

Effective Management of Post-Orthodontic Relapse Using ClearPath Aligners: A Case Report

Nasreen Nagani*, Waqas Wahab

Consultant Orthodontist, DentoCorrect Clinic Lahore, Pakistan

ABSTRACT

Orthodontic relapse is a common challenge following fixed appliance therapy, often necessitating retreatment to restore proper alignment and occlusion. This case report presents the successful management of a relapse case, demonstrating the effectiveness of clear aligner therapy in achieving precise tooth movement while maintaining patient comfort and aesthetics. A 25-year-old male with mild dental crowding and post-orthodontic relapse underwent non-extraction treatment involving interproximal reduction (IPR), strategic attachment placement, and sequential aligner wear over a seven-month period. The patient exhibited excellent compliance, leading to successful correction of the malalignment and establishment of a stable, functional occlusion. Periodontal health was closely monitored and maintained throughout treatment, with no adverse effects observed. The results highlight the benefits of clear aligners in orthodontic retreatment, offering a minimally invasive, patient-friendly, and predictable approach to correcting relapse cases while ensuring long-term stability through proper retention protocols.

Keywords: Clearpath Aligners, Relapse, Orthodontic Treatment.

INTRODUCTION

Orthodontic relapse, defined as the tendency of teeth to return to their pre-treatment positions after active orthodontic therapy, remains a significant concern for both clinicians and patients. Various factors contribute to relapse, including periodontal ligament elasticity, continued unfavorable growth, neuromuscular adaptation, and inadequate retention strategies [1,2]. Studies suggest that without proper retention, approximately 70% of orthodontic patients experience some degree of relapse within a decade post-treatment, underscoring the importance of effective retention protocols and relapse management strategies [3].

Traditionally, fixed appliances have been used for retreatment in relapse cases, but they come with certain drawbacks such as prolonged treatment duration, patient discomfort, difficulty in maintaining oral hygiene, and aesthetic concerns [4]. In recent years, clear aligner therapy (CAT) has gained popularity as an alternative to fixed appliances for orthodontic relapse cases due to its numerous advantages. These include improved

Vol No: 09, Issue: 01

Received Date: June 28, 2025

Published Date: July 11, 2025

*Corresponding Author

Dr. Nasreen Nagani

Consultant Orthodontist, DentoCorrect Clinic
Lahore, Pakistan, Email: nasreen.iqbal@duhs.edu.pk

Citation: Nagani N, et al. (2025). Effective Management of Post-Orthodontic Relapse Using ClearPath Aligners: A Case Report. Mathews J Dentistry. 9(1):59.

Copyright: Nagani N, et al. © (2025). This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

aesthetics, better patient compliance, easier oral hygiene maintenance, and reduced soft tissue irritation [5,6]. Clear aligners work by using a series of custom-fabricated, removable trays that exert controlled forces to achieve the desired tooth movements in a sequential manner [7].

ClearPath aligners, a type of clear aligner system, have emerged as an effective option for orthodontic retreatment. They utilize a CAD/CAM-based technology that enables precise digital planning of tooth movement, minimizing unwanted forces and maximizing treatment efficiency [8]. Unlike conventional fixed appliances, ClearPath aligners provide a minimally invasive and comfortable treatment experience, making them an attractive choice for patients seeking retreatment for orthodontic relapse [9].

This case report highlights the effective management of a relapsed orthodontic case using ClearPath aligners. It aims to demonstrate how this aligner system can efficiently correct minor to moderate post-treatment shifts in tooth position while maintaining patient comfort and aesthetics. The report also discusses the advantages of ClearPath aligners in relapse management and their potential role in enhancing long-term orthodontic stability.

CASE REPORT

A 25-year-old male in good overall health presented with concerns regarding dental misalignment and crooked teeth. He had previously undergone fixed orthodontic treatment but experienced a relapse. His medical history was unremarkable, with no known familial or dental issues.

Extraoral examination revealed a mesencephalic head shape and a mesoprosopic facial form with a symmetrical frontal profile. His facial profile was orthognathic, complemented by a medium-sized nose and competent lips (Figure 1). The interlabial gap was within normal limits, and there were no clinical signs of temporomandibular joint dysfunction.

A smile analysis demonstrated an adequate display of the upper incisors, maintaining a harmonious smile arc, although the alignment was not ideal. Intraoral examination showed fair oral hygiene and healthy periodontal status. Both molars and canines exhibited a Class I occlusal relationship, while the incisors were also in a Class I position. The patient presented with a 1mm overjet and a 0.5mm overbite. A minor maxillary midline deviation of 0.5mm to the right was observed, while the mandibular midline remained centered.

Mild crowding was noted in both the upper and lower arches. A panoramic radiograph confirmed healthy periodontal structures, with no evidence of caries, root resorption, or

other dental anomalies. Cephalometric analysis indicated a skeletal Class I relationship, a normodivergent facial pattern, normally inclined incisors, and an acute nasolabial angle.

Treatment objectives

The primary objective of the orthodontic treatment was to address the patient's concerns through clear aligners. The treatment also focused on achieving a stable, functional, and healthy bite while improving overall dental aesthetics.

Treatment options

Various treatment options were presented to the patient for consideration:

The first option involved using traditional braces for orthodontic correction. However, the patient was hesitant to choose this method, as he had previously undergone fixed orthodontic treatment and preferred a more aesthetically pleasing alternative.

The second option proposed clear aligners, which aligned with the patient's desire for a more discreet and comfortable treatment approach.

Treatment procedure

Based on the patient's history and clinical examination, intraoral and extraoral photographs were taken, and optical impressions were obtained using intraoral scanning. These records were then submitted to the ClearPath facility for the development of a personalized treatment plan. A panoramic X-ray confirmed adequate bone support and indicated satisfactory oral hygiene, making the patient a suitable candidate for clear aligner therapy without the need for additional dental procedures.

A 3D treatment plan was created using the submitted records, outlining 13 stages for the upper arch and 19 stages for the lower arch. The treatment followed a non-extraction approach, incorporating interproximal reduction (IPR) and arch expansion to address the patient's dental concerns. A digital treatment simulation (Figure 2) was presented to the patient, who reviewed and approved the plan after expressing satisfaction with the proposed corrections.

The treatment plan was discussed with the patient within seven days of data submission. He was pleased with the suggested approach, and no modifications were required. The estimated treatment duration was seven months, which the patient accepted, allowing the aligner therapy to begin shortly thereafter.

IPR Technique

Interproximal reduction (IPR) is a widely used orthodontic technique that involves the precise removal of a minimal amount of enamel between adjacent teeth to create space for resolving crowding while maintaining overall dental stability [10]. Various methods are available for performing IPR, including the use of diamond burs, abrasive discs, and manual abrasive strips [11].

In this case, IPR was performed using a thin, double-sided, diamond-coated abrasive strip, ensuring controlled enamel removal. The amount of reduction was carefully measured using an IPR gauge to maintain accuracy and prevent excessive enamel loss. To minimize potential adverse effects and enhance enamel remineralization, topical fluoride was applied following the procedure.

Attachment Placement

Attachment placement plays a vital role in clear aligner therapy, significantly enhancing the precision and efficiency of tooth movement. Attachments are small, tooth-colored composite resin shapes bonded to the enamel surface, designed to facilitate specific orthodontic movements such as rotation, extrusion, and intrusion [12]. Their shape, size, and positioning are strategically determined based on the individualized treatment plan to optimize aligner retention and force application [13].

These attachments function as anchor points, allowing the aligners to exert controlled and directed forces on the teeth, thereby improving the predictability of complex movements. Their proper placement and management are essential for achieving optimal orthodontic outcomes efficiently and ensuring successful treatment progression [14].

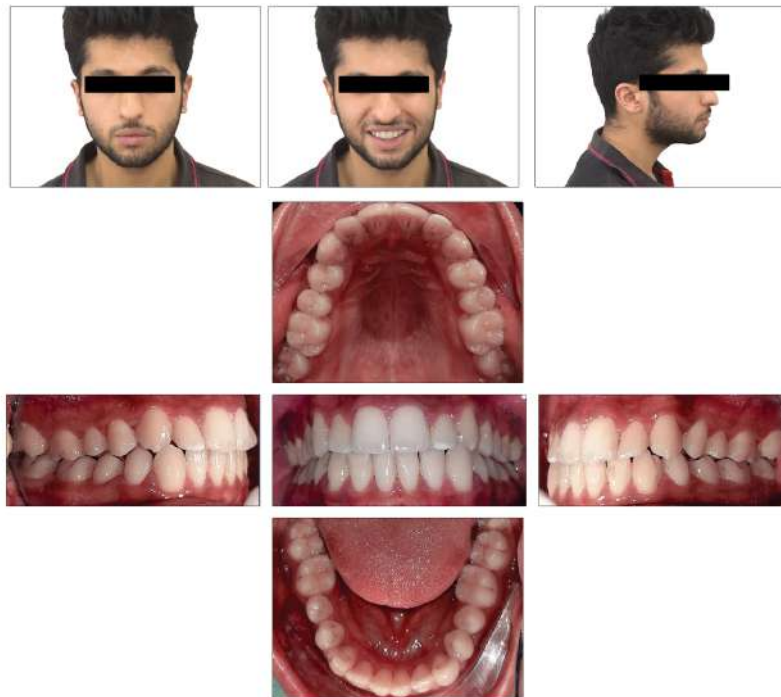


Figure 1. Pretreatment; extraoral & intraoral photographs.

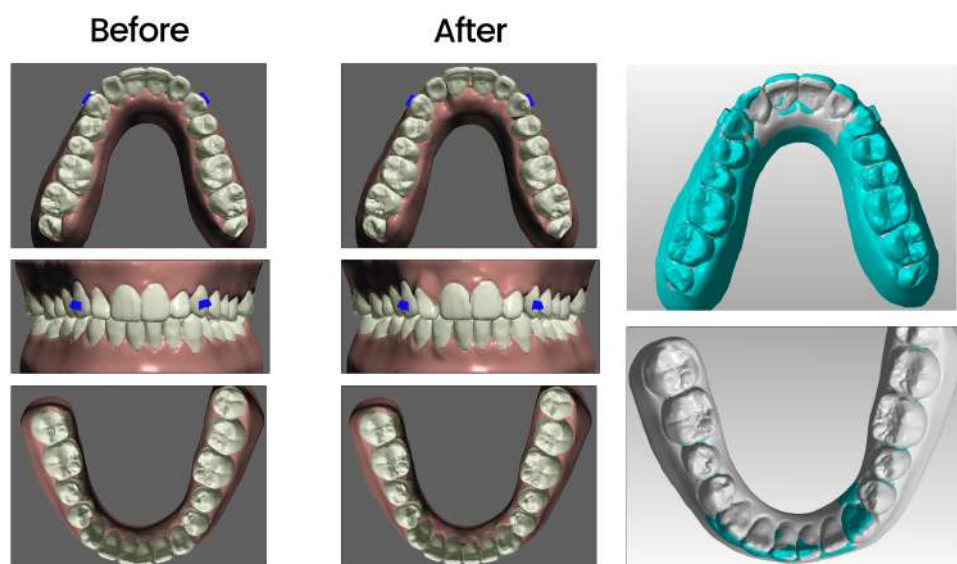


Figure 2. 3D treatment plan (a) Before & After, (b) Superimpositions.

Treatment progress

Once the treatment simulation was approved, instruction forms (Figures 3 and 4) were provided by the aligner manufacturer, along with 13 sets of upper aligners and 19 sets of lower aligners. Each set was prescribed to be worn for 22 hours daily over a ten-day period. The patient received detailed guidance on maintaining oral hygiene and periodontal health throughout the treatment.

To facilitate tooth movement, two extrusion attachments were placed on the upper canines using a transfer tray. The first set of aligners was then delivered, and the patient was scheduled for an interproximal reduction (IPR) appointment before transitioning to the second set.

IPR was performed in the upper arch at two sites, with 0.3

mm of enamel reduction between the central and lateral incisors, as well as between the canines and first premolars. In the lower arch, a 0.3 mm reduction was carried out at two locations: between the central incisors and between the right central and lateral incisors. The patient continued progressing through the aligner sets and was monitored every three months for periodontal health and aligner tracking, both of which remained satisfactory.

The patient demonstrated excellent compliance, resulting in successful treatment completion. At the end of the treatment, two sets of retainers were provided, with instructions to wear them full-time for the first six months, followed by night-time wear for three months, and then every other night for an additional three months.

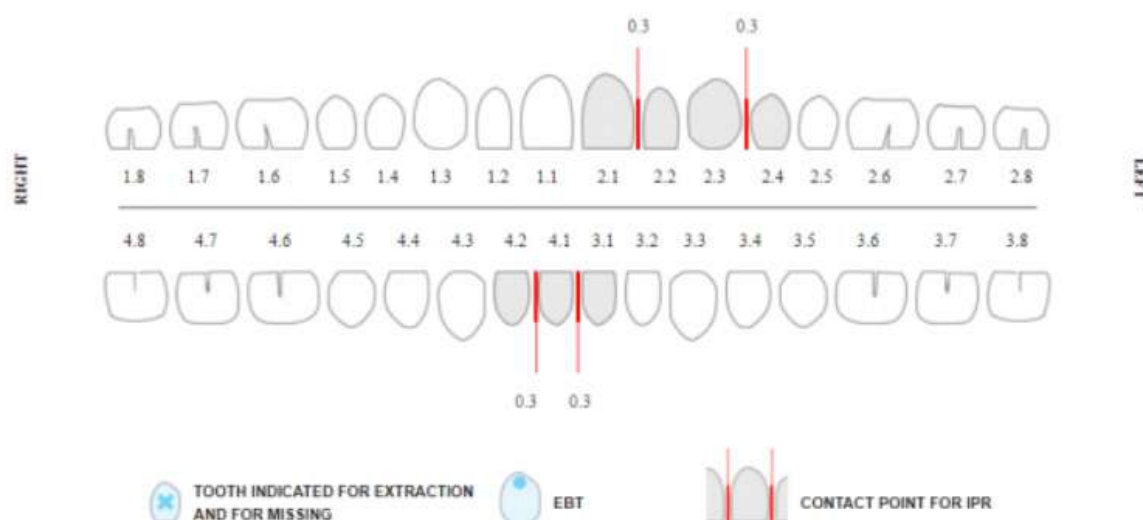


Figure 3. IPR form.

	Upper Right								Upper Left							
Stg. #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2										BTP	MTP					
3									BTP	BTR	DRO					
4								BTP	BTP	BTP	DRO					
5								BTR	MRO	DTP	DRO					
6								BTP	DTP	DTP	DTP					
7							BTO	BTP	DTP	BTO						
8						EXT	DRO			BTP	EXT					
9						EXT					EXT					
10						EXT					EXT					
11							BTO				DTO					
12							BTO	BTP	BTP							
13							BTO			BTO						

	Lower Right								Lower Left							
Stg. #	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
1																
2						BTP	BTP									
3						BTR	BTP	DTP								
4						BTP	BTP	MRO	MRO							
5							DRO	DTP	MRO	MTP						
6							DRO	DTP	MRO	MTR						
7							BTO	DTP	MTO	MTP						
8							BTO	DTP	MTO	MTP						
9							BTO	DTP	MTR	MTP						
10						BTO			MTO	MTP	MTP					
11						BTO			MTO	MTP	MTP					
12							BTP	BTP	BTP	BTP						
13							BTP		MTO		BTP					
14							DTP	DTP	MTP	MTP	MTP					
15							DRO	LTP	BTO	LTP	DRO					
16								LTP	LTP	LTP	LTP	LTP				
17								LTP	LTP	LTP	LTP	MTO	LTP			
18								LTP	LTP	LTP	LTP	MTO	LTP			
19								LTP	LTO	LTP	LTP	LTP	LTP			

Dark lines indicate that IPR need to be done on this stage before inserting aligner

*Please use EBT on specific tooth/teeth ONLY at the particular stage mentioned in MRF form.

*EBT technique has to be used wherever "EXT" code is written.

Code	Movement Detail	Code	Movement Detail	Code	Movement Detail
MTR	Mesial Translation	MTP	Mesial Tipping	DTO	Distal Torque
DTR	Distal Translation	DTP	Distal Tipping	MTO	Mesial Torque
LTR	Lingual Translation	BTP	Buccal Tipping	INT	Intrusion
BTR	Buccal Translation	BTO	Buccal Torque	EXT	Extrusion
LTP	Lingual Tipping	LTO	Lingual Torque	DRO	Distal Rotation
				MRO	Mesial Rotation

Figure 4. Movement Record Form.

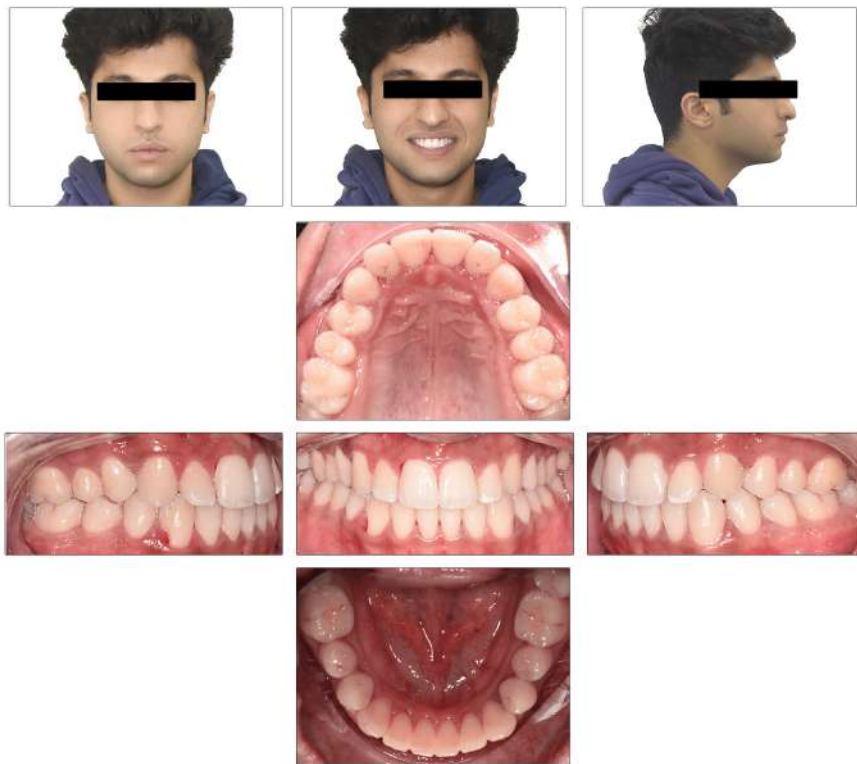


Figure 5. Post treatment records; extra oral and intra oral photographs.

TREATMENT RESULT

The treatment was completed over a period of seven months, with each aligner worn for 22 hours per day and replaced every 10 days. By the end of the treatment, the relapse had been effectively corrected, resulting in well-balanced lip competence and an optimal interlabial gap. The final outcome included achieving a proper overjet and overbite, ensuring ideal tooth alignment and bite function (Figure 5).

Furthermore, the maxillary and mandibular arches were successfully aligned, enhancing both the aesthetic and functional aspects of the patient's smile. Periodontal health was closely monitored throughout the treatment, with no signs of gum recession or periodontal pocket formation, ensuring the preservation of overall oral health.

DISCUSSION

Orthodontic relapse is a common challenge following orthodontic treatment, often resulting from inadequate retention, continued growth, and soft tissue adaptation. Studies have shown that without proper retention, relapse occurs in a significant proportion of patients within a few years post-treatment [3]. In such cases, clear aligner therapy (CAT) presents a viable alternative to traditional retreatment with fixed appliances, offering superior aesthetics, improved patient comfort, and better oral hygiene maintenance [5].

In this case, ClearPath aligners were used successfully to correct post-treatment relapse, ensuring optimal occlusion and improved dental aesthetics. The non-extraction approach combined with interproximal reduction (IPR) and arch expansion effectively addressed the patient's concerns while maintaining a conservative treatment strategy. Previous studies have reported that clear aligners can efficiently achieve minor to moderate tooth movements, making them an ideal choice for relapse cases [6].

Attachment placement played a crucial role in enhancing the effectiveness of aligner therapy, as attachments act as anchor points to facilitate complex tooth movements, such as extrusion and rotation [9]. In this case, extrusion attachments on the upper canines helped guide the teeth into their proper positions, improving the final alignment. Proper selection and positioning of attachments have been shown to significantly enhance treatment efficiency and predictability.

Interproximal reduction (IPR) was utilized to create space and resolve mild crowding. This technique is widely recognized as a conservative approach for achieving space without requiring extractions and has been successfully integrated

into clear aligner protocols [14]. The use of precise IPR gauges ensured accurate enamel reduction, minimizing the risk of excessive removal while maintaining tooth structure integrity. Research indicates that when performed correctly, IPR does not increase the risk of caries or periodontal issues, especially when fluoride is applied post-procedure [10].

Patient compliance is a critical factor in the success of clear aligner treatment. In this case, the patient adhered well to the prescribed wear schedule, leading to a smooth and efficient treatment process. Studies highlight that patients using clear aligners demonstrate higher compliance levels compared to those undergoing fixed appliance therapy, largely due to the comfort and aesthetic appeal of aligners [15]. Regular monitoring ensured proper tracking and periodontal health maintenance, with no signs of adverse effects such as gum recession or root resorption.

The post-treatment phase is crucial in preventing further relapse. The patient was provided with retainers and instructed on a structured wear schedule, which is essential for long-term stability [2]. Retainer protocols are key in orthodontic relapse prevention, with studies emphasizing that long-term retainer wear significantly reduces the risk of post-treatment changes [16].

Overall, this case highlights the effectiveness of ClearPath aligners in managing orthodontic relapse, demonstrating their advantages in providing a minimally invasive, patient-friendly, and predictable treatment option. The integration of precise digital planning, strategic attachment placement, and controlled IPR contributed to a successful outcome, reaffirming the role of clear aligners in modern orthodontic retreatment.

CONCLUSION

In conclusion, this case reaffirms the role of clear aligners as a minimally invasive and predictable approach for correcting orthodontic relapse. Their ability to provide controlled, efficient, and aesthetically favorable treatment makes them a valuable alternative to traditional fixed appliances. Long-term retention remains essential in preventing future relapse, emphasizing the importance of patient adherence to post-treatment retention protocols.

CONSENT & CONFLICT OF INTEREST

A written consent form was signed from the patient for use of the dental records for publications & social media marketing. Also, there is no conflict of interest with this paper.

REFERENCES

1. Little RM. (1990). Stability and relapse of dental arch alignment. *Br J Orthod.* 17(3):235-241.
2. Johnston LE Jr. (2002). Growth and the class II patient: The untold story. *Am J Orthod Dentofacial Orthop.* 121(6):566-570.
3. Renkema AM, et al. (2018). Stability of orthodontic treatment outcomes: A systematic review. *Eur J Orthod.* 40(5):546-553.
4. Janson G, et al. (2003). Occlusal changes during and after orthodontic treatment. *Am J Orthod Dentofacial Orthop.* 124(2):145-153.
5. Rossini G, Parrini S, Castroflorio T, Deregibus A, Debernardi CL. (2015). Efficacy of clear aligners in controlling orthodontic tooth movement: a systematic review. *Angle Orthod.* 85(5):881-889.
6. Kuncio D, et al. (2007). Invisalign and traditional orthodontic treatment post-treatment changes: A comparative study. *J Clin Orthod.* 41(3):303-309.
7. Kesling HD. (1945). The philosophy of the tooth positioner. *Am J Orthod.* 31(6):297-304.
8. Elkordy SA, et al. (2020). Efficiency of ClearPath aligners in orthodontic treatment: A clinical perspective. *J Clin Orthod.* 54(7):405-412.
9. Kravitz ND, Kusnoto B, BeGole E, Obrez A, Agran B. (2009). How well does Invisalign work? A prospective clinical study evaluating the efficacy of tooth movement with Invisalign. *Am J Orthod Dentofacial Orthop.* 135(1):27-35.
10. Zachrisson BU. (2004). Interproximal enamel reduction: indications, limitations, and long-term effects. *World J Orthod.* 5(2):67-73.
11. Sheridan JJ. (1985). Air-rotor stripping. *J Clin Orthod.* 19(1):43-59.
12. Simon M, Keilig L, Schwarze J, Jung BA, Bourauel C. (2014). Treatment outcome and efficacy of an aligner technique—regarding incisor torque, premolar derotation, and molar distalization. *BMC Oral Health.* 14(1):1-8.
13. Kravitz ND, Kusnoto B, BeGole E, Obrez A, Agran B. (2009). How well do clear aligners move teeth? A prospective clinical study evaluating Invisalign. *Am J Orthod Dentofacial Orthop.* 135(1):27-35.
14. Castroflorio T, Garino F, Lazzaro A, Debernardi CL. (2013). Upper-incisor root control with Invisalign appliances. *J Clin Orthod.* 47(6):346-51.
15. Boyd RL, Miller RJ, Vlaskalic V. (2000). The Invisalign system in adult orthodontics: mild crowding and space closure cases. *J Clin Orthod.* 34(4):203-212.
16. O'Rourke N, et al. (2016). The effectiveness of orthodontic retainers in maintaining treatment results: A systematic review. *Eur J Orthod.* 38(6):552-558.