REVIEW ARTICLE

Invisalign: a newer approach to treat orthodontic cases

Saumya Kakkad[1]

ABSTRACT:

As with the increasing demand for aesthetics among adults seeking orthodontic treatment, newer methods have been developed to replace conventional methods. Invisalign is a newer trend to treat orthodontic cases whose demand is increasing exponentially. It can be used to treat not only simple cases but also complex cases with the help of various modifications in aligners in the form of attachments. Orthodontists have given a new dimension by shifting from labial to lingual and then to invisible braces.

Keywords: Invisalign, attachments, clear aligners

INTRODUCTION

Most of the patients undergoing orthodontic treatment in today's scenario demand transparent appliances that are more appealing and elegant compared to conventional fixed appliances.[1] The pioneers in the field of Clear Aligner therapy date back to Keeling (1945), Mr.Nahum (1964), and other authors such as Points (1971), and Mc Namara.[2]

Later, Align Tech., Inc 1999 introduced Invisalign which can be used to treat practically any malocclusion. This system uses CAD-CAM technology to fabricate a series of positioners(aligners) in polyurethane. Based on the concept of Schwarz for the optimal force which is equal to capillary blood pressure, each aligner is designed to move the teeth a maximum of 0.25-0.3mm in 2 weeks.[3] The patient is advised to remove aligners to eat, brush and floss daily to maintain good oral hygiene. It is advised to wear these aligners for approximately 20 hrs. daily.

STEPS FOR FABRICATION OF INVISALIGN ALIGNERS

The various requirements for fabrication of Invisalign are to be submitted to Align Tech. are polyvinyl siloxane impressions, a centric occlusion bite registration, a lateral cephalometric radiograph, and photographs. [4]

The next step is scanning plaster models by the system develops a 3D presentation, separates the teeth (allowing them to be moved individually) and places virtual gum. Thus, the Invisalign appliance includes a series of aligners that consist of transparent, thin (less than 1mm) plastic material manufactured with CAD-CAM technology.

1.Reader

Department Of Orthodontics &DentofacialOrthopedics

Kothiwal Dental College & Research Centre

Correspondence Address:

Dr. Saumya Kakkad
Department of Orthodontics &Dentofacial Orthopedics,

Kothiwal Dental College & Research Centre

HOW INVISALIGN WORKS

Invisalign clear aligners work the same way traditional braces do: by applying carefully controlled forces to teeth to move them into a better position. Specialized computer software helps us design a plan for moving your teeth from their current positions into the possible alignment. This movement will be broken down into perhaps several dozen stages. For each stage, the Invisalign company will manufacture two plastic mouths "trays" or "aligners", one for maxilla arch and one for mandibular arch as per the requirement. Each set of aligners are advised to wear 20-22 hrs./day for 2 weeks, then move on to the next set of aligners to accomplish the next stage of gradual movement[5].

In the past several years, two features have been added to make Invisalign a more appropriate orthodontic treatment method for teenagers. Special "eruption tabs" hold the appropriate amount of space open for molars that have not fully grown in. Invisalign for teens also comes with "compliance indicators" built into the aligner material, which fade with wear. This allows parents, dentists, teensthemselves, to make sure the trays are worn as prescribed.

MODIFICATIONS IN ALIGNERS FOR DIFFERENT TOOTH MOVEMENTS

The various modifications in aligners are

1. Precision cuts: These are precuts designed to facilitate the use of buttons and elastics for anchorage control when treating Class II/III patients with Invisalign aligners and eliminate the need to manually cut aligners.[6]
   E.g., hooks for elastics allow elastics to be used without button and button cutouts accommodate buttons bonded to teeth.
2. Attachments: Attachments are a critical part of treating patients with the Invisalign system. Proper placement of attachments helps ensure that the tooth movements occur as shown in the CLIN check treatment plan and is an essential step to achieve the expected patient outcome. Taking care to place attachments properly at the outset of treatment will minimize bond failure.

ADVANTAGES

- Meithei et al showed that plaque index was significantly lower in patients treated with Invisalign.[7]
- The time needed for brushing teeth is shorter
- Invisible, therefore aesthetically superior to braces
- Shorter dental appointments
- Easier for the patient to replace their aligners on their own every 2 weeks.[8]

DISADVANTAGES

- Invisalign requires more time than fixed appliances for more complex cases.
- Patient compliance needed to wear aligners at-least 22 hrs./day.
- They should be removed during meals.
- Much costlier compared to conventional braces.
- Invisalign appliances, because of their removability, have very limited control over precise tooth movements.

CONCLUSION

The demand for Clear aligners is increasing day by day due to their superior aesthetics. The Invisalign appliance can provide an excellent aesthetic during treatment, the comfort of wear, ease of use, and superior oral hygiene. If the indications are correctly established and the patient is properly informed, treatment with Invisalign can be a source of great satisfaction for both the patient and the clinician.

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