3M℠ Health Care Academy

Improvement of the smile of a Class III adult patient using customized lingual appliance

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Introduction

Esthetics is the primary expectation of most people when planning any dental treatment. Likewise, orthodontics plays an essential role in improving the patient's smile as well as providing better function. With the development of invisible orthodontic treatment options, more and more adult patients seek orthodontic treatment to improve their smile. Lingual orthodontics using customized appliances offers the most esthetic solution to treat all kinds of malocclusions in adults, with full 3D control of the dentition and complete invisibility. This case demonstrates the treatment of an adult Class III patient with a particular emphasis on smile esthetics.

Case

A male patient, 46 years 3 months of age, presented to our clinic for the correction of his crowded anterior teeth. (Figure 1A-H) He had a mild skeletal Class III malocclusion that presented itself with a crossbite on both central incisors and the upper left and lower right central incisors showed gingival recession due to occlusal trauma resulting from the crossbite.

His smile analysis revealed insufficient exposure of upper incisors which caused the patient to look older than his current age and a flat smile arch. Correction of the crossbite was the main goal of the treatment and a minimal extrusion of upper front teeth was also planned as a secondary gain.

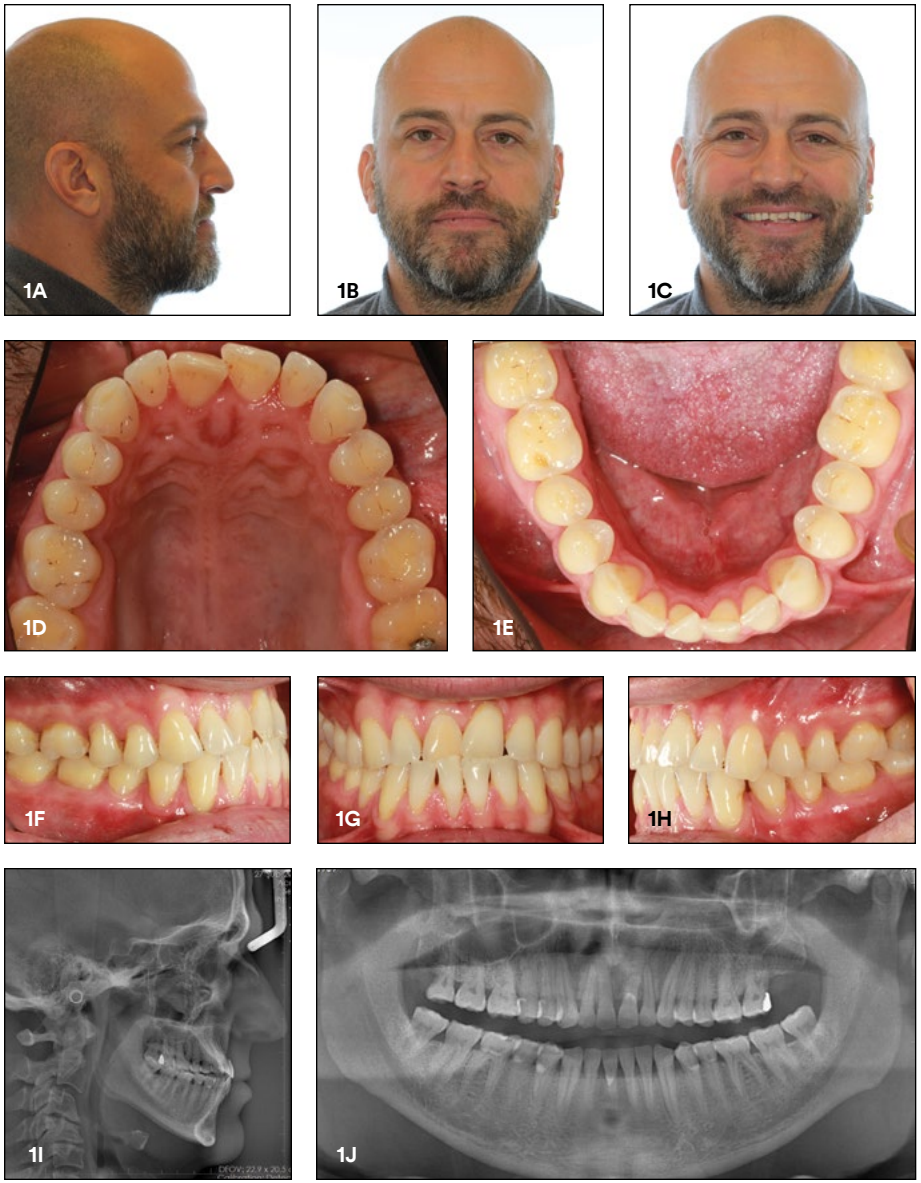

Figure 1A-J: Pretreatment photos and radiographs.

Radiographic evaluation revealed a healthy dentition with no missing teeth. (Figure 1I-J). According to the cephalometric analysis, the patient was a skeletal Class III patient with protrusion of upper incisors. Lower incisors were in optimal position. The patient had a high rate of esthetic expectancy from the appliances. Therefore, lingual treatment using the 3M™ Incognito™ Appliance System was offered.

After the initial bonding appointment, 0.014 NiTi SE archwires were placed. The further sequence of archwires were 0.016×0.022 NiTi SE, 0.018×0.025 NiTi SE and 0.016×0.024 Stainless Steel. Class III elastics were applied while steel archwires were in place from the buccal side, due to difficulty of hand manipulation of the patient on the lingual side (Figure 2A-E). The elastic cooperation was perfect and the elastics were worn for only three months. Interdental stripping was performed to lower anterior teeth with a perforated disk to provide further overjet. The finishing was achieved using a 0.0182×0.0182 archwire.

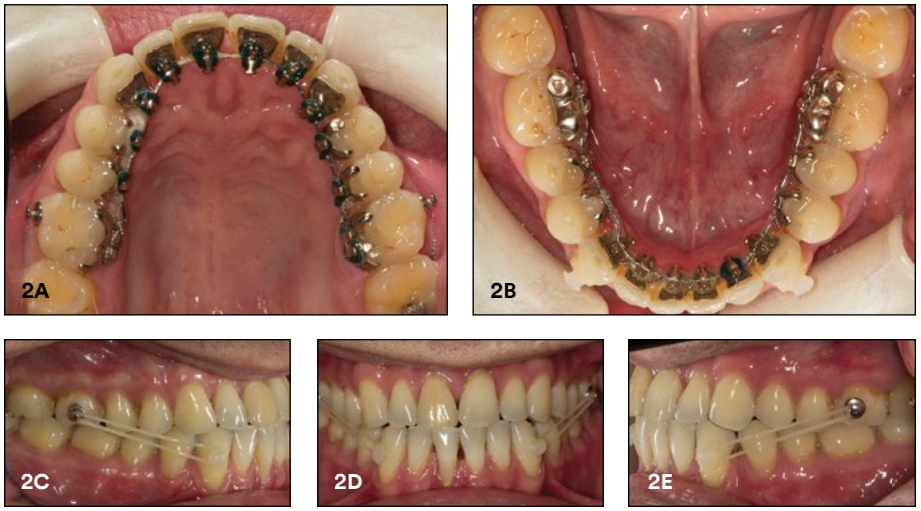

Figure 2A-E: Application of Class III esthetics.

The treatment lasted 12 months. Upper and lower fixed retainers were placed at the time of debonding (Figure 3A-H). Post-treatment radiographs are given in Figure 3I and Figure 3J. Pre- and post-treatment cephalometric measurements are shown in Table 1. His cephalometric superimposition is shown in Figure 4.

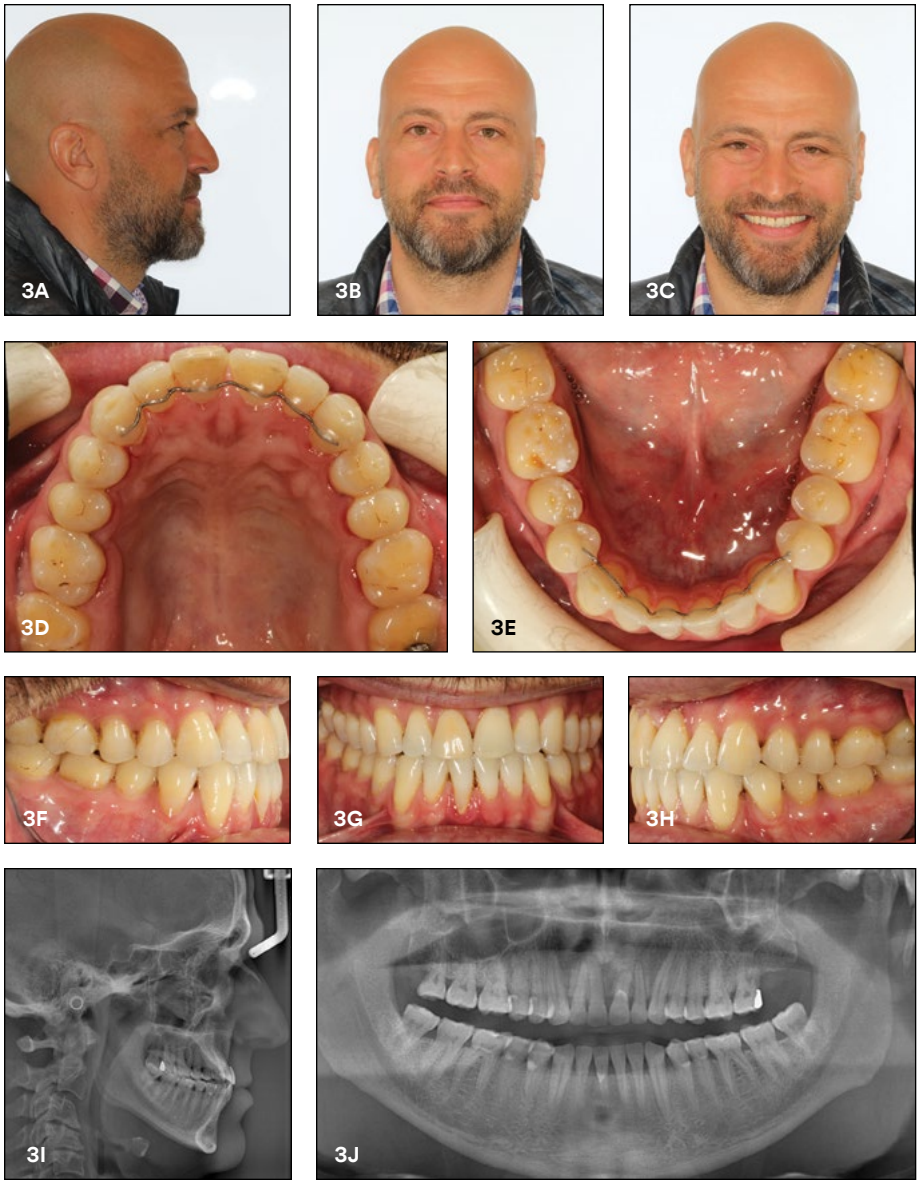

Figure 3A-J: Post-treatment photos and radiographs.

	Pretreatment	Post-Treatment
SNA°	77.3	77.9
SNB°	81	81.1
ANB°	-3.6	-3.2
MP-SN°	30.9	31.9
U1-SN°	111.6	114.5
U1-NA°	34.3	36.6
U1-NA (mm)	9.9	11.5
IMPA°	90.9	88.4
L1-NB°	22.8	21.8
L1-NB (mm)	6	4.9
Ulip-Eplane	-9.1	-11
Llip-Eplane	-3.4	-5.9

Table 1:
Pre- and post-treatment cephalometric measurements.

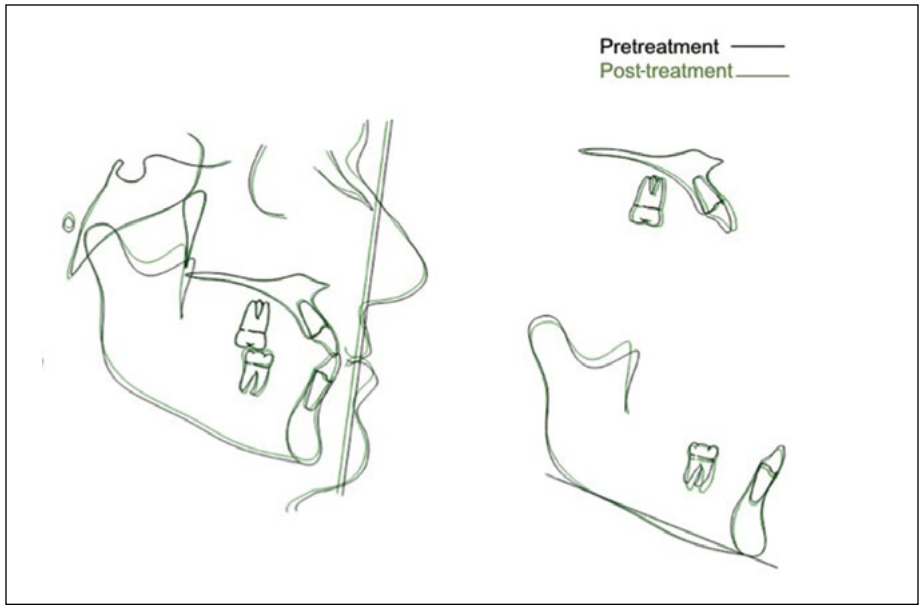

Figure 4: Treatment cephalometric superimposition.

When the patient's pre- and post-treatment smile photos are examined, it is evident that the patient's showing more incisal display at the end of treatment (Figure 5A-B). This is partially achieved with slight extrusion of upper incisors that was requested when the initial order of Incognito Appliance was placed. Moreover, we can also see that his smile arch is quite parallel to his lower lip.

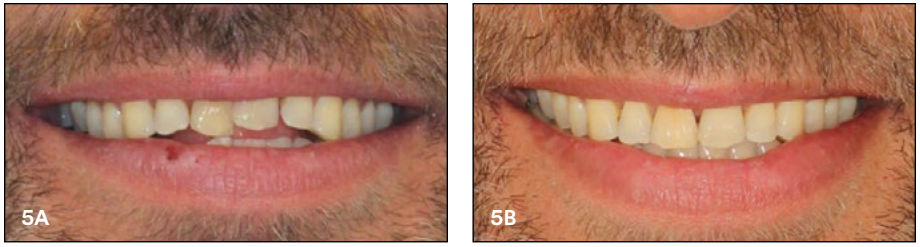

Figure 5A-B: Pre- and post-treatment smile comparison.

By using a fully customized lingual appliance, like the Incognito System, three major problems in lingual orthodontics were solved:

- Patient discomfort during the phase of adaptation: The appliance is designed as low profile as possible, not much higher than a bonded retainer; this significantly improves the patient's comfort.
- Inaccuracies during re-bonding: The customized bracket base covers the major part of the lingual tooth surface and therefore allows a direct re-bonding without the need for any other positioning aids.
- Difficulties in finishing: Inaccuracies of the slots due to production, and resulting variations in torque play, are a part of the past, thanks to the Incognito System. Measuring rates show divergences of not more than 0.008 mm between the slots. The precise-shape archwires also make high standard finishing easily achievable.

In conclusion, mild Class III treatment of an adult was successfully completed using Incognito brackets with further improvement of the smile.

Patient Summary

Dental Analysis

- Bilateral Class III malocclusion
- Crossbite of incisors
- Light crowding in both arches
- Insufficient upper incisor display

Treatment Plan

Class III compensation treatment using upper/lower Incognito Appliance

Wire Sequence

0.014 Superelastic NiTi; 0.016×0.022 Superelastic NiTi;
0.018×0.025 Superelastic NiTi, 0.016×0.024 SS; 0.0182×0.0182 TMA

Treatment Duration

12 months

Retention

Upper/lower fixed retainers (3-3) 0.215 Multistranded Wire

Case photos provided by Dr. Omur Polat-Ozsoy.

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