

REVIEW

## Orthodontics Without Braces and Wires!! ..... A New Paradigm.

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### ABSTRACT:

The very need of orthodontic treatment by a majority of patients is often for reasons of enhancement or improvement in dental alignment and facial esthetics. Reluctance for use of labial fixed metallic appliances is due to poor esthetics and fear of pain. Clear plastic aligners offer an excellent alternative to esthetic orthodontic treatment especially for young adults in their permanent dentition.

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### Introduction

What is **INVISALIGN**?

"Invisaligners<sup>1</sup> are a series of clear, custom-made, thin, removable plastic aligners, nearly undetected and created to effectively move teeth into their desired position". These are the new age Aesthetic Orthodontic treatment methods developed especially for adults who are very self conscious of how they appear.

With the growing emphasis towards beauty and how one present themselves, more and more adults and teens are looking forward to orthodontists to improve their appearance, with alternate methods of tooth correction, and especially for ones which offer more esthetic options, like the "Invisalign Systems".

So it becomes the responsibility of the orthodontists too, to make themselves aware of the

more esthetic options available and to choose the more appropriate treatment depending not only on the malocclusion of the patient but also being sensitive to the patient's esthetic needs.

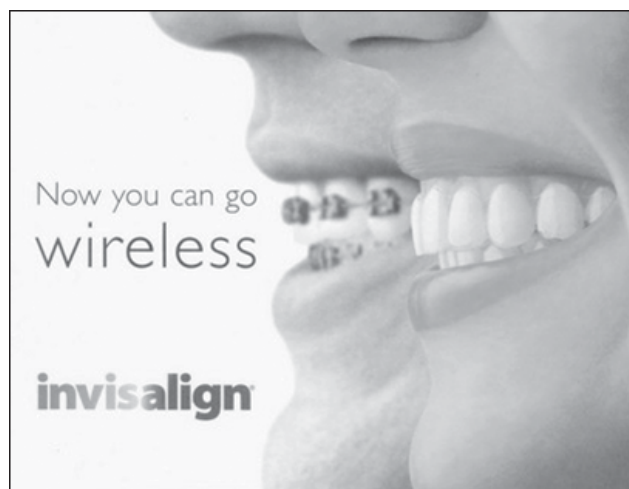


Fig 1

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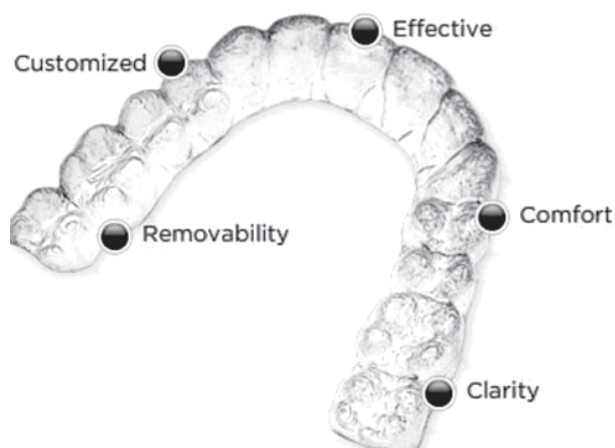


Fig 2

(Courtesy : stevenlondondds.com)

### History

In 1945, Kesling<sup>3</sup> introduced the "tooth positioning appliance," as a method of refining the final stage of orthodontic finishing after debanding. A positioner was a one piece pliable rubber appliance fabricated on the idealized wax set-ups for patients, whose basic treatment has completed. Kesling predicted that certain major tooth movements could be accomplished with a series of positioners, fabricated from sequential tooth movements on the set-up as the treatment progressed. In 1971, Pontiz R.J. introduced a similar appliance called the "invisible retainer" made on a master model that repositioned teeth with base plate wax. He claimed that this appliance could produce limited tooth movement. In 1985, Sheridan J.J et al later developed a technique involving interproximal tooth reduction and progressive alignment using clear Essix appliances<sup>7</sup>. This technique was based on Kesling's proposal but almost every tooth movement required a new model set-up and therefore a new set of impressions at almost every visit, making the technique excessively time consuming.

The sequential clear plastic aligners were first introduced by Align Technology Inc, Santa Clara, California, USA in June 1999 with trade name of Invisalign. Another system of "transparent corrector" was formed in 2002 in NSW by Clear Smile Pvt Ltd.

### Concept and protocol

The Invisalign system<sup>1</sup> is proprietary to Align

Technology. In this system, the clinician forms a diagnosis, plans the treatment, and communicates this desired plan through the Internet to laboratory technicians who refine these communications via the computerized ClinCheck until the clinician is satisfied with the plan. Aligners are then fabricated and shipped to the treating clinician. Patient compliance can be superior to other removable appliances because the use of highly accurate impression materials leads to an excellent fit, and the patient is more willing to wear an appliance that cannot be seen.

The skill set required for this system by the clinician is unique in comparison to other fixed and removable orthodontic techniques. Clinicians generally do not make continual midcourse changes as treatment progresses. These skills are learned in certification courses and seminars available through Align Technology. One of the advantages of Invisalign is the ability to perform even complex tooth movements with a clear and removable system. Complex tooth movements are possible once the clinician has reached a level of training and experience appropriate to the more challenging tooth movements. It is always advisable to master simple cases before progressing to the most complex movements.

### Indications for Invisalign appliances

1. Mild crowded and malaligned problems<sup>3</sup> (1-5 mm)
2. Spacing problems (1-5 mm)
3. Deep overbite (Class II div 2 cases )
4. Narrow arches that can be expanded without tipping the teeth too much.
5. Absolute intrusion<sup>5</sup> (1 or 2 teeth)
6. Lower incisor extraction for severe crowding cases
7. Tip molar distally.

### Contraindications:

1. Crowding and spacing<sup>3</sup> over 5mm
2. Antero-posterior skeletal discrepancies of more than 2mm
3. Centric relation and centric occlusion discrepancies

4. Rotated teeth more than 20 degrees
5. Open bites
6. Teeth with short clinical crowns
7. Extrusion of teeth
8. Dental expansion for blocked out teeth<sup>5</sup>
9. Closure of premolar extraction space
10. Molar uprighting

#### Advantages:

1. Ideal esthetics<sup>3</sup>
2. Easy to use for the patient
3. Comfort of wear
4. Better oral hygiene

#### Disadvantages

1. Limited control over root movement
2. Limited intermaxillary correction
3. Lack of operator control

#### Steps and treatment stages with Invisalign system

##### Collection of Records:

1. Pretreatment<sup>1</sup> study models, photographs, OPG, cephalogram and other diagnostic records for the orthodontic diagnosis and treatment planning.
2. In addition, it is pertinent that high precision impressions are made of polyvinyl material. The bite is also recorded, and the impressions (fig-3) are sent to the Invisalign office.
3. Highly sophisticated softwares are used, which through a 3D scan technology create a virtual patient. Other specific softwares include 'Tooth shaper' & 'Autobite tool' which identify the shape of the teeth and occlude them in centric relation.



Fig 3

#### Interactive treatment planning :

1. The clinicians download the virtual treatment setup, stage by stage at the dedicated internet site and if required, request for modification of treatment.
2. Once precise treatment plan and sequence of tooth movement has been finalized, the aligners are made and dispatched to the orthodontist. This step is called 'ClinCheck'.

#### Clinical management with Aligners:

1. Number of aligners<sup>1</sup> for a patient varies according to type of malocclusion and treatment from 10-50.
2. The first aligner is issued and checked for any discomfort, freedom of the freni and any soft tissue impingement.
3. Patient is seen two weeks later, where aligners 2 & 3 are issued. Each aligner works for two weeks and patient visits the doctor every four weeks.
4. The treatment progress is monitored for wearing time, desired tooth movement & oral hygiene.

**invisalign®**



**BEFORE**

**AFTER**



Fig 4

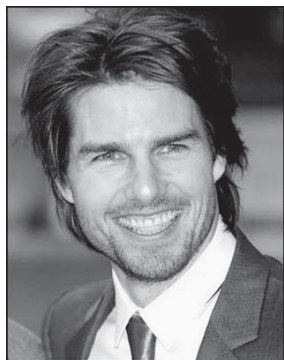


Fig 5

(courtesy : findtheorthodontist.com)

**Benefits of Invisalign:**

The Invisalign system<sup>2</sup> also boasts improved

**Invisalign VERSUS Metal brackets<sup>2</sup>**

	Invisalign	Metal brackets
<b>How does it work?</b>	Invisalign® uses a series of clear removable aligners to bring alignment	Metal braces use wires and brackets to bring alignment.
<b>Nearly invisible</b>	<b>Yes</b>	No.
<b>Removable during treatment</b>	<b>Yes</b>	No.
<b>Treatment doesn't involve metal that can irritate teeth and gums.</b>	<b>Yes</b>	No. The metal wires and brackets used with braces can cause mouth irritation.
<b>Allows you to brush and floss normally during treatment</b>	<b>Yes</b>	No.Braces hinder the ability to reach the entire tooth/gum area when brushing and flossing.

**Conclusion:**

The Invisalign system has opened up a new area of adult orthodontics for serving patients who may not want conventional fixed appliances. Achieving similar results to those of more conventional fixed appliances may be difficult. Conversely the Invisalign appliance provides excellent esthetics during treatment, ease of use, comfort of wear, and superior oral hygiene.

However further research is required in this field, preferably in the form of prospective randomized controlled trails.

hygiene over traditional braces. Because the clear retainers are removable, patients can brush and floss as they normally would, reducing the chances of possible staining and decay that often occurs with traditional braces.

Food and drink choices are less restrictive, as well. If patients wish to eat sticky candy or drink soda, they may do so after removing their clear Invisalign retainer.

**How Much Does Invisalign Cost?**

The exact figure will depend heavily on several factors, including the extent of treatment required and how many aligners need to be created.

**References**

1. Orthodontics, Current Principles and Techniques: Graber and Vanarsdall; 4<sup>th</sup> edition :1169-1171
2. Matt T.Walton: Invisalign advantages: Invisalign vs Braces; Smile dental journal ; March 2009.
3. Phan X and Ling PH. Clinical limitations of Invisalign. J Can Dent Assoc 2007;**73**:(3):263-266
4. Joffe L. Invisalign : Early experiences . J orthod 2003;**30**:348-52
5. Boyd.R. L.; Miller,R.J; and Vlaskalic,V.:The Invisalign system in adult orthodontics: Mild crowding and space closure cases, J. Clin. Orthod.2000 **34**:203-212.
6. Proffit : Contemporary orthodontics ; 4<sup>th</sup> edition: 402-407
7. Sheridan JJ. What percentages of your patients are being treated with Invisalign appliances? J Clin Orthod 2004; **38**:544-5.