We all know that not all deep anterior overbite cases are alike. Before we can decide the mechanics and treatment plan that we would like to employ, we must consider factors including the patient’s age, skeletal type, smile line and degree of crowding. For example, if a patient has a dental deep bite, but still displays excessive gingiva upon smiling, the treatment goal would be to intrude the upper anterior teeth more than the lower anterior teeth when leveling the arch. If a patient is also dental Class II, consideration needs to be given to the effect that Class II elastics will have on the anterior teeth. We will address these typical issues later in this paper.

This paper compares and contrasts the treatment approaches for two young, growing patients who both have deep bites, but have different skeletal and esthetic concerns. This paper also shares tips for setting up ClinCheck treatment plans, particularly highlighting the application of Invisalign® G5 clinical innovations for deep bite.

CASE PRESENTATION 1: PATIENT GB

The first patient we will study is GB, a 13.5 year old male who presented with a moderate Class II malocclusion, accompanied by a deep overbite and excessive maxillary gingival display.

Treatment Goals and Approach

- To alleviate the maxillary gingival display and address the deep bite, level arches by intruding the upper anterior teeth more than the lower anterior teeth
- To finish with ideal anterior guidance, achieve adequate torque in upper incisors
- To discocclude the posterior teeth, and aid in maxillary incisor intrusion by exerting more intrusive force on upper central incisors than lower incisors, use Precision bite ramps on upper central incisors
• Procline first, then intrude, then retract as needed to push along the long axis of the tooth. By pushing directly along the long axis of the tooth, all force from the aligner is directed in a purely intrusive vector, making the intrusion much more efficient.

• To achieve the A-P correction needed to put the patient in full Class I occlusion, plan to use Class II elastics

**SETTING UP THE CLINCHECK® TREATMENT PLAN TO ACHIEVE THE TREATMENT GOALS**

1. **Indicate Both Upper and Lower Intrusion**

To improve the deep bite, in the prescription form on question 7, I indicate both upper and lower intrusion.

**B, G**

7. **Overbite**

- Correct deep bite
  - Intrude anterior teeth only
    - Upper
    - Lower
  - Intrude anterior teeth and extrude premolars
    - Upper
    - Lower
- Other (e.g. surgical simulation) specify in Special Instructions

**Figure 1.** Both upper and lower intrusion selected

Besides adding aligner features called pressure areas to more efficiently intrude the anterior teeth, this selection on the prescription form will automatically trigger the placement of SmartForce® deep bite attachments on bicuspid to aid in aligner retention. The intrusive force of the aligners on the incisors produces an extrusive force on the posterior teeth, tending to dislodge the aligners. The deep bite attachments on the bicuspid will keep the aligners firmly engaged on the teeth.

I also build in over-treatment of deep bite in the ClinCheck treatment plan. It has been my experience that the final clinical overbite at the end of treatment will typically be 2 mm deeper than what the ClinCheck treatment plan indicates. Therefore, I set up the treatment plan to intrude the anterior teeth 2 mm beyond ideal so that the correct amount of intrusion will express in the patient’s mouth. To help the technician understand that I want more upper intrusion than lower, in the special instructions, I ask the technician to “set the overbite to 0.5 mm at the 1|1 and 0.0 mm at the 2|2 by intruding the upper anteriors 60%, lower anteriors 40%”. In this case, setting up minimal overbite is also crucial to resist the tendency for the bite to deepen with the Class II elastic wear.

2. **Add Precision Bite Ramps to Leverage Bite Forces**

For this case, I also ask for the new Precision bite ramps to be placed on the central incisors:

**B, G**

8. **Bite Ramps**

- None
- Place Bite Ramps on lingual of these upper teeth
  - Incisors (Caution: Bite Ramps and Anterior Intrusion features cannot co-exist on the same tooth)
    - Central incisors
    - Lateral incisors
  - Canines

**Figure 2.** Precision bite ramps added to central incisors only

**Figure 3.** An illustration showing how Precision bite ramps might look from the lingual perspective. Note that the placement of the bite ramps on the central incisors will override the placement of the pressure areas on those teeth, as both features cannot be placed at the same time.

By using the Precision bite ramps on the upper incisors, I am making sure that I get the needed differential intrusion. The pressure areas do make intrusion more efficient. However in this case, due to the gingival display, I want to make sure that the upper central incisors are intruded preferentially over the lower incisors. The Precision bite ramps exert more pressure directly on this area of concern by using the forces of the patient’s occlusal forces in addition to the forces of the aligner by itself.

3. **To Achieve Ideal Torque at the End of Treatment, Over-Treat Torque**

When the patient presents with lingually tipped incisors, it is my experience that the final torque is typically 10 degrees less than the ClinCheck treatment plan predicts. This is analogous to the torque in fixed appliances not ever being fully expressed by the bracket. I therefore instruct the technician to “labially crown-torque the upper 1|1 10 degrees beyond ideal” in the “Special Instructions” section of the treatment form. This will ensure that I will have adequate torque in the upper incisors to prevent excessive anterior guidance and a possible posterior open bite.
4. To Correct the Overjet and Address the A-P Discrepancy, Apply Class II Elastics

Class II elastics will tend to tip the upper incisors lingually, as well as to extrude them. Fortunately, this side-effect is much less severe than seen with fixed appliances, due to the occlusal coverage of the aligners, along with more secure fit of the aligners against the labial and lingual surfaces of the teeth. By asking for increased labial crown torque and a minimal overbite in the ClinCheck treatment plan, I will end up with ideal torque and overbite at the end of treatment.

Now let's compare a second patient's treatment plan to GB's.

CASE PRESENTATION 2: PATIENT RW

Patient #2 is a 13 year old male who presented with a Class I malocclusion accompanied by a moderately deep overbite and anterior spacing in both arches.
2. Setting the Overbite

For both patients, I asked for the overbite to be set at 0.5 mm at the 1|1, again assuming that over-treating the overbite in the treatment plan will result in an ideal finish.

![Figure 9. Over-treatment of the overbite seen in the last stage of treatment](image)

Case #2's incisor torque should also be over-treated like case #1 to ensure a good inter-incisal angle at the end of treatment:

![Figure 10. Incisor torque shows over-treatment in the ClinCheck treatment plan](image)

3. No Bicuspid Extrusion Requested

I did not ask for bicuspid extrusion for either patient, because they had normal mandibular planes and both patients showed either a normal amount or a slightly excessive amount of gingiva when smiling. Had either of these two case required more bite opening or had “buried” upper incisors when smiling, I would have asked for extrusion of the bicuspid to help open the bite a little more and hopefully increase the vertical height of the lower face.

Retention

Both patients were retained in Vivera® retainers. I have them made from the ClinCheck treatment plan, with just a slight amount of over-correction built into the prescription. (Usually, one stage of over-correction.) For example, patient #2 had a total of 24 aligners, including 3 stages of over-correction. I had his Vivera retainers made at stage 22. This assures that I have a retainer that is actually an active appliance, holding the teeth to where I have programmed them in the ClinCheck treatment plan. In particular, the patient's initial deep bite is held at the minimal overbite of 0.5 mm. I have found that the long-term stability of the treatment is greatly enhanced by utilizing a retainer that holds all of the teeth in a prescribed relationship.

Conclusion

When treatment planning a growing patient with a deep overbite, it is important to assess the patient's skeletal type, smile line, incisor torque and overbite severity. Once this has been done, the proper tooth movement mechanics can be applied. The G5 enhancements can then be applied as needed. This assures that a precisely applied anterior intrusion force as well as a precisely placed posterior extrusion force is not only attainable, but predictable.

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DISCLOSURE

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