The Inman Aligner: A detailed step-by-step case study

By Dr Trf Qureshi takes us through this example of Inman Aligner therapy

This article will detail a step-by-step approach to Inman Aligner therapy. The Inman Aligner was introduced into the UK by myself to offer patients wanting a fast solution to crooked teeth, and another option other than veneer preparations.

Since then nearly 100 dentists have trained to use the system and many cosmetic dentists are realising that aggressive veneer preparations could soon become a thing of the past because of the remarkable efficiency of the Aligner and the ability to employ a far more ethical approach.

Introduction

This patient was a 26-year-old female who presented wanting a better smile four months before her wedding. She complained that her teeth were 'straight once' but that she had only been told to use a removable retainer after orthodontic treatment as a teenager, for three months, after which her teeth slowly relapsed.

Treatment options

The patient did not want fixed braces and time would have been a problem anyway. Clear aligners were also out of the question as she had been quoted at least nine months of treatment. She had already had several consultations for veneers as part of a radical smile makeover, but it was evident that some of her preparations would have been highly aggressive, meaning that her upper left central and right lateral may have needed endodontic therapy to get them in position to allow for veneers to align the teeth for correct aesthetics.

Not only would that have been highly destructive, but the veneers would have been bonded to the dentine rather than more ideal enamel. This kind of treatment has been prevalent in the UK until recently. Fortunately pre-alignment techniques are so much quicker now using systems like the Inman Aligner, a far more conservative and ethical outcome is possible. The patient was offered all available options and chose the Inman Aligner.

Assuming space calculations were correct, an Inman Aligner would be suitable. She also requested that her teeth were whitened and that a few small defects were corrected. Her upper left lateral would require internal bleaching. Despite this, she was still keen on having veneers after the treatment to get a perfect smile, but at least her teeth would be straighter and the veneers more minimal.

Sequence of planning

1) Full examination to check the health of the teeth and gums. Cases should be occlusally stable and free from periodontal disease and caries.
2) Study models and full clinical photographs are taken for planning. Periapical X-rays are taken of the teeth being moved and those supporting the Aligner, to ensure that no apical or periodontal pathology exists. Before photographs are essential to demonstrate movement achieved to the patient. (It is highly recommended to take sequential photos at treatment reviews. This has a great motivating effect on the patient, and quickly dispels any questions that the treatment may not be working).
3) Arch Evaluation is completed. We need to assess the amount of crowding present. The Inman Aligner requires that 3mm of space can be created through inter-proximal reduction from the mesial of canine to canine. More space can be claimed in suitable cases by IPR between the premolars and canines and of course using expansion techniques. In this case 2.8mm of crowding was calculated by measuring the teeth (required space) and then the ideal curve (the available space) and subtracting to get the amount of crowding present or the amount of space needing to be created through IPR or expansion.
4) Impressions of both arches are taken and the prescription form is sent to the technician.

Prescription

A full and detailed prescription is essential for construction of the Aligner. All Inman Aligners are created on corrected models. This means that the operator needs to tell the technician where exactly he or she wants the teeth to move.
1) What type of Inman Aligner (in this case a standard upper).
2) What teeth are being moved (we plan to straighten 2112 so these teeth are ticked. In a more crowded case (beyond 3mm) we might distalise the canines with domino effect pressure induced by the aligner on the anteriors so we would tick these too).
3) What springs. Generally 010x030 springs are used in mild crowding cases buccally and palatally. 012x030 springs are available, but are best left for larger retractions.
4) Amount of IPR. The measurements will have been easily calculated from the arch evaluation and should be passed to the technician. One should also describe where IPR is being planned. In this case it will be on all the contacts from the mesial of the canine to canine. On the incisors it is generally accepted that 0.5mm per contact is a safe amount to remove.

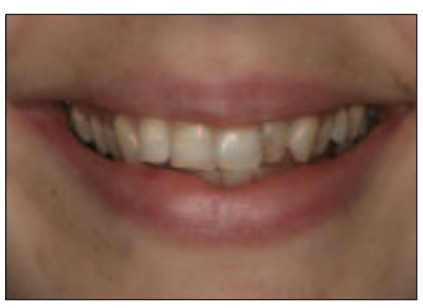

Figure 1: Front smile view before

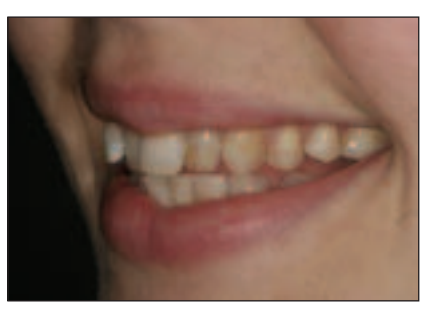

Figure 2: Side smile view before

Figure 3: Occlusal view before

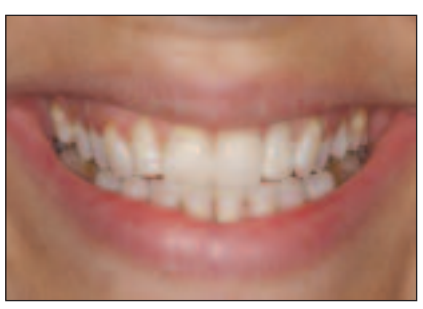

Figure 4: Full-face view before

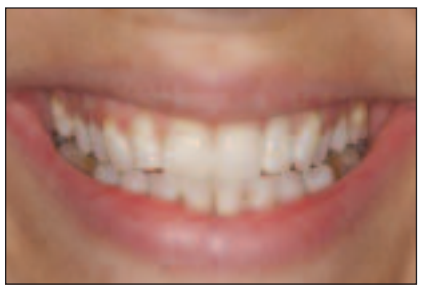

Figure 5: Front smile view after Inman Aligner (whitening and minimal bonding) at 11 weeks

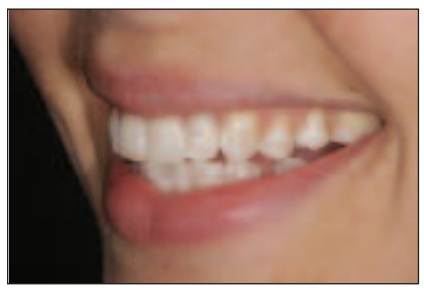

Figure 6: Side smile view after Inman Aligner at 11 weeks

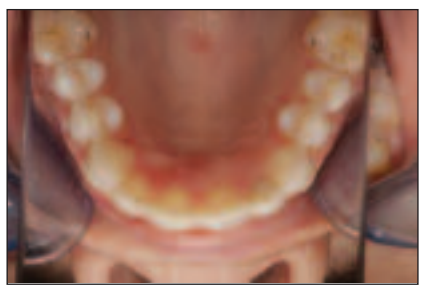

Figure 7: Occlusal view after 11 weeks

Figure 8: A delighted patient 11 weeks after she started treatment

Slightly more can be removed from canines mesially and distally and on the mesial of the premolars. Studies have shown that IPR conducted correctly is perfectly safe over the long term. (1)

Fitting

On the fitting appointment several stages are essential and must be completed in sequence.

1) Show the patient how to fit the aligner. It is vital the dentist shows the patient exactly how to fit the aligner using a mirror and then checks that the patient can insert and remove the aligner easily. This will give the patient confidence and help compliance.

2) If the patient finds the aligner comfortable and is not complaining of pain, then inter proximal reduction (IPR) can be started on that day. I would always recommend only performing measured and incremental IPR using accurate thickness strips. In this case 0.13mm strips were used on each contact from the mesial of 3-3 on day one making a total of 0.65mm IPR completed on day one. By taking a measured incremental approach instead of doing all of the IPR on one day, we can ensure that measurement errors in the arch evaluation don't results in gaps being formed and critically that if for any reason the patient cannot wear the aligner (which has been rare) only a small amount of IPR will have been completed. IPR is followed by careful smoothing with polishing strips and fluoride gel application.

3) Full instructions are given. The patient must be instructed on how long to wear the aligner – 18-20 hours a day is optimal. Studies (2) show that four hours of ortho inactivity a day (something not possible with fixed braces) minimises the risk of root-resorption. Of course the Inman Aligner needs to be taken out to eat and clean, so four hours out of the mouth works well from a patient's comfort and reducing resorption risk aspect. It was also explained to the patient that she would suffer a small degree of tenderness on the anterior teeth, she would salivate excessively and that the teeth may be slightly mobile after a couple of weeks. Aligner maintenance and cleaning should also be covered.

Review 1

After two weeks the patient returned. She described that the Aligner had been sore for a few days but she was used to it now. Her speech had also improved.

On this appointment the contact points are then rechecked. If they contacts are tight even when attempting to run a 0.08mm strip through, it is clear the patient has been wearing the aligner correctly. A small amount of movement was evident and an occlusal shot was taken to compare and the patient was shown. This has a great motivating affect.

IPR is then started again. This time approximately 1mm of space is created from the distal of the 3-3. Making a total of 1.65mm since starting.

No Aligner adjustments are necessary, but a small composite anchor was placed on the buccal aspect of the upper central tooth as the bow started to skid up towards the gingivae. This could be done at day one, but it is important to ensure the bows engage in the incisal thirds for high efficiency.

The aligner was refitted and the patient sent away.

Review 2

After another three weeks the patient returned. Again all contacts had closed and there was a noticeable difference and improvement in alignment. A further 1mm IPR across seven contact points (about 0.13mm per contact) were opened. The labial bow was slightly tightened by compressing the labial springs with flowable composite then curing (only 25% increased spring rate at one time is needed).

Review 3

After another two weeks the patient returned. Her alignment was almost completed. At this point an impression was taken and sent to the technician for a finishing clear retainer to be made. This is done by the technician, simply by correcting any minor imperfections on the model and clear finishing aligner is then blown down onto this. A set of bleaching trays were also made at this point.

Two days later the clear aligner was seated. These work extremely well after an Inman Aligner has been used. The patient was instructed to wear this clear aligner for 18-20 hours a day, removing for eating and cleaning. She wore this for four weeks full time. After which she was instructed just to use it as a night-time retainer.

During this period she whitened her teeth with 6% hydrogen peroxide in close fitting sealed trays and internal bleaching was carried out on the UL2. Her total alignment treatment time was 11 weeks, of which only eight was with the Inman Aligner.

Her retention regime will be monitored and if for any reason it is not sufficient, a permanent retainer will be bonded.

Review 4

At this point the patient was so delighted with the outcome that she decided not to have porcelain veneers. The whitening had worked well, so instead we performed a tiny amount of composite bonding on her UR2,1 and UL1.

Discussion

The patient does not have a result that can be described as a 'perfect smile' with regards to the criteria as defined by Smile Design theory. And yet, her outcome in not needing or wanting veneers arguably provides us with a far better and more ethical outcome long term.

Of course veneers are always available in future when the patient's enamel ages and they can simply be placed in an additive manner, which is a far more conservative option and at least her teeth are straight to do so.

I believe the benefits of Smile Design theory needs to be debated and weighed up carefully against patient benefits and their perception of what is actually aesthetic to clinicians and patients alike. The Inman Aligner gives us the ability to rapidly improve aesthetic alignment at low risk and cost to our patients before irreversible techniques are used. As a result, the Inman Aligner is profoundly changing the way cosmetic dentistry is being approached by everyone who uses it. ■

References

1. Björn U. Zachrisson, Lise Nyøygaard, Karim Mobarak. Dental health assessed more than 10 years after interproximal enamel reduction of mandibular anterior teeth. AJO_DO Volume 131, Issue 2, Pages 162-169 (February 2007)
2. Kameyama, T. Inactivated periods of constant orthodontic forces related to desirable tooth movement in rats. Orthodontic Science, Department of Orofacial Development and Function, Division of Oral Health Sciences, Graduate School, Tokyo Medical and Dental University, 1–5–45 Yushima, Bunkyo-ku, Tokyo, 113-8549, Japan. E-mail: kame.orts@tmd.ac.jp.

Dr Tif Qureshi qualified from King's College London in 1992. He is on the board of directors of the British Academy of Cosmetic Dentistry, an organisation that is promoting cosmetic dentistry in the UK and which has embraced orthodontic techniques to help minimise tooth preparations in cosmetic cases. He is a partner at Dental Elegance in Sidcup, Kent, where he practises cosmetic and restorative dentistry. He is also an active and sustaining member of the American Academy of Cosmetic Dentistry. Tif has a special interest in simple orthodontics using removable appliances, and was the first dentist in the UK to pioneer the Inman Aligner. He has completed over 300 cases using Inman Aligners as a stand-alone treatment and to align teeth before veneer preparations.

Dr Tif Qureshi, Dr Tim Bradstock-Smith and Dr James Russell are currently running hands-on courses in the UK and Europe to teach the Inman Aligner system and its philosophy. To find out more go to www.straight-talks.com.