3M℠ Health Care Academy

Lingual correction of a complex Class III malocclusion: Esthetic treatment without sacrificing quality results.

Incognito™ Appliance System

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Introduction

There is an increasing demand for esthetic orthodontic treatment options. Patients are forced to make a choice between a buccal appliance or no treatment at all. This false choice results in thousands of patients not benefiting from the treatment they desire. For many patients, there is a difference between “excellent treatment” and “excellent treatment outcome”; for these patients an excellent treatment outcome is necessary but not sufficient to achieve an “excellent treatment”. This case presentation illustrates a situation where only a fixed appliance can fully correct the Class III relationship. While it is true that perhaps clear aligner therapy in conjunction with heavy IPR could improve this patient occlusal relationship, clear aligners are unlikely to achieve the Class III correction shown here. This case shows how the 3M™ Incognito™ Appliance System can provide not only “excellent treatment results” but the truly esthetic treatment that for this patient constituted “excellent treatment”.

Diagnosis

Patient was a 28-year-old caucasian male with no significant medical or dental history. He had a history of orthodontic treatment as an adolescent. The chief complaint was, “I did not wear my retainer and I want to fix my teeth.”

The patient presented with a Class III skeletal dysplasia, characterized by slightly retrognathic maxilla and prognathic mandible. Dentally the patient had a Class III molar and canine (sub div) relationship, upper and lower crowding and a partial anterior crossbite involving the UR3-UL2 with LR3-LL2 (Figure 3A-H and Figure 4A-F). The anterior crossbite resulted in moderate attrition of UR1 and L1’s. The periodontal charting revealed probing depths within normal limits although he had gingival recession on UR4,5, UL1,2,3, LL3, LR3,4. The functional analysis revealed no anterior guidance with significant anterior traumatic occlusion.

Figure 1: Pre-treatment cephalometric image.

Figure 2: Pre-treatment panoramic image

Figure 3A-H: The initial photo layout show a Class III sub div molar relationship, anterior crossbite, upper and lower crowding.

The etiology of the Class III relationship is likely genetic and the anterior crossbite is likely a result of late mandibular growth after the completion of his initial orthodontic treatment.

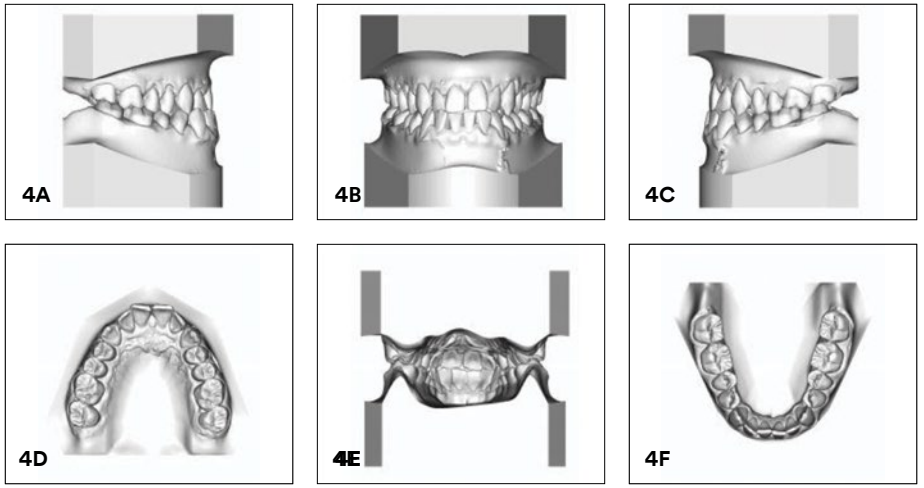

Figure 4A-F: The malocclusion models are shown here: note the anterior crossbite and the Class III molar relationship on the left side.

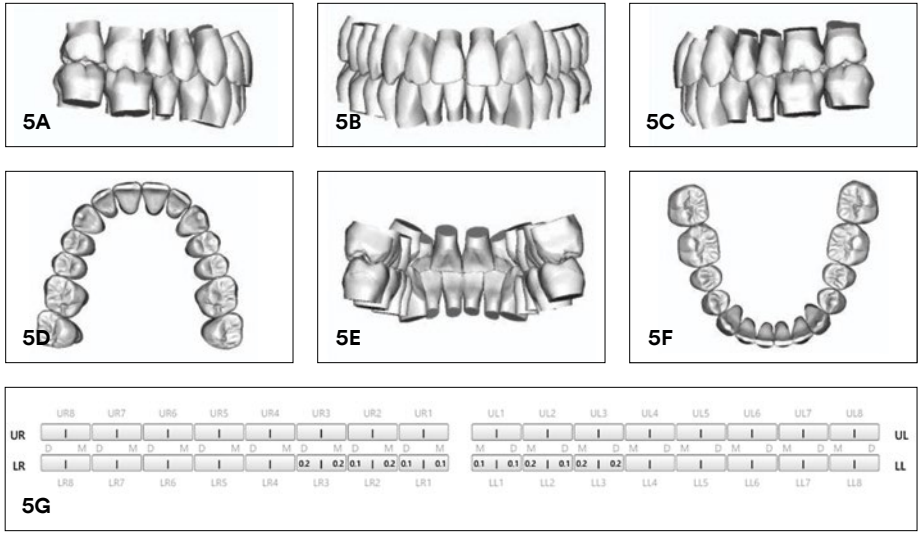

Figure 5A-G: The setup and planned IPR are shown in the figure.

Objectives of Treatment

The treatment objectives were to level and align the dentition, correct anterior crossbite, establish proper anterior guidance with a Class I canine relationship, improve periodontal stability and smile esthetics. In the maxilla we wanted to expand the intercanine distance and maintain the intermolar distance. In the mandible our goal was to maintain or constrict the intercanine distance and maintain the intermolar distance.

Treatment Plan

Upper and lower lingual fixed appliances, non-extraction, lower anterior IPR (1.8 mm per setup), Class III elastics. The treatment setup and planned IPR chart is shown in Figures 5A-G.

Treatment Discussion

The Incognito Appliance design and wire progression can be seen in Figure 6A-F; bands with half occlusal coverage were employed to initially open the anterior bite. Figure 6A-F also shows that the upper first molar bands were designed with buccal buttons in anticipation of using Class II elastics. Figure 6A-F on the left shows 0.014 NiTi wires engaged into the upper and lower arches. The lower wire is engaged into the self-ligating slot; in the upper the wire is fully engaged using double overties. Figure 6A-F in the middle depict progress photos with the upper and lower aligned with 0.016×0.022 NiTi wires fully engaged. On the right in Figure 6A-F the arches are shown with upper and lower 0.016×0.024 SS wires. The upper wire had 13 degrees of extra torque in the anterior and lower clear buttons have been placed on the lower canines for the Class III elastics. An upper 0.0182×0.0182 TMA wire was used with the lower stainless steel wire and vertical elastics to detail and finish the treatment.

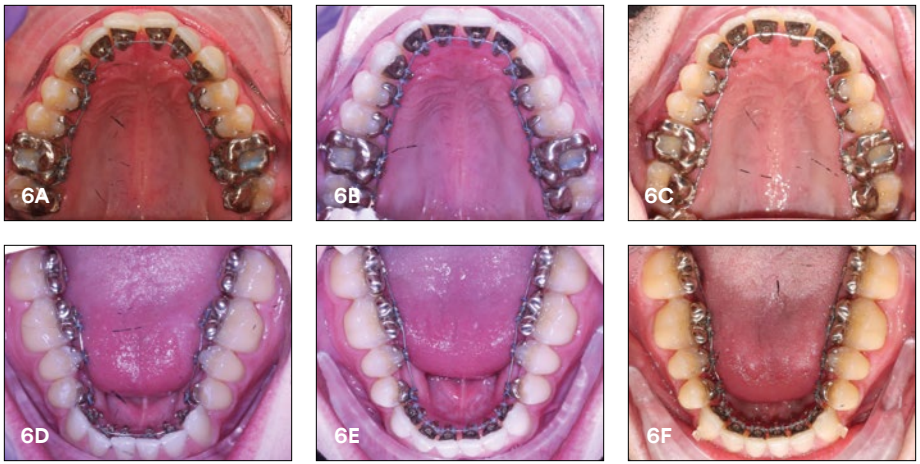

Figure 6A-F

The final treatment result is shown in Figure 7A-H. Class III elastics were planned and used during the treatment to accomplish A-P Class I correction of the molars and canine; 1.8 mm of lower anterior IPR planned in the treatment setup and was this was accomplished during treatment (see Figure 5A-G). The amount of intercanine expansion planned in the setup was fully expressed to the tenth of a millimeter (see Table 1). Interestingly, the superimposition (Figure 9) reveals that the molar Class I correction was largely due to extrusion of the posterior teeth and down and backward rotation of the mandible rather than strictly anterior posterior movement of the upper and lower dentition. This type of correction is very unlikely with clear aligner therapy.

Figure 7A-H: The final photo layout.

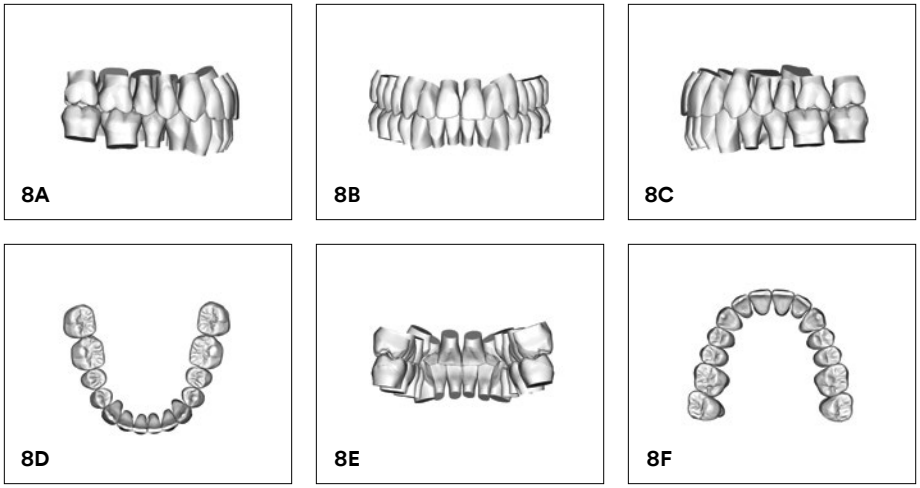

Figure 8: The final models revealed an easily passing ABO CRE score of 15.

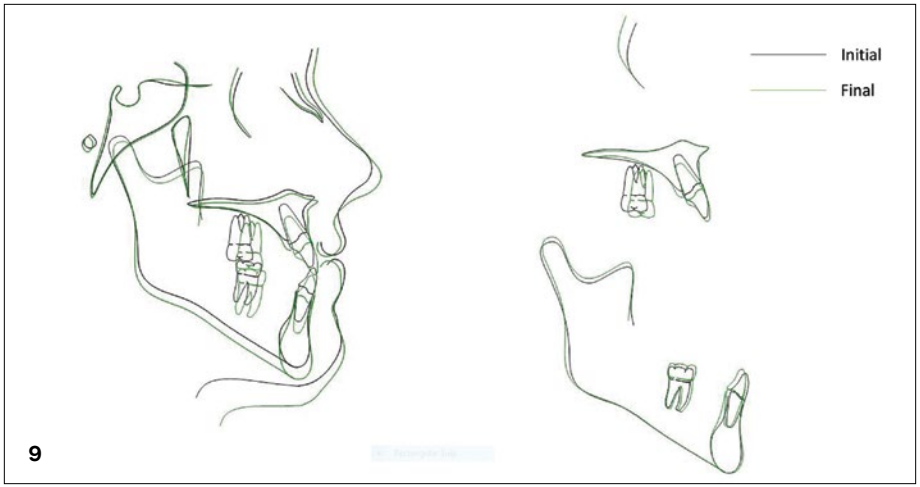

Figure 9: The pre- and post-treatment superimpositions show extrusion as well as anterior movement of the maxillary posterior molars. This dental movement resulted in rotation of the mandible, an increase in the LAFH and correction of the Class III molar relationship. The anterior crossbite was corrected through dental compensation.

Figure 10: Post-treatment cephalometric image.

Figure 11: Post-treatment panoramic image

		Malocclusion	Setup	Actual post-treatment
Maxillary	Inter Canine	30.8 mm	32.7 mm	32.7 mm
	Inter Molar	45.0 mm	43.3 mm	44.5 mm
Mandibular	Inter Canine	23.3 mm	24.3 mm	24.3 mm
	Inter Molar	36.2 mm	36.7 mm	37.8 mm

Table 1: Initial analysis.

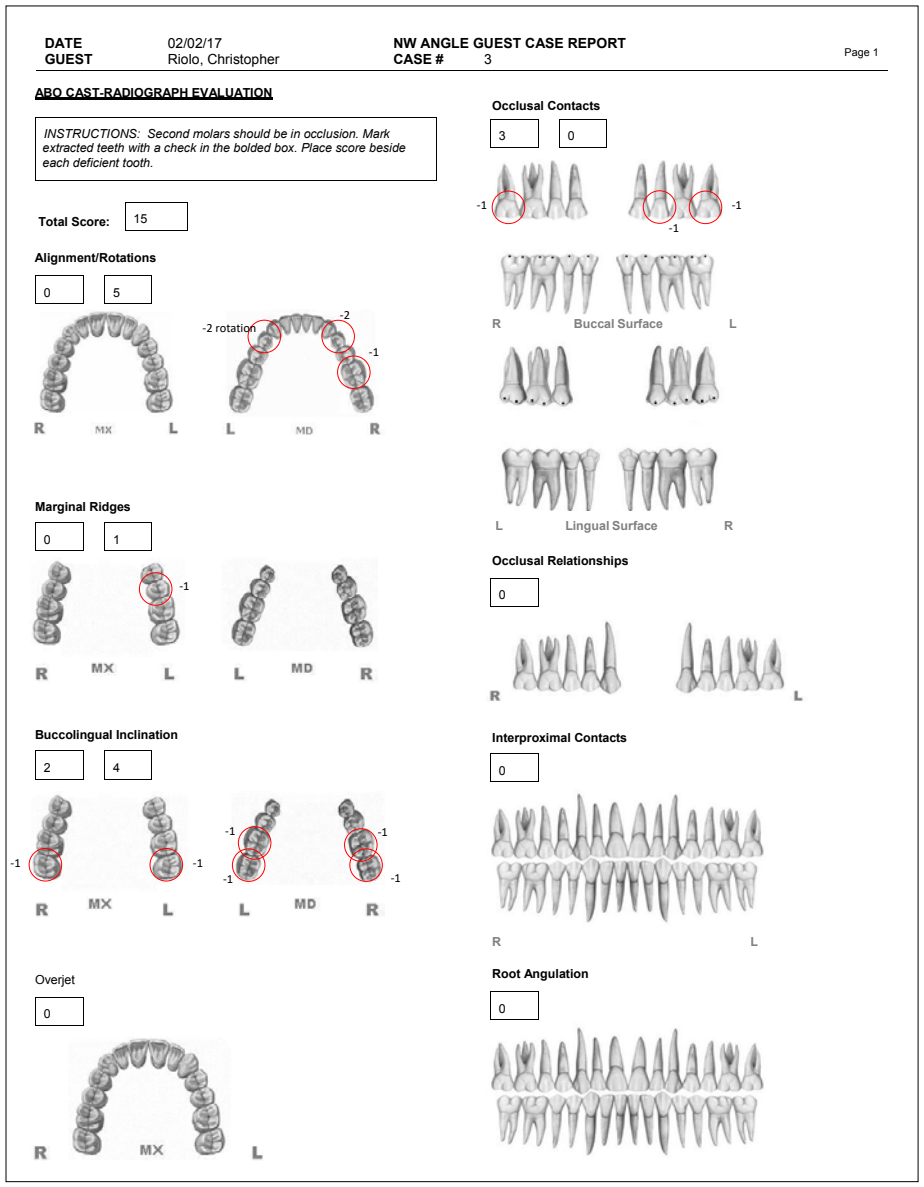

Figure 12: ABO quality treatment results.

Comments

The Incognito Appliance System allows the orthodontist to achieve ABO quality treatment results using a completely esthetic fixed appliance. Our adult patients deserve to have treatment options that not only deliver an excellent treatment outcome but allow them to experience excellent esthetic treatment.

Case photos provided by the Dr. Christopher S. Riolo.