

The Benefits of Using Invisalign Clincheck Tools to Achieve Physiologically Possible Outcomes - Case Report of Three Distinct Clinical Situations

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Abstract

Using Align technology™ tool, the Clincheck, it is possible to create and refine treatment plans with complete control over the process. If used effectively, very few written instructions are required to develop a Clincheck. This removes a common problem for dentists, communication with the technician. This article demonstrates that 3 challenging different clinical situations were effectively approached and the treatment programmed. Although this requires a learning curve and some commitment by the professionals the results are very promising.

Three case reports illustrate the amount of possible expansion with Invisalign. The patient's selection included anterior crossbite, openbite and posterior crossbite. The final stable occlusion obtained in all cases was esthetic, functional and healthy.

Keywords: Clincheck Tools; Crossbite; Openbite

Introduction

It is evident that there are a variety of malocclusion and health concerns that can be treated by orthodontic therapy. Factors from treating systemic issues to minor tooth movement can be addressed specifically to the patients' needs and desires. It is important to be aware that orthodontics can improve one's quality and longevity of life, but that the knowledge of current orthodontic therapy treatment modalities available and its tools will enhance the overall comprehensive care the patient receives.

The maxillary deficiency in the transverse plane

Maxillary constriction, is considered one of the most common orthodontics problems. The main etiologic factors of this deficiency are mouth breathing, harmful habits, like thumb sucking and/or pacifiers, and atypical phonation and swallowing. The passage of air through the nostrils, purified and warmed by the nasal hair, and the contact of the dorsum of the tongue at rest with the palate are the major stimuli of transverse growth of the maxilla during the craniofacial developmental period. The poor positioning of the tongue, the imbalance of perioral muscles, the lack of lip seal, together with the labial hypotonicity, contribute to maxillary constriction.

This could be accompanied by unilateral or bilateral posterior crossbite, narrow nasal cavity, and dental crowding. Posterior expansion is the most prevalent malocclusion [1].

The maxillary constriction affects most of the orthodontic patients and is one of the most prevalent malocclusions in the orthodontic practice. This is also because it is generally associated with other types of malocclusion such as Class II and III.

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Maxillary constriction treatment is essential for the success and continuity of treatment of these associated malocclusions. Usually the maxilla must be "prepared" to receive the mandible, unlocking the occlusion and its functions.

The Invisalign treatment give the possibility to utilize the Clincheck tools to address the patients' problems and very important, the patients chief complain.

The more effort we put on the treatment planning at the beginning, better results we get at the end.

The Clincheck should be modified as much as necessary.

With Invisalign Clincheck it is possible to compare Stage 0 on the first Clincheck with Stage 0 on the finish Clincheck, in that manner, predict the desirable outcome. Determine the desirable outcome to physiologically feasible. Biology always dictates the tooth movement treatment and the treatment plan. You can also compare the last stage of the first clincheck with the stage 0 of the finish clincheck; this give you answer on the patient compliance, the accuracy of the predictive movement.

This article describes three adult patients with complex malocclusions who were treated with Invisalign, the Clincheck tools were used to help elaborate the suitable treatment plan.

Case 1

A 35-year-old female presented with the chief complaint: "I don't like my smile, the space in the front". Clinical examination showed a Class I molars relationship, associate with a severe anterior crossbite in centric occlusion, V-shaped dental arches with severe maxillary and mandibular crowding, 2 mm Overjet and a 2.5 mm Overbite. The upper midline was on, but the lower midline was shift to the right about 3.5 mm.



Figure 1

The treatment objectives were to maintain the Class I molar relationship through a combination of expansion, proclination and small interproximal reduction using the Invisalign System.

The patient changed the aligners every ten days. After 30 months, the occlusion was well aligned.

Using the grid tool and the clincheck we can appreciate the amount of expansion we gained.

The figure 2 represents the stage 0 of the first clincheck.

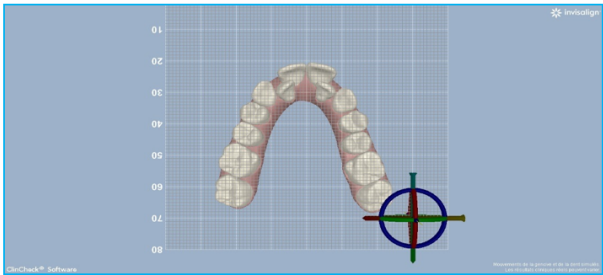


Figure 2

The figure 3 represents the stage 0 of the last refinement.

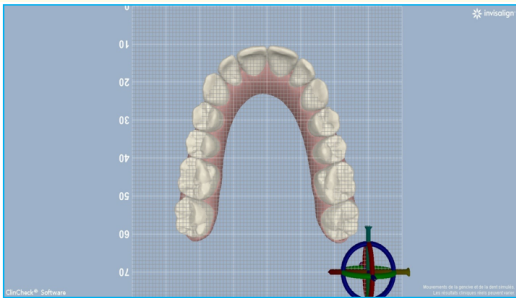


Figure 3

The distance between the two lateral incisors was almost 6 mm before treatment and became almost 15 mm before the last refinement. The distance between the two first upper molar before treatment was 23 mm, almost 28 mm before the last refinement. It was possible to obtain 9 mm expansion between the lateral incisors and 5 mm expansion was gained between the first molar.



Figure 4

The figure 5 represents the prediction treatment and in this case the prediction is comparable with the result.

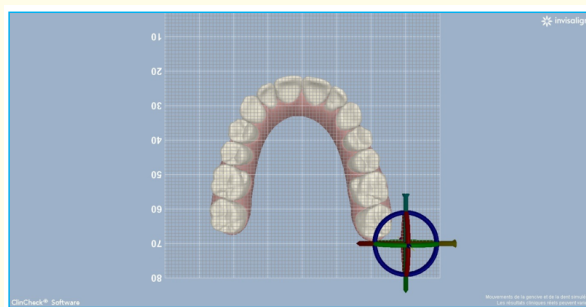


Figure 5

Case 2

A 43 years old female presented with a Class I associated to an open bite with constricted palate.



Figure 6

The orthodontic treatment goal included closing the open bite, expanding the upper and lower arches, and correcting the light crowding.

All treatment goals were achieved over a 24 months' period with of Invisalign treatment. Both arches were expanded and the open bite was corrected.

The figure 7 represents the stage 0 of the first treatment.

The figure 8 represents the stage 0 of the last refinement.

Prior to the treatment the distance between the two upper cuspids was 21 mm and 32 mm between molar and before the last refinement 23 mm and 35 mm respectively.

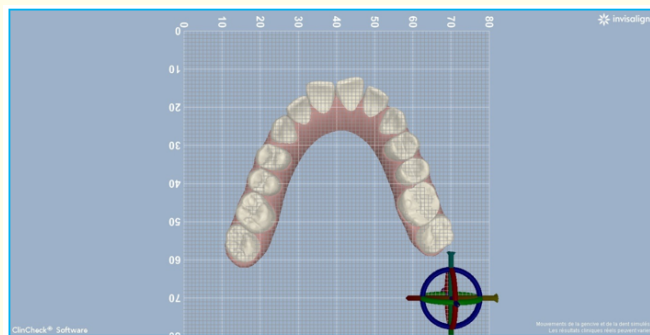


Figure 7

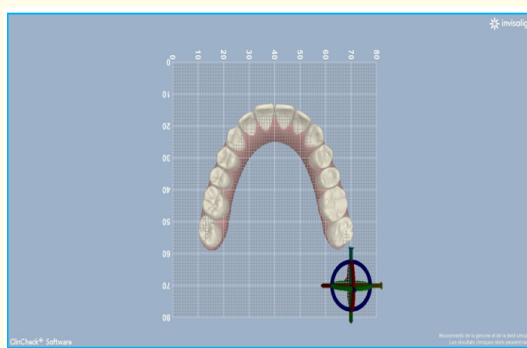


Figure 8

The periodontal health was well preserved after the planned slow expansion movement.

The figure 9 represents the prediction of the first clincheck.

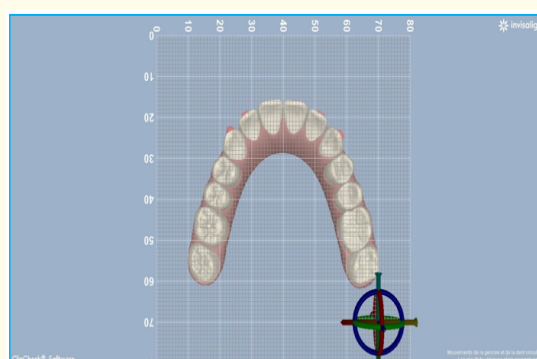


Figure 9

To accomplish the prediction two refinements were needed.



Figure 10

Case 3

A 49-year-old female presented with a Class II malocclusion, posterior crossbite on the right and mild lower crowding. The patient also presented a 1.5 mm upper midline shift to the left.

The chief complain involved the crossbite and the anesthetic smile with of the front upper teeth.

The treatment objective was to correct the posterior crossbite, the lower crowding and finish with a nice smile line.



Figure 11

After 31 months of treatment, both arches were leveled and aligned; the Class II and the midline were corrected and a pleasant well-balance esthetic smile line was achieved.



Figure 12

The figure 13 represents the stage 0 of the first clincheck.

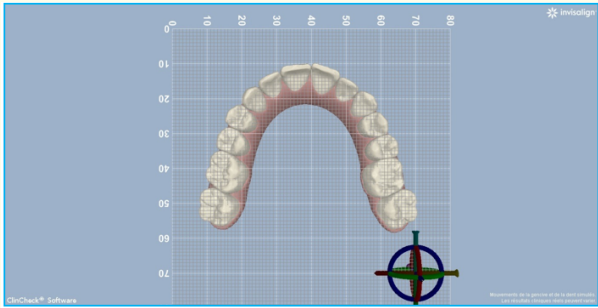


Figure 13

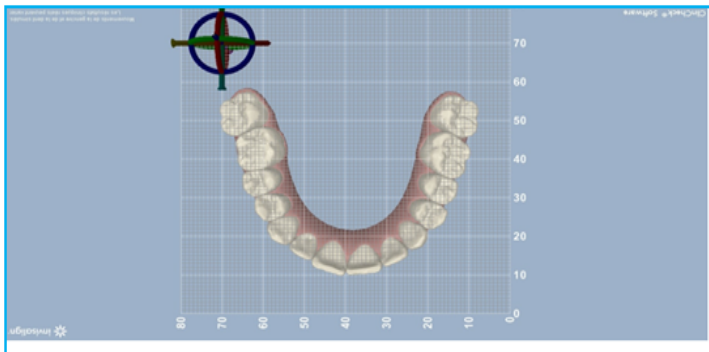


Figure 14

The figure 15 represents the stage 0 of the last refinement.

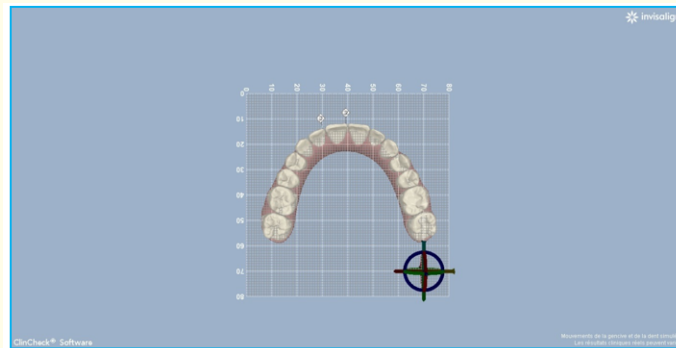


Figure 15

Before treatment the distance among the two upper cuspids was 24 mm followed by a 32 mm distance on the first molars. Before the last refinement a 2.5 mm expansion was accomplished on the cuspids and an 8 mm for the molars, resulting on a 26.5 mm and 40 mm distance respectively.

Although a significant expansion was performed on the upper first molars the periodontal tissue was perfectly healthy and an attractive smile was created.

Discussion

In order to establish health maintainable aesthetic functional outcomes, the use of Invisalign treatment in adults has shown effective results despite complex orthodontic cases involving mild to severe crowding, deep bites, open bites and posterior crossbite [2]. Rapid and slow maxillary expansion showed similar stability in the long-term [3]. Mobrici., *et al.* demonstrated that slow maxillary expansion can be regarded as an efficient device and a helpful alternative in the treatment of the transverse maxillary deficiency in adults, giving increased space in premolar area, minimum molar tipping, expansion of alveolar processes and non-clinical negative effects on periodontium. In the future, aligners are likely to be used in even more complex cases involving rotations, deep overbite, open bite and unusual extractions [4-8].

Conclusion

The primary goal of cosmetic dental rehabilitation is to reestablish the harmonious relationship between intraoral and orofacial features for an otherwise debilitated dentition. To this end the utilization of modern technology, taking advantage of Invisalign tool-grid to carry out a comparison between clincheck prediction and final outcome, can easily and effectively be achieved, and confer the orthodontist the chance to perform any additional adjustments if necessary.

Working with modern technology and solid biological basis it is possible to provide patients with a smile they deserve and desire.

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