

## Invisible Orthodontics: Smile All You Want

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### ABSTRACT

Appearance does count at any age. Esthetic compromise repels adult patients from accepting traditional metallic look orthodontic treatment. Tooth colored brackets and wires gained popularity for a few decades but gradually declined owing to its own disadvantages. Lingual orthodontic appliances brought paradigm shift, but could not get prevalent because of tedious bracket positioning, insufficient training of orthodontists and cost. Chemical insult to the enamel, a common problem to all bracket system, gained attention towards non adhesive orthodontics.

Clear thermoplastic aligner trays, customized to individual orthodontic needs are fetching adult orthodontic patients seeking treatment. Clear aligners do have some limitations and inconveniences. The benefits of clear aligners generally outweigh the drawbacks.

**KEYWORDS:** Clear Aligners, Esthetic, Metallic orthodontic treatment.

### INTRODUCTION

Orthodontic treatment is encircled with metals (wires and brackets). This esthetic compromise repels adult orthodontic patient from accepting treatment. Tooth colored brackets and wires tried to overcome these limitations but could not proved to be an answer to metals because of its bulk, and cost. In last few decades lingual orthodontics has gained worldwide popularity in terms of esthetics but its widespread use is again restricted on account of complexity in bracket positioning, treatment mechanics, limited access to the lingual/palatal surface and cost.<sup>1,2</sup> Furthermore, bracket bonding endangers the precious enamel to chemical insult, making it unaesthetic and susceptible to microbial attack.<sup>3,4</sup>

Of late, clear thermoplastic medical grade polymers have emerged as a promising option for adult orthodontic patients.<sup>5</sup> Clear Aligner Therapy is an orthodontic treatment modality in which the patient wears a series of customized clear, removable aligners that gradually moves the teeth to a desired position. The total number of aligners varies depending on severity of malocclusion.<sup>1-5</sup> Clear aligners do have some limitations and inconveniences. The benefits of Clear Aligner Therapy generally outweigh the drawbacks. Clear thermoplastic appliances take a variety of forms, including retainers.<sup>6</sup>

### Transient Problems with Clear Appliances

These appliances may initially irritate oral mucosa and tongue causing soreness. A temporary alteration of

speech, with slight lisp is also inevitable. These immediate discomforts are transient and vanish within a few days, as the patient gets accustomed to the appliance.

### Indication

Though can be used for all cases, these appliances are ideal for minor crowding (less than 4mm). In cases of crowding, interproximal reduction may be required to create enough space to allow teeth movement.

Rotation control, intrusion, and extrusion are better controlled by placing tooth colored attachments on the labial and lingual surfaces. Open bite, deep bite, cross bite and mild to moderate expansion can also be corrected satisfactorily using clear aligners.<sup>1,5,7</sup> The aligners can also be used simultaneously for tooth bleaching, if a bleaching gel is placed inside the tray. Clear aligners can also be used as active and passive retainers.<sup>6</sup>

### Cutting edge advantages of clear appliances

Crystal clear aligners remain unnoticed while wearing. The transparent look and option to remove the appliance enhances the cosmetic value of the appliance. Less chair side time adds convenience to both operator and patient. There are no cuts or abrasions from wires or brackets like with traditional braces. The aligner trays are fabricated with soft medical grade polymers and therefore comfortable. The patient can remove the appliance while eating and brushing, and therefore can maintain a good oral hygiene.<sup>5</sup>

**Potential limitations**

Patient cooperation is utmost important for the success of treatment and a desired treatment result. A short clinical crown can cause problems with aligner retention, affecting stability of the appliance and tooth movement. Large edentulous space and sharp cusps may become cause of frequent appliance breakage. White spots lesions, tooth decay, gingival inflammation and periodontal breakdown may occur if proper oral hygiene protocol is not followed.<sup>8</sup> Missed appointments, not wearing aligners the required number of hours per day, and broken appliances can prolong the treatment duration. Allergic reactions to the material used during treatment may occur. Teeth may supra-erupt if not covered by the aligner.<sup>2</sup> Being removable appliances should be avoided in medically challenged and uncooperative patients to prevent accidental swallowing or aspirating the aligner.

**Contraindication**

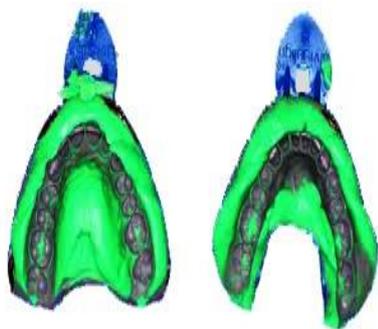
Like any other appliances, these aligners also have some limitations, e.g; Extraction cases, tip control, torque control and moderate to severe open and deep bite cases are not a good case for these appliance.<sup>9,10</sup>

**From consultation to optimal treatment results**

1. Consulting the dentist: Discuss your possible treatment using the **CLEAR ALIGNER** system with your doctor.
  2. Taking impressions. (Fig 1)
  3. Cad - cam model produced by CT scan of dental Impression. (Fig 2)
  4. Identifying pressure points on the computer generated model. (Fig 3)
  5. Clincheck – computer generated tooth alignment, to be approved by dentist. (Fig 4)
  6. Production of thermoplastic appliances. (Fig 5)
- The series of splints are accurately and customarily fabricated in the lab. The dentist regularly monitors the timely treatment progress, in order to achieve the best result.

**CONCLUSION**

The Invisible thermoplastic appliances have overcome the limitations of traditional orthodontic appliances and have opened a new dimension to adult orthodontics, serving patients with high esthetic demand. An additional restorative procedure might be required to correct anatomical variations in tooth.



**Fig 1: High precision maxillary/mandibular impression**



**Fig 2: 3-D model generated using CT scan & CAD-CAM**



**Fig 3: pressure points identified by software**



**Fig 4: Clincheck – expected post treatment model.**



**Fig 5: Clear thermoplastic appliance.**

**CONFLICTS OF INTEREST:** None Declared.

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