Resolving Moderate – Severe Anterior Crowding with Orthodontic Splint Therapy

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

Many people of all ages want a beautiful smile without anterior spacing or crowding. In order to achieve this more and more adults are willing to undergo orthodontic therapy for cosmetic reasons. However, they usually want the appliance to be as inconspicuous and comfortable to wear as possible. In many cases, splint therapy can be applied successfully. In this case the anterior crowding was treated with In-Line splints from Rasteder Orthodontic Laboratory. (www.in-line.eu).

Initial Situation
The 21-year-old patient presented with an aesthetic request. He felt his smile was compromised by upper and lower moderate–severe crowding. He 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). UL1 was rotated exacerbating the appearance of the mal-aligned UL2. LL2 was displaced behind LL1 and LL3 which was also rotated. LL1 was labial to LL2 and LR1. LR1, LR2 and LR3 were also mal-aligned.


Figure 1 Initial situation frontal view


Figure 2 Initial situation side view


Figure 3 Occlusal view of maxillary anterior crowding


Figure 4 Occlusal view of 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 aesthetic 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 his 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.

Treatment Planning

A quotation and treatment plan with a 3D digital set-up was requested from Rasteder Orthodontic Laboratory, the manufacturers of In-Line splints. The 3D set-up includes 7 images of the final situation, allowing the patient to see how his 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)

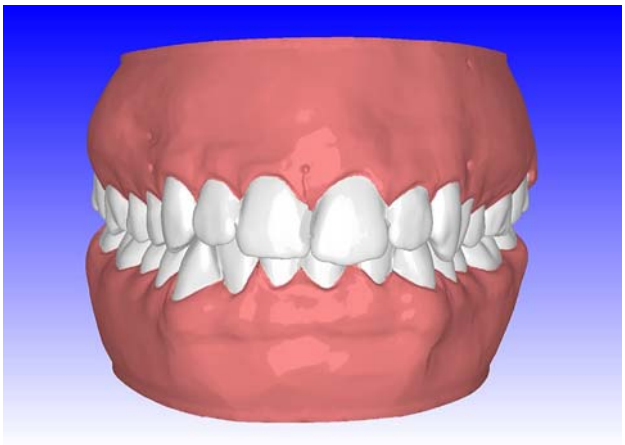
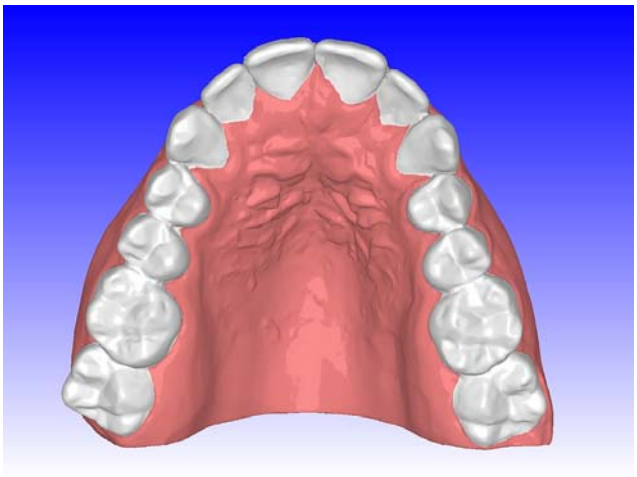


Figure 5



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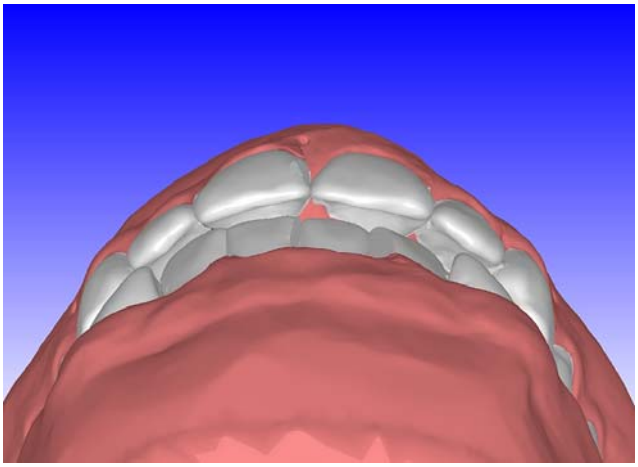

Figure 7

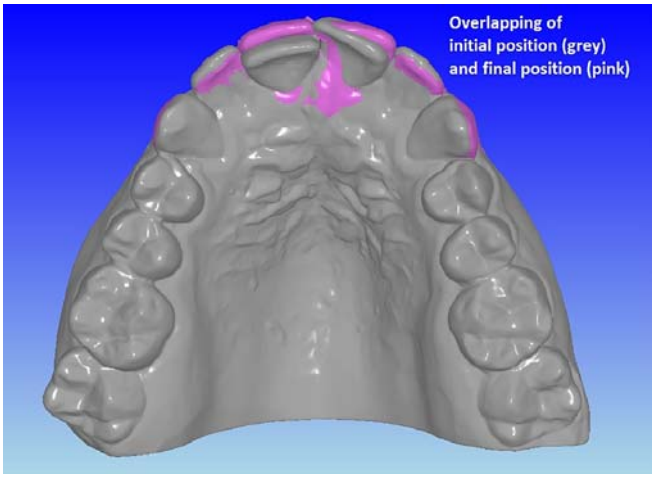

Figure 8

The treatment plan prescribed 5 splints for the upper arch and 6 splits for the lower. In-Line splints must be worn for 6 - 8 weeks, each splint can effect a movement of up to 0.7mm.

The laboratory explained that the treatment would result in a near perfect alignment in the upper arch and a significant improvement, although not a perfect alignment, in the lower arch. The treatment plan recommended slight inter-proximal reduction between the upper centrals and of multiple lower anterior contact points.

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. He wore the splints for the recommended time of at least 18 hours a day and the treatment goal was reached ahead of the scheduled 9 – 11 months. (Fig 9, 10, 11, 12, 13)

Figure 9 Frontal view after treatment but before whitening

Fig 10 Frontal view after treatment and whitening

Figure 11 Before and after comparison

Figure 12 Side view before and after comparison

Figure 13 Before and after comparison

A comparison of before and after study models shows the impressive results achieved with less than 9 months of splint 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 pre-treatment 3D set up and the post treatment models shows that the treatment goal had been achieved almost perfectly. (Fig 16, 17)

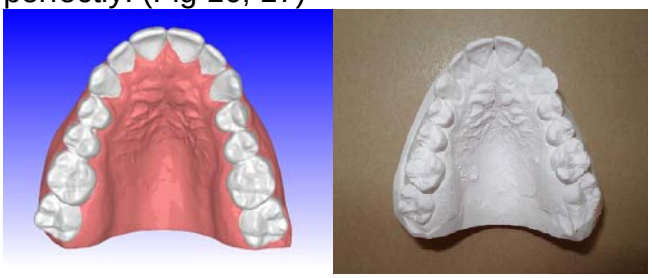

Figure 16

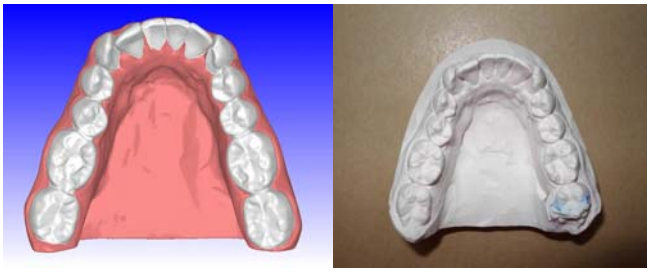

Figure 17

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. As the patient has only recently completed his treatment, he is still wearing the initial retention splint and has not yet decided his chosen method of long term retention.

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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, and has successfully treated many of his patients with the system ever since 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