Resolving Severe Upper Anterior Crowding with ‘Invisible’ Orthodontic Splint Therapy

Dr Gary Dorman leads us through the treatment of maxillary crowding using In-Line orthodontic splints

People of all ages want a beautiful, natural smile as well as healthy teeth and gums. An increasing number of adult patients with anterior spacing or crowding adults are willing to undergo orthodontic treatment in order to achieve this. However, they usually want the appliance to be as inconspicuous and comfortable to wear as possible. In many cases, invisible splint/ brace therapy can be applied successfully. In this case the anterior crowding was treated with In-Line splints, produced in Germany by Rasteder Orthodontic Laboratory (www.in-line.eu).

Initial Situation

The patient wanted to resolve her severe maxillary crowding in order to improve both the appearance of her smile and her dental hygiene. She expressed a desire to have the mal-alignment corrected with a therapy which should be as invisible as possible. The severity of the crowding was not immediately apparent from a frontal view (Fig. 1). However, the mal-alignment is more clearly seen when viewed from the side or from occlusion (Fig. 2, 3, 4). UR2 was noticeably labial to UR1. UR1 was retro-clined, indeed both centrals were mal-aligned. UL2, UL3 and UR3 were also marginally mal-aligned.

Figure 1 Initial situation frontal view

Figure 2 Initial situation lateral views

Figure 3 Occlusal view of severe maxillary anterior crowding

Figure 4 Occlusal view of mild mandibular anterior crowding

As a part of the diagnostics, a model and OPG were produced. Clinical examination showed that the patient's teeth and gums were otherwise healthy with no problems relevant to orthodontic treatment.

Treatment Decision

The patient was informed about all the available treatment options. In addition to treatment with In- Line splint therapy, the possibility of fixed brackets was also discussed. However, even braces made of tooth coloured ceramics were rejected by the patient on both aesthetic and comfort grounds. The patient was shown a sample of an In-Line splint to get an impression of the material, the robustness and the thickness of the splint. This solution met her need for comfort; the splints affect the patient's speech only initially and are visually barely noticeable. In-Line's laboratory charges are also significantly lower than some competitive brands, which brings the treatment within the reach of a wider range of patients.

An In-Line splint

Treatment Planning

A quotation with treatment recommendations and a 3D digital set-up was requested from In-Line. The 3D set-up includes 7 images of the final situation, allowing the patient to see how her teeth will appear post treatment from all angles. (Fig 5, 6, 7). An overlaid image showing the movements made by each tooth is also provided. (Fig 8) In addition to the 3D set-up photographs, study models of the anticipated final situation were also requested.

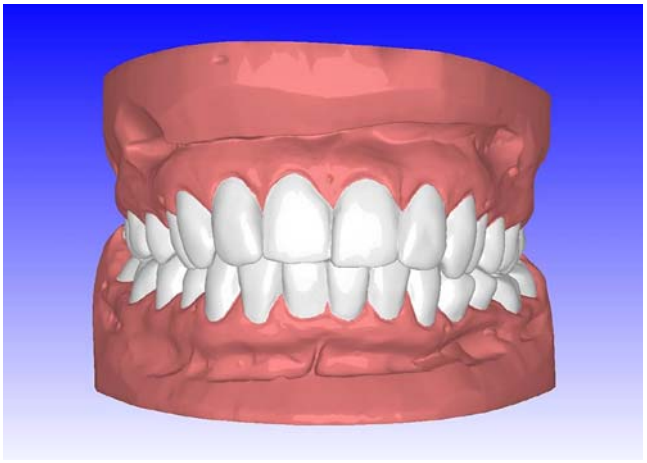
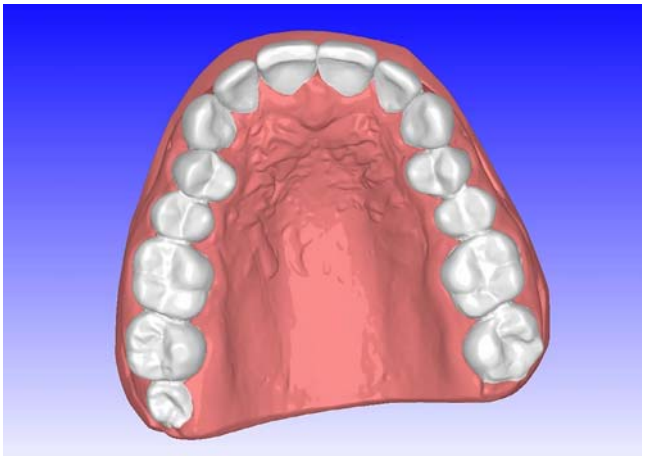


Figure 5



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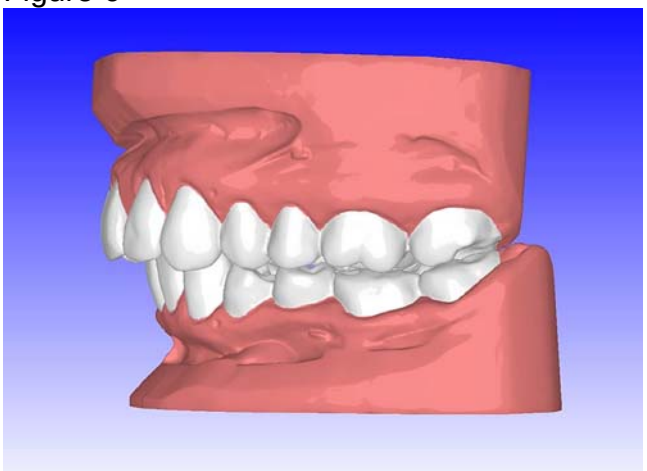

Figure 7

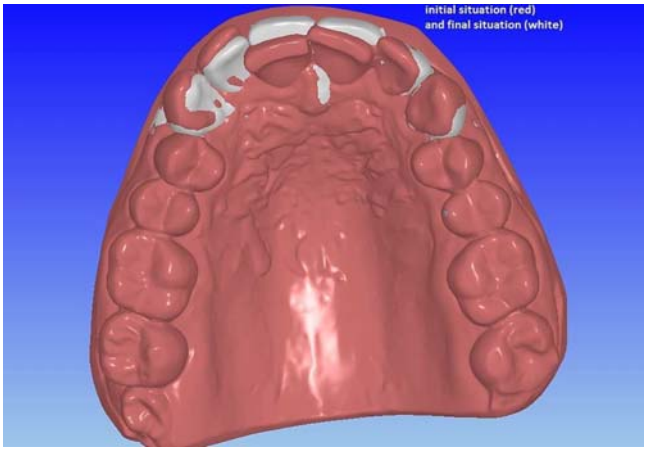

Figure 8

The treatment plan prescribed 7 splints for the upper arch and 4 splits for the lower. In-Line splints must be worn for 5-6 weeks, each splint can effect a movement of up to 0.6mm.

The treatment recommendations proposed slight inter-proximal reduction of 0.15mm between 5 designated contact points in the upper arch. IPR was not required on the lower arch. In-Line's state of the art software is able to accurately calculate the amount of IPR required in advance of treatment.

Treatment Progress

The patient was given new splints successively at individual check-up appointments, at intervals of approximately six weeks. Inter-proximal enamel reduction was carried out incrementally over the first 3 to 4 splint fittings, until the enamel had been reduced by the specified amount.

The patient's compliance was excellent and made a significant contribution to the success of the treatment. She wore the splints for the recommended time of at least 18 hours a day and the treatment goal was reached ahead of the scheduled 8 – 10 months. (Fig 9, 10, 11, 12, 13)

Figure 9 Frontal view after treatment but before whitening

Fig 10 Frontal view after treatment and whitening (teeth in protrusion to show alignment on both arches)

Figure 11 Before and after comparison

Figure 12 Lateral view (left) before and after comparison

Figure 13 Lateral view (right) before and after comparison

A comparison of before and after study models shows the impressive results achieved with around 9 months of invisible splint / brace therapy (Fig 14, 15).

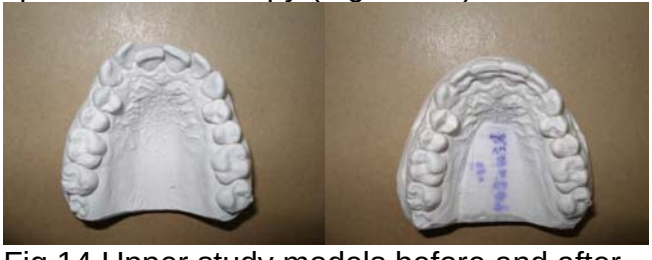

Fig 14 Upper study models before and after treatment

Fig 15 Lower study models before and after treatment

A comparison of the study models showing the anticipated final situation (sent by In-Line pre-treatment) and the post treatment study models shows that the treatment goal had been achieved almost perfectly. (Fig 16, 17)

Figure 16

Figure 17

Retention

Long term retention is crucial following adult orthodontic treatment in order to avoid the risk of potential relapse. In-Line initially supplies a retention splint with each splint set, however this splint is only intended to be a short term solution. The Laboratory also supplies two products for long term retention; an unbreakable retention splint to be worn for 3-4 nights per week and a 3–3 bonded wire retainer. The patient opted for a 3–3 bonded wire retainer as her chosen method of long term retention.

Gary Dorman BDentSc,

Gary Dorman trained in Dublin and qualified in 1990. He joined the Hartley Dental Practice in Kent as an associate in 1991 and became Principal in 1998. He first discovered In-Line in 2007 having treated himself with the system. He has since successfully treated many of his patients with the system as part of his General Dentistry. If you would like more information please email Gary at garydorman@hotmail.com, call the Hartley Dental Practice on 01474 703484, or visit the website www.hartleydentalpractice.co.uk