Tips from your peers to help you treat with confidence.

Class II Correction with Invisalign

Molar rotation.

Dr. Mazyar Moshiri.
Orthodontic correction of a mild to moderate Class II malocclusion with the Invisalign system may be handled both predictably and efficiently. When correcting a unilateral or bilateral Class II dental malocclusion, it is important to carefully evaluate the etiology of the Class II relationships. Dr. Mazyar Moshiri generally considers the following four variables below, in priority. Correction of mesial rotation of the maxillary molars tops this list. It has been shown that up to 85% Class II patients have mesial rotation of their maxillary 1st molars.\(^1\) One cause for displacement of the molars is mesial movement into the leeway space left during transition from mixed to permanent dentition. This creates a loss of arch length and resultant mesial version of the remaining dentition anteriorly, creating a Class II cuspid relationship and increased overjet. Any further mesial drift from anterior crowding and/or arch constriction further exacerbates this problem. Correction of molar rotation not only helps to classify the molars into a Class I relationship, but concomitantly opens room for subsequent distalization and Class I correction of the remaining buccal dentition.

Below is his priority list for Class II malocclusion correction with Invisalign:

1. Are there mesial-in rotations of the upper molars, especially the first molars?

2. Upon correction of molar rotations, is distalization required to achieve ideal Class I molar occlusion?

3. How much expansion is necessary to further gain space for distalization and Class II correction of the remaining buccal segments?

4. Is there a tooth size discrepancy (TSD), and can this be used to aid in correction of the malocclusion?

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Here are Dr Moshiri’s techniques for addressing Class II correction.

Tip 1: Correct any mesial rotation of upper 1st and 2nd molars.

Request the buccal surfaces of the upper molars to be near parallel to each other on the ClinCheck treatment plan. Due to the rhomboidal shape of the upper first molars, correction of mesial rotations may open up to 2 mm of space per side for subsequent distalization of bicuspids and cuspids. The decision to use a vertical attachment per molar, beveled towards the direction of movement (distal), will depend on whether additional distalization of the molars will also be required, in combination with rotation correction, as outlined below. However, it is known that rotation of the molars with aligners alone is a predictable movement.

Tip 2: Address any remaining Class II molar correction needed with molar distalization (up to 2 mm).

Based on the buccal relationships achieved after correction of molar rotations, sequential distalization may be achieved by using the force of the aligners and Class II elastics to “push” the molars into a Class I relationship, with the distal cusp of the maxillary first molar matching the embrasure of the mandibular first and second molars. Dr. Moshiri does not routinely attempt more than 2 mm of sequential distalization with aligners. For this type of distalization, it is important to have an attachment on the maxillary second molar to initiate this movement. Ask for distalization movements to be delayed until attachments have been bonded on the teeth if your Clinical Protocols place attachments at later stages.

Additional attachments may then be placed on every other tooth up to the cuspids, in order to make appliance removal amenable to the patient. If a patient has maxillary 3rd molars present, ask for their extraction after the patient has their impressions(scan to take advantage of the inflammation and space created. Once the buccal occlusion is nearly seated into full Class I on the ClinCheck treatment plan, Dr Moshiri asks for retraction of the 2-2 segment with additional lingual root torque to achieve proper overbite and overjet.
Tip 3: Expand the maxillary archform to gain any further space needed for possible distalization of bicuspids and cuspids into Class I relationships, in addition to arch form coordination.

Generally speaking, Class II malocclusions have a relative maxillary transverse discrepancy relevant to the mandibular arch. According to the aforementioned mechanics needed for Class II correction, the maxillary teeth need to be directed towards a wider part of the arch during treatment. Given the advances in tooth movement with the Invisalign appliance, we know that in most scenarios it is more efficient to combine movements to decrease treatment time and increase predictability of the treatment outcomes. Practitioners should aim to see on their respective ClinCheck treatment plans simultaneous distal rotation, expansion, and distalization of the molars. Ask patients to use aligner chewies 10 minutes per day posteriorly during these movements to help seat the aligners properly. Regarding the total amount of expansion needed, Dr. Moshiri asks for 2 mm of buccal overjet on all teeth and DOES NOT like to see a “socked-in” occlusion at the end of the ClinCheck treatment plan. The reasoning behind this preference is that the amount of expansion indicated on the ClinCheck treatment plan may not express clinically, especially when using a lot of Class II elastic wear, which has a constrictive force on the maxillary arch.

Tip 4: Ask for a tooth size discrepancy analysis for first molar to first molar (6-6).

Undiagnosed tooth size discrepancies (TSD) are a major reason for occlusal instability and poor treatment outcomes. This information is easily attained from your technician, and is crucial for detailing the occlusion and treatment success. Given your patients’ anterior esthetics (i.e. small upper laterals), buccal occlusion, depth of bite, etc., any existing tooth size discrepancy may be used to the clinicians’ advantage to further treat a Class II malocclusion predictably. For example, if at the end of the ClinCheck treatment plan the patient is still Class II in the premolar and canine areas, and there is a maxillary excess indicated on the TSD analysis, then this may be used to help address any remaining space and distalization needed to seat the patients’ buccal occlusion into full Class I. As another example, commonly mandibular excesses will be noted. In this scenario, IPR may be used for mesialization of the lower dentition with Class II elastics to further aid in Class I correction and establishment of proper overbite and overjet.
The above methodology has proven very valuable in Dr. Moshiri's practice in evaluating and treating Class II patients with Invisalign. Outside of patient compliance with aligner and elastic wear, treatment may not go as planned for some of the following reasons:

- As mentioned above, Dr. Moshiri believes expansion needs to be "over-engineered" in the ClinCheck treatment plan for proper treatment of Class II patients as the software cannot predict the constrictive force Class II elastic wear elicits onto the maxillary arch during treatment. Otherwise, interocclusal interferences may exist preventing proper occlusion.

- Furthermore, Dr. Moshiri finds that anterior lingual root torque is another movement that can be overprescribed (by about 20%) for the movement to occur clinically. Firstly, diagnose how much torque is required based off cephalometric measurements, and then ask the technician to add this amount into the Clincheck treatment plan. For example, if the upper incisors require 10 degrees of lingual root torque, I ask the technician to add 12 degrees of lingual root torque.

  Bite ramps (bite turbos) lingual to the upper incisors further increase the predictability of this movement. The lingual force from the lower incisors against the bite ramp, facilitated by the propulsive movement of the mandible forward from Class II elastics, helps to seat the aligner anteriorly while providing a counter moment to the Power Ridge on the buccal of the aligner. If the patient is Class II division II, ask for the technician to push the teeth out first before placing bite ramps to allow for better application of force relative to the center of resistance for the maxillary teeth.

- Elastic wear needs to start as soon as possible for proper Class II correction, especially if distalization is involved. Start elastic wear for patients at stage 6, and ask for distalization to be delayed until you know the patient is in elastics. Elastics are worn from a hook/button at the upper 3 or 4 to the lower 6 or 7 with 4 oz, 3/16 size elastics.