

Incognito™ lite lingual orthodontic appliance: Enhancing the scope of targeted mechanics with customized computer-aided design/computer-aided manufacturing therapy

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Abstract

Invisible or Inconspicuous Orthodontic appliances are an integral part of the orthodontists armamentarium in current protocols. Customisation have made mechanics with Lingual orthodontics more predictable and operator friendly. The leading lingual system in the world, Incognito™ (3M Unitek) has introduced Incognito™ Lite as a popular and efficient system for correction of minor malocclusions. This clinical showcase discusses the rationale, scope and clinical uses of this system.

Key words: Lingual orthodontics, incognito™ lite, CAD CAM appliances

INTRODUCTION

Orthodontics is interestingly juxtaposed globally! Practices are yearning for growth, and orthodontic education is looking at reinventing itself to face the times. Clinical perfection as a goal today, cannot be isolated from patient needs and patient “centric appliances.”^[1] In an aspirational society, orthodontic patients have become more knowledgeable of treatment options and appliances, and their demands are getting more specific. Not only do they want excellent treatment results, they also want faster treatment, efficient mechanics and invisible orthodontic appliances.

On the invisible orthodontic appliance marketplace, Invisalign has invested the largest amount of resources

in marketing and advertising, and created a demand for these services. A lot of patients today approach specialist clinics requesting aligner services, assuming that they are comprehensive orthodontic solutions for all orthodontic cases. As orthodontic specialists, we all know that removable invisible orthodontic appliances have their limitations in controlling tooth movement in three-dimensions (3D). A well-referenced study has shown that the mean accuracy of tooth movement for Invisalign® is only 47%.^[2] The advent of computer-aided design/computer-aided manufacturing (CAD/CAM) technology in lingual orthodontics, allows clinicians to provide patients invisible treatment options, which are accurate and more predictable.

The Incognito™ lingual appliance has positioned itself as an excellent choice from amongst the vast galaxy of lingual systems available. However, some patients may not want to go through extensive and comprehensive treatment, and prefer a solution that is faster, more affordable but predictable as well. This article will illustrate with cases that can be treated with a sectional lingual fixed appliance, which is an excellent option for adjunctive orthodontic treatment.

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Segmental appliances and mechanics that “target” the malocclusion, without involving teeth that do not require tooth movement are gaining popularity globally. Reciprocal and unwanted effects of orthodontic force systems can thus be prevented, and more predictable results can be achieved in a shorter time span.

Incognito™ lingual orthodontic appliance or “Incognito™” is amongst the most popular lingual appliance. Lingual appliances are only prescribed by a “specialist in orthodontics” since it is very technique sensitive, and requires specialist training before certified to use it. Lingual braces are not visible from the outside, and there is little or no esthetic impairment of a patient’s smile during treatment. The disadvantages would be initial tongue discomfort and speech disturbances.^[3]

INCOGNITO™ LINGUAL ORTHODONTIC APPLIANCE

Dr. Dirk Wiechmann of Germany invented the Incognito™ lingual appliance in late 1990’s and has created enormous interests in the lingual appliance in the last decade.^[4-7] His company and technique were subsequently acquired by 3M Unitek in 2009. The appliance is distinguished from other bracket systems because both the brackets and the wires are custom made for individual patients and fabricated using state-of-the-art CAD/CAM technology and wire bending robots.

The technological advances in Incognito™ lingual appliance helps solving the three major problems in lingual orthodontics:

1. Improve patient comfort and speech adaptation as the appliance is custom made and adapted to the tooth surface as flat as possible.
2. Improve accuracy of rebonding as the custom made bracket base covers most of the lingual tooth surface, this allows the ease of direct rebonding of a bracket without need of any jig or positioning aids.
3. Improve ease of finishing and detailing of a case based on the final set-up models, the custom made brackets and prefabricated arch wires according to the arch form have improved accuracy in finishing the case as close as to the set up models as possible.^[8,9]

ARCH-WIRE PRODUCTION

The 3D geometry of each archwire is calculated with the CAD/CAM software, and the information is transferred

to the state-of-the-art archwire bending robot. All the arch wires in the sequence of treatment have the same geometry to obtain the final position of the teeth in the setup model. Although the arch wires are custom made and bent, it is still up to the orthodontists to do some final adjustments and detailing on the chair sides. The orthodontist has full control in finishing and detailing, and there is no need to take more impressions for refinement as in removable aligners cases. The Orthodontist decides all the selection of wires. For Incognito™ Lite appliance, three standard wires suggested and included are 0.014-inch super elastic (SE) nickel-titanium (NiTi) wire, 0.016 × 0.022-inch SE NiTi wire and 0.0182 × 0.0182-inch titanium molybdenum alloy wire which are sufficient for most of the adjunctive cases.

CASE PRESENTATION

Three cases are presented herewith, showcasing the range of conditions that the appliance can address.

Case 1

Adult female with a chief complaint of malaligned front teeth due to orthodontic relapse. Treatment time with Incognito™ Lite was 7 months [Figure 1].

Case 2

Adult female with a chief complaint of crooked front teeth. She has a missing lower incisor. The treatment plan was with Incognito™ Lite lingual appliance without extraction of any teeth. Treatment time was 9 months [Figure 2].

Case 3

Adult male with a chief complaint of upper and lower crowding. Treatment with an Incognito™ Lite lingual appliance without extraction of any teeth. Treatment duration was 6 months [Figure 3].

The scope

Incognito™ is generally suitable for treatment of all malocclusion regardless of age, as long as the patient has a permanent dentition with a healthy periodontium. Incognito™ Lite, however, has the following general indications:

- Nonextraction.
- Stable buccal posterior occlusion.
- Mild-to-Moderate overbite.
- Mild-to-moderate crowding.

The clinical cases presented showcase the efficacy and efficiency of the concept.



Figure 1: Adult female with a chief complaint of malaligned front teeth due to orthodontic relapse. Treatment time with Incognito™ Lite was 7 months



Figure 2: Adult female with a chief complaint of crooked front teeth. She has a missing lower incisor. Treatment plan was with Incognito™ Lite lingual appliance without extraction of any teeth. Notice the presence of the “splinted” premolars brackets for improved stability of posterior teeth and anchorage reinforcement. Treatment time was 9 months



Figure 3: (a-d) Pre- and post-frontal and right lateral changes. (e-h) Upper progress. (i-l) Lower progress

CONCLUSIONS

Incognito™ Lite lingual orthodontic appliance has created interests in orthodontic patients who look for invisible braces, which can deliver a quick and efficient way to straighten the teeth. It is the only customized, individually fabricated, fixed and invisible lingual orthodontic appliance, which is segmental. The advantages of easier bonding protocols with individually fitted bracket bases, makes it operator friendly as well. Wire bending is reduced with prefabricated arch wires provided, thus increasing accuracy. Tooth movements and incisor torque and tip control are also improved with Incognito™ compared with the removable orthodontic aligners. Incognito™ Lite

lingual appliance is an excellent orthodontic appliance, and definitely provides predictable orthodontic solutions, in dedicated time spans.

“Customization” and “targeted mechanics” are important attributes in the dream appliances of the future, and the Incognito™ Lite heralds the confluence of the two concepts.

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