A multi-disciplinary approach to minimally invasive functional aesthetic dentistry

By Dr. Tif Qureshi, UK

Simple tooth alignment is rapidly becoming accepted as the norm in cases that previously would have been treated with porcelain veneers. However, patients often present with a mix of problems such as previous metal ceramic work, the treatment of which should be integrated as part of the treatment plan. Timing becomes a vital part of the treatment when mixing restorative care, alignment, tooth whitening and occlusal planning. The following case illustrates an effective approach to treatment.

Case report
A patient presented complaining that “his two front teeth (old upper anterior crowns) felt as if they were too large and were always hitting the lower teeth”. In addition, his bite never felt “right” (Figure 1). He also wanted to try to improve the appearance of his teeth. He was aware of what could be done with porcelain veneers, but wanted to try to make the best of his own teeth.

Examination
On inspection, it was clear there were several issues:
1. Occlusion - The irregular alignment of the lower incisors and the thickness of the upper old crowns were adding to the problem of unbalanced anterior contacts. The back of the crowns, especially the upper left central, were hitting the front of his lower teeth, in particular the lower left central.
2. Thickness/aesthetics of crowns - The occlusion meant that the upper crowns had been placed quite labially and because they were metal ceramic, made them feel particularly thick. They also appeared rather opaque.
3. Lower crowding - The patient was also keen to improve the aesthetics of the lower teeth as the incisors had an irregular outline. The incisal edges appeared to be of different heights. This was down to the varying anterior-posterior position.
4. Colour - The old crowns had been made at A3/A3.5 and the natural teeth had darkened a little with age.

Treatment plan
A combination of techniques and good timing can make sure we optimize the opportunity for treatment. In this case, the treatment plan was as follows:
1. Remove the two upper crowns and replace them with temporary composite crowns; Use of crowns as temporaries through treatment. The crowns - The occlusion meant that the upper crowns had been placed quite labially and because they were metal ceramic, made them feel particularly thick. They also appeared rather opaque.
2. Simultaneously fit a lower Inman Aligner to align the lower incisors into a better functional position, while using bespoke aligners to slightly tilt the upper crowns into better alignment. The rationale for using upper clear aligners and a lower Inman was that only 1 mm of movement was needed for the upper and about 2.5 mm of movement was required for the lower. Inman Aligners are much faster than clear aligners with a lower Inman Aligner to allow the lower incisors to settle into a better functional position. This was down to the varying anterior-posterior position.
3. The use of aligners would need correcting and a lower Inman was placed quite labially and because they were metal ceramic, made them feel particularly thick. They also appeared rather opaque.
4. Colour - The old crowns had been made at A3/A3.5 and the natural teeth had darkened a little with age.

Treatment
On the initial appointment the two old crowns were removed (Figure 2). The preps were merely cleaned and treated as conservatively as possible. Temporary crowns, which could be adjusted, were placed (Figure 5). Upper and lower impressions were taken for upper clear aligners and for a lower Inman Aligner. A prescription of the tooth movement using Spacewize software was given to the technician so they were aware of exactly where we wanted the teeth to be moved. Spacewize also calculates a figure for the amount of crowding present giving us an idea of the total amount of space that would need correcting and whether the case is suitable for Inman Aligners or not.

Two weeks later, the patient returned. The Inman Aligner and clear aligner were fitted on the lower and upper teeth respectively. Minimal interproximal reduction (IPR) was started. Despite calculating the amount of crowding present, the IPR is never carried out in one go. Only IPR strips or discs are used. This gives the opportunity to ensure the stripping is far more anatomically respectful than using burs or heavy discs. This massively reduces the risks of excess space formation, gouging or poor contact anatomy. No more than 0.15 mm per contact on the posterior teeth was adjusted on this single visit. The contacts are smoothed and fluoride gel is applied each time.

Alternative options
Alternative options were discussed. Fixed braces were discounted because of the cost, the difficulty in simultaneous whitening and added difficulty in having the crowns as temporaries through treatment. The patient’s posterior occlusion was also good. Full anterior veneers were discussed, but after the patient understood how simply and quickly the alignment could be done, seemed a completely ridiculous and unethical solution.

5. Retain the lower arch.
6. Upper crowns - The occlusion meant that the upper crowns had been placed quite labially and because they were metal ceramic, made them feel particularly thick. They also appeared rather opaque.

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The patient was then sent home. The Inman Aligner was worn for 16-20 hours per day with the patient removing it for eating and rest. 20 hours a day is the maximum needed wear and this intermittent wear reduces the risk of root resorption. On return 2 weeks later, it was clear that the contacts had closed tight and the teeth had moved a little.

More IPR was carried out on both the upper and lowers. The occlusal contacts of the upper temporary crowns were adjusted to allow clearance for the lower teeth to move and the lower left lateral to advance particularly and the patient was then asked to wear the trays for 2 weeks. The temporaries were also facially contoured to ensure they were flush with the natural teeth. On the subsequent return visit, it was clear that the teeth were aligning rapidly and especially well (Figures 4 and 5). We then decided to start some simultaneous tooth whitening.

Impressions were taken, even though the result was still 25% from completion. Sealed, rubber trays were made and careful instructions given to the patient. While the patient is concentrating on using the Inman Aligner, they are always highly receptive to using bleaching trays. It adds greatly to motivation and often means they achieve a far better result. DayWhite from Oral Healthcare (formerly Discus Dental) is used so that the patient only needs to wear the bleaching trays 55-45 minutes a day.

The patient returned after another 2 weeks and was happy with the result. More IPR was carried out and the upper lower retainer wire to be fitted. The temporary crowns were removed and new IPS e.max F1 Tetric (Vivadent Vivadent) crowns were bonded using Variolink II (Vivadent Vivadent) and Optifast FL. (Tetric). The occlusion against the aligned lower teeth was checked. The patient was extremely happy with the end result and felt his teeth looked natural (Figures 6-12).

Discussion

The case is another example of why a progressive form of smile design can be so essential in any case where a patient is looking to improve their smile. At every point, the patient sees their smile improving, first with the teeth that are straight and light, so less invasive and more translucent veneers can be used. Now more often than not, patients prefer a more natural result where we “make their own teeth look as good as they can”. In a case like this with previous metal ceramic cases, one can see how integrating alignment, and whitening can enhance aesthetics and simplify restoration dramatically. This makes a stable and aesthetically pleasing outcome far easier to achieve (Figures 15-17).

Conclusion

In each of our practices, there must literally be hundreds of patients who have issues similar to this gentleman’s complaint. Previously, conventional solutions often placed a barrier to treatment, adding time and cost into what was already an expensive treatment. Most patients just could not be bothered and would live with it. Now, simple anterior alignment can be so much quicker and more cost effective. I’m amazed at the sheer volume of patients who will have treatment like this done if they are suitable. Being able to combine whitening because the aligners are removable is just another bonus so we can capitalize on the patient’s current compliance and get an even better result. Of course, case selection is absolutely vital! Understanding what is treatable and what should be referred to a specialist orthodontist is essential. This means that patients must be fully consented and understand the risks and disadvantages of not treating any posterior issues if just concentrating on anterior alignment.

Disclosure

Dr Qureshi runs courses with Dr James Russell and Dr Tim Bradstock-Smith and lectures on the Inman Aligner worldwide.

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Contact Information

Dr Tif Qureshi is Immediate Past President of the British Academy of Cosmetic Dentistry. He has a special interest in minimally invasive cosmetic dentistry and presents hands-on courses and lectures on the Inman Aligner worldwide.

Dr Tif Qureshi teaches Inman Aligner Training. Inman Aligner courses can be booked at: inmanalignertraining.com

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*The images in this article are not available in the downloadable version of this article.

Figure 11: Upper occlusal before.
Figure 12: Upper occlusal after.
Figure 13: Lower occlusal before.
Figure 14: Lower occlusal after.
Figure 15: Side smile before.
Figure 16: Side smile after.
Figure 17: Side smile after closed.