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 lowers 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.

A heavy, not long centric contact was present in MIP, which was causing slight deflection of the central. This meant that the upper central crown had been placed quite labially and because it was metal ceramic, it made it feel particularly thick.

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.

5. Retain the lower arch.


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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; 2. Simultaneously fit a lower Inman Aligner to slightly tilt the incisors into a better functional position, while using bespoke clear aligners to slightly lift the upper incisors to help correct arch form and close any space that had closed after alignment. 3. Simultaneously fit a lower Inman Aligner to slightly lift the upper incisors to a better functional position, while using bespoke clear aligners to slightly lift the upper incisors to help correct arch form and close any space that had closed after alignment.

5. 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.

6. 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 anterior teeth were adjusted on this single visit. The contacts are smoothed and fluoride gel is applied each time.
The Inman Aligner was worn for 16-20 hours per day with the patient. Two 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 sent away for 2 weeks. The temporary crowns were then 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. Day-While from Oral Health (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 3 weeks and was happy with the improvement achieved. Upper and lower alignment was now complete. An impression was taken for a lower retainer wire to be fitted later. The temporary crowns were removed, the props cleaned with CJI and new impressions were taken after some minor adjustments to the incisal margins.

A new lower impression was taken of the final occlusion to ensure the crowns could be made with a good long centric contact. The tempos were replaced and impressions sent to the laboratory. The patient booked in for a shade one week later and two weeks after cessation of bleaching where colour and tooth morphology was examined and discussed with the patient. Two weeks later, the patient returned. A retainer wire 0.016 was bonded to the lower incisor teeth using a preformed wire on a jig made by the orthodontic technician. The temporary crowns were removed and new IPS e.max HF (Ivoclar Vivadent) crowns were bonded usingVari-olink II (Ivoclar Vivadent) and Optilink FL (Ivoclar). 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 alignment and then with whitening. If they are still keen to have full ceramic crowns, then at least the teeth are straight and light, so less invasive and more translucent veneers can be used. 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 ceramics, 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 composure 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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