

Invisalign treatment with mandibular advancement update: enhanced precision wings



Enhanced precision wings for Invisalign treatment with mandibular advancement

Align Technology is pleased to introduce enhanced precision wings for Class II Invisalign treatment with mandibular advancement. Enhanced precision wings for Invisalign treatment with mandibular advancement are a patient-friendly way to treat Class II malocclusions in growing pre-teen and teenage patients. The enhancements to the precision wing feature are designed to help doctors achieve the sagittal correction outcomes they need for their Class II patients. The precision wings now have three key design updates:

01



The shape of the wing is now longer than before and curved for increased durability.

02



The improved design provides greater overlap between the upper and lower wings to help patients maintain their jaw posture forward during treatment.

03



An additional rib has been added.

Comparison of the previous and enhanced precision wing design (intraorally).

Photos courtesy of Dr. Eugene Kholov (Toronto, Canada).



Previous precision wing design.



Enhanced precision wing design. The curved wing design and longer wings create more overlap and better engagement between the upper and lower arches. An additional rib is added to each wing.

Comparison of the previous and enhanced precision wing design (in the ClinCheck Pro® 6.0 set-up)



Previous precision wings design.



Enhanced precision wing design (as it appears in ClinCheck Pro 6.0 software). Wing color changed from dark blue to light blue.

**Dr. Eugene Kholov (Toronto, Canada)**

Dr. Eugene Kholov was born in Russia and moved to Canada at the age of 16. He received his degree in dentistry in 1982 and a specialty diploma in orthodontics in 1985 at the University of Toronto. He established his private practice, Orthodontically Yours (www.orthoyours.com), in 1985.

Dr. Kholov is a member of the Canadian Association of Orthodontists, American Association of Orthodontists, the Great Lakes Society of Orthodontists and the Canadian Dental Association. Since 2017, he has treated 50+ Class II patients annually using Invisalign treatment with mandibular advancement. He joined the Align Technology clinical study for the enhanced precision wings for Invisalign treatment with mandibular advancement in October 2020, and has been participating in the limited market release (LMR) since June 2021. He currently has over 80 patients under treatment with Invisalign treatment with mandibular advancement featuring enhanced precision wings.

Enhanced precision wings clinical study results (mandibular advancement phase only).

All cases shown in this clinical update are still in the finishing phases.

Case 1:

Age of patient: 11 years old

Gender: Female

Mandibular advancement phase:

- 9 months
- 32 aligners (weekly aligner changes)
- No pre-mandibular advancement aligners



Initial.



Post-mandibular advancement (the patient's treatment is still in progress).

- A-P correction to super Class I/mild Class III (may need Class III elastics during the additional aligners phase)
- Midlines centered
- Good initial alignment/space closure simultaneous with sagittal bite correction
- The posterior open bite is within the range of expected for the functional appliance phase and will be addressed with elastics to bonded buttons on the lower molars during the additional aligners phase
- The patient's treatment is still in progress

Enhanced precision wings clinical study results (mandibular advancement phase only).

Case 2:

Age of patient: 15 years old

Gender: Male

Mandibular advancement phase:

- 8 months
- 36 aligners (weekly aligner changes)
- No pre-mandibular advancement aligners



Initial.



Post-mandibular advancement (the patient's treatment is still in progress).

- A-P correction to Class I
- Midlines – lower is shifted slightly to the right
- Good initial alignment simultaneous with sagittal bite correction
- The posterior open bite is within the range of expected for the functional appliance phase and will be addressed with elastics to bonded buttons on the lower molars during the additional aligners phase
- The patient's treatment is still in progress

Case 3:

Age of patient: 10 years old

Gender: Female

Mandibular advancement phase:

- 8 months
- 32 aligners (weekly aligner changes)
- No pre-mandibular advancement aligners



Initial.



Post-mandibular advancement (the patient's treatment is still in progress).

- A-P correction to Class I
- Midlines centered
- Good initial alignment simultaneous with sagittal bite correction
- The posterior open bite is within the range of expected for the functional appliance phase and will be addressed with elastics to bonded buttons on the lower molars during the additional aligners phase
- Buttons bonded to the right canines were used with vertical elastics for extrusion (but the left side canines extruded equally well using optimized attachments)
- The patient's treatment is still in progress

Discussion

For many years, we used the bionator and twin block functional appliances for Class II correction. Along the way, we learned how to use the banded Herbst appliance, and would generally get good results. The results are never guaranteed to be 100%, but we found the Herbst to be a very reliable appliance for Class II correction that did not rely on patient wear compliance. At the same time, the metal appliance had a whole lot of moving parts that could break, and patient comfort was a bit of an issue.

When Invisalign treatment with mandibular advancement was first introduced, we liked the idea of a Class II solution integrated into a removable clear aligner, especially if the absence of moving parts in the Class II corrector could lead to fewer emergency visits for repairs. Unfortunately, in handful of cases patients were not always able to engage the wings properly, or the wings would bend if the patient bit down on the aligners in the wrong place.

Now that we have seen the improved wing engagement with the enhanced precision wing design in the clinical study, and the Class II corrections we accomplished in those participants who have completed the mandibular advancement phase of the study, our confidence in recommending this feature has gone up tremendously. We are also participating in the limited market release (LMR) for this product, and whenever Invisalign treatment is introduced to our Class II patients, this option is recommended.

Every single patient eligible to be treated with Invisalign treatment with mandibular advancement is told that this approach is the doctor's treatment of choice. Patients are still offered a choice between the Herbst appliance combined with aligners or Invisalign treatment with mandibular advancement, but we have noticed fewer patients choosing the Herbst option ever since the enhanced precision wings were introduced. Most patients choose the Invisalign treatment with mandibular advancement over Herbst for the esthetic appearance and comfort of the aligners. We feel extremely confident in recommending this solution to our Class II patients, and our patients have taken notice of our enthusiasm, so we expect a trend of increased adoption to continue.

The enhanced precision wing design can even be used to correct severe Class II patients to Class I (or to super-Class I/mild Class III) – sometimes in less than a year for the mandibular advancement phase with weekly aligner changes. We are also able to start initial alignment of the anterior teeth while the mandible is advanced, which the patients greatly appreciate, because they can start to see the differences in their smile early in treatment.

The posterior and lateral open bites we see after the mandibular advancement phase are no different than what would typically be seen during other functional appliance treatments. As such, the posterior open bite observed after the mandibular advancement phase in patients with deeper curves of Spee is also not uncommon, and Class II elastics connected to bonded buttons can be used to help extrude the posterior teeth to close the bite. Opening of the posterior occlusion occurs when the curve of Spee is not completely leveled when the mandible is advanced to Class I. Intruding the anterior teeth and extruding the posterior teeth with elastics during the additional aligner phase is the approach we usually take to close these open bites. Sectioning the transitional aligners to allow for settling of the posterior occlusion before the additional aligner phase is also an option.¹

What is important about this feature design enhancement is that the enhanced precision wings engage well, and we have seen great results with this enhanced precision wing feature for Invisalign treatment with mandibular advancement in our Class II study participants. Only one of the 80+ patients we are currently treating with this enhanced design feature as part of limited market release has had issues with compliance, and even that patient has since improved their behavior so that proper aligner maintenance is no longer a problem. Overall, the enhanced precision wing feature is a wonderful option. We are thrilled that we can offer it to our patients.

¹ Align education resources: MKT-0004418 Rev A Case Report-1 Dr. Iwaszuk Moderate-Class II Orthodontic Treatment with MA 20200710; MKT-000304044 Rev A Invisalign MA Dr. Lekic White Paper 20190606; MKT-0007197 Rev A Dr. Thiesen Class II Division 1.

How to add the enhanced precision wings for Invisalign treatment with mandibular advancement

The enhanced precision wings option will still be ordered through the online prescription form and is available with all Invisalign Comprehensive aligner packages.²

The prescription options for the Invisalign treatment with mandibular advancement are the same as before located under Anterior - Posterior (A-P) Relationship section, and the doctor can select:

1. Where to position the bite as the goal for the mandibular advancement phase
2. Whether incremental or full correction in the aligner staging is desired
3. How to manage asymmetrical Class IIs, and
4. Whether vertical elastics are needed (if the patient sleeps with their mouth open)

There is no additional cost for enhanced precision wings. The feature can be added to existing Invisalign patients (MA or non-MA) as part of their Additional Aligner orders. New scans or impressions need to be sent if the enhanced precision wings are to be added to the Additional Aligners.

Mandibular advancement (MA) (Use of clinical preferences will be limited during the MA stages)

The teeth under and adjacent to the precision wings should be present and stable throughout the Mandibular Advancement phase of treatment. In a small percentage of cases, precision wings for MA cannot be placed due to combination of several factors, such as interarch space, crown height, etc [Learn More](#)

End of MA phase set up position [Learn More](#)

Edge to edge position

Lower arch 1 mm beyond edge to edge position

Lower arch 2 mm beyond edge to edge position

MA Staging [Learn More](#)

2 mm incremental advancements to the end of MA phase set up position

Single advancement to the end of MA phase set up position

Asymmetrical Movement of the Lower Arch [Learn More](#)

Shift lower arch to improve midlines (up to 2 mm) during the MA phase (Note: This may create slight asymmetrical advancement of the right and left side)

Do not shift the lower arch to improve midlines during the MA phase

Precision Cuts for Vertical Elastics [Learn More](#)
(Specify in Precision Cuts Interface)

Yes

No

Any pre-mandibular (“pre-MA”) aligners needed to remove anterior interferences will still appear prior to the appearance of the precision wings in the ClinCheck Pro® 6.0 set-up. Doctors should schedule to see the patient in-person when the enhanced precision wings first appear in the aligners, in order to instruct the patient on proper wing engagement. Aligner fit should be monitored as needed throughout treatment, and additional aligners without the precision wing feature can be ordered for additional leveling and aligning as needed after the mandibular aligner phase is completed.

Typical clinical phases for Class II correction using Invisalign aligners with mandibular advancement:

1. Pre-MA aligners for initial leveling and aligning in Class II division 2 cases (to reduce anterior interferences for mandibular advancement)
2. Mandibular advancement phase
3. Initial mandibular advancement aligner delivery – spend the time to educate the patient on how to seat the first MA aligner
4. Use vertical elastics if the patient sleeps with their mouth open
5. Finishing phase – Order additional aligners with Class II elastics on bonded buttons as needed to level the curve of Spee. Precision bite ramps can also be added to the lingual of the upper aligners to help level the curve.
6. Retention phase – Our preferred retainer for all our patients (regardless of whether they were treated with mandibular advancement) is a bonded lingual wire to the six upper and lower anterior teeth, as well as a clear retainer (on top of the wire) for the upper arch only, to be worn only at night.³

²The mandibular advancement feature may not be available in all countries.

³When new scans/impressions are submitted, Invisalign retainers and Vivera® retainers can be made to go over bonded lingual retainers.