The Inman Aligner: An effective tool for minimally invasive cosmetic dentistry - Part 1

By Dr. Tif Qureshi

Traditionally, cosmetic dentistry has always been faced with the challenge of treating poorly aligned teeth. Treatment options available for mildly and moderately crowded teeth initially include orthodontics and restorative dentistry. Many patients have chosen to pursue treatment options for this, for example porcelain veneers, over orthodontic techniques because of longer treatment times combined with either unsightly habitual wires and brackets or the expense of ‘invisible’ braces. In cases in which patients choose not to pursue these options conservatively, owing to their anatomy and the minimum of tooth movement required, a difficult balance has to be found between overprepared and placed crowning and overcontoured restorations. However, owing to the excitements and the potential created by the effect of popular large smile makeovers, aggressive tooth preparations in which teeth are prepared to stumps, seem to have been accepted as normal practice, simply because there has been no alternative that could achieve the patient’s objectives in a sufficiently short period.

Inman Aligners are now offering a minimally invasive alternative to patients in Australia. With only one appliance, most Aligner cases can be completed in six to 16 weeks. In anterior crowding cases, Inman Aligners have proven to be much more time- and cost-effective than invisible braces or conventional fixed and short-term retainers. More than 1,000 cases have been treated and have found that case acceptance has been close to 100%, simply because many patients much prefer a removable appliance that fits their lifestyle more easily. Treatment can also easily be combined with simultaneous bleaching and final edge-bonding for dramatic, quick and non-invasive results. From this, a new procedure has arisen in cosmetic dentistry - alignment, bleaching and bonding - which will be covered in the second part of this series. The cases presented in this article will outline some case types that can be treated.

The Inman Aligner

For over 30 years, spring aligners have been used to correct minor tooth movements. Early designs were developed for minor tooth movements and were used to treat slight rotations. Previous spring aligners were useful, but several problems always limited the amount of tooth movement achievable. Their active components were made from stainless-steel wire, which is relatively inflexible and lacks any innate springiness. As a result, traditional removable appliances required periodic reactivation, leading to short-lived force application that limited the speed of tooth movement, owing to the need to allow the bone around the roots of the teeth being moved to ‘rest’ between successive activations. In addition, the direction of force application with traditional springs was less easy to control, leading to a mousetrap-like force that tended to unseat the appliance. These factors limited the degree of correction that could be accomplished. For larger movements, single appliances were insufficient to complete the movement.

In developing the Inman Aligner, Donal Inman, CDT created a patented design that takes advantage of the gentle, steady and consistent forces generated by NiTi. The design relies on piston-like components driven by NiTi coil springs. Inman designed lingual and labial components to function or move in parallel to the occlusal plane, eliminating the mousetrap-like unseating forces and allowing actual physiological movement of teeth. Inman Aligners are ideally worn for 16 to 20 hours a day. Studies have demonstrated that the removal of orthodontic forces for four hours a day massively reduces the risk of root resorption and that this risk of root resorption is lower in removable versus fixed appliances.

A standard Inman Aligner as described in the following cases consists of both lingual and labial components. The forces have the effect of squeezing the teeth into alignment. The components can be used in isolation to retract teeth with a more steady force, requiring less adjustment than a standard labial row retractor. In Case III, a unique approach that incorporates an expander on the Inman Aligner is described.

Patient selection

Case selection for the Inman Aligner is critical. The following criteria should be met before treatment proceeds:

1. Cases should require movement of incisor and/or canine teeth only.
2. Root formation of the teeth to be moved must be complete.
3. Crowding or spacing should be less than or equal to 3mm.
4. Cases should have fully erupted posterior teeth to facilitate reactivation, with a reasonably well-aligned arch form to facilitate the path of insertion.
5. Cases should be stable and preferably periodontally disease-free.
6. Patients must agree to wear the Aligner for at least 16 weeks a day and be responsible for good appliance and oral hygiene.

Should the patient wear the Aligner for 14 hours a day only, treatment will still be successful. Model evaluation/arch analysis with Spacewiz

Arch analysis should be performed before any Aligner case is attempted in order to ensure that the case is suitable and, if not, what additional space creation techniques will be needed to allow the Inman Aligner to work. The extent of crowding present is calculated by measuring the sum of the mesial-distal widths of the teeth to be moved. This distance is called the required space. If canines and incisors are to be moved, this distance will be measured from the distal surface of one canine to the distal surface of the other canine. Using an orthodontic retaining or jeweller’s chain or a polishing strip, the ideal arch form is then measured from the distal of each canine to allow the bone around the roots of the teeth being moved to ‘rest’ between successive activations. In addition, the direction of force application with traditional springs was less easy to control, leading to a mousetrap-like force that tended to unseat the appliance. These factors limited the degree of correction that could be accomplished. For larger movements, single appliances were insufficient to complete the movement.

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required, which can be taken chairside. One tooth needs to be divided to be split into. A curve can be digitally established and the extent of crowding calculated using such software.

**Laboratory requirements**

Accurate upper and lower impressions are taken, preferably two impressions per arch treated. Simple alginate can be used if cast quickly. A bite registration and prescription should be completed and sent to a certified Inman Aligner Labo-
ratory. This data should be informed of the amount of crowding calculated. The teeth to be treated should be noted clearly. The prescription should provide details to the technician regarding the teeth to be moved, the area they are to be moved to and the distance they are to be moved. A Spacewire trace of the ideal curve can also be submitted.

**Interproximal reduction**

Interproximal reduction (IPR) is a technique for space incu-
mentation using abrasive strips or discs. The model analysis will have to be preceded by the extent of IPR required. Many authors acknowledge that between 1.5 and 3.0 mm of the interproximal enamel on the mesial and distal of each inci-
sor should not be removed. This equates to 0.3 mm per contact point, creating 2.5 mm of space between the teeth. In some cases, the distal of the canine and mesial of the premolars could be reduced allowing for a total of 3.5 to 4.5 mm. These cases will require more experience in using the system but offer a number of possibilities for cli-

**Case I**

A 25-year-old female pa-
tient complained about the appearance of her lower an-
terior teeth. She had a history of orthodontics in her teenage years, having a fixed appliance fitted for a period of two years. She had been given a retainer at the time but was told to wear it at night for 5 months only. She had noticed her lower four incisors starting to become crowded. Both treatment options were discussed: invis-
iraligners, conventional fixed braces or an Inman Aligner. The amount of space required for reduction was calculated as 5.5 mm. Interproximal re-
duction was performed using diamond strips (Brasseler). A reduction of 1.5 mm at each contact point was achieved at the fitting appointment. This was verified with a thick-

gap. The patient was seen three weeks later and a fur-
ther 0.15 mm reduced at each contact point. The teeth were aligned in just over nine weeks. The Inman Aligner was left in for one month to stabilise the tooth positions. Tooth whit-
ing was undertaken for two weeks during the last two weeks of treatment. Simulta-
neous bleaching was a significant advantage in remedial systems and helps patient moti-
vation. Finally, an orthodontic retention wire was bonded in place on the lingual surfaces, ensuring the patient could still use upper cross-flush for hygiene.  

**Case II**

A female patient presented complaining mainly about her rotated upper right central incisor. She was considering veneers to redistribute the space over the four front teeth. This tooth was not very sensitive so she would undergo three aggres-
sive preparations and one in-

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References are available from the publisher.

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**Contact Information**

Dr. TJ Qureshi is the Past Presi-
der worldwide.

For information on courses and lectures on the Inman Aligner, visit www.inmanalignertraining.com or contact Caroline Cross on tlf: +44 (0) 756 548 9177.