RPD is typically not very durable and is often taken out for meals. This can cause an embarrassing situation and increases the risk of loss or damage of the RPD if it is left on a napkin or stuffed in a pocket. A more elaborate and durable cast RPD can be fabricated at an increased cost, but this style of RPD often requires creating preparations within enamel to serve as rests on which to stabilise the appliance. For these reasons, RPDs are not considered a long-term treatment of choice for most patients.

An FPD requires some preparation of adjacent teeth, depending on the design. These designs vary, including a conservative Maryland bridge, a cantilever pontic bridge and a conventional crown-supported bridge. No matter the design of the FPD, careful attention must be paid to the gingival architecture and development of papillae. This is often most successfully accomplished with an ovate pontic to mould the tissue of the edentulous space into natural-appearing gingival contours around the pontic. Tissue moulding must be carried out under the careful hands of a skilled restorative dentist and sometimes requires the assistance of soft-tissue grafting to be successful. Another challenge of an FPD is cleansability, and studies have shown that there is more gingival inflammation in FPD patients than in patients with natural teeth.[2]

Dental implants have long been considered the gold standard for replacing a missing tooth. However, dental implants cannot be placed in growing teens, as dentofacial growth is not complete. If a dental implant is placed before growth is complete, then the implant will eventually appear to be in infraocclusion as the adjacent teeth continue to grow and change around it.[3] In fact, even in mature adults, studies have shown that the face is still changing and growing through the fourth decade of life and infraocclusion of dental implants in the aesthetic zone can still occur.[4] Another challenge of dental implants in the aesthetic zone is that over half of them show noticeable colour change of the overlying gingiva after five years.[5]

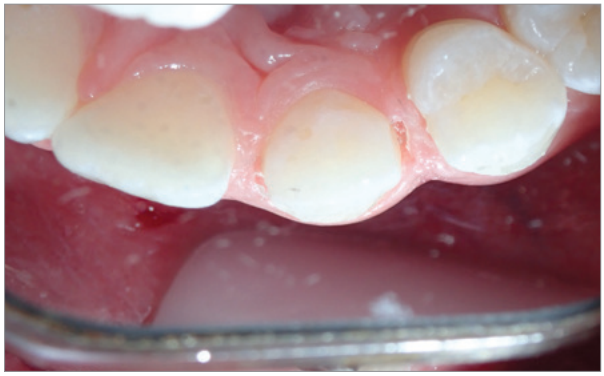
Canine substitution allows a natural tooth to remain in the aesthetic zone; however, there are several key principles to optimise the aesthetics and function of this option:

1. **Perform pre-orthodontic sculpting.** Before brackets are bonded to the canine which will serve as a lateral incisor, the canine should be sculpted with burs and composite to resemble a lateral incisor of the appropriate size (80% of the width and length of the central incisor; Figs. 1a–j). Here is a step-by-step guide:

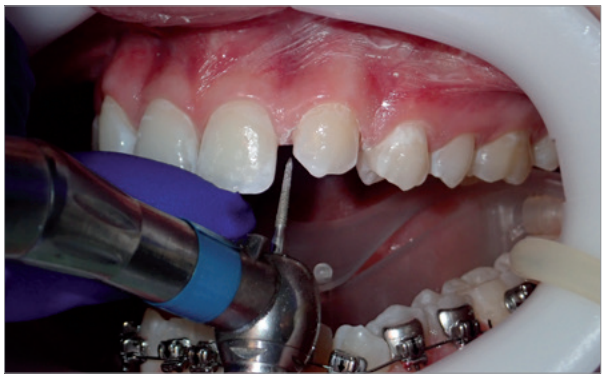
a. Flatten the facial surface with a diamond disc bur.
b. Reduce the width mesially and distally with a straight diamond bur.
c. Reduce the incisal edge with a diamond disc bur.
d. Reduce the lingual contour with a diamond disc bur.
e. Add composite to the mesio-facial and disto-facial line angles and create proper mesio-incisal disto-incisal contours to simulate a lateral incisor.

2. **Push. Do not pull.** One of the common complaints of dentists is that canine substitution cases appear too narrow, and the author believes that this is often due to

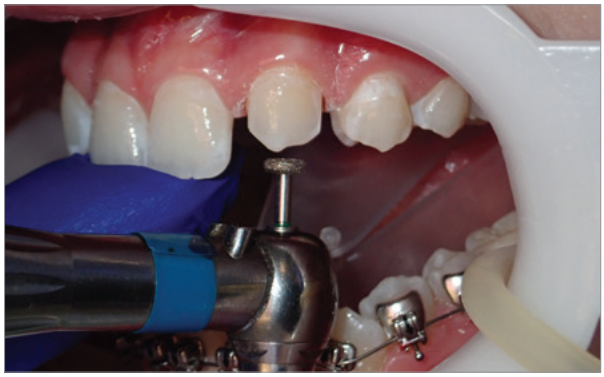

Figs. 1a & b: Left maxillary canine before and after lateralisation.

Figs. 1c & d: Flattening the facial surface with a diamond disc bur.

Figs. 1e & f: Reducing width mesially and distally with a straight diamond bur.




Figs. 1g & h: Reducing and flattening the incisal edge with a #5909 diamond disc bur.

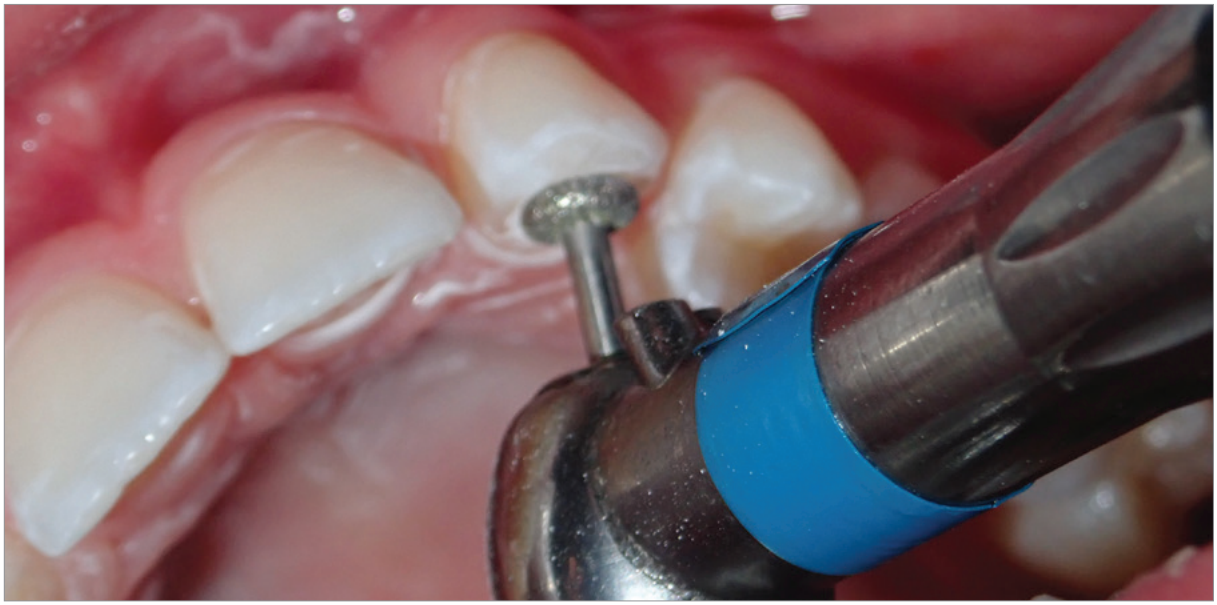


Fig. 1i: Reducing the lingual prominence with a #5909 diamond disc bur to produce a flat lingual surface.

Figs. 1j & k: Adding composite to the mesio-facial and disto-facial line angles and creating proper mesio-incisal disto-incisal contours to simulate a lateral incisor.

the use of elastic chains to close spaces between maxillary central incisors and canines. Elastic chains constrict; whereas open coils springs expand. One should use open coil springs between the first premolar and the canine to close any space between the new lateral incisor and the central incisor. Open coil springs can also assist in centring midlines in cases of unilaterally missing lateral incisors.

3. **Intrude the first premolar.** A maxillary premolar is approximately 3 mm shorter than a maxillary canine. Therefore, to achieve appropriate gingival architecture, the bracket of the first premolar should be moved 3 mm occlusally when it is first bonded. This will provide adequate time for the premolar to intrude as archwire sizes are increased during treatment. Once the premolar is positioned in a Class I relationship with the mandibular canine, it will need composite restoration to lengthen it to its appropriate canine length and contour. Eventually, the tooth should be restored with a more definitive long-term restoration such as a porcelain veneer or crown.

4. **Place the new canine in group function.** In order to protect the smaller root of the premolar serving in the canine position, group function occlusion is advised so that the lateral excursive forces can be distributed among all teeth in the buccal segment.

5. **Use a Y-bar to protract maxillary posterior teeth.** Once the maxillary midline is on to the face, the incisors are in their correct vertical and antero-posterior positions with the new lateral incisor/s properly aligned, and all incisors are adequately coupled with the mandibular incisors, it is then time to lock them into place via indirect palatal anchorage. Two 1.5 × 9 mm Spider Screw temporary anchorage devices (Ortho Technology) with self-

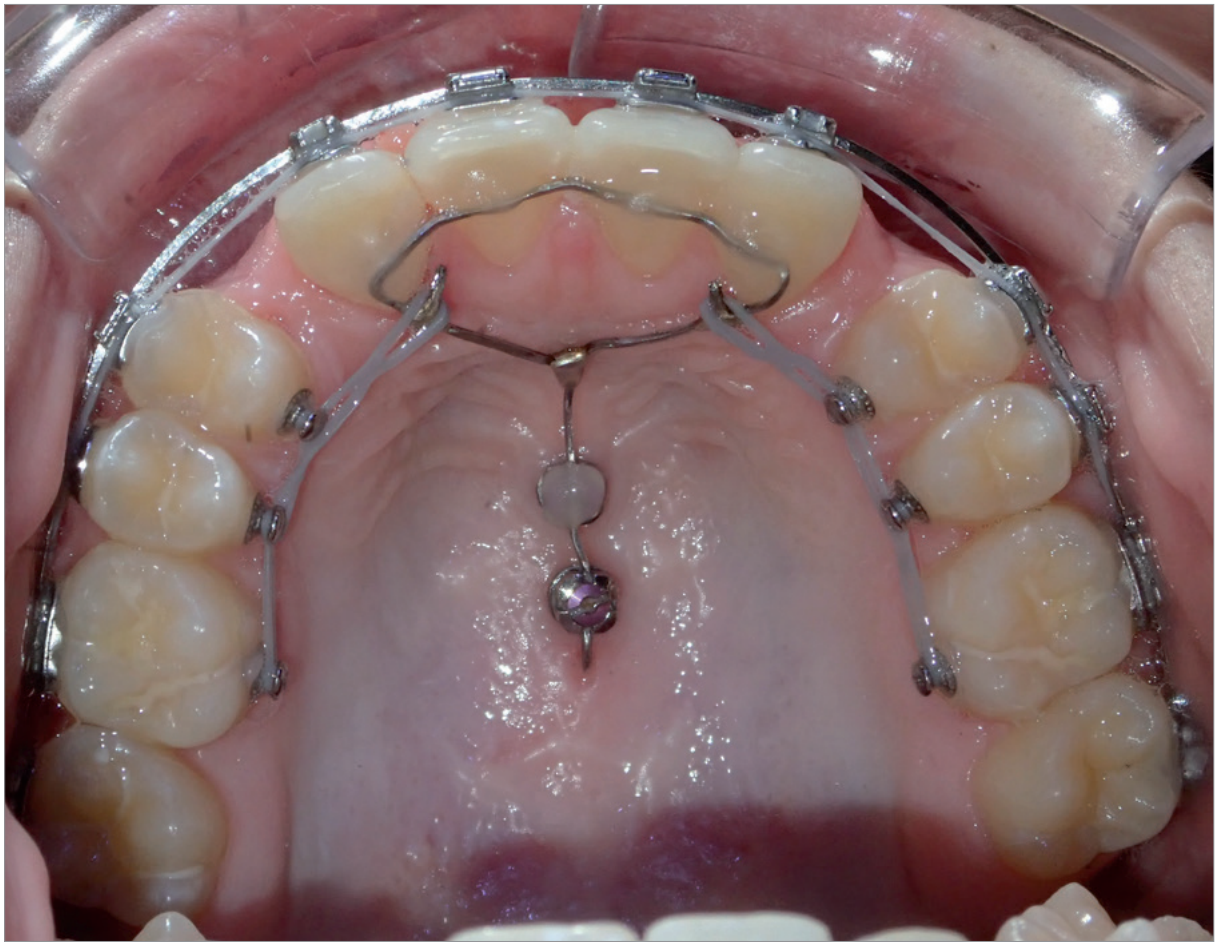


Fig. 2: Y-bar fabricated with 0.016 × 0.022 in. stainless-steel archwire secured into two palatal self-ligating 1.5 × 9.0 mm Spider Screw temporary anchorage devices. Note the lingual buttons on the premolars.

ligating heads are placed in the midline of the palate approximately 10 mm apart, and an impression is taken so that a 0.016 × 0.022 in. stainless-steel Y-bar can be fabricated and locked into place (Fig. 2). This Y-bar is then adhered to the lingual surfaces of all four maxillary incisors, providing absolute indirect skeletal anchorage. Now remaining posterior spaces can be efficiently closed on 0.019 × 0.025 in. Norris Extra Broad stainless-steel rounded rectangular archwire (DynaFlex) using facial and lingual elastic chains. The lingual elastic chains are attached to lingual buttons bonded to all posterior teeth, and the elastic chains are terminated on to hooks integrated within the Y-bar.

6. **Flip the first molars.** When canine substitution is planned for missing maxillary lateral incisors, it typically results in the molars finishing in a Class II relationship. This means that the palatal cusp of the maxillary first molar will rest on the marginal ridges of the mandibular second premolar and first molar, rather than in the central fossa of the mandibular first molar. Therefore, the palatal cusp of the maxillary first molar must finish more occlusally than it normally does, so more facial root torque is needed. Similarly, less rotation is desired on the maxillary first molar, owing to its relationship with the mandibular second premolar and first molar. The bracket that has more facial root torque and less rotation is the mandibular first molar buccal tube of the contralateral arch (typically 22° of torque and 0° of rotation). Proper placement of this buccal tube will aid in first molar fit and finish.

When the aforementioned principles are consistently applied, canine substitution cases can predictably provide optimal aesthetics combined with a natural tooth in the aesthetic zone which will grow, change and induce bone formation as the patient continues to grow and

Figs. 3a–i: Pretreatment facial and intra-oral photographs.

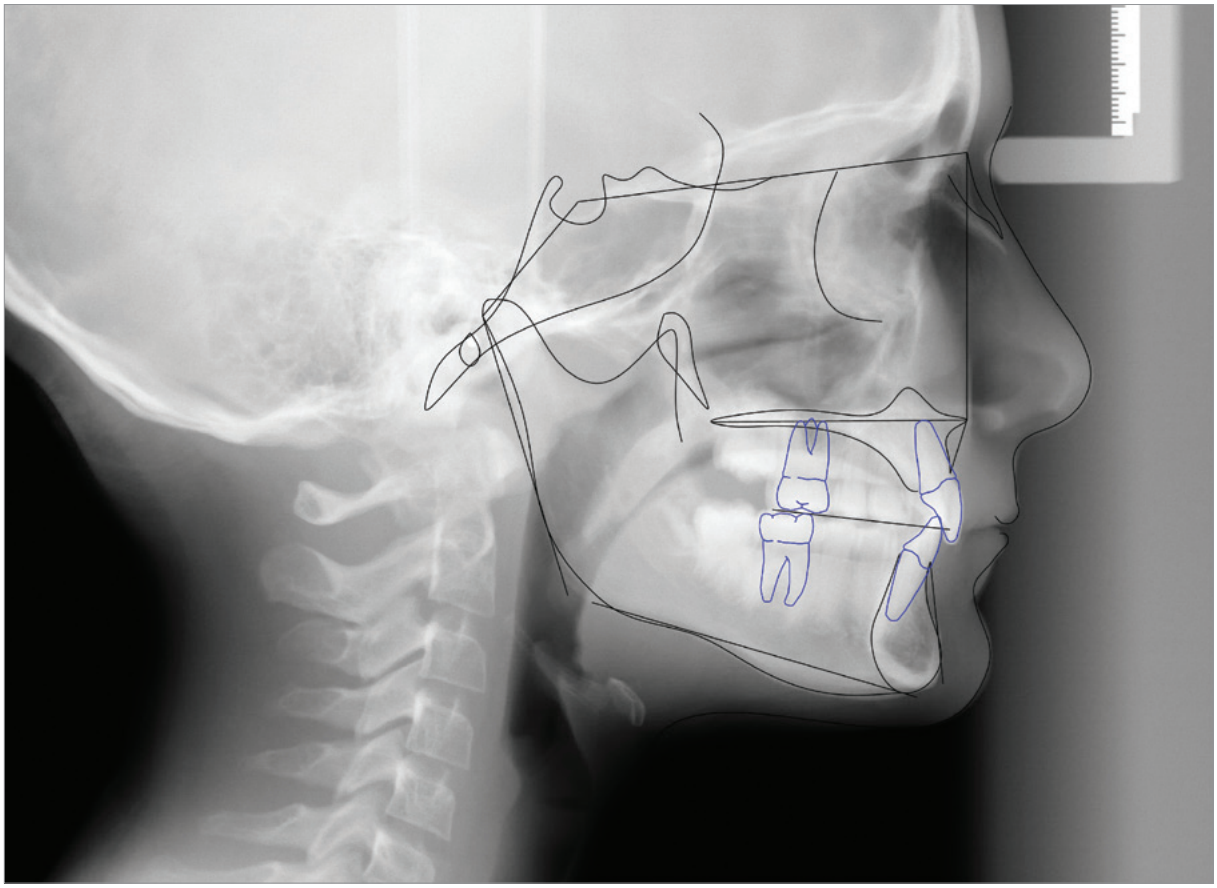


Fig. 3j: Pretreatment cephalometric radiograph and tracing.

Fig. 3k: Pretreatment panoramic radiograph revealing missing maxillary lateral incisors.

Figs. 4a–c: Intra-oral photographs at initial bonding and placement of 0.014 in. Norris Extra Broad NiTi archwire. Note the occlusal position of the brackets on the first premolars.

Figs. 5a–c: Intra-oral photographs at the second appointment, during which the second molars were bonded and 0.018 × 0.018 in. Norris Extra Broad NiTi archwire was placed.

change. Eventually, the provisional composite restorations can be replaced with porcelain restorations, enhancing the long-term aesthetic prognosis.

Case report

A 10-year-old female patient presented with the chief complaint of excess maxillary spacing and missing maxillary lateral incisors (Figs. 3a–k). She had a deep bite and an Angle Class II molar and canine relationship. Clinical examination of her short clinical crowns hinted at early signs of altered passive eruption;[6] however, owing to her young age and growth potential, a definitive diagnosis of altered passive eruption could not be made at that time.

The cephalometric radiograph revealed that she was brachio-cephalic and slightly bimaxillary retrusive (Figs. 4a–c). However, her maxillary incisal angulation was ideal. Her panoramic radiograph was unremarkable, with the exception of the missing maxillary lateral incisors, teeth #12 and 22 (Figs. 5a–c). The treatment plan was canine substitution, converting the maxillary canines to lateral incisors and the maxillary premolars into canines. The molars would remain Angle Class II.

Figs. 6a–c: Placement of 0.019 × 0.025 in. Norris Extra Broad NiTi archwire. Note intrusion of the maxillary first premolars to level the gingival architecture.

Figs. 7a–c: Intra-oral photographs after conversion of the maxillary first premolars to canines.

Figs. 8a–i: Post-treatment facial and intra-oral photographs.

The canine conversion procedure described earlier was followed as tooth #13 was reshaped to resemble the missing tooth #12 and tooth #23 was reshaped to resemble tooth #22. Orthodontic brackets with 0.020 × 0.026 in. bracket slots (Norris 20/26 system, DynaFlex) were placed, paying particular attention to moving the maxillary first premolar brackets 3 mm to the occlusal aspect in order to begin intruding those teeth which would eventually serve as maxillary canines. Mandibular molar brackets with 0° of rotation and 20° of torque were placed on the maxillary molars in order to enhance the fit of the molars in an Angle Class II relationship. Bite turbos were placed to disclude her occlusion. At the initial visit, 0.014 in. Norris Extra Broad nickel–titanium (NiTi) archwire was placed (Figs. 6a–c).

The normal Norris 20/26 system archwire progression was followed, and 0.018 × 0.018 in. Norris Extra Broad NiTi archwire was placed at her next appointment. (Figs. 7a–c). Subsequently, 0.019 × 0.025 in. NiTi arch-

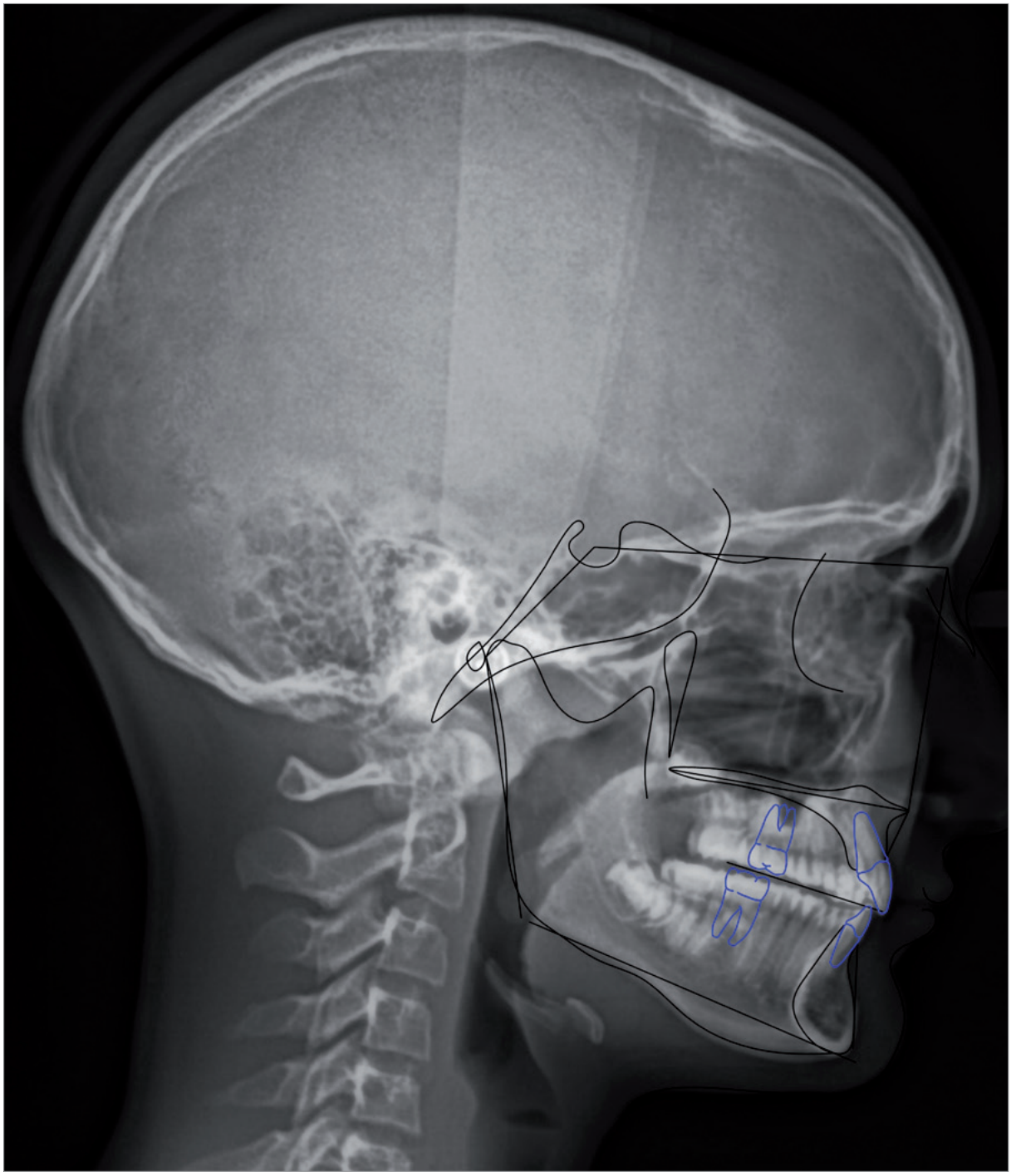


Fig. 8j: Post-treatment cephalometric radiograph and tracing.

wire was placed, completing the intrusion of the maxillary first premolars, continuing arch development and providing a strong enough wire on which excess spaces could begin to close using elastic chains and Class III elastics (Figs. 8a–k).

Once the maxillary first premolars reach an ideal Class I relationship with the mandibular canines, then the orthodontic brackets are removed from them and composite resin is added to convert them to canines. Note that when the brackets are replaced after the bonding procedure, they are sometimes placed in an even further incisal position to further intrude the new canines in order to idealise the final gingival architecture. Eventually, the canines are positioned in a group function role, whereby the posterior teeth share lateral excursive forces with the new maxillary premolar that is serving as a canine.

Upon completion of orthodontic treatment, bonded lingual retainers were placed and the patient was fitted

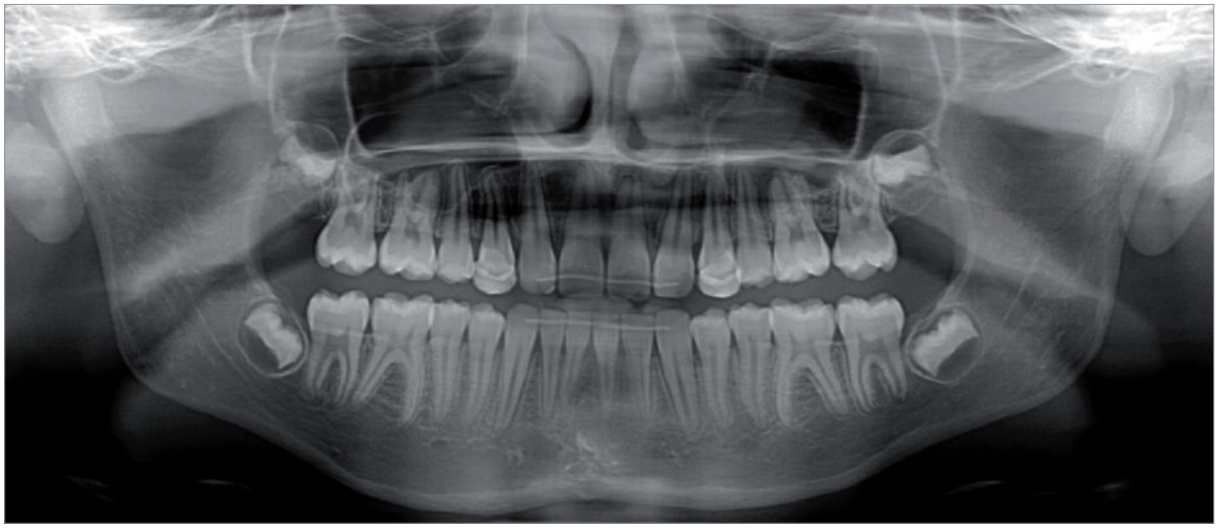


Fig. 8k: Post-treatment panoramic radiograph.

with vacuum-formed retainers for night-time wear. The patient and parent were informed that she would likely need osseous crown lengthening to correct her altered passive eruption and establish ideal posterior gingival height. Long-term restorations, such as porcelain veneers, on the maxillary lateral incisors and canines would also be indicated once growth was complete. Normally, the timing of the crown lengthening and definitive restorations occurs after the age of 16 in females and after the age of 18 in males.

about

Dr Robert "Tito" Norris is devoted to creating smiles for a lifetime. His unique background in mechanical engineering provides him with a distinct advantage in mastering the forces, vectors and movements inherent in performing orthodontic treatment. Dr Norris is a 1992 graduate of the University of Texas Health Science Center at San Antonio School of Dentistry in the US. He then moved to Washington in the US, where he completed a general practice residency at the Veterans Affairs Medical Center, followed by orthodontic specialty training at Howard University. After serving as an Air Force orthodontist in Misawa in Japan, Dr Norris returned to San Antonio in 1998 and opened a thriving private orthodontic practice. He holds several patents and trademarks, is board-certified by the American Board of Orthodontics, and is a member of ten dental organisations and study clubs. He lectures nationally and internationally on topics including aesthetics, efficiency, sustainability, customer service, accelerated treatment and aligner treatment. He has created and manages several other companies pertaining to real estate investments, marketing and retail sales, and a non-profit providing complimentary orthodontic care to children in need.

References:

1 Zilberman Y, Cohen B, Becker A. Familial trends in palatal canines, anomalous lateral incisors, and related phenomena. Eur J Orthod. 1990 May;12(2):135–9. doi: 10.1093/ejo/12.2.135.

2 Robertsson S, Mohlin B. The congenitally missing upper lateral incisor. A retrospective study of orthodontic space closure versus restorative treatment. Eur J Orthod. 2000 Dec;22(6):697–710. doi: 10.1093/ejo/22.6.697.

3 Thilander B, Odman J, Jemt T. Single implants in the upper incisor region and their relationship to the adjacent teeth. An 8-year follow-up study. Clin Oral Implants Res. 1999 Oct;10(5):346–55. doi: 10.1034/j.1600-0501.1999.100502.x.

4 Bernard JP, Schatz JP, Christou P, Belser U, Kiliaridis S. Long-term vertical changes of the anterior maxillary teeth adjacent to single implants in young and mature adults. A retrospective study. J Clin Periodontol. 2004 Nov;31(11):1024–8. doi: 10.1111/j.1600-051X.2004.00574.x.

5 Garber DA, Salama MA, Salama H. Immediate total tooth replacement. Compend Contin Educ Dent. 2001 Mar;22(3):210–6, 218.

6 Dolt AH 3rd, Robbins JW. Altered passive eruption: an etiology of short clinical crowns. Quintessence Int. 1997 Jun;28(6):363–72.

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Dental anti-ageing: The interdisciplinary management of complex rehabilitation with invisible aligners

Drs Antonello Francesco Pavone, Andrea Bazzucchi, Simone Verardi, Alessandro Rampello & Mario Bazzucchi, Italy

Introduction

Dental ageing is the sum of the ageing effects that the body undergoes over the years, owing to mechanical tribological masticatory problems; erosive factors, such as endogenous or exogenous acidic agents; cariogenic bacterial pathologies; periodontal problems; and iatrogenic errors.[1–5]

Adult patients often have several problems to be solved: lost teeth, dental wear, old, infiltrated and damaged restorations, misaligned teeth, etc.[6–8] Their treatment requests are always related to aesthetic and masticatory needs. The dentist must try to please the patient and try to improve not only aesthetics but also function, seeking to preserve the residual biology as far as possible, restoring lost structure, such as missing teeth or worn tissue, and defining a treatment plan that has long-term predictability.[9, 10] These cases are complex, and to be able to achieve all these objectives, an interdisciplinary rehabilitation which we call "dental anti-ageing" is needed. Dental anti-ageing is rehabilitation aimed at rejuvenating the teeth in a biological and minimally invasive manner.

The new rehabilitation will have to allow the patient to smile and chew for as long as possible. Prosthetic dentists must be able to work on aligning teeth and obtaining adequate inter-arch coherence in order to ensure aesthetics, function, respect of the biology and long-term predictability of the rehabilitation.

It is necessary to initially identify the missing teeth to be replaced and the teeth that present with pathologies such as caries and periodontal problems and to define which teeth will be able to be used as temporary or definitive abutments at the end of the pre-prosthetic phase. During the pre-prosthetic phase we have to treat active disease processes, realign the teeth, regenerate bone and gingival tissues and replace missing teeth with implants. In this phase, it is recommended that long-term biological therapies such as orthodontic therapy, implants and bone regeneration be started as soon as possible.[11]

The more important goal of orthodontics is to obtain the most pertinent inter-arch coherence of the sagittal and frontal planes. The final position of the teeth should be ideal not in terms of orthodontic parameters but in terms of pre-prosthetic parameters. Using Invisalign's ClinCheck software (Align Technology), the prosthodontist must plan the final result with the orthodontist in order to find the best position for the teeth before restoring them. Tooth size final proportion, the final position within the dental arches, the inter-arch relationship, interdental spacing, torquing of the anterior teeth and the anterior envelope of function at the end of the orthodontic phase need to be defined together, considering the future additional restorations that will be carried out.

First of all, the prosthodontist and the orthodontist must immediately determine by how much the position of maximum intercuspation of the patient differs from the position of centric relation, or rather the most adequate mandibular joint position from which to start, to obtain a final correct rehabilitation both in the sagittal and in the frontal plane. It is always necessary to start by muscle deconditioning and checking whether there are no intra-articular problems before defining the starting mandibular position. In case of temporomandibular disorder, we first undertake osteopathic and gnathological therapy to restore cervical, muscular and articular health. Therefore, we plan the complex rehabilitation, starting from a new and healed condylar position.[12]

Figs. 1–4: Baseline situation.

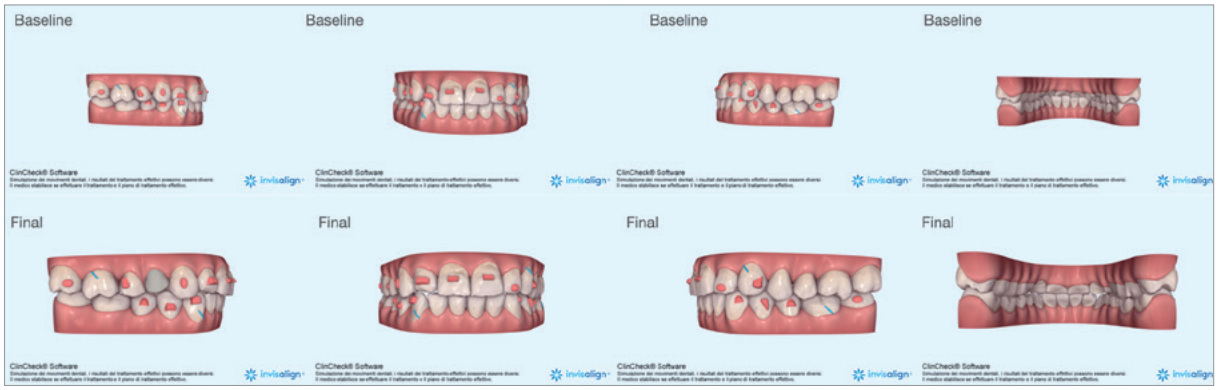
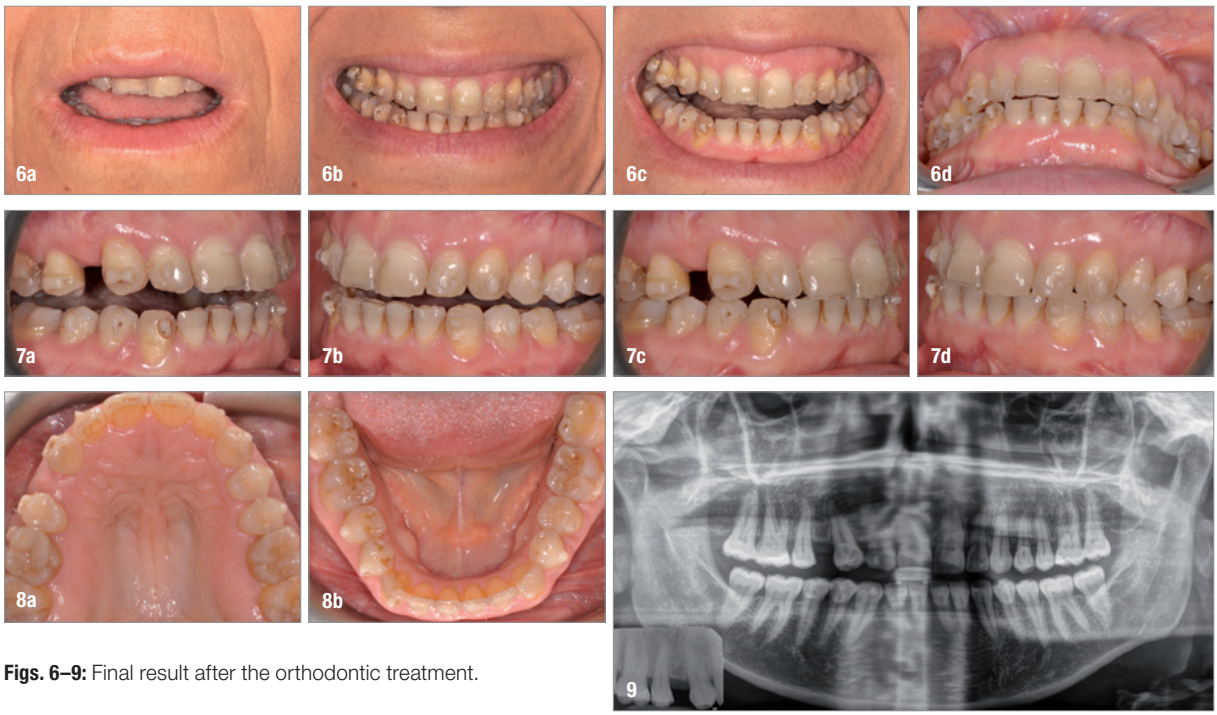
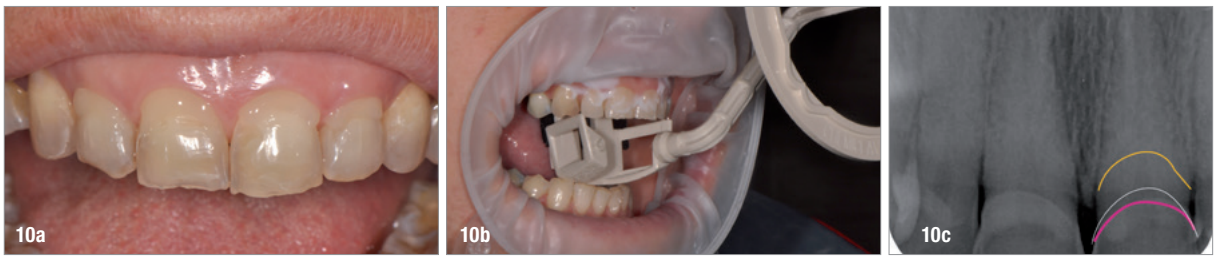


Fig. 5: ClinCheck analysis before and after images.

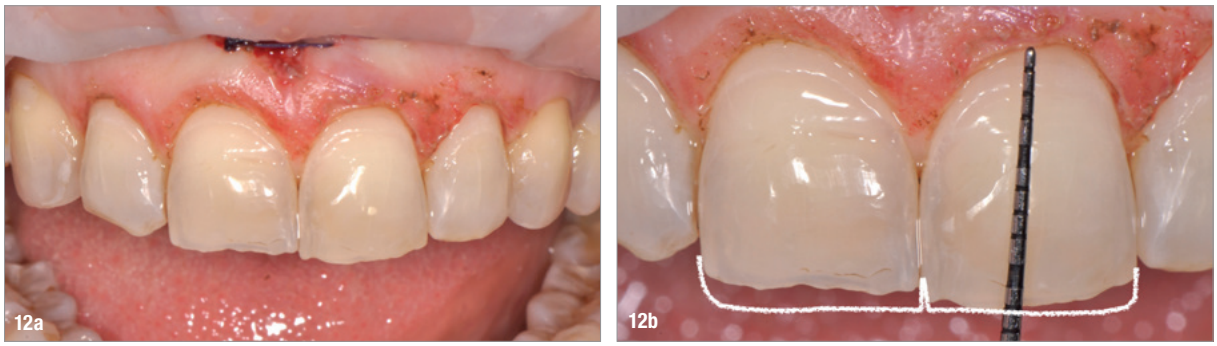


Figs. 6–9: Final result after the orthodontic treatment.



Figs. 10a–c: Altered eruption radiographic technique (AlteRx) to detect the presence of altered passive eruption with a radiopaque marker.

Figs. 11a & b: Lengthening of the central incisors (a) upwards with gingival surgery and (b) downwards to restore the worn incisal edges.

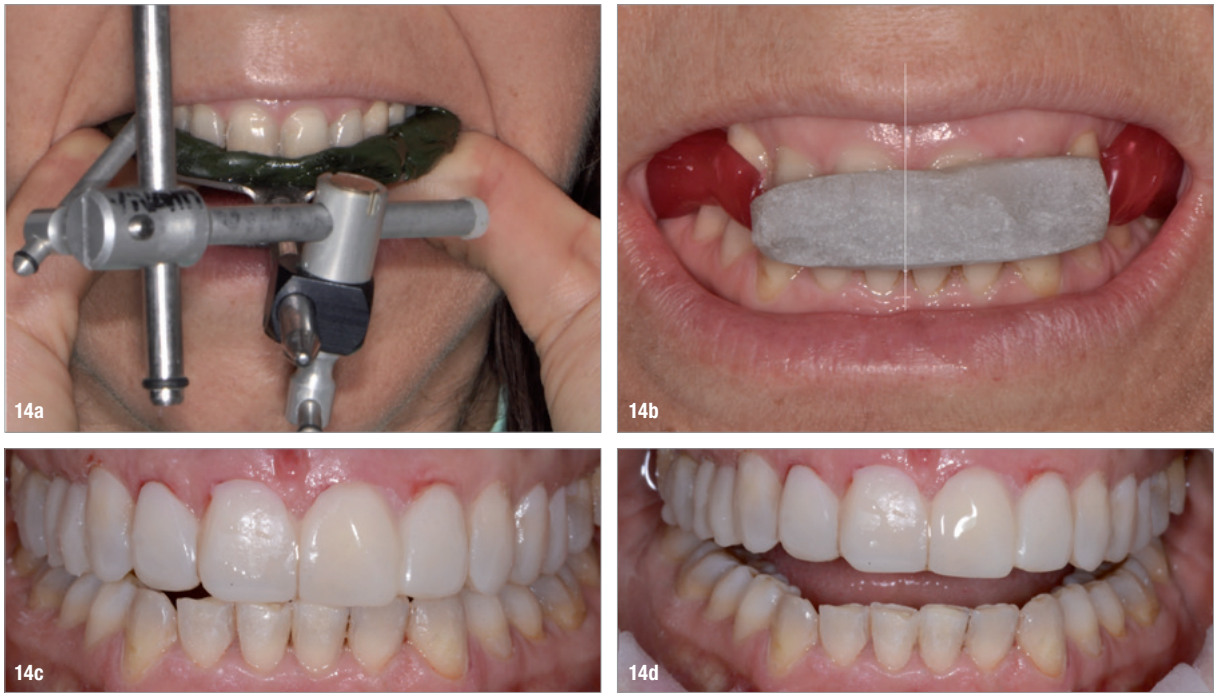


Figs. 12a & b: Gingivectomy and fraenectomy.

Figs. 13a & b: Ri.P.A.Ra. lingual ring.

Case 1

The 48-year-old patient wished to improve her smile. She was concerned about her worn dentition, her short tooth syndrome and her lateral cross bite (Figs. 1–4).[13] Her general medical history did not present any specific problems. We proposed first improving the inter-arch coherence and cross bite with orthodontic aligners and then fixing the short tooth syndrome with gingival surgery[14] and restorative dental anti-ageing.



Figs. 14a–d: Facebow and recording of the maxillomandibular relationships in centric relation with a lucia jig and dental anti-ageing mock-up.

Figs. 15a–e: Definitive ceramic veneers and cantilever bridge on teeth #14 and 15.

The final restorative dental anti-ageing always aims to achieve[15] a minimum increase in the vertical dimension, to restore worn teeth with minimal biological invasiveness and to improve the dental proportions, colour and structural strength in the anterior area, and in so doing to limit the removal of healthy tissue with additional dental care.[9,10]

During the orthodontic planning, we decided to open the space to subsequently insert the missing tooth #14 and, at the same time, to fix the cross bite of teeth #12 and 43, and finally to expand and square the arches and reduce the anterior constriction to improve function (Fig. 5).

At the end of the orthodontic treatment, we have to define the prosthodontic and aesthetic treatment plan based on the result obtained from the orthodontic treatment (Figs. 6–9). We first assessed the presence of the altered passive eruption with an AlteRx, in order to slightly reduce the gummy smile and increase the height of the anterior teeth with gingival surgery (Fig. 10).[13,14] We performed a simple gingivectomy and fraenectomy to

Figs. 16a–c: Definitive restorations, frontal and lateral views.

Figs. 17a & b: Occlusal views of the final arches.

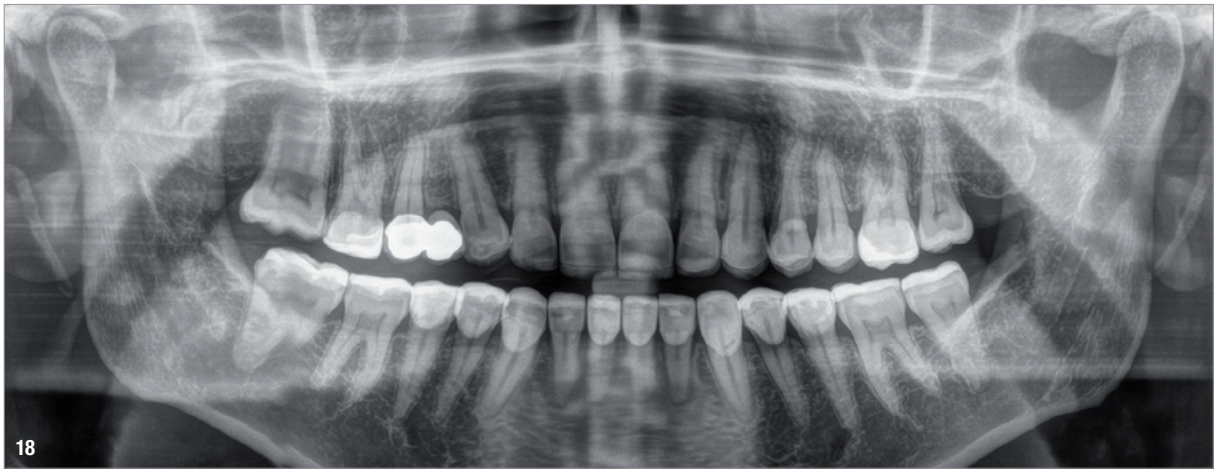


Fig. 18: Dental panoramic tomogram after dental anti-ageing.

Figs. 19a–e: Clinical situation and dental panoramic tomogram after three years.

Figs. 20–23: Clinical situation and dental panoramic tomogram after three years.

improve the final height of the anterior teeth gingivally first and then plan a minimum lengthening of the incisal edges with ceramic veneers (Figs. 11 & 12).

During tissue healing, we reduced the muscular tension with a deprogrammer (Ri.P.A.Ra. lingual ring, IPERMEDICAL; Fig. 13). We took an occlusion record with an increase in the occlusal vertical dimension, the facebow registration and the impressions of the two arches to have the casts mounted in the articulator in the laboratory and proceed with the wax-up of the two arches, to prepare the dental anti-ageing treatment plan. With the silicone keys of the dental anti-ageing wax-up, we then performed an intra-oral direct pressed mock-up with bis-acrylic material to study the aesthetic effect of the new smile and the new posterior support and function (Fig. 14). The teeth were prepared based on the mock-up, for anterior veneers and posterior onlays. Finally, to replace tooth #14, we opted for an adhesive cantilever bridge made of zirconia with preparation for a veneerlay and cemented with PANAVIA V5 (Kuraray Noritake Dental; Figs. 15–18). At the end of the treatment, the patient wore a protective night guard. The patient had excellent occlusal and aesthetic stability at a distance (Figs. 19–23).

Case 2

This 57-year-old patient wished to have a perfect smile: white, rejuvenated and aligned teeth with closed spaces (Figs. 24–27).[16] We started with extraction of tooth #15, aetiological periodontic therapy, endodontic treatment of teeth #35 and 37, implant insertion in position #36 and placement of temporary restorations on teeth #35–37. We then obtained an intra-oral scan for the ClinCheck analysis (Figs. 28 & 29), and the atypical swallowing of the patient was corrected with a FroggyMouth appliance (Froggy&Co.) worn for 21 days for 20 minutes a day.

The patient then began orthodontic therapy with aligners and during this time was asked to wear the Ri.P.A.Ra. appliance at night, to improve the lingual posture and protect and improve the action of the aligners. The Ri.P.A.Ra. appliance (IPERMEDICAL) has a lingual ring that guides the tongue to the anterior palatal portion, and being made of silicone, it behaves like a stabilisation splint during clenching at night and is easy to wear with invisible aligners, improving the biomechanics, as a sort of aligner chewie (Fig. 30).[17]

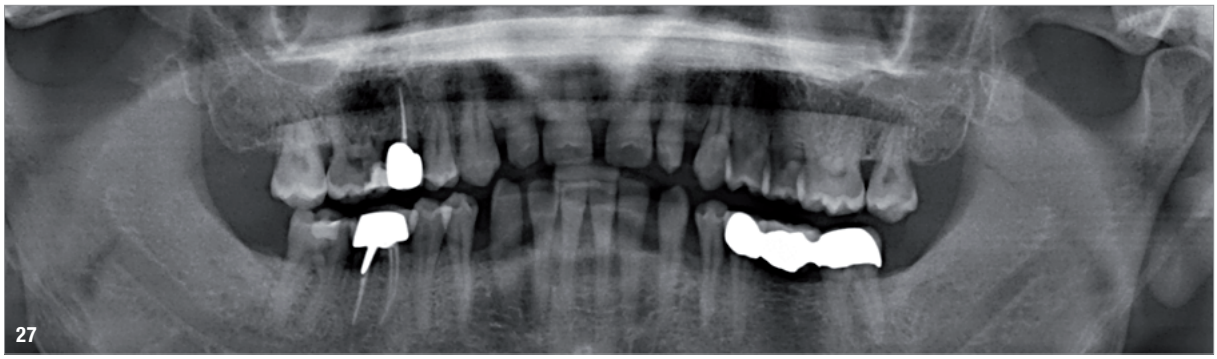
At the end of the orthodontic treatment, we extracted tooth #46, inserted implants in positions #15 and 46. We took the occlusal and aesthetic reference as always—bite registration wax with occlusal vertical dimension augmentation, facebow registration and silicone impressions—to fabricate the dental anti-ageing wax-up easily in the laboratory on the casts mounted on the articulator.

The mock-up is a crucial opportunity to analyse all the aesthetic parameters, particularly the smile proportion fitting of the anterior teeth in this case, and to understand whether the occlusal vertical dimension and the function and anatomy prepared in the laboratory are functionally adequate for the case (Figs. 31–35).

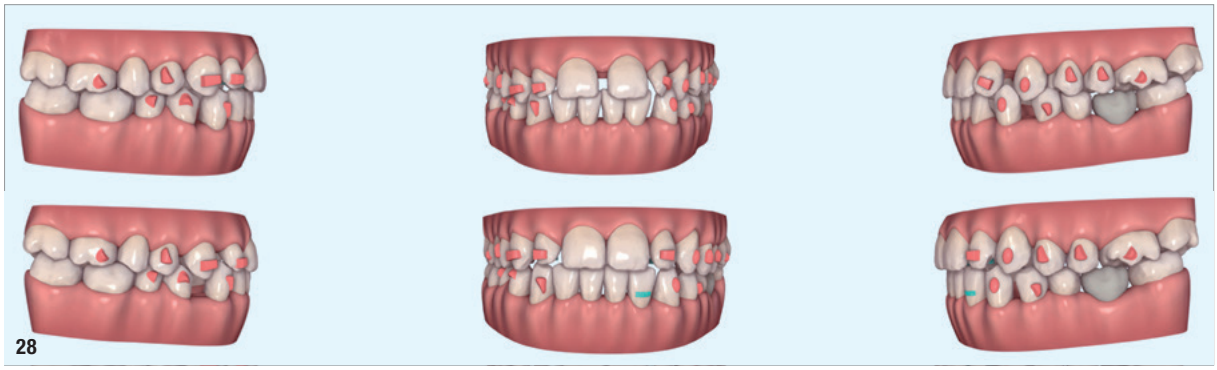
As has happened very often, we decided to perform a gingivectomy to to fix the altered passive eruption more upwards than downwards, improving the final proportion, without useless and risky increase of the overbite. (Fig. 36). We pre-pared the teeth minimally and placed feldspathic veneers on the anterior teeth. We then finished the posterior with temporary restorations, and the patient wore Essix retainers at night while the temporary restorations were in place (Figs. 37–41).

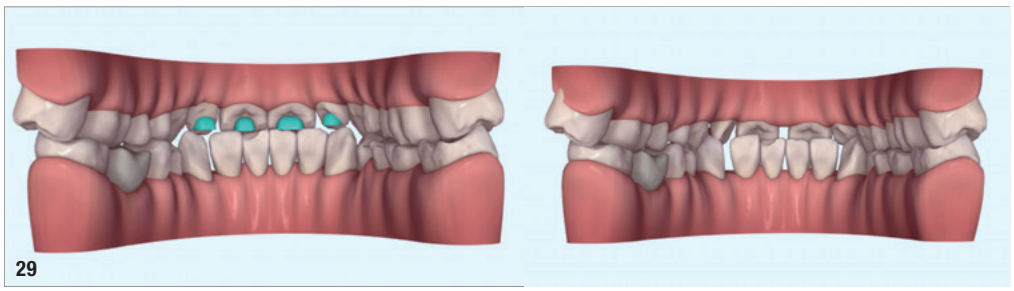
We finished the treatment of dental anti-ageing with ceramic veneers, increasing the occlusal vertical dimension for minimal intervention during the prosthodontic phase. We placed ceramic veneers for the anterior maxillary and mandibular areas, ceramic veneerlays for the sound posterior teeth and zirconia crowns for the implants and teeth #35 and 37 (Figs. 42–44). The patient continued maintenance with Vivera (Align Technology) and the Ri.P.A.Ra. lingual ring at night (Figs. 45–47).

Figs. 24 & 25: Baseline situation.



Figs. 26 & 27: Baseline situation.





Figs. 28 & 29: ClinCheck analysis before and after images.

Fig. 30: Ri.P.A.Ra lingual ring.

Figs. 31a–f: Orthodontic attachments.

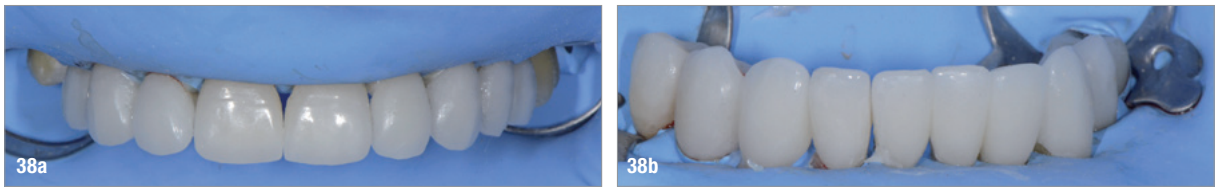
Figs. 32a & b: Results of orthodontic treatment.

Fig. 33: Smile proportion fitting.

Figs. 34 & 35: Mock-up for aesthetic and functional assessment.

Figs. 36a–d: Gingivectomy of the anterior teeth to improve the proportions.

Figs. 37a–c: Preparation guided by the mock-up.



Figs. 38a &b: Ceramic veneers cemented under dental dam isolation.

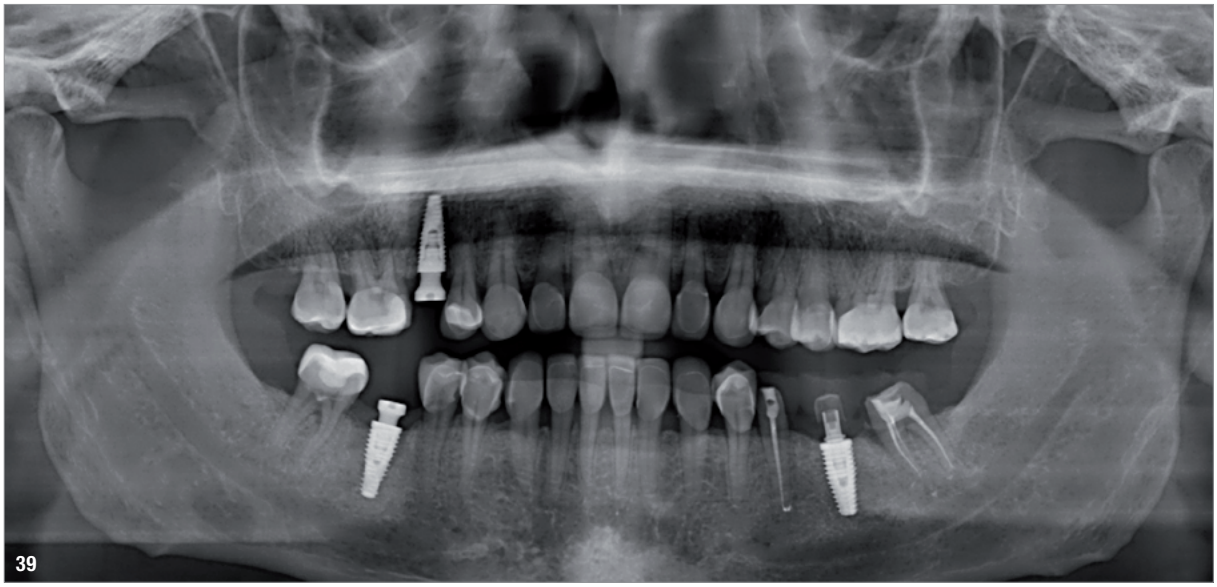
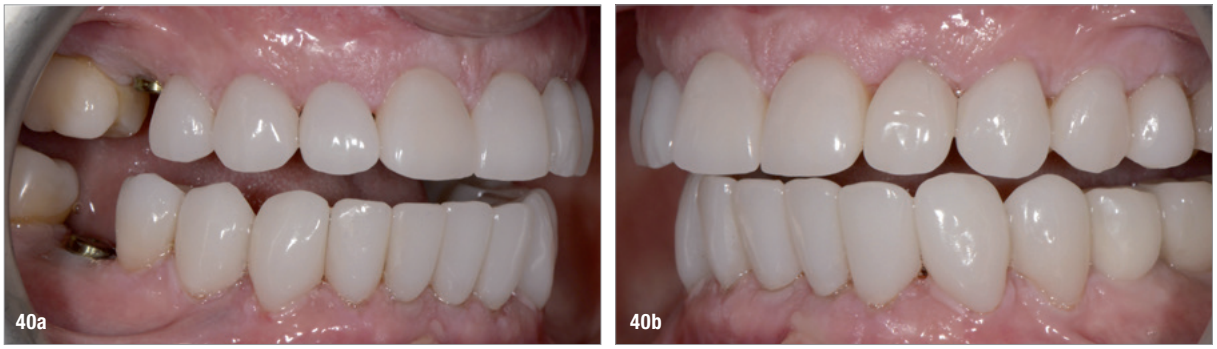


Fig. 39: Dental panoramic tomogram after placement of ceramic veneers, implants and indirect composite restorations and temporary restorations in the posterior.



Figs. 40a & b: Ceramic veneers in the anterior and indirect composite restorations and temporary restorations in the posterior area.

Figs. 41a & b: Essix retainers for maintenance while wearing the temporary restorations.

Figs. 42 & 43: Situation at the end of the prosthodontic treatment.

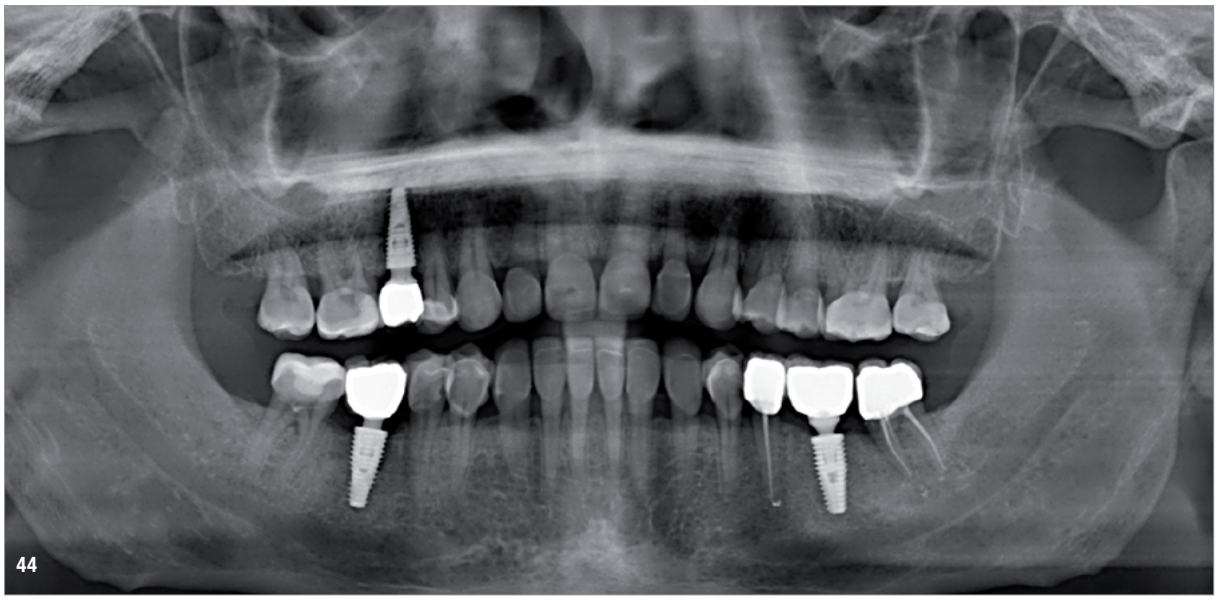


Fig. 44: Dental panoramic tomogram at the end of orthodontic treatment.

Figs. 45a–d: Ri.P.A.Ra. and Essix retainers to protect and maintain the system.

Figs. 46a–f: Situation after two years.

Fig. 47: Dental panoramic tomogram at the two-year check-up.

Conclusion

Dental anti-ageing represents a multidisciplinary rehabilitation that aims to rejuvenate the patient's teeth trying to be as minimally invasive and as biological as possible, improving the patient's aesthetics appropriate to his or her age, avoiding excessive rejuvenation of the smile, ensuring new symmetrical and functional bilateral cyclic mastication, and finally planning long-term predictability of the result.

To obtain the right compromise and a good prognosis for all the parameters—aesthetics, biology, structure, mechanics and function—the initial diagnosis is fundamental, as is the creation with an ortho phase, of inter-arch coherence before prosthetic finalisation. In adult patients, a 3D orthodontic reorganisation phase of the arches should always be performed before starting to finalise the treatment prosthetically.

Editorial note: A list of references is available from the publisher.

about

Dr Antonello Francesco Pavone graduated with a PhD from Tor Vergata University of Rome in Italy. He has deepened his studies in the field of aesthetics and prosthesis and carried out scientific research at the dental medicine school of the University of Geneva in Switzerland. As an expert in interdisciplinary manage ment of aesthetic complex cases, he is co-director of the Dental Center of Excellence of Clinique La Prarie in Montreux in Switzerland. His private practice, in Rome, is dedicated to the management of interdisciplinary and aesthetic treatment in prosthodontics and implantology. He has been an international speaker for Align Technology and lecturer on interdisciplinary dentistry at various universities in Italy, Switzerland and the US. Dr Pavone writes scientific articles and regularly presents at national and international congresses. He is a certified member of the European Academy of Esthetic Dentistry and an active member of the Italian Academy of Italian Gnathology.

Image: treety/Shutterstock.

What will be the new normal after COVID-19?

Jerko Bozikovic, Belgium

For over 18 months, the world has been challenged in reinventing itself constantly. Nobody would have imagined ringing in the 2020 new year that the world would go through what it has: lockdowns, red zones, health crises, isolations, reinventing the workspace and so much more. Most of us thought that this might be a temporary situation; however, three months became six, became 12, became 18, and we are still counting. While in some areas in the world, life has gone back to normal, in other areas strong measures are being taken again and the solutions that were promised to us by specialists, politicians and the media suddenly have not given us back the life we are all longing for. So, in this new, unstable reality, how can we be the best we can be?

We live in a world of VUCA—volatility, uncertainty, complexity and ambiguity—concepts most people do not like. Therefore, the challenge is not to try to avoid these—the reality is that we are living in VUCA—the challenge is dealing with them. VUCA concerns all aspects of life, personal and professional. Each of these four types of challenges require four distinct types of responses. It would be interesting to delve deeper into them for yourself through a self-examination.

A good exercise to do for yourself is to write down those four different challenges in different areas of your life and assess honestly how they have affected you and how you dealt with them. Have you really dealt with these, or did you hope they would pass? If you dealt with them, did you create the desired results? If you did, what were the outcomes? If you did not create the desired results, did you try other ways to create the desired results? This applies to all areas of your life: yourself, your partner, your kids, but also your patients, your team, your colleagues, your providers and your professional partners.

I do not believe in the concept of assessing something as good or bad. We live in a world ruled by duality: yes/no, good/bad, young/old, rich/poor, man/woman, sick/healthy, correct/incorrect, etc. As long as we keep thinking in this duality, we will fall into the pitfall of seeing things only our way. But things are seldom black or white, yes or no, correct or incorrect. There is a whole range in between, creating nuances, and every situation also depends on the context. There are two questions I find more interesting to ask ourselves:

- Is what I am doing efficient?
- Is it giving me the desired results?

If the answer is yes, keep doing it; however, if the answer is no, then you have a choice: either you keep doing the same thing, creating the same results (which was Einstein's definition of insanity: hoping for different outcomes doing the same thing), or you do something different to create a different outcome.

This approach is for me fundamental in doing the exercise I have suggested, identifying your reactions and behaviours in the VUCA world we live in. What you did in the past 18 months in dealing with a VUCA world was not good or bad. Rather ask yourself whether it was efficient and whether it gave you the desired results. If yes, wonderful! If no, it is an opportunity to start looking for other ways and methodologies. I strongly encourage you to ask your team to do the same exercise too, to give you feedback and different perspectives of the past 18 months—and that can only be beneficial for you, your team and your patients. The same of course applies to your personal life with your partner, kids or friends.

Another impact the past 18 months might have had on you is that some measures of safety or hygiene, for example, were created for a COVID-19 environment. Many might have thought that this would only be temporary, but it might be that some of these procedures are here to stay. This is the same for some other protocols for work and for collaboration, communication, delegation, etc. that had to be installed and developed in this ever-changing world. Therefore, take the learned lessons to a next level, integrating them and making them new habits, but do not be afraid of creating your own reality in this VUCA world, by following your intuition, acknowledging the specificities of your work environment and taking the steps you feel you need to.

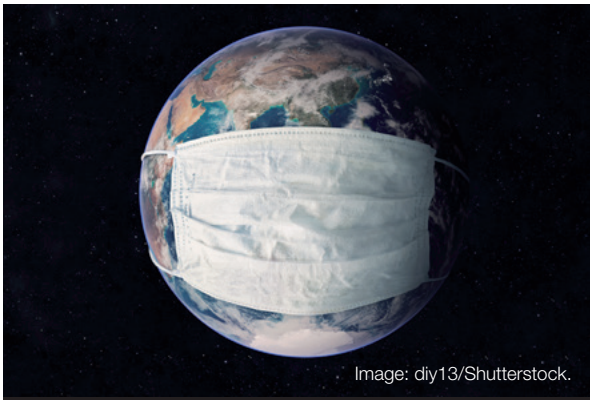


Image: diy13/Shutterstock.

If we give our authority away, it is difficult to create the life we want, we need, we deserve. That authority can be politicians and scientists but also patients, colleagues, etc. Be open to listening, to observing, to analysing, to challenging, integrating the outside truth with your inner truth. My experience is that this will take you where you want to go, will give you the answers you seek, will give you the tools to deal with what is happening around us in this VUCA world. As I said before, life is not what happens to us, but how we deal with it, and honestly, I think we are in for a longer, more challenging and more exciting ride than we can foresee. Take that opportunity to connect with your inner truth, to connect with the people around you who matter, to listen to their feedback, and to create together the best life and work environment you can in these times.

"May the force be with you", like the famous movie said, but most of all, do not be scared, angry, frustrated, desperate. These emotions do not help us build the life we want. Transform that energy into solutions, hope, connection, love, possibilities, and be open to the impact that this will have.

about

Jerko Bozikovic is a specialist in communication skills, emotional intelligence, time and stress management, leadership and change management. He is fascinated by human behaviour and finds working with people on personal development to be a daily challenge and blessing. He speaks seven languages and has offered his training courses in four languages since 2001. He embraces and embodies the motto "Love the life you live; live the life you love". He can be contacted via LinkedIn.

Image: Humble Smile Foundation.

Humble Smile Foundation: Fostering equitable oral healthcare access alongside environmental sustainability

Nathalie Schüller, Dental Tribune International

The Humble Smile Foundation was established in 2015 by its president, Dr Darren Weiss, who felt that dentistry was not accessible to the people who needed it the most. The foundation works to build a bridge between dentistry and general healthcare, and a guiding thread in achieving its goals is awareness of the need for dentistry to be responsible.

The Humble Smile Foundation's mission is to help prevent suffering caused by oral disease, by developing and sharing effective and sustainable models of oral health promotion for communities with high unmet needs and managing and supporting oral health outreach projects to promote hygienic and healthy lifestyles.

For the foundation, children everywhere should be able to live healthy lives with healthy smiles, and to try to achieve this vision, it relies on the FDI World Dental Federation's view that oral health is a fundamental component of overall health and mental well-being. It further envisions den-

tistry leading the promotion of oral health and the prevention of oral disease regardless of socio-economic status, age, religion, sex, nationality or geographical location.

The foundation fosters collaborations to enable the development, testing and promotion of innovative models that support communities in achieving healthy lifestyles and dedicates itself to providing vulnerable children with the means and motivation to prevent oral pathology, by implementing simple behavioural and dietary adjustments to their daily routine. The monitoring, research and evaluation of each project enables the foundation to further improve lifelong impacts, but also to develop new models of oral health promotion.

The objectives guiding the foundation are the integration of oral health promotion in schools, the adoption and implementation of oral health promotion policies and structures in schools and homes, the development of plans and activities to accelerate change in public health promotion, and the increase and strengthening of collaborations with other for-profit and non-profit organisations, dental professionals, and public and governmental institutions around the world that identify with the Humble Smile Foundation's vision and preventive oral health models.

To achieve its objectives, the foundation works with local and global partners to develop projects, programmes and initiatives specific to each community it becomes involved with, applying a holistic and human-centred approach. These objectives must go hand in hand with strategies that build economic growth and address a range of social needs, including education, health, equality and job opportunities, while tackling climate change and working to preserve our ocean and forests. Therefore, each project is undertaken with an emphasis on the sustainability of its impact, both environmentally and socially, by using biodegradable materials as far as possible and by focusing on continual and long-lasting impact in communities, empowering them to be able to improve their children's nutritional and oral hygiene behaviours.

The foundation brings together people who have chosen to share responsibility for preventing oral disease. With its partners, the foundation invests in developing and testing ideas at the operative level, improving and diffusing the knowledge, to ultimately form initiatives for the promotion of humanitarian innovation within and across organisations, making a real difference to the lives of many.

Volunteerism is at the root of the foundation's work, and volunteers come from all over the world. Many carry on with outreach work back in their own communities.

Among the organisations the foundation has partnered with to ensure effective, efficient and authorised implementation of the projects are the Indian Dental Association, the University of Pretoria in South Africa, the Organization for Refuge, Asylum and Migration in Kenya, Mexico and Greece, Advocacy for Global Health Partnerships in the US, the Hand in Hand non-profit dental service organization in Armenia, the Jan Sahas non-profit in Nepal and the International Association of Dental Students in Switzerland. It also has the support of several companies in the dental industry, and its main corporate sponsor is The Humble Co.

The foundation collaborates with ambassadors and clinics around the world too. Some of dentistry's global leaders, as Humble Smile Ambassadors, leverage their worldwide recognition to advance the cause of environmentally and socially responsible toothbrushing. Currently, there are 13 Humble Smile Ambassadors in 13 countries.

Dr Miguel Stanley of Lisbon in Portugal is one. He teaches and shares his knowledge and principles all over the world. Stanley founded the Slow Dentistry movement to help improve the standards of care of patients as well as their treatment experience. He believes in taking a holistic approach to dentistry and has developed an advanced biological cosmetic dentistry approach to his work. Many have heard the passion in his words and embraced his conviction that dentistry must be practised with care.

Another ambassador is Dr Moody Alexander of Arlington in Texas in the US. Alexander has incorporated his love for serving and giving back into the lifeblood of his orthodontic practice and through a ministry that serves the dental needs of people in Ethiopia. In 2019, he received the American Association of Orthodontists Humanitarian Award. When I asked him why he chose to become an ambassador, his reply was: "I became involved in the Humble Smile Foundation because of what it stands for. Aside from my wife and children, the two greatest passions in my life are dental care and caring for the underserved. The Humble Smile Foundation combines those two beautifully in an effective and sustainable way."

At times, we think that the challenges of addressing things that should be changed are so unsurmountable that they are out of our reach. Weiss recalled a project in Cambodia, in a community where most of the children had decayed teeth due to poor nutrition and too much sugar in their diets, where the foundation transformed the school into a health-promoting school. Only healthy food was made available to the children. This initiative established such a wonderful model that officials of the ministry of education came to visit the school, and about a year later, Cambodia adopted new regulations to restrict sweets in schools. So indeed, as advertising pioneer John Wanamaker once said, "One may walk over the highest mountain one step at a time."

The year that was and the future that awaits the ICD

The International College of Dentists

The International College of Dentists (ICD), which has 12,000 fellows in 122 countries, has continued to serve its mission of honouring the world's leading dentists and advocating for humanitarianism and education amidst the global pandemic crisis, by providing charitable services to its communities, including oral health check-ups, food and water distribution, disaster relief and community development.

The ICD celebrated its centennial year in 2020, proudly acknowledging a century of recognition and leadership in the dental profession. The COVID-19 pandemic changed the major event of the year dramatically. Dr Dov Sydney, ICD editor and general chair of the centennial committee, noted: "While our centennial celebrations' grand finale had to be cancelled, many sections celebrated the 100th anniversary with special regional events. In Italy, the publicity generated from the audience with Pope Francis talking about ICD core values had an extraordinary impact on the stature of the ICD."

During these unique times, the ICD has remained diligent and creative in providing services, staying connected and delivering its mission. A major highlight from this past year is the historic US$3.6 million donation of personal protective equipment the ICD received from the Henry Schein Cares Foundation for use in ICD humanitarian missions.

ICD sections worldwide found new ways to grow through virtual and hybrid convocation ceremonies. The all-new digital platform ICD Online now connects ICD fellows and supporters through webinars and online content. The ICD also made a progressive shift to an all-virtual operation in 2020, enabling its world headquarters team to manage the ICD remotely from across the globe. Dr Joseph Kenneally, ICD secretary general, added: "Technology and virtual management have given us the capability in many areas to do more than we have in the past. This has been a good time to reassess and reorganise the ICD for future success."

The 2021 international council meeting will take place virtually to ensure the safety of all participants. As the incoming international ICD president, Dr Richard M. Smith will guide the ICD over the next year. Looking forward, he said: "This last year has been quite a time for the college. President Akira Senda, from Japan, did a superb job of leading the college during extremely difficult times. Now, as we come out of these trying months, it is apparent that not all sections will return to pre-pandemic activities simultaneously. The challenge for the college will be to help each section with support and information to keep the sections functioning as well as possible. Sharing best practices of operation and understanding the financial strain placed upon some sections by the shutdowns will be part of the help the college will offer. One of the benefits of this time has been the ability of the college to carry on business and develop innovative ways to carry on the college's traditions while maintaining the college's standards."

ICD fellows in Mexico used funds raised at an early 2020 event to purchase personal protective equipment and dental materials for donation to front-line healthcare workers during the COVID-19 pandemic. (Image: International College of Dentists)

International ICD President Dr Richard M. Smith. (Image: International College of Dentists)

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EAS announces programme for Malta congress this October

Image: Maltese tourist board

The vaccination roll-out through the EU countries and many other countries around the world is progressing well enough to allow the European Aligner Society (EAS) to predict that its congress will still take place on 7 to 9 October 2021. Final restriction lifting will not be announced until closer to October, but at present, the congress destination of Malta is on most countries' green lists for travel, and it is believed that restrictions on social interaction will be lower by October. It is hoped that the event will be opened by the Maltese deputy prime minister and minister of health.

The EAS education committee has curated an absorbing programme which will progressively build on the knowledge from its first two congresses (and meetings) and continue to explore the perpetual advances in technologies and techniques in aligner orthodontics. The congress draws together the latest innovations, and these will be presented by an international line-up of expert speakers who are pushing the boundaries of clear aligner therapy.

Keynote speakers:

Dr Sean K. Carlson, US: Diagnosis and treatment planning in the 3D era

Dr Juan Pablo Gómez Arango, Colombia: Biomechanics in the plastic revolution: The key to that elusive predictability

Dr Hyo-Sang Park, South Korea: Considering factors for distalization of whole dentitions with micro-implants

Dr John Kaku, Japan: Hybridization of clear aligner therapy in teens

Dr Vincenzo D'Antò, Italy: How to transform your virtual project in a clinical reality

Dr Chris Laspos, Cyprus: Treatment of complex cases with Invisalign. Where is the limit?

Invited speakers:

Dr Vicki Vlaskalic, Australia: The emperor's new clothes—aligners and pluralistic ignorance

Dr Lars Christensen, UK: The digital workflow in the orthodontic practice

Dr Luis Huanca, Switzerland: How much can we trust the ClinCheck?

Dr Beatriz Solano Mendoza, Spain: The efficacy of corticotomy in tooth movement with aligners in periodontal patients

Dr Paul Gange, US: Bonding attachments: How, when and why?

Dr Ivo Marek, Czech Republic: Ortho-prosthodontic collaboration of dentition in patients with massive abrasion and loss of the vertical dimension of occlusion treated by aligners

Dr Frank Celenza, US: Ortho/perio in the aligner age

Dr Shmuel Einy, Israel: Clear aligner effectiveness in the ortho/perio interphase

Prof. Dror Aizenbud, Israel: Invisalign: Improved efficacy of mechanotherapy for complicated cases

Dr Sherif Kandil, Germany: A new dimension in orthodontics called 4D

Dr Waddah Sabouni, France: Orthognathic surgery using Invisalign clear aligners orthodontics treatments: Which protocol?
Dr Rooz Khosravi, US: Crossing the chasm to implement a lean in office aligner system
Dr Arturo Vela-Hernandez, Spain: Aligners and T.A.D.s to go further in complex cases
Dr Jerko Bozikovic, Belgium: Change versus non-change in an ever-changing world, the big dilemma
Dr Marco Tremolati, Italy: Orthodontic diagnosis and treatment planning with aligners: it's time to step into a full 3D world
Drs Simone Parrini and Gabriele Rossini, Italy: What patients want
Dr Frederick Murrell, Canada: Striving for the ideal: Complex treatment, exceptional outcomes, efficient user-friendly software
Dr Ivan Malagon, Spain: Gaining control, achieving predictable outcomes on challenging clinical scenarios.

Presenters of pre-congress courses and congress workshops:

Dr Sean K. Carlson for OrthoScience Inc.
Prof. Andrea Deregibus for Orthoplus
Dr Adriana Garro for Clear TPS
Dr Yong-Min Jo for SCHEU-DENTAL
Dr Pedro Monteiro for Dental Monitoring
Matthias Peper for inviSolution
Dr Jose Ponce de Leon for SureSmile (Dentsply Sirona)

Assistants' programme:

EAS has also curated a dedicated assistants' programme at the congress. A combination of presentations and practical demonstrations of 50 minutes each will address four main topics.

As well as the main plenary lectures, the congress will offer numerous breakout sessions and workshops so that the educational sessions are delivered in a measured way and allow everyone to dip in or delve deeper into subjects which interest them most.

The programme is now available at https://www.eas-aligners.com/3rd-eas-congress-malta/.

Booking for the EAS congress is open

The conference venue is the Hilton Malta hotel, which is situated in the heart of the fashionable Portomaso waterfront in the popular St Julian's district on Malta's north-eastern coast, and the island's capital, Valletta, is only 10 minutes' drive away. The stunning Portomaso development overlooks a magnificent yacht marina and is bordered by a tree-lined promenade.

The congress runs from the afternoon of Thursday 7 October, and runs through to Saturday 9 October, leaving Sunday free to explore the baroque palaces, gardens and fortifications of Valletta, a UNESCO World Heritage Site. The weather in October is typically warm, so you can kick back, sip a Kinnie (the national drink of Malta), and enjoy the tranquillity and hospitality of this wonderful island.

Image: Maltese tourist board

Booking for the EAS congress opened on 2 July 2021, and all the registrations for the postponed March 2020 and March 2021 congresses have been carried forward to October 2021. There are dentist and staff packages. The congress has partnered with Air Malta to ensure that reasonable travel rates are available for members and has negotiated special reduced accommodation rates with Hilton Malta.

Please visit https://www.eas-aligners.com, where it is also possible to renew EAS membership and benefit from reduced booking rates. Attendees are encouraged to download the official app free here: https://whova.com/portal/rdeas_202003/?source=download_email. This will enable attendees to:

- view the event agenda and plan their schedules;
- find someone to share a cab with to get to the conference together or meet for a lunch/dinner together;
- plan social activities, such as a morning run, city tour or meeting up with fellow attendees; and
- receive updates on pre-congress courses and workshops (and self-register for these), social events or last-minute room changes by the organisers.

After downloading, attendees are advised to use an email address when signing up to the app and choose a strong password, or sign up using a social media account. Once signed up, attendees should be taken directly to their event.

EAS
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TPAO—an aligner congress unlike any other

Having worked with his team on over 50,000 ClinCheck cases to date, Matthias Peper, founder of digital orthodontic treatment planning service inviSolution, realised that digital treatment planning imposes a new set of requirements on orthodontists. He initiated the Treatment Planning in Aligner Orthodontics (TPAO) Congress to meet these requirements: "To plan treatments digitally, we have to understand the software and the technical background for the results to be clinically feasible. The road to success is orthodontic knowledge combined with technical understanding."

The 2021 TPAO congress will not only have experienced orthodontists present their exciting cases, but also bring software experts to the stage to dissect these cases with regard to each step of the treatment planning involved. They will address all possible challenges and illustrate smart and efficient approaches for ensuring that aligner treatments are bound for success from the very beginning.

On 26 and 27 November in Cologne in Germany, you will have the opportunity to experience the power of this one-of-a-kind event.

The unique format will present the learning content so comprehensively and so logically that you will have no option but to leave as a true master of digital treatment planning.

The extensive knowledge that will be shared during these two days will allow you to develop a deeper understanding of the software and the underlying protocols and algorithms, to start questioning the artificial intelligence and to achieve greater results even for complex cases.

You can look forward to such world-renowned speakers as Dr David Raičković, Dr Iván Malagón, Matthias Peper (certified master dental technician), Dr Udo Windsheimer, Dr Pedro Costa Monteiro, Dr Boris Sonnenberg, Dr Andreas Dasy, Dr Mareike Niederwahrenbrock, Dr Thomas Drechsler, Dr Dietmar Zuran, Björn Reiners (certified master dental technician), Dr Sandra Tai, Dr Jörg Schwarze and Dr Enzo Pasciuti, and many more during the largest interdisciplinary congress for digital treatment planning.

The lectures will cover the whole range of topics: intelligent automated algorithms of the software, artificial intelligence and technical expertise. Staging protocols, movement management, application of the different optimised and conventional attachments, the latest software tools, challenges in biomechanics, programming of sequential movements like distalisation, mesialisation and intrusion, and anchorage management will be discussed in detail regarding technical and clinical feasibility and illustrated with case studies.

Apart from all these engaging presentations, you will have the opportunity to discuss and modify your open treatments on-site with inviSolution software experts. Additionally, you will be able to test all new aligner systems with regard to their software handling on-site.

As a special highlight, you will receive an accompanying booklet on digital treatment planning to use as a step-by-step guide for successful planning of all your future aligner treatments.

For more information and early bird registration, visit www.tpao-congress.com.

How to send us your work

Please note that all the textual components of your submission must be combined into one MS Word document. Please do not submit multiple files for each of these items:

- the complete article;
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- the complete list of sources consulted and
- the author or contact information (biographical sketch, mailing address, e-mail address, etc.)

In addition, images must not be embedded into the MS Word document. All images must be submitted separately, and details about such submission follow below under image requirements.

Text length

Article lengths can vary greatly—from 1,500 to 5,500 words—depending on the subject matter. Our approach is that if you need more or fewer words to do the topic justice, then please make the article as long or as short as necessary.

We can run an unusually long article in multiple parts, but this usually entails a topic for which each part can stand alone because it contains so much information.

In short, we do not want to limit you in terms of article length, so please use the word count above as a general guideline and if you have specific questions, please do not hesitate to contact us.

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Please use single spacing and make sure that the text is left justified. Please do not centre text on the page. Do not indent paragraphs, rather place a blank line between paragraphs. Please do not add tab stops.

Should you require a special layout, please let the word processing programme you are using help you do this formatting automatically. Similarly, should you need to make a list, or add footnotes or endnotes, please let the word processing programme do it for you automatically. There are menus in every programme that will enable you to do so. The fact is that no matter how carefully done, errors can creep in when you try to number footnotes yourself.

Any formatting contrary to stated above will require us to remove such formatting before layout, which is very time-consuming. Please consider this when formatting your document.

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Please number images consecutively throughout the article by using a new number for each image. If it is imperative that certain images are grouped together, then use lowercase letters to designate these in a group (for example, 2a, 2b, 2c).

Please place image references in your article wherever they are appropriate, whether in the middle or at the end of a sentence. If you do not directly refer to the image, place the reference at the end of the sentence to which it relates enclosed within brackets and before the period.

In addition, please note:

- We require images in TIF or JPEG format.
- These images must be no smaller than 6 × 6 cm in size at 300 DPI.
- These image files must be no smaller than 80 KB in size (or they will print the size of a postage stamp!).

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Questions?

Please contact Nathalie Schüller at n.schueller@dental-tribune.com.

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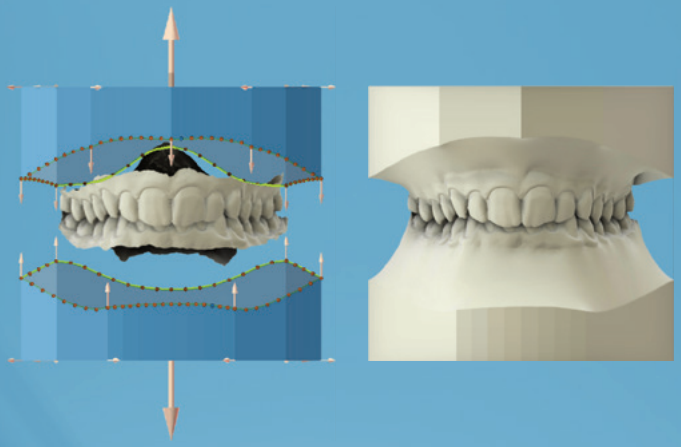

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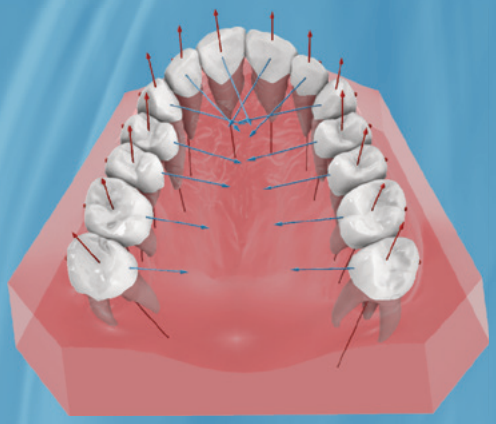

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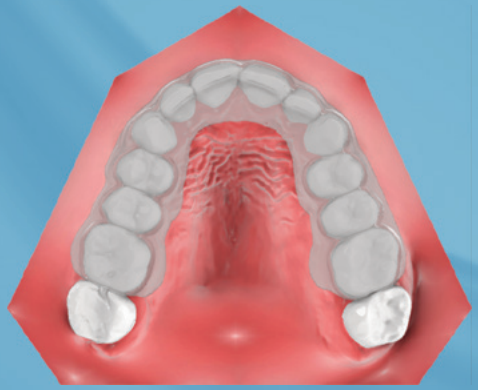

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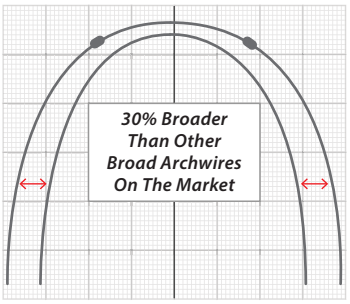

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