

Clinical

Non-invasive smile designing

Filipe Amante presents tackling severe crowding with Invisalign

The patient, JD, 28 years, attended a consultation at our practice in Cambridge to discuss some concerns regarding her smile. Despite being a very charming, young and successful woman she felt that her severely crowded teeth affected her confidence both in her professional and personal life, and after years of consideration, she finally took the courage to book an appointment hoping to find a solution to achieve the smile she always dreamed of.

Dental history

Her previous dental history revealed the presence of very few fillings, with evidence of good dental and periodontal condition as confirmed after the clinical and radiological examination. Her oral hygiene seemed efficient but the severely crowded anterior teeth – she reported – were 'very difficult to keep clean' and often she would accidentally find herself biting her lower lip.

Orthodontic approach

It was clear that the solution for this patient's oral problems, both aesthetical and functionally would have to be an orthodontic approach. Cosmetic dentists are often approached by patients that are after a quick-fix, the shortest path to reach the desired and often long wanted final outcome. The admirable results that modern ceramics offer, allow the rehabilitation clinician to attend to multiple clinical cases such as discoloured, misshaped and mildly crowded teeth, and crowns and veneers are quite appealing in the eyes of the impatient patient, as the treatment time required for their completion is noticeably much shorter than any orthodontic approach. Nevertheless in this particular clinical case and for this particular young patient it seemed that the right choice was to consider a, perhaps longer, but remarkably less invasive approach with the orthodontic system Invisalign.

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Invisalign

Invisalign consists on a revolutionary orthodontic method that is presently widely used by dentists and orthodontists worldwide. The system offers different treatment options to attend to a wide range of clinical cases, it has been used in over two million patients and the results are extraordinary and just plainly speak by themselves. Furthermore, the fact that it seems to be a much more comfortable and discrete approach, particularly when compared with other conventional wire-based orthodontics, has boosted its popularity namely amongst adult patients that rank discretion and flexibility as priorities for their smile transformation.

The patient was delighted with the treatment plan suggested and was very appreciative of the concepts of preservation and easier maintenance of her teeth that the orthodontic treatment would permit. The record taking stage followed entailing two full arch polyvinyl siloxane



Figure 1: Pre operative frontal view

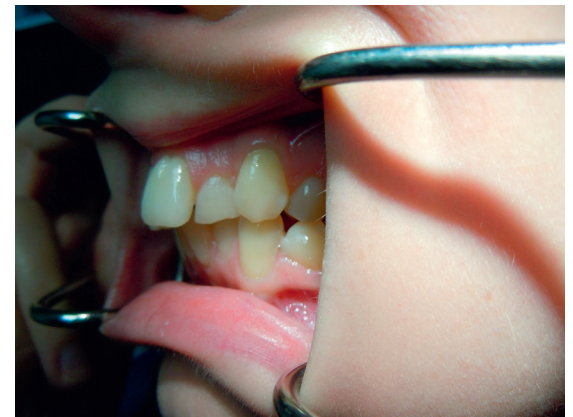


Figure 2: Pre operative right hand side lateral view



Figure 3: Pre operative left hand side lateral view



Figure 4: Pre operative occlusal maxillary view

(PVS) impressions (double mixture silicone technique), bite registration, intra and extraoral photos (Figures 1-4). After this an individual treatment plan was crafted in a joint and dynamic process involving the dentist and the orthodontic team at Invisalign in America, and finally producing a video simulation of the treatment – the Clincheck (Figures 5-6). The Invisalign Clincheck software allows the dentist to manipulate an interactive online 3D simulation of the full treatment plan in each of its different stages and can also be converted into a short video that can be easily be forwarded to the patient via email. Despite being only a mere computer simulation with its inherent possible flaws, it proves to be an excellent clinical tool as it allows the dentist to meticulously monitor the predicted movements throughout the treatment plan and is furthermore a powerful motivator for the patient, that despite acknowledging the possible length of the treatment, can optimistically picture what will happen ahead.

Commitment and motivation

This is a system that is highly user sensitive and requires full commitment and motivation from the patient's end to assure maximum treatment predictability. The patient needs to be instructed to use the removable orthodontic appliances – aligners – for an approximate period of 22 hours a day, which effectively means that they should be kept in permanently apart from the usual meal times.

The patient should change into a new aligner every other week and this process is continuous until treatment completion. Depending on the clinical preferences and the particularities of every clinical case, attachments

(resin bonded custom made structures placed on the buccal aspects of specific teeth to assist with the required movements) and interproximal reduction (IPR) – (to allow movement in certain cases of crowding) can be needed at certain stages of treatment. To allow maximum predictability the system also allows the usage of rubber bands and other auxiliary methods to assist in more complex tooth movements. In this particular case the severe crowding especially on the upper anterior area demanded that an IPR of 0.5 mm had to be established between the maxillary incisors and canines. A total of eight attachments – five maxillary and three mandibular – were also placed using a conventional composite resin with an adequate shade to match the patient's teeth.

The treatment started to unfold gradually as the patient progressed through the sequence of aligners (each aligner allows on average for a dental movement of 0.25 mm to take place) for approximately 18 months, during which she attended regular periodic visits and a final refinement stage (Figure 7). It's important to monitor the patient in a fairly regular fashion to ensure optimum fitting of the aligners and also to confirm that the predicted orthodontic movements are on track (The Clincheck simulation can be an excellent tool to compare the predicted movement with the real clinical process).

The retention stage

The system permits mid-course corrections during the treatment time – and refinements – after the original number of aligners to assure that any unplanned events



Filipe Amante has practiced general, cosmetic and implantology dentistry at Dentastique, Cambridge since 2011. He is licensed in Medical dentistry, ISCSN, Portugal and has a Masters in Implantology and Oral Rehabilitation. Filipe is an extremely motivated and communicative dentist always thriving to offer the best possible treatments and treatment care for his patients.

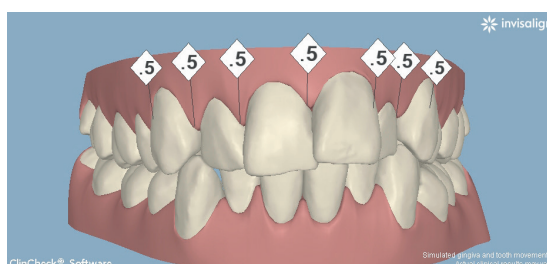


Figure 5: Clincheck: initial view

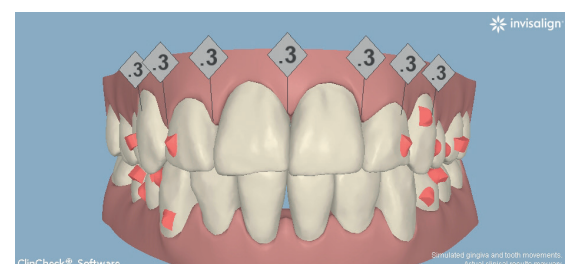


Figure 6: Clincheck: final view

Clinical



Figure 7: 12 months of treatment frontal view

can be addressed to achieve the desired outcome, nevertheless, patient compliance plays an essential role throughout the active treatment time and also during the retention stage. Upon reaching the ideal functional and aesthetical result (Figure 8) it is of utmost importance to make sure that the ideal position of the teeth prevails upon



Figure 8: Post operative frontal view

the pressure of time, occlusal forces and hypothetical periodontal factors. The retention stage follows and is of imperative importance for the long-term maintenance of the achieved results. It was decided to fit a fixed wire retainer on the palatal aspect of the upper incisors and canines (Figure 9), using a conventional flowable resin



Figure 10: Post operative after whitening view

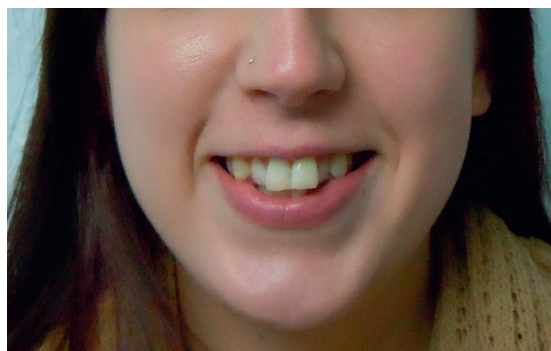


Figure 11: Initial smile



Figure 9: Post operative maxillary palatal fixed retainer

bonding technique and a custom made orthodontic wire (3D Ortho Lab, Essex) and finally and as practiced routinely in these orthodontic cases, the usage of two removable acrylic retainers was advised nightly during the following 12 months.

She confessed she was over-the-moon with the results and that she was now a more confident and happier person smiling confidently into a bright and positive future

The option to choose between an only removable or fixed and removable retention approach is a delicate and very individual decision that the clinician should face very seriously. Factors such as the degree of movement needed throughout the treatment, the possible existence of any parafunctional habits and more importantly the resulting final occlusal dynamics and periodontal condition should play a crucial role in this decision. The removable retainers were also used as whitening trays and after two weeks after a gradual and comprehensive whitening treatment, Polanite Southern Dental Industries (SDI), with the usage of carbamide peroxide gel 16% there was a noticeable improvement on the post-operative shade (Figure 10).

Final appointment

On the final appointment the clinical setting revealed an aligned and occlusally adequate scenario and the patient confessed she was over-the-moon with the results and that she was now a more confident and happier person smiling confidently into a bright and positive future. (Figures 11-12). **D**



Figure 12: Final smile