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

By Dr. Til 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 include orthodontics and restorative dentistry. Many patients have chosen the restorative approach, for example porcelain veneers, over orthodontic techniques because of longer treatment times combined with either unsightly labial wires and brackets or the expense of ‘invisible’ braces. In cases in which patients choose to have crowns, upper and lower anterior teeth treated with veneers, it is extremely challenging to prepare teeth conservatively, owing to their anatomy and the minimum thickness of porcelain required. A difficult balance has to be found between overprepared tooth preparations and placing overcontoured restorations. However, owing to the exciting new advances in labial components 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 appliances. The 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 mouse-trap-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 risk of root resorption is lower in removable versus fixed appliances.

A standard Inman Aligner as described in the following case 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 hook retractor. In Case III, a unique approach is taken which is relatively inflexible and lacks any innate springing. 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 risk of root resorption is lower in removable versus fixed appliances.

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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 retentive clasps, 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 about 20 hours 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 Spacewize
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 in alignment with the ideal arch form following orthodontic correction. Critically, the arch needs to pass through the suggested position of the contact points and not the incisal edges. This is described as the available space or the curve. It is possible to perform this task more quickly and just as accurately with software such as Spacewize. Just one simple occlusal photograph is...
Interproximal reduction

Interproximal reduction (IPR) is a basic technique of space-creating treatment using abrasive strips or discs. The model analysis will have established the extent of IPR required. Many authors acknowledge that IPR is a safe and effective technique with a biologic advantage through the interproximal enamel on the mesial and distal of each incisor and canine. These preparations are achieved allowing for a total of 3.5 to 4.5mm. These cases will usually require more experience in using the system but offer a number of possibilities for clinical once trained to use the system correctly. Meticulous records of the amount of enamel removed should be kept. An in-surgery fluoride rinse or application of topical fluoride gel is recommended after any enamel reduction procedure. El-Mangoury et al. have demonstrated that there is no increased risk of caries after IPR, provided surfaces are smooth and correctly. Hetins et al. and Talh have demonstrated that there is no increased risk of periodontal disease, despite the decreased interproximal space.

Anatomically, Inman Aligner treatment uses progressive, anatomically respectful IPR. While the space available is considered already known, it is never carried out in one treatment. In order to provide optimal IPR (0.15mm per visit per contact point) is carried out only in small, carefully planned steps. The patient is sent away with the Aligner. Owing to the Aligner forces, the amount of enamel removed should be kept. Interproximal re-duction is performed at each appointment. This is achieved by using strips or discs, which ensures the stripping is far more accurate and less destructive than would be the case using burs. This significantly reduces the risk of excess space formation, gouging or poor contact anatomy.

Lingual/labial anchors

Composite resin placed intra- or extraorally even in small areas where the contact point is carried out only in small, carefully planned steps. The patient is sent away with the Aligner. Owing to the Aligner forces, the amount of enamel removed should be kept. Interproximal re-duction is performed at each appointment. This is achieved by using strips or discs, which ensures the stripping is far more accurate and less destructive than would be the case using burs. This significantly reduces the risk of excess space formation, gouging or poor contact anatomy.

Figure 7. Smile view before treatment.

Figure 8. Close side view before treatment.

Figure 9. Close side view after treatment.

Figure 10. Close side view after treatment.

Figure 11. Occlusal view before treatment.

Figure 12. Occlusal view after nine weeks with an Inman Aligner.

Figure 13. Side smile view before treatment.

Figure 14. Side smile view after treatment.

For information on courses and materials on the Inman Aligner worldwide.

www.inmanalignertraining.com or contact Carolina Cross on tel: +44(0)899 956 5417