Traumatic Bite Resolution Using Kline Clear Aligners

Srishti Bhatia[1], Gurkeerat Singh[2]

ABSTRACT

Clear aligners have been conventionally used for the correction of mild to moderate malocclusions. Advances in technology have enabled them to successfully correct complex malocclusions such as open bite, deep bite and severe rotations as well. A case report has been presented here showing management of deep bite using clear aligners with temporary anchorage devices.

Keywords: Clear aligners, K Line, Deep bite, Intrusion

INTRODUCTION

Today, increasing numbers of adults have become conscious about the appearance of their teeth and hence are more willing to undergo orthodontic treatment to achieve that perfect smile1. However, they are not very intent on getting traditional fixed appliance therapy due to the considerable visibility of wires, bands and brackets. Clear aligner therapy is a relatively newer technique which makes it possible for orthodontists to offer adult patients an esthetically agreeable solution.

Clear aligner therapy uses a computer assisted technology to pre plan movements, divide the total movement into smaller segments and fabricate a series of clear plastic appliances. A polyvinyl siloxane impression of the arches or a dental scan of the same is required to be recorded and sent to the laboratory. The laboratory then uses a software to plan the final treatment result and divides the planned movement into multiple stages. Aligners are formed for individual stages and sent back to the clinician. These are then delivered to the patient.

CASE REPORT

A 20 year old male patient reported with the chief complaint of malaligned upper front teeth (Fig1). Clinical examination revealed retroclined upper central and lateral incisors with Angle's Class I molar relation and Class II canine relationship (end on) on right and left side. The upper right first premolar was in scissor bite. The overbite was 120% with the upper central and lateral incisors contacting the gingiva on the labial side of lower incisors. A backward path of closure due to the severely retroclined upper incisors was suspected. The treatment plan primarily involved intrusion of the upper incisor and simultaneous correction of their inclination to open the bite. Since the patient was esthetically concerned, K Line clear aligners coupled with anterior temporary anchorage devices for intrusion were proposed as a treatment option to the patient to which he readily agreed. The correction of the scissor bite was not a part of the treatment plan as the patient was very specifically concerned about the upper anterior teeth and did not want to add to his treatment duration.

His initial records were made using polyvinyl-siloxane impression material and uploaded on the K Line portal. A 3D simulation of the treatment progress was presented and the treatment outcome was predicted. Attachments were placed on the maxillary and mandibular first premolars and the lower first molars. Interproximal reduction (IPR) was done in the upper and lower arch according to the presented IPR estimate sheet. The received aligners had crescent shaped cuts on the gingival margins of upper central and lateral incisors to facilitate bonding of composite buttons on the gingival third of these teeth. Temporary anchorage devices (TADs) measuring 1.5mm in diameter and 6mm in length were inserted between the roots of central and lateral incisors at a level of 6mm above the gingival margin. The patient was instructed to wear clear intra oral elastics exerting an intrusive force of 50gm per side (Fig 2). Aligners were given to the patient at one week interval for the first month followed by two week intervals for the rest of the duration. The treatment took 8 months to open the bite to a clinically acceptable level. 3mm of lower incisors could be seen at this stage (Fig 3). Due to the intrusive force some rotations were seen in the upper anterior teeth. Polyvinylsiloxane impressions were again made and sent to K Line for refinement aligners. The rotations were corrected in the next four months. This treatment delivered an esthetically pleasing smile to the patient. The position of the posterior teeth remained unchanged and class 1 molar relationship was maintained while the anteriors were intruded to open the bite and their inclination got simultaneously corrected. Class I canine and molar relation was obtained on the left and right side. Bonded lingual retainer (BLR) was placed in both the arches at the end of the treatment.

1. Dr. Srishti Bhatia *- Post Graduate Student, Dept. of Orthodontics, SRCDSR, Faridabad*

2. Dr. Gurkeerat Singh *- Professor and HOD, Dept. of Orthodontics, SRCDSR, Faridabad*

The patient was satisfied and happy to have received an esthetic as well as comfortable solution to align and intrude the anterior teeth without braces (Fig 4).

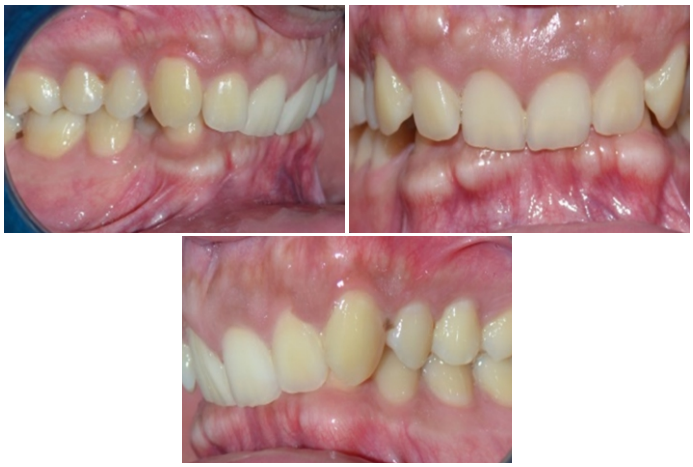

Fig.1: Pre-treatment photographs

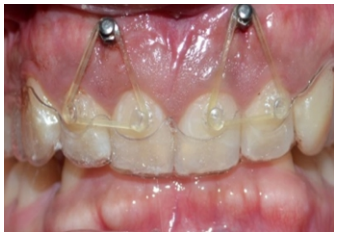

Fig.2: Treatment with aligners and temporary anchorage devices

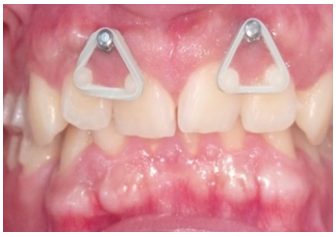

Fig.3: Post intrusion photographs with mild rotations in the upper anterior segment

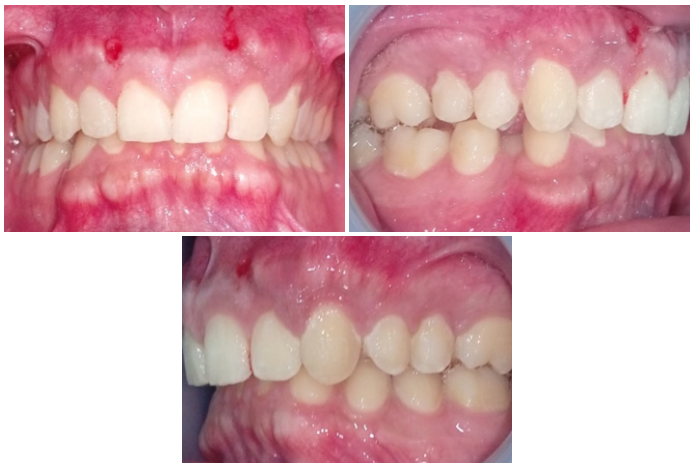

Fig.4: Pre-treatment photographs

DISCUSSION

Although clear aligner therapy was initially introduced for correction of mild to moderate malocclusions, several studies and case reports have proved them to be capable of correcting moderate to severe malocclusions as well. Various creative adjuncts have been proposed over the years to aid in correction of complex malocclusions.A huge advantage of the clear aligner therapy, apart from being esthetic, is that it can be clubbed with various other techniques such as TADs to provide excellent results. In this study, intrusion of upper anterior teeth was undertaken and successfully achieved using a combination of clear aligner therapy and TADs. It took a time period of about 8 months for intrusion followed by 4 months to achieve proper alignment of teeth.

Thiscase presented here shows the efficacy of clear aligners in correcting moderate to severe malocclusions. Boyd et al have presented a case series showing successful management of complex malocclusions using InvisalignTM system.In the above case, Kline clear aligners have been used for the same. Appropriate case selection is very important for successful case management with clear aligner therapy. Severe rotations, deep bite, open bite, extraction cases were considered difficult malocclusions to be corrected with clear aligner therapy. The above case report has shown aligners to be a viable modality for deep bite correction.

CONCLUSION

This article presents the use of newer technology of clear aligners in the management of more difficult cases such as intrusion and rotations which were earlier perceived to be impossible with clear aligner therapy.

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Address for correspondence :

Dr. Srishti Bhatia
A1/260 2nd floor
Janak Puri, 110058
M.:+91-9711495014
E-mail: srishti.bhatia.18@gmail.com