In the past deep bites have been a challenge to treat with occlusal coverage appliances like Invisalign.® The transient posterior intrusion that we often see with posterior occlusal coverage leads to autorotation of the mandible. This has the effect of bringing the lower incisors forward and superior resulting in more overbite than was seen in the ClinCheck®. However, if we can learn to mitigate the transient posterior intrusion inherent in aligners, we can begin to level the lower arch earlier with Invisalign than with braces. This may result in shorter treatment times to open a deep bite with aligners than with fixed appliances.

**Tip 1: Deep Bites Can Be Corrected with Relative Posterior Extrusion or Absolute Anterior Intrusion**

Facial esthetic factors such as face height, mandibular plane angle and incisor exposure at rest and smile help determine which technique or combination of techniques you will employ. First, determine if incisor display is adequate or excessive. Then, look at the face height and curve of Spee and optimize your strategy based on this information. For example, in a patient with excessive incisor and gingival display with a high mandibular plane angle, you would not want to open the bite with absolute or relative posterior extrusion. Absolute anterior intrusion would make sense here and would improve anterior esthetics.

**Tip 2: If You Are Planning on Absolute Anterior Intrusion Decide if It Should Be the Upper, Lower or Both Arches and Add Virtual Bite Ramps to Assist the Intrusion**

Virtual bite ramps are linguually placed 1-2 mm thick horizontal rectangular attachments, horizontal gingival beveled attachments or vertical rectangular attachments. Align’s default is the horizontal beveled attachment. Virtual Bite Ramps are never bonded to the teeth but act as a bite ramp when the patient has the aligners in place. By discluding the posterior teeth they prevent transient posterior intrusion. The amount of overjet will determine how thick you make the virtual bite ramps and whether you use horizontal or vertical orientation.

**Troubleshooting Tip:** If the patient has a large overjet, their lower incisors will not contact the Virtual Bite Ramps and you will not see the same bite opening effect. Mandibular advancement, class II elastics and upper IPR can all reduce overjet to allow contact with the virtual bite ramps. Vertically oriented bite ramps will follow the lingual slope of the upper incisors and will allow earlier contact with the bite ramps in those patients with large overjets. Be aware that some SmartForce® features such as the lingual Power Ridges on maxillary incisors can interfere with virtual bite ramps if they occupy the same spot on the aligner. In the case of a conflict, you need to decide which is more important in that particular case and remove the conflicting feature.
Tip 3: Clincheck Will See the Virtual Bite Ramp as a Collision Between an Attachment and the Lower Incisors but Clinically the Virtual Bite Ramps Will Disclude the Posterior Teeth

Virtual bite ramps eliminate transient posterior intrusion, disclude posterior teeth to aid crossbite correction, add intrusion force to lower incisors and may cause a slight clockwise rotation of the lower occlusal plane.

Tip 4: Adding Bite Ramps During Treatment

If you find yourself in need of a bite ramp during treatment and you didn’t build it into the ClinCheck treatment plan, you can add bite ramps to an aligner with the Bite Plane Plier invented by Dr. Keith Hilliard. If you need to add a bite ramp to a vacuum formed retainer, the Orthoarch mini mold anterior bite ramp can be used. Adding bite planes to aligners can be helpful if the clinician is having trouble opening the bite, notices transient posterior intrusion or has a patient who is clenching excessively on the aligners (headaches etc.) If the patient is a severe clencher they can crush the thermoformed bite planes so in this case they can be reinforced with composite. This doesn’t seem to happen with factory made virtual bite ramps since they are full thickness plastic.

Treatment Applicability: Virtual Bite Ramps are useful for any patient with a deep bite who needs relative extrusion or absolute anterior intrusion. They are also useful in the normal overbite patient where transient posterior intrusion and posterior open bite is a concern. The only real contra-indication to using Virtual Bite Ramps would be an open bite patient where you would like some posterior intrusion. In this case the virtual bite ramps would prevent the posterior intrusion.

Communicating with Technicians: Simply ask for virtual bite ramps and specify you want horizontal or vertical, rectangular or beveled, thickness (in mm) and where you would like them placed. An example would be, “Please place 1.25 mm thick gingival beveled virtual bite ramps on the lingual of the U2-2. Please place 1 mm from the incisal edge of the U1’s.”

Reviewing ClinCheck Treatment Plans for Deep Bite Cases:

When reviewing ClinCheck treatment plans make sure you are getting the type of movement you want based on your evaluation of the patient’s esthetics. Relative posterior extrusion or absolute anterior intrusion or a combination of the two are possible to certain degrees with aligners, so make sure you are getting what you requested by carefully reviewing the ClinCheck treatment plan. On patients who have a short lower face height, low mandibular plane angle, excessive maxillary incisor display and supra-erupted lower incisors you may need to employ both techniques to open the bite effectively. Generally, Dr. Gierie will overcorrect a deep bite by 1 mm by placing the bite ramps 1 mm from the incisal edge of the U1’s. The ClinCheck treatment plan will actually show normal 2-3 mm of overbite but clinically you will get a little overcorrection. Remember, you are in control of what happens and you are prescribing the movement.

Managing Patient Expectations: It is better to include the virtual bite ramps from the beginning of treatment so the patients will get used to them right away. Some patients will experience speech disruption for a day or two if you add bite ramps to their aligners but this is similar to them getting used to speaking with their initial set of aligners. In bruxers or clencher that had improvement of their symptoms with virtual bite ramps built in to their aligners, it’s a good idea to continue them in their retainers.