Class II Correction with Invisalign® and Elastics

Sequential Distalization—Two Teeth at a Time

Dr. Andrew Schwartz

“I prefer to distalize more than one tooth at a time because it works and it helps keep the number of aligners down. The force from aligners alone can move one tooth distally without substantial side-effects and when the horizontal force from Class II elastics is added, 2 molars or 2-3 smaller rooted teeth can be moved concomitantly without worry.”

DR. ANDREW SCHWARTZ

Not too long ago in orthodontics, the only removable appliance doctors could imagine correcting a Class II case with was a headgear. Times have certainly changed. Correcting class II cases with Invisalign has enabled Dr. Schwartz to distinguished his orthodontic practice amongst many local colleagues.

Combining Forces—Distalization and Leveling and Aligning

Dr. Schwartz will typically stage leveling and aligning starting at the same time as distal movements of posterior teeth as long as the movements work to achieve a common goal and do not contradict one another. The anterior and posterior teeth should be thought of as two separate units that can be “pushed” apart or “pulled” together and these forces should be used towards a common goal.

For example, if maxillary anterior teeth are retroclined initially, adding proclination in aligner 1 would actually help in distalizing posterior teeth as this “pushing” between the two units would increase the equal and opposite forces of pure distalization alone. If upper anterior teeth were spaced or proclined initially, palatal movements should be delayed as this force would be counterproductive to distal movement of the posterior teeth by “pulling” the two units together.

The Power of “Rubberizing”—Elastics Wear Protocol

Rubber band wear is critical to the success of correcting Class II cases with Invisalign. Dr. Schwartz starts elastic wear at the patient’s second visit (or aligner 4) so that he/she can get used to the aligners alone without overwhelming them. The first three aligners have distal movements limited to only the 2 most posterior teeth. Starting with aligner 4, add composite buttons and Precision Cuts for inter-arch Class II elastics (3/16 inch 4 oz). The inter-arch elastics are attached to the composite button on the upper canine/s and to a bondable molar on the mandibular molar(s). To minimize the tendency for tipping, Dr. Schwartz places the composite button as gingivally as possible on the canine so that it can be as close to the center of resistance as possible.

Elastics with Precision Cuts
Walking the Walk—Staging Distalization

Once the molars have begun their walk distally, and the elastics are in place to back up anchorage, Dr. Schwartz slowly starts moving 1 or 2 premolars distally. This needs to be done judiciously so that the equal and opposite force from distalizing the posterior teeth that is pushing mesially on the anterior teeth is successfully overcome by the force of the Class II elastic and a net distal movement of teeth is created. Using this technique, there is no need to overcorrect Class II molars beyond Class I before retracting the anterior teeth. Once the molars are back into a full Class I position, distalizing the premolars should take less force and be very predictable as long as the elastics are worn consistently.

Maxillary molars are distalized two at a time. Once this is accomplished, three premolars/canines/incisors can be moved at a time. The rationale for this approach is based on root surface area. Multi-rooted maxillary molars have a very large root surface area and require more force per tooth to move without worrying about significant reciprocal forces on adjacent teeth. Once the second premolar is touching the first molar, retraction of the first premolar, canine and one and then two incisors can begin. In a unilateral Class II case, the molars and premolars should be in a solid Class I relationship before moving the contralateral side incisors around the arch.

Rationale for Using Invisalign in Class II Cases

1. In treating Class II cases, the longest and often most challenging part is the Class II correction. One of the main reasons Dr. Schwartz likes to use Invisalign to correct Class II’s is that he can begin the Class II correction starting with the first aligner rather than waiting until the arches are fully leveled, aligned, and in working arch wires as he would in a fixed case.

2. Since most Class II cases have an average to high mandibular plane angle to start, controlling vertical forces is imperative. When using Class II elastics, there are 2 components to the force vectors created. A horizontal (favorable) force that is used to correct the Class II and a vertical (less desirable) force that can lead to posterior supra-eruption and subsequent increase in the mandibular plane angle.

When using Invisalign to correct class II cases, an increase in MPA is typically not a worry. The two layers of aligner material (upper and lower) between the occlusal surfaces of the teeth exert intrusive forces on the posterior teeth when the teeth are occluding. When the teeth are apart, the aligner material directly blocks the posterior teeth from supra-erupting. Even after wearing Class II elastics for extended periods of time, no increase (and often a decrease) in mandibular plane angle can be expected during treatment.

3. Another advantage of having two layers of aligner material inter-occlusally is the inherent disarticulation of the upper and lower teeth that it provides. This separation discludes the dentition and helps reduce the dental interferences that often times plague orthodontists in Class II correction.

4. The traditional worry in cases where Class II elastics are to be used is lower incisor flaring (proclination) due to mesial forces from elastics. When aligners are used, there is little space for incisors to procline. The aligners act almost like a splint holding the teeth rigidly in place preventing proclination. To be on the safe side, Dr. Schwartz typically requests that 8-10 degrees of lingual crown torque be placed on lower incisors to counteract any unwanted forces that may be generated.
The Battle is Won in the Details—Tips for Predictable Finishes

1. A short vertical rectangular attachment is placed on maxillary canines (incisal to the elastic attachment) to help prevent the tooth from rotating distally (mesial out) from the pull of the elastic. If the canine is initially rotated mesial-in, the button can be placed mesially to aid in mesial-out rotation. Dr. Schwartz typically asks for the attachment to be placed incisally so that the gingival Precision Cut can still be used and there is adequate space for the composite button above it.

2. To aid in intrusion of lower anterior teeth, horizontal beveled attachments are placed on the lower first premolars. The intrusive force directed via the aligners on the lower anterior teeth creates an equal and opposite force on the posterior portion of the aligner that tends to unseat the aligner. With the beveled attachments directed horizontally placed in the middle of the arch, the aligners snap into place and the occlusal movement of the aligner is prevented by the attachments.

3. Never try to correct a Class II case with a maxillary third molar in the way even if they are not fully erupted. If needed, Dr. Schwartz likes to schedule the extraction about 2 weeks before the elastic wear is to start.

4. General Orthodontic Intuition (GOI) is needed when staging treatment. Distalization of an entire side is not going to occur in 15 aligners, nor will it require 50.

Technician Communication Tips

- When starting out treating Class II cases with Invisalign, patience is needed with the Clincheck technicians. Until your technician understands generally how you, the individual doctor prefers to treat your cases, many revisions to the initial Clincheck plan will be needed. Doctors need to be persistent and explain precisely what they are looking for.

- A ClinCheck treatment plan should not be accepted if it isn’t fully expect to work. Remember, the technicians are not orthodontists, they don’t know how teeth move as doctors do. The software doesn’t understand physics or biology. The direction needs to come from you as the doctor.

Motivating Patients

- In more difficult cases or cases that Dr. Schwartz expects to be longer in duration than 15 months, he prepares the patient well ahead of time about the probable need for case refinement. Expectations are managed from the start and the ability to fine-tune the case without getting push-back from the patient is preserved if this is established from the onset of treatment.

- Dr. Schwartz uses Invisalign Teen for all patients (except very simple Express cases). Just like teens he feels adults benefit greatly from the addition of compliance indicators. The marginal increased cost of the case he feels pays for itself by reducing the number of trays if refinement is needed.

- Compliance is stressed at every visit by Dr. Schwartz himself. “My patients are taught that pressure needs to be on the teeth at least 22 hours per day for treatment to be successful. I explain that even if they cheat 10%, they are not going to get a 90% result, rather treatment will not work at all.” Patients often ask him if they can wear their aligners 12 hours per day for 4 weeks instead of what is recommended. If needed, Dr. Schwartz explains to them the cellular biology of osteoclasts and osteoblasts until they can understand why intermittent aligner wear will not work at all and aligners must be worn without exceptions. Before his patients leave their first appointment with aligners 1 through 3, they understand the difference between consecutive hours of wear and cumulative hours of aligners wear.
DR. ANDREW SCHWARTZ

Dr. Andrew Schwartz is a private practice orthodontist in Washington, DC and Rockville, MD. He holds a DMD degree and Orthodontic Certificate from the University of Pennsylvania and is a Diplomate of the American Board of Orthodontists. Dr. Schwartz has been an Invisalign Elite Provider since 2005 and has treated over 1,200 patients with Invisalign. He is a member of the AAO, MASO, DC Dental Society, and Alpha Omega Dental Fraternity.