



Techniques for Deep Bite Correction with Invisalign®

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Treatment Applicability

Like extrusion and treating anterior open bites, correcting deep overbites with aligners has evolved from thinking it was a clinical impossibility to a predictable clinical challenge, provided it is designed properly on the ClinCheck® treatment plan. As with any treatment planning, a proper understanding of the etiology of the deep overbite is important, as well as the type of patient you are treating: adult versus teenager.

Adults tend to have lingually tilted and super-erupted lower anterior teeth creating a two-step occlusal plane from the anterior to the posterior teeth. Many times this is combined with lingually inclined upper anterior teeth as well. Often there is excessive wearing of the incisal edges. In a sense our goal is to reverse what has gradually happened over time keeping in mind any restorative treatment plan that may be involved. Transversely, adults tend to have teeth lingually inclined as well, thus uprighting clinical crowns and improving the curve of Wilson tends to help overbite correction.

Teens tend to have deep curves of Spee that can be leveled in a similar fashion as with fixed appliances. Sometimes this is also accompanied with lingually inclined upper anterior incisors. There is luxury of differential growth of the jaws and vertical facial growth that we can use to our advantage when correcting a deep overbite with teens that we do not have with adults.

Protocol for Leveling the Curve of Spee

I communicate to level the curve of Spee by intruding the lower incisors and extruding the lower bicuspid with horizontal beveled gingival attachments on the bicuspid. Simultaneously, I intrude and torque upper anterior teeth with Power Ridges. It is a must to apply 10-15 degrees of lingual root torque to the upper anterior during space closure to avoid tipping upper anterior teeth lingually which would deepen the overbite again or create anterior interferences and posterior open bites. This best mimics a slightly curved edgewise wire binding in the slot when power-chaining molar to molar. These are the small interactions we take for granted with fixed appliances that we do not even think about, but fail to translate this language of fixed appliances to the lexicon of aligner therapy. I have several teen cases showing correcting a 95-100% overbite in under a year. What makes my protocol slightly different is my active extrusion of the lower bicuspid in addition to the lower anterior intrusion.

Special Instructions to create the ClinCheck Treatment Plan:

- Level curve of Spee by extruding the lower bicuspid at the rate of 0.15 mm per stage for a total of 3 mm and by intruding the lower cuspid to cuspid a total of 4 mm.
- Attachments on lower bicuspid: horizontal rectangular beveled gingival: 4 mm wide, 1.5 mm high, 1.25 mm thick at the occlusal margin tapering to a thickness of 0.25 mm at the gingival margin. Place as far occlusally without any interferences with the opposing arch.

Think about putting a reverse curve in a lower arch wire. When you remove it after being in a few weeks it is still convex and the lower arch is still slightly concave. Furthermore, when the wire is removed from the anterior brackets it goes below the brackets into the vestibule. Is this considered excessive? No. Then asking for a similar amount of movement in a ClinCheck treatment plan should not be either. Like a wire has flexibility so does an aligner that is why it will snap and fit over the clinical crowns despite what is present on the ClinCheck treatment plan. Why slow the rate down to 0.15 mm from default of 0.25 mm in this particular case? Simply to make sure we do not go past the physiologic tolerance of the PDL during extrusion to avoid lack of tracking within the aligner.

It is my opinion that the described attachments on the lower bicuspids give the maximum amount of surface area to push against when attempting this extrusion as the broad surface of the attachments are as perpendicular as possible to the vector of force acting on the tooth - in this case pushing the tooth up for extrusion. Finally, it creates a contrasting angle to that of the lingually inclined clinical crown so my pushing vectors of force would not skip off the tooth and if there is slippage between the attachment surface and aligner, there is tolerance built in to continue pushing the tooth in the desired direction. How would the force vector interact with the buccal surface of the clinical crown without the attachment? They would skip right off the crown and the teeth would not be extruded.

Benefits of Using Invisalign for Deepbites

The advantage that aligners have over fixed appliances is that you can start correcting the overbite on both arches from the beginning rather than wait 4-6 months to bond the lower arch after the upper teeth have been flared/intruded to open the bite or bond bite ramps, bond occlusal surfaces or use bite ramps that may prove uncomfortable for patients or require extra clean up at some point in the future.

Tip for Predictable Results

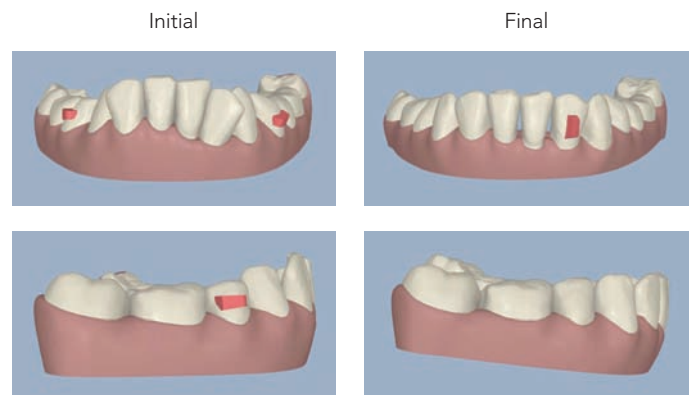
In the lower anterior there is intrusion and 'relative intrusion' to help correct the overbite. In the upper, there is intrusion and torquing of the incisors that are useful in correcting the overbite; Align's protocol will automatically add attachments on teeth that

are adjacent to the teeth that are intruding. In the lower buccal segments there is extrusion of the bicuspids with simultaneous intrusion of the lower anterior to help level the curve of spee to help correct the overbite. This seems more predictable with teens in comparison with adults and interestingly I find the same phenomenon with fixed appliances when attempting to level the curve of Spee.

Conclusion

The 'Deep Bite Fright' need no longer exist for teen or adult patients when considering treatment with Invisalign, provided that we take the time to focus on the etiology of the deep bite. Think about how you accomplish the corrective mechanics with fixed appliances and design your ClinCheck treatment plan to do the same while taking into account how the pushing plastic is interacting on your clinical crown and translates to the root. In doing so I have found that using aligners for correcting deep overbites is my preferred appliance system as cases tend to treat out faster than with traditional fixed appliances as we are able to start the correction on both arches from the beginning without using auxiliaries.

Case 1: Adult



Initial



Refinement: 11 Months of Treatment



Final: 16 Months of Treatment



Case 2: 14 Year Old

Initial



Final: 11.5 Months of Treatment



18 Month Retention



To learn more about Deep Bite clinical techniques, watch the Ask the Expert webinar by Dr. Nicozisis and Dr. Gierie at www.AligntechInstitute.com/ATE/05-25-12

Disclosure: Dr. Nicozisis was provided an honorarium from Align for his presentation. The statements, views and opinions expressed in this presentation are those of the author, and do not necessarily reflect the views and opinions of Align Technology, Inc.