The Inman Aligner: A progressive approach to smile design - Part 2

By Dr Tif Qureshi

The following article is Part 2 in a series discussing the use of the Inman Aligner as a tool for minimally invasive cosmetic dentistry. The first article (published in DTMEA November 2013) demonstrated that standalone treatments of patients who desire a more traditional smile makeover can achieve beautiful results in a more progressive manner that allows them to make their choices along the way. This often results in virtually no removal of tooth structure and a treatment result with the responsibility of decision-making shared between dentist and patient.

Moreover, the subject matter of this article could potentially start one of the most controversial debates in cosmetic dentistry for years. We are not only discussing a radically different approach to smile makeovers, but critically a sharply different approach to the traditional methods of planning smile design.

What would you choose? Patients entering cosmetic practices are often assessed at the initial consultation. They have digital photographs taken and perhaps study models are made. Normally, dental imaging software is used to show patients what can be achieved. These ingenious programmes (see www.snapdental.com/UK) can help patients visualise what is possible. Naturally, care must always be taken when promising treatment results that are viewed digitally.

While computer imaging can be a very powerful tool to help the patient see the potential in his/her smile, I believe it also can make a patient focus on a certain prescribed goal that may not be the only way of satisfying his/her wishes. Dentists using imaging would ideally create a set of five to ten different outcomes of varying degrees of improvement to allow the patient to make a more informed decision. While ideal, it is not certain that dentists actually present different levels of treatment to their patients digitally. Even if they were able to see various images of their teeth, it can still be difficult for a patient to really see and feel the suggested changes in their mouth. One can question the ethics of allowing patients to commit to a potentially irreversible procedure based on 2-D photographs.

Three-dimensional wax-ups can also be very useful at this stage. If a patient is keen on the image, going to an additive wax-up can sometimes allow for a direct preview try-in using a silicon stent taken from set-up. Temporary material of variable shades can be tried in directly, without any bonding to allow the patient to see the proposed outline, form and overall aesthetics.

Despite this, veneers are often used to treat alignment issues and it is very difficult for patients to appreciate the alignment of their own teeth with wax-up or imaging. By approaching these cases with a different protocol in mind, a dramatically less invasive treatment plan becomes evident.

“We are not only discussing a radically different approach to smile makeovers.”

The first step is to look at the patient’s tooth alignment. Mis-aligned teeth often cause issues in gum heights, line angles, light reflections, shades and tooth length. Correcting the misalignment first can create a completely different perception of the apparent problems. Next, the teeth should be bleached. This can be done either immediately after the teeth have been aligned or preferably simultaneously. After alignment and bleaching, edge bonding (we term this the ABB concept) should be offered to improve the incisal edge outline.

This combination of treatments also works well because the Inman Aligner is a removable appliance and only needs to be worn 16 to 18 hours a day. This means simultaneous bleaching is very possible and straightforward. A recent study from Sweden indicates a cost-benefit advantage of treating patients with removable appliances in general dental clinics, rather than with fixed appliances at specialist orthodontists. The conclusion of this study is significant, since a popular choice amongst aesthetic dentists in the UK is removable orthodontics.

The cases outlined here highlight patients who, either at the start of treatment or for years, had originally wanted veneers and had a specific result in mind that only veneers could have offered quickly. They were all concerned about the degree of preparation required, so undertook alignment first. Then, part of the way through, started bleaching and very quickly changed their minds about what they wanted once they saw their own teeth improve.

Case 1 (Figures 1-8) Laura was concerned about her very prominent central incisors. She wanted to have them straightened and had considered veneers. She had ruled out conventional orthodontics and invisible braces because she wanted a quick treatment and did not want anything stuck to her teeth, which is the reason that she had refrained from orthodontic treatment. Several years ago, she may well have had veneers placed.

On viewing her teeth before the occlusal photograph, it was quite clear that this would have involved massive preparation of the upper teeth.

Laura was keen on traditional orthodontics and was an ideal candidate for the Inman Aligner. As would be expected, it is virtually invisible, so her friends saw no change in her smile. She was keen to start immediately and undertook the full treatment with ABB. The first step was to straighten the incisors by the Aligner. The length of teeth can be changed slightly by the ABB technique to improve the overall aesthetics. The first and second incisors were too long and the result was that they had to be reduced.

Laura’s incisors were normal in height and the desired outcome of the treatment was to reduce the length of the incisors and create a more harmonious smile. The second step was to undertake bleaching. Simultaneously, Laura undertook in-office bleaching as her incisors were dark, creating a very different perception from her face. After bleaching and before bonding, the incisors were an ideal length and the bonding was carried out. The incisors were then edge bonded as normal, creating a complete change in Laura’s smile.

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Figure 1. Smile view before treatment.

Figure 2. Occlusal view before.

Figure 3. Close up view before.

Figure 4. Close view after Inman Aligner and whitening at week 9.

Figure 5. Close view after ABB at week 9.

Figure 6. Smile view after 9 weeks.

Figure 7. Occlusal view after.

Figure 8. Full face view after.
central teeth. Preparation would have been well into dentine and may have even involved elective endodontics. Her lateral teeth would have needed little preparation, but the emergence profiles would have been poor, creating unrealistic aesthetic and a possible periodontal risk later on. Instead, the alignment was completed with an Inman Aligner in ten weeks. Her treatment sequence is detailed below.

BACD-style digital photographs were taken and the amount of crowding was calculated using an electronic crowding calculator, which can also be done by arch evaluation of the patient’s study models. We measured the ideal curve and subtracted this measurement from the total mesio-distal widths of the teeth being moved. The results showed that there was only 1.6 mm crowding. This seemed less than one would have expected; the reason for this was that because the laterals were being pushed out, the arch was being expanded, thus creating space.

It was clear from the photographs that despite the obvious crowding, there was some less obvious irregular tooth wear. It was important to indicate this to the patient, as this would become more evident once the misalignment had been corrected. The patient was quoted for three incisal composite tips. She opted for an Inman Aligner with an incorporated expander. These expanders are a very handy way of creating extra space either to treat cases that are more complex or to use instead of performing interproximal reduction (IPR).

In this case, no IPR was performed. We planned to get nearly all space by using the midline expander. The patient was instructed to turn the midline screw once a week after one week of wear. Each turn is a quarter of a revolution and equates to 0.25 mm. At week six, bleaching was started with soft rubber sealed trays. After nine weeks, the patient had expanded 1.8 mm and all her teeth were in alignment (As a rule, less than 2.5 mm expansion with an incorporated expander is easily tolerated).

Looking at her post-alignment result, the golden proportion, gingival heights and axial-inclinations had improved dramatically, all without a handpiece being picked up and in the space of nine weeks. What was very clear to the patient at this point was that she only needed some simple bonding to improve the incisal edge outlines. Without the use of an anaesthetic, the edge outlines were prepared with very slight roughening of the edge, bonding of hybrid composite on the load bearing edge and a micro-fill on the facial surface. The edges were then polished.

The patient was thrilled with the result we achieved using an Inman Aligner and some simple bonding. She described that when she had once considered having veneers, she had hoped for a similar result. There are still minor imperfections, but, in my opinion, these contribute to her natural beauty.

There is a stark contrast between the treatment selected and the potential treatment approaches in this case. Where once a patient, who refused orthodontics, would have consented and received highly aggressive tooth preparations to achieve correct alignment with veneers, now a removable aligner and some simple bonding were able to achieve a similar and arguably better result in less than three months with not a micrometer of tooth reduction needed.

Case 2 (Figures 9-17)

This young lady had been attending my practice for some time and was aware of porcelain veneers, having seen our previously advertised cases. We had spoken about the aesthetic benefits of veneers years before. However, on reviewing her case, it was clear that we could improve her alignment dramatically with an Inman Aligner in a short period.

We took an occlusal image of her anterior teeth and outlined the amount of tooth structure that would have to be removed to produce veneers that would look aesthetic. It was immediately apparent to the patient that alignment of her teeth would offer a possibly better treatment outcome. Her case was suitable for an Inman Aligner and as only 2.5 mm crowding was present, this meant it could be treated quickly and simply.

Her Inman Aligner was fitted and IPR performed progressively over three visits. At week eight, upper and lower bleaching trays were constructed even though her alignment was not yet complete. Home whitening was begun with clear and concise instructions. We used rubber trays with a deep seal cut into the model to create a tight dam effect. Over two weeks, her teeth whitened nicely and at week ten, she returned for a review.

Interestingly, the patient’s perception of her smile had changed dramatically. Owing to the improved line angles, whiter teeth and aligned gum heights, her eyes were now only drawn to the irregular outline caused by chipping and differential wear.

The patient then enquired about fixing the edges. We offered to bond the incisal edge with virtually no preparation. A hybrid composite (Tetric Flow, Ivoclar Vivadent) was placed palatally and incisally with a micro-fill on the facial surface. This was done in B0 and B1 shades to match the bleaching. The patient was delighted with the result and a wire retainer was bonded immediately.

Despite some clear deviations from her ideal simulated smile, the patient explained that she felt her smile after alignment was better than she had imagined her veneers would have been. Had veneers been placed, we could perhaps have corrected the golden proportion more fully, balanced the zirconium-improved canine outlines, widened the buccal corridors, etc. However, that was clearly not what the patient desired. Should she later decide that she does need further improvements, she can proceed with already straightened teeth. The ARB smile design is progressive and can be updated over time.

In this manner, the patient is given the opportunity for decision-making in his/her treatment and the responsibility in choice is shared.
This patient presented with Case 3 which is a very attractive part of Simultaneous whitening and orthodontic treatment. At week eight, bleach had been used for one week to de-rotate the front incisors over the period of eleven weeks. An Inman Aligner was used to align the arches. After aligning first both before and after, it was fully decided on the next step in treatment.

An Inman Aligner was used over the period of eleven weeks to de-rotate the front tooth and to tip out the laterals. At week eight, bleaching was using 5% to 45-minute a day H2O2 gels. Simultaneous whitening is a very attractive option of aligner treatment, as it helps with patient motivation. After alignment, the case was re-examined. Once her teeth had been straightened, it became evident to the patient that her problem concerned edge shape, which had actually worsened with alignment owing to differential wear. In fact, the left central was 2.5 mm narrower than the right. It was very clear to the patient that only these incisal edges needed building in order to achieve the smile she desired.

For placement of the incisal edges at week twelve, no local anaesthetic was administered. Other than slight roughening of the worn incisal edges of the upper left 1 and 2, no other preparations were needed. A tetric hybrid composite (Tetric Flow, Ivoclar Vivadent) was built up free-hand on the incisal edge and palatal surface to match the outline of the other central. A small amount of white opaquer was dotted in to match the facial surface and was simply filled with a nano-hybrid composite (Venus Diamond, Heraeus) for high polish. The composite was placed vertically using rubber sticks (PoGo, DentsplySPELT DeTrey) to try to blend in with surface anatomy to mask the join. The process was repeated on the lateral.

The patient was held in retention using her aligner and an impression was taken for a wire retainer to be fitted two weeks later. It was especially nice to retain the natural aesthetic characterisation of this patient. Ceramic work, as beautiful as it can be, would certainly have changed her appearance more - some may say for the better, but that was not what the patient actually wanted. She wanted her own teeth to have correct length and look straighter and whiter.

Shared responsibility of treatment

The ABB concept can truly be described as minimally invasive. At the same time, it actively involves the patient in the treatment, giving him/her a feeling of being in control and taking responsibility for his/her treatment. This has been proven to be of great significance when measuring patient satisfaction of treatment results.

There are many anecdotal stories about patients who had technically beautiful veneers placed but found that these simply did not meet their desires. The problem is that even with no-preparation veneers, an irreversible procedure has been under-taken and this has been done mainly based upon the treating dentist’s opinion, with the patient having very little input.

In my experience, every patient that I have treated according to the ABB concept has accepted the result happily, even though technically it might not be perfect from a smile design point of view. Nowadays, with rising levels of litigation, one would have to question the wisdom of selecting a treatment path that could result in conflict over one in which the patient participates in key decisions and sees his/her own teeth improve.

I believe this approach firmly sits alongside minimally invasive cosmetic dentistry core principles, which recommend a more minimally invasive and patient-led approach.

Conclusion

I understand the controversy in challenging the traditional approach to smile design, but new ways of thinking can be rounded for a gentle yet effective clean. As opposed to other brush heads that wrap filaments in metal loops implanted in the brush head before being cut to size from above, anchor-free tufting technology pulls filaments through the brush head until they are the right length and then cut from below. This ensures that the filament tips remain uniform in shape and can be rounded for a gentle yet effective clean.

Phillips Sonicare Flexcare Platinum

By Philips

Phillips Sonicare Flexcare Platinum is the latest introduction from the number one sonic toothbrush brand recommended by dental professional worldwide. The new Phillips Sonicare Flexcare Platinum is uniquely designed to give patients an even deeper clean between the teeth, removing up to six times more plaque between teeth than a manual toothbrush.

Sonic technology

The innovative Philips Sonicare Flexcare Platinum powered toothbrush uses Phillips Sonicare’s patented sonic technology to deliver an exceptional, deep clean between the teeth. Using a unique combination of high frequency and high amplitude, the Sonicare Flexcare Platinum produces over 30,000 brushstrokes a minute to create a dynamic yet gentle cleaning action. Its brush head moves with a side-to-side sweeping motion and a high filament tip velocity to gently drive fluid deep between the teeth and along the gum line.

InterCare - the innovative interdental brush head

The Philips Sonicare Flexcare Platinum features a new brush head with innovative anchor-free tufting technology and extra-long filaments designed to reach deep between teeth and remove more interdental plaque biofilm than a manual toothbrush.

The Philips Flexcare Platinum’s brush head filaments are moulded directly in the plastic housing allowing for a unique filament pattern and lengths designed to deliver an optimal and complete clean. As opposed to other brush heads that wrap filaments in metal loops implanted in the brush head before being cut to size from above, anchor-free tufting technology pulls filaments through the brush head until they are the right length and then cut from below. This ensures that the filament tips remain uniform in shape and can be rounded for a gentle yet effective clean.

Anchor-free tufting technology also allows for the brush head to be fitted with more filaments than traditional brush heads which can be arranged in various patterns to perform specific tasks:

• Reminder filaments – fade to remind the user to change the brush head after approximate three months
• Along-the-gum-line filaments – remove plaque along the gum line
• Elongated filaments – reach deep in between teeth
• White filaments – polish and clean the surface of the teeth

The InterCare brush head is available in standard and compact sizes. The InterCare brush head is available in standard and compact sizes.

Brushing modes – an individual brushing experience

Phillips Sonicare Flexcare Platinum has three individual brushing modes and three intensity settings to give patients greater control over their brushing experience and to deliver a cleaning action suited to their specific needs. The toothbrush has three cleaning settings:

• Clean – standard cleaning for the whole mouth
• White – removes stains and helps whiten teeth
• Gum Care – gently stimulates and massages the gums

Additionally, three adjustable pressure maximise control and comfort:

• Normal – the standard intensity for normal brushing
• Sensitive – a gentle intensity for sensitive teeth
• Extra soft – an extra-gentle intensity for an even softer brushing experience

Automatic pressure sensor

The new Philips Sonicare Flexcare Platinum also features an automatic pressure sensor which provides real time feedback to help prevent an optimal cleaning every time.

UV sanitizer

The Philips Sonicare Flexcare Platinum is also available with a UV sanitizer to help reduce the bacteria build up on toothbrush heads.

Contact Information

Dr. Tif Qureshi is the Past President of the BACD.

He presents hands on courses and lectures on the Inman Aligner worldwide.

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References are available from the author.