

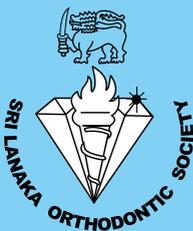
Sri Lankan Journal of Orthodontics

January 2018 | Volume 01 | Issues 01 | ISSN 2579-1575



Official Publication of the
Sri Lanka Orthodontic Society

Online edition can be viewed at
www.journaloforthodontics.org



PREDICTABLE RESULTS USING CLEAR ALIGNERS: CASE REPORTS

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Abstract:

Clear aligners have become the treatment of choice for treating mild to moderate malocclusions in patients who are concerned for esthetics compromise of fixed orthodontic appliance treatment. Two case reports are presented to demonstrate the effectiveness of clear aligners in resolving crowding due to orthodontic relapse and spacing in the anterior teeth region. In both the cases, predicted results were achieved using clear aligners which was simple and convenient for both the patient and the clinician.

Keywords: Clear aligners, Relapse, Crowding, Midline diastema, Relapse

Introduction:

The introduction of clear aligners has added a new dimension to orthodontic treatment worldwide. Patients who would never accept the aesthetic and/or functional compromise of fixed orthodontic appliances may be offered a more comfortable option with significant dental health advantages¹. Clear aligners were introduced by Align Technology (San Jose, California, USA) marketed as "Invisalign"™ in 2000 and the majority of the published data revolves around this brand. With the advent of 3D printing and more predictable software additional companies are now entering the market. Initially aligners were not capable of controlling root movement and more complex tooth movement but advances in design and placement of bonded composite attachments have seen expansion of the range of tooth movement over substantial distances². Experienced clinicians have found that clear aligner therapy for more complex treatment needs often fails to yield the same degree of precision anticipated with fixed appliances. This necessitates more careful case selection and counselling when offering this treatment to patients. Two suitable cases are presented, illustrating the ease and simplicity with which clear aligners could resolve the malocclusion in patients who refused fixed orthodontic alternatives.

Case Report 1:

A 21 year old female patient presented with relapse of her malocclusion two years after cessation of removable retainer wear after treatment with full fixed appliances involving extraction of all first pre-molars. The patient was now in college and did not want re-treatment with fixed appliance. She presented with Class I molar and canine relationship and mild upper and lower crowding (Fig.1). Initial records were taken and the case logged onto the K-line (K Line Europe, Lileinthalstr 74, 40474 Dusseldorf, Germany) portal. It was decided to resolve the anterior crowding in both the arches using "K line" clear aligner therapy (Fig.2). 0.2 mm interproximal reduction (IPR) was performed in the mandibular anterior segment, per contact, to facilitate unravelling of the crowding. The patient was instructed to wear the appliance all the time and only remove it while eating, drinking and toothbrushing or flossing. At the end of the treatment, the crowding had completely resolved in both the arches and the canines and molars were maintained in a Class I relationship. The patient was satisfied with the outcome (Fig.3) and a bonded lingual retainer (BLR) was placed in both the arches for retention (Fig.3).

Case 1

(Fig 1) Pre treatment records



Extra oral photographs



Intra Oral Photographs



Pre treatment OPG



Post treatment OPG

(Fig 2) During treatment Intra Oral Photographs



(Fig 3) Post treatment records



Extra Oral Photographs



Intra Oral Photographs

Case Report 2:

A 32 year old female patient presented with a chief complaint of spacing between her upper front teeth (Fig.4). The clinical examination revealed a midline diastema in the upper arch and spacing between the lower anterior teeth with Class 1 molar and canine relationship (Fig.4). Since the patient was esthetically demanding, K line clear aligner therapy was suggested to which she readily agreed. Her initial records were taken and uploaded to the “K line” portal (Fig.5). A 3D simulation of the treatment progress was presented and the treatment outcome was predicted (Fig.6). Attachments were placed on both the maxillary central incisors and all the first molars. Interproximal reduction (IPR) was performed in the lower arch according to the presented IPR estimate sheet (Fig.7). Aligners were delivered to the patient for 2 week intervals (Fig.8). The treatment took 10 months to close the anterior spaces (Fig.9) and deliver an esthetically pleasing smile to the patient (Fig.10). The position of the posterior teeth remained unchanged and the Class 1 molar and canine relationship was maintained while the anteriors were retracted to close the anterior spaces. Bonded lingual retainers (BLR) were placed in both arches at the end of the treatment. The patient was satisfied and happy to have received an esthetic as well as comfortable solution to close the anterior spaces without braces.

(Fig 4) Pre- treatment photographs



Extra oral Photographs



Intra Oral photographs

(Fig 5) Pre- treatment digital models



(Fig.6) Predicted treatment outcome generated by computer with attachments



(Fig.7) IPR done

		IPR ESTIMATE																			
		Upper Right															Upper Left				
		16	15	14	13	12	11	21	22	23	24	25	26	11	12	13	14	15	16		
		D	M	D	M	D	D	M	D	M	D	M	D	D	M	D	M	D	M	D	
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Discussion:

Clear aligner therapy was introduced to resolve minor tooth irregularity and treat problems of orthodontic relapse.³ Clear aligners have become a treatment of choice for esthetically concerned patients who do not want fixed appliance treatment and present with mild to moderate crowding, spacing or relapse problems. In this study, a case of mild crowding due to orthodontic relapse was successfully treated using K line clear aligners. It was convenient and simple to treat the relapse problem with aligners and the treatment did not take more than 5 months to completely resolve the problem. A second case of spacing, where the patient did not want fixed orthodontic treatment, was managed easily with aligners. Moreover, with use of this appliance, excellent patient cooperation with minimal discomfort, better esthetics and oral hygiene was experienced when compared to fixed appliances. The point that needs to be mentioned here is patient compliance and the initial diagnosis of the case. The diagnosis of the individual case is paramount and it cannot be delegated to a lab or technician. For the success of cases treated with the clear aligner systems both patient cooperation as well as a correct diagnosis is essential.

The cases presented here show the efficacy of aligners in managing mild to moderate malocclusions. Boyd et al⁴ successfully treated similar malocclusions which involved mild to moderate crowding and space closure using the Invisalign* system. However, there are currently some limitations to the clear aligner appliance regarding case selection, cost, experience for computer treatment planning, difficulty in certain tooth movements and cases involving the mixed dentition or impacted teeth.⁵ According to Duncan¹, quality results with aligners can be achieved if attention is given to case selection, treatment planning, software modifications, clinical management and resolving treatment tracking issues. With the innovation of new attachments, advances in material science and the detailed analysis and comprehension of outcomes from specific strategies, , the scope of aligners will most likely expand for correcting more complex cases involving rotations, deep bites, open bites and unusual extractions in the near future.⁶

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