

# Conservative Treatment of a Skeletal Class II Malocclusion and Overjet Using Clear Aligners

## Abstract

**History:** A 42-year-old female presented for orthodontic consultation with a severe skeletal Class II malocclusion, anterior crowding, overjet of 7 mm, dental Class II molar and canine relationships on both sides. The chief complaints were poor esthetics and an uneven smile.

**Diagnosis and Etiology:** The patient presented with a narrow upper arch, constricted 1<sup>st</sup> molars and premolar area, retroclined upper incisors, and crowding, with overjet of 7 mm. On the lower arch, there was mild crowding. Molar and Canine relationships were full-cusp Angle Class II malocclusion on both sides. However, cephalometric analysis showed a skeletal Class II relationship with a straight profile. The increased overjet is probably due to external factors, including childhood thumb-sucking and ongoing habits such as mouth breathing and tongue thrusting. These behaviors contribute to the narrowing of the upper arch. A skeletal retrognathic mandible was noted. A high mandibular angle (FMA, 37°) led to a hyperdivergent facial pattern, increased overjet, and Class II malocclusion.

**Treatment:** A non-surgical orthodontic treatment plan utilizing clear aligners and elastics has been created. A thorough pre-treatment evaluation was conducted, including digital impressions taken with the iTero Element II scanner. All necessary records and the prescription form were submitted for the comprehensive Invisalign clear aligners. Extraction of upper third molars on both sides were performed prior to arrival of the aligners. A set of 61 aligners was prescribed. After one week, at the second visit, attachments were bonded, and early Class II elastics were used. The patient was appointed every 4 weeks, with 7-day intervals between aligner changes. Upon finishing the aligner treatment, we observed substantial improvements in the overjet and overbite, as well as achieving Class I molar and canine relationships on both sides. Retention was maintained using clear retainers. (*J Digital Orthod* 2026;78:4-23)

**Outcomes:** Treatment goals were achieved after 18 months of treatment with clear aligners.

**Key words:**

Class III malocclusion, Class III molar relationship, open bite, crossbite, Class III elastics, overjet, overbite

## Introduction

A 42-year-old female presented with chief complaints of uneven smile and crowding with increased overjet. She was previously seen by other orthodontists and was given the options of premolars extraction or surgery to solve her problem. Oral soft tissues, periodontium, frena, and gingival health were all examined and were within normal limits. Oral hygiene was very good. No significant medical or dental histories were noted.

## Diagnosis and Etiology

Pre-treatment facial and intraoral photographs (Fig. 1) showed a hyperdivergent facial pattern with a straight profile, competent lips, and retrusive lower chin. The pre-treatment close-up photographs (Fig. 1) showed a high lip line smile and 7-mm overjet, a moderate crowding of upper anteriors as well as retroclined upper incisors, and mild crowding in lower anterior teeth. Canine and molar Class II malocclusion of full unit of 7 mm was observed on both sides. A constricted upper arch at premolars

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■ Fig. 1: Pre-treatment facial and intraoral photograph

and molars area with palatal crown tipping was noted. Two wisdom teeth in the upper arch were fully erupted, whereas the two lower wisdom teeth were congenitally missing (Fig. 1). The patient reported no significant pain or discomfort in the temporo-mandibular joints (TMJs). Patient reported

history of mouth breathing habit as a child because of an allergic blocked nose and allergic pharyngitis. Pre-treatment panoramic and cephalometric radiographs are shown in Figs. 3 and 4, respectively. Cephalometric analysis showed a hyperdivergent skeletal Class II pattern with a retrusive mandible



■ Fig. 2: Pre-treatment intraoral digital scans



■ Fig. 3: Pre-treatment panoramic radiograph



■ Fig. 4: Pre-treatment cephalometric radiograph

and severe Class II dental relationships, as seen clearly in the pre-treatment intraoral digital scans (Fig. 2). The panoramic radiograph obtained prior to treatment indicated that there were no significant pathological lesions in the hard tissues (Fig. 3). From the pretreatment cephalometric radiograph (Fig. 4), and the pretreatment analysis data showed the ANB angle was  $9^\circ$ , the FMA angle was  $37^\circ$ , the upper incisors were retroclined  $92^\circ$ , and the lower incisors were inclined  $98^\circ$  to the mandibular plane. The cephalometric values are summarized in Table 1. The American Board of Orthodontics (ABO) Discrepancy Index (DI) was 45, as documented in Worksheet 1. The patient was successfully treated with a conservative non-surgical protocol with extraction of the upper 3<sup>rd</sup> molars only and Class II elastics. Upper molars retraction protocol and the use of early Class II elastics for anchorage were prescribed. A beautiful and satisfying smile was achieved by the end of the treatment. The IBOI Pink and white score as documented in Worksheet 3.

## Objectives

To enhance the esthetics of the patient's smile, the treatment objectives were to (1) sequentially retract

the upper posterior teeth to produce a Class I molar and canine relations on both sides, (2) expand the the upper arch around the 1<sup>st</sup> molars and premolars area to correct the upper narrow arch and to eliminate black corridors, and (3) intrude and retract the anterior teeth with lingual root torque to overcome the tendency of deep bite. Extrusion of the upper and lower molars and premolars and intrusion of the lower anterior teeth were also planned to level the curve of Spee and to control the vertical dimension of anterior occlusion (VDO) and minimize the tendency of gummy smile which could worsen during retraction. Selective retroclination and rotation of upper anterior teeth was planned to correct the moderate crowding and overlapping. The patient's chief concerns were esthetics as well as difficulty in closing the lips and incising food (Fig. 1). A conservative treatment plan with extraction of the upper third molars only was carried out despite the orthognathic surgical option or 1<sup>st</sup> upper premolars extraction option as were previously suggested by other orthodontists, which the patient declined because they were too aggressive. Therefore, extraction of upper 3<sup>rd</sup> molars on both sides were requested virtually to provide space for retraction after oral scanning. An orthodontic treatment of light force with clear aligner system (Invisalign, Align Tech Inc., San Jose, CA) was recommended to meet the patient's needs:

### Treatment Objectives

1. Correct the skeletal Class II discrepancy: Achieve a more harmonious sagittal skeletal relationship by utilizing dento-alveolar compensation techniques appropriate for non-surgical adult treatment.
2. Reduce the severe overjet: Retract maxillary anterior teeth to decrease the excessive overjet and establish proper anterior guidance and incisal coupling.
3. Improve molar and canine relationships : Achieve bilateral Class I molar and canine relationships through upper arch retraction and Class II elastics.
4. Address upper arch crowding and proclination: Create space by extracting upper third molars and allowing posterior segmental retraction, improving incisor angulation and arch form.
5. Control the vertical dimension and deep bite : Prevent deepening of the bite during retraction using a combination of true and relative anterior intrusion, posterior extrusion, and leveling of the curve of Spee.
6. Enhance facial esthetics and soft tissue profile: Improve the convex profile and reduce lip protrusion while maintaining smile esthetics and avoiding a gummy smile, especially considering the patient's high smile line.
7. Maintain periodontal health and root positioning: Utilize controlled tooth movements with torque expression (e.g., power ridges) to maintain root parallelism and prevent flaring or root resorption.

8. Establish stable occlusion and long-term retention: Ensure proper occlusal contacts and stability after treatment using customized clear removable retainers.

### Treatment Strategies

1. Non-extraction approach in the anterior region: Maintain all anterior teeth and avoid premolar extractions to preserve facial esthetics and reduce the risk of excessive flattening of the profile.
2. Extraction of upper third molars: Remove upper wisdom teeth to facilitate posterior segmental retraction without compromising anchorage or treatment efficiency.
3. Segmental retraction of the upper arch: Implement sequential retraction of posterior teeth using clear aligners, beginning with second molars and progressing anteriorly, to correct the Class II molar and canine relationships.
4. Use of Class II elastics: Employ early light Class II elastics during retraction to reinforce anchorage and enhance mandibular advancement, improving sagittal correction.
5. Expansion of the maxillary arch: Apply programmed transverse expansion through the aligner system to broaden the upper arch, facilitate molar rotation, and support Class I molar interdigitation.
6. Molar disto-buccal rotation: Correct the mesio-palatal rotation of upper molars to gain effective distal space and optimize occlusal intercuspation.
7. Retraction of maxillary anterior teeth: Retract protrusive upper incisors to reduce overjet while using power ridges and optimized attachments to maintain root torque and upright incisor positioning.
8. Vertical control through curve of Spee leveling: Control bite deepening by combining relative and true anterior intrusion with posterior extrusion, addressing both overbite and smile esthetics.
9. Root torque and anchorage control: Use clear aligner features such as power ridges and optimized attachments to ensure proper root control and minimize anchorage loss during retraction.
10. Retention with clear removable retainers: Deliver upper and lower clear retainers posttreatment to maintain results, stabilize occlusion, and preserve rotational and expansion correction.

### Treatment Progress

The total treatment period lasted 15 months, and the final results are documented in the finish records (Figs. 5-7). A dental scan was performed using the iTero Element II (Align Tech Inc., San Jose, CA), and all necessary records were submitted to initiate the analysis and treatment planning for the case. The following instructions were provided to the CAD designer: Virtual extraction of upper third molars. The upper posterior teeth were planned to move in three dimensions: 1. sequential retraction, 2. expansion with buccal root torque and disto-buccal rotation, and 3. extrusion. For Class II elastics, placements of hooks at



■ Fig. 5: Posttreatment facial and intraoral photographs



■ Fig. 6: Posttreatment panoramic radiograph

upper canines and button cut-outs on the lower first molars were requested. The initial ClinCheck treatment simulation using the Invisalign System (Align Tech Inc., San Jose, CA) was satisfactory, and minor modifications were made using 3D control and was approved after reviewing the desired biomechanics design and treatment outcome.

A total of 61 aligners were used: 61 active aligners in the upper arch and 14 active aligners in the lower arc. The treatment interval for changing aligners



■ Fig. 7: Posttreatment cephalometric radiograph

was set at every 7 days. The process began with the delivery of the first aligners, but no attachments were placed for the first week. This allowed the patient to adjust to speaking with the aligners in place and ensured greater comfort and ease of use. The patient was instructed to wear the aligners full-time, for 22 hours each day, and was advised to remove them only when eating and brushing their teeth. After one week, the patient returned for a follow-up appointment. During this visit, their teeth were polished and prepared for the adhesion of attachments using an attachment template. The composite resin used for this was Bulk Fill, a flowable composite (SDR Flow, Dentsply Sirona, Germany).

Upper arch :

1. Optimized expansion support attachments on UR4-7 and UL4-7
2. Optimized root control attachments on UR3, UR2, UL2, and UL3

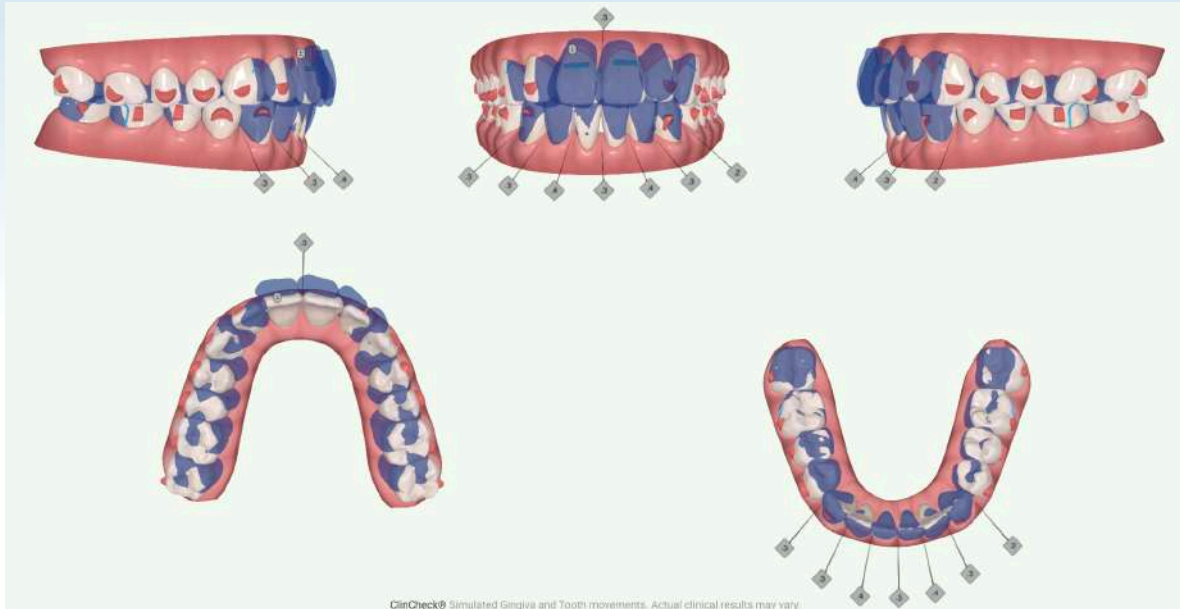
Lower Arch:

1. Conventional rectangular attachments on LR6, LR5, LL5, and LL6
2. Optimized expansion support and root control attachments on LR7, LR4, LR3, LL3, LL4, and LL7

The digital simulation of the treatment outcome was designed to meet the treatment goals (Fig. 8).

At aligners #5, metal lingual buttons were bonded at the corresponding cut-out on the buccal surfaces of teeth LL6 and LR6. The patient was requested to hook elastics in Class II pattern (Fox, 1/4 -in, 3 oz,Ormco, CA) on both sides while wearing the aligners (Figs. 9a and 9b). The patient received instructions on how to attach the elastics and was advised to keep them hooked at all times while wearing the aligners. They should be removed every 8 hours for changes and taken off during meals or when brushing teeth.

After aligners #61, a new scan was performed. The patient was instructed to continue wearing the last set of aligners and to keep the Class II elastics on at night only until the new additional aligners arrive. A new ClinCheck was created and modified to meet the following instructions:



■ Fig. 8: The Initial ClinCheck views show initial teeth position (blue) and simulated final position (white).



■ Fig. 9a: Class II elastics from right buccal view



■ Fig. 9b: Class II elastics from the left buccal view

1. Removal of all old attachments and button cutout and hooks
2. Extra intrusion of upper central incisors with palatal root torque
3. IPR in the upper anteriors

Modifications in the attachments were as follows :

1. All the existing attachments were removed.
2. New optimized retention deep bite attachments on UR4, UR3, UL4 and UL3

3. New optimized root control attachments on UL1 and UL2, and LL4
4. Power ridge on UL1 for palatal root torque
5. IPR of 0.4 mm between upper central incisors to reduce the black triangle effect
6. No button cut-outs or hooks

The additional aligners is consisted of 8 active aligners. Digital simulation outcome as shown in (Fig. 16). All the old attachments were replaced by

new attachments as needed. The new attachments were placed with the use of a new template. After aligner #8, all the planned goals were achieved with satisfying results. All attachments were removed, and final records of photos, X-ray, and digital scans for clear retainers were taken. The patient was advised to wear aligner #8 for full time to hold the teeth in place waiting for the retainers.

### Retention

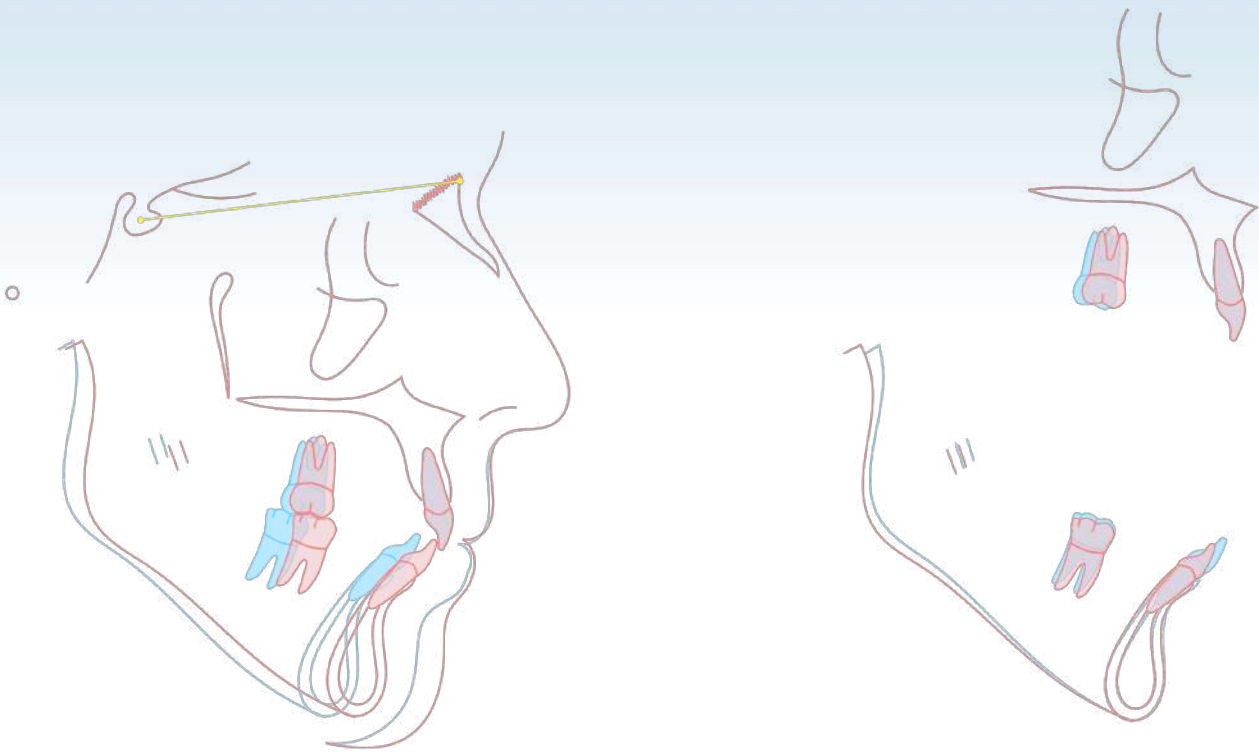
Digital scans for clear removable retainers were taken using the iTero scanner. The clear retainers (Vivera, Align Tech., CA) were delivered after two weeks and it was advised to wear them full time for six months. No Class II elastics were used (Fig. 11).

### Treatment Results

Posttreatment documentation included photographs (Fig. 5), radiographs (Figs. 6 and 7), cephalometric measurements (Table 1), and superimposed tracings (Fig. 10). The analysis indicated that both the overbite and overjet were within normal ranges. Additionally, a Class I molar and Class I canine relationship were achieved on both sides. Alignment and retraction of upper anteriors was achieved, and crowding was eliminated. Intrusion of upper anteriors, correction of overjet and overbite by leveling of the curve of Spee were achieved. Two sets, a total of 69 aligners for both arches, over 15 months produced the final results. The treatment goals were achieved as planned and closely matched the original 3D ClinCheck projection. The results were stable as shown in two years follow up photos (Fig. 12).

CEPHALOMETRIC SUMMARY			
	PRE-TX	POST-TX	DIFF.
<b>SKELETAL ANALYSIS</b>			
SNA° (82°)	78°	78°	0°
SNB° (80°)	69°	72°	3°
ANB° (2°)	9°	6°	3°
SN-MP° (32°)	44°	45°	1°
FMA° (25°)	37°	36°	1°
<b>DENTAL ANALYSIS</b>			
U1 TO NA mm (4 mm)	2	1	1
U1 TO SN° (104°)	92°	92°	0°
L1 TO NB mm (4 mm)	9	9	0
L1 TO MP° (90°)	98°	99°	1°
<b>FACIAL ANALYSIS</b>			
E-LINE UL (-1 mm)	3	5	2
E-LINE LL (0 mm)	2	4	2
%FH: Na-ANS-Gn (53%)	54%	55%	1%
Convexity:G-Sn-Pg' (13°)	25°	17°	8°

■ Table 1: Cephalometric summary



**Fig. 10:** Superimposed cephalometric tracings show the dentofacial changes after 18 months of treatment (red) compared to the pre-treatment position (blue).



**Fig. 11:** Clear retainers with buttons and elastics

## Discussion

This case demonstrates the effectiveness of the clear aligner system in addressing a challenging skeletal Class II malocclusion in an adult without the need for orthognathic surgery or premolar extractions. Maxillary third molar extractions allowed for retraction of the upper arch, an approach supported by multiple studies.<sup>1</sup> Class II elastics provided additional anchorage control and sagittal correction.<sup>2</sup> Patient compliance was critical to success, as was careful planning of attachment design, elastic placement, and staging of movements. While not all Class II cases are amenable to conservative management, this case supports the use of clear aligners as a viable treatment modality when



■ *Fig. 12: Two years follow up intra-oral photos*

patients present with mild to moderate skeletal discrepancies and high motivation.<sup>3</sup>

In adult patients, achieving true bodily retraction of maxillary molars using clear aligners is biomechanically challenging. While clear aligners can deliver controlled forces to induce tooth movement, the predominant effect observed is often distal tipping of the crown with some degree of root uprighting rather than complete bodily movement.<sup>4</sup> The following outlines the biomechanical principles behind Class II correction with clear aligners in adults:

1. True Bodily Retraction vs. Tipping: True bodily movement requires both the crown and root to move in tandem, which demands significant anchorage and precise force vectors. In

contrast, distal tipping is more easily achieved with clear aligners due to their force application characteristics.<sup>5</sup> Aligners primarily apply force at the crown level unless modified with attachments and torque elements.

2. Challenges in Adults: Due to higher bone density and decreased biological responsiveness, adult patients present with slower and more resistant tooth movement.<sup>6</sup> This makes controlled bodily retraction more difficult. Furthermore, anchorage demands are higher, and relapse risk may be elevated without adequate control.
3. Molar Retraction Protocol: In this case, sequential molar retraction was employed. The process typically involves retracting the second



■ Fig. 13: Occlusal view shows the progress of sequential retraction and alignment of the lower arch in weeks (W).



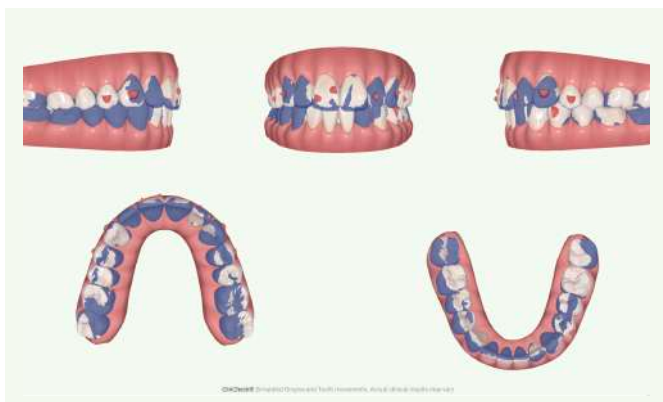
■ Fig. 14: Lateral right view shows the progress of sequential retraction and correction of open bite in weeks (W).



■ Fig. 15: Lateral left view shows the progress of sequential retraction and correction of open bite in weeks (W).

molars first, followed by the first molars and premolars, and finally retracting the anterior teeth.<sup>7</sup> Optimized attachments, such as horizontal rectangular and torque control designs, were essential to reduce tipping and promote root control (Figs. 13-15).

4. Use of Class II Elastics: Class II elastics were used in conjunction with clear aligners to reinforce anchorage and promote sagittal correction. Elastics provided a distal vector on the maxillary arch while supporting anterior anchorage. However, care was taken to monitor vertical side effects, such as bite opening. The early use of Class II elastics during clear aligner therapy serves a strategic biomechanical role in enhancing the predictability and effectiveness of Class II correction. In adult orthodontic cases where anchorage demands are high and distalization is complex, elastics provide critical support during early treatment phases (Figs. 9a and 9b).



■ Fig. 16: The ClinCheck of additional aligners  
Blue shows the teeth position after the end of first set of aligners, and white shows the simulated teeth position after refinement treatment.

## Retraction of Anterior Teeth: Torque Control and Bite Management

Retraction of anterior teeth was a central component of the Class II correction in this adult case, with the goal of resolving severe overjet and achieving optimal incisor angulation and smile esthetics. Clear aligners, supplemented by biomechanical features such as power ridges and staged intrusion, played a crucial role in this process.

1. **Power Ridges and Palatal Root Torque:** Power ridges are specifically designed features within clear aligner systems that help deliver torque to the roots of incisors. In this case, power ridges were used to exert palatal root torque during retraction of the upper incisors. This was essential for maintaining proper incisor inclination and avoiding excessive lingual crown tipping. The application of palatal root torque helped achieve more upright upper incisors, enhancing both esthetic and functional outcomes.
2. **Control of Incisor Position:** The initial presentation involved significant proclination of the upper incisors, contributing to a large overjet. Retraction with torque control not only reduced the overjet but also re-established proper incisor angulation, which was critical in achieving a harmonious smile arc and incisal display.
3. **True and Relative Intrusion for Bite Control:** To manage the deep overbite and prevent bite deepening during retraction, both true and relative intrusion strategies were employed. True intrusion was achieved through carefully

programmed vertical movements in the aligners, primarily affecting the anterior segment. Relative intrusion occurred as a result of posterior extrusion and vertical control in the molars, assisting in the leveling of the curve of Spee.

4. **Preventing Gummy Smile in a High Lip Line Patient:** Given the patient's high smile line, controlling vertical movements during anterior retraction was paramount. Over-retraction or incisor extrusion could exacerbate a gummy smile. By combining anterior intrusion with torque control, the treatment maintained an appropriate gingival display while retracting the teeth into a more esthetic and functional position.
5. **Combined Outcome:** Through a combination of torque application via power ridges, incisor retraction, and vertical control, the treatment successfully reduced overjet, improved incisor angulation, prevented deepening of the bite, and maintained a pleasing smile line despite the initial high lip position.

## Correction of Deep Bite Tendency During Anterior Retraction

In adult Class II cases, retraction of the anterior teeth can often deepens the bite due to the clockwise rotational effect it exerts on the occlusal plane. To counteract this tendency, a deliberate biomechanical approach was taken to level the curve of Spee through a combination of true and relative intrusion of anterior teeth, as well as true and relative extrusion of posterior teeth, as follows:

1. **Intrusion of Anterior Teeth (True and Relative):** True intrusion was programmed into the aligner staging to apply vertical intrusive forces on the upper incisors. This was facilitated by the use of optimized attachments and aligner design that directed forces apically along the long axis of the anterior teeth. Relative intrusion occurred as a result of posterior extrusion and molar uprighting, which effectively reduced the incisor overbite without increasing incisal display.<sup>8</sup>
2. **Extrusion of Posterior Teeth (True and Relative):** True extrusion of the upper and lower molars was programmed in selected stages to support bite opening. This helped counteract the deepening effect of incisor retraction. Relative extrusion took place as the occlusal plane was altered through sagittal correction and retraction mechanics, particularly as posterior teeth uprighted into a more vertical orientation.<sup>9</sup>
3. **Coordinated Vertical and Sagittal Control:** By synchronizing posterior extrusion and anterior intrusion, the occlusal plane was leveled without increasing gingival display, which was especially critical in this patient with a high lip line. This vertical control maintained a balanced smile line and ensured that the deep bite was addressed while retracting the anteriors.<sup>10</sup>
4. **Functional and Esthetic Outcome:** This vertical biomechanical strategy prevented the retraction-induced deepening of the

bite and promoted a more stable occlusion. It also helped avoid excessive gingival display or gummy smile, ensuring both esthetic and functional harmony at the conclusion of treatment.

### Biomechanics of Upper Molars Disto-Buccal Rotation in Class II Correction and Expansion

In Class II malocclusion cases, particularly those treated with clear aligners, disto-buccal rotation of the upper molars is a critical movement that contributes significantly to both Class II correction and transverse arch development (expansion).<sup>11</sup> This rotation, when strategically incorporated, serves both sagittal and transverse treatment objectives:

1. **Nature of Upper Molar Rotation in Class II Malocclusion.** In many Class II cases, the upper first molars are mesio-palated rotated—that is, their mesiobuccal cusp is positioned more anteriorly and medially than ideal.<sup>12</sup> This rotation makes the tooth occupy more arch space mesiodistally, limiting the available space for distalization and contributing to the Class II molar relationship.
2. **Biomechanical Benefits of Disto-Buccal Rotation:**
  - **Sagittal Space Gain (Effective Retraction):** Disto-buccal rotation repositions the mesiobuccal cusp distally and laterally, effectively shortening the mesiodistal width of the molar in the arch. This movement creates additional space that mimics

retraction, helping to transition the molars from a Class II to a Class I relationship—even before true bodily retraction occurs.

- Improved Arch Coordination: Rotated molars disrupt occlusal interdigitation with lower molars. Correcting the rotation aligns the buccal cusps of the upper molars more appropriately over the buccal grooves of the lower molars, improving Class I molar intercuspation.
- Contribution to Expansion: The buccal component of the rotation moves the distobuccal cusp laterally, aiding in the transverse development of the arch. This is particularly beneficial in adults with constricted maxillary arches, as it increases buccal overjet, enhances smile width, and facilitates crossbite correction when present.<sup>13</sup>
- Better Root Alignment and Anchorage Control: Rotational correction aligns the long axis of the molar more favorably, improving load distribution and anchorage control. It also creates a more stable platform for retracting forces or Class II elastics by orienting the molar's root complex properly within the alveolus.

### 3. Clear Aligner Mechanics for Rotation:

- Optimized Attachments: Aligner systems often employ buccal attachments (rectangular or optimized rotation attachments) on the mesiobuccal and distobuccal line angles to generate rotational couples that apply torquing forces on the crown.

- Sequential Staging and Pressure Points: Aligners deliver rotational force through programmed pressure points that cusp the tooth and deliver precise force couples. Disto-buccal rotation is often staged early in treatment to maximize space gain before bodily retraction or Class II elastic mechanics.

- Stability Considerations: Achieving and maintaining molar rotation is crucial for occlusal stability. Without proper retention, upper molars tend to relapse into their pre-treatment rotational positions. Therefore, retainers must encompass the molars fully to preserve their rotational correction.

### 4. Clinical Relevance in Class II Clear Aligner Therapy:

In this case, upper molar disto-buccal rotation was an essential first step that enabled smoother posterior retraction, reduced anterior anchorage demand, and contributed to a broader arch form. When combined with expansion and sagittal mechanics (e.g., Class II elastics), this rotation supported both functional occlusion and facial esthetics.

## Conclusion

This case demonstrates the successful conservative orthodontic management of a skeletal Class II malocclusion with a severe overjet in a 42-year-old female patient using a clear aligner system. Through a carefully planned biomechanical approach featuring upper third molar extractions,

sequential retraction, early Class II elastics, controlled anterior retraction with torque expression, and strategic leveling of the Curve of Spee, functional and esthetic objectives were achieved without the need for orthognathic surgery. The treatment maintained vertical control, preserved soft tissue harmony, and improved both occlusal function and facial profile. Cephalometric and photographic records confirmed the effectiveness and predictability of aligner therapy in addressing complex adult malocclusions when combined with sound biomechanical principles. The use of clear removable retainers ensured post-treatment stability and patient compliance. This case highlights how clear aligner systems, when applied with precision and supplemented by appropriate auxiliaries, can serve as a viable and esthetically pleasing option for managing even challenging skeletal Class II discrepancies in adult patients.

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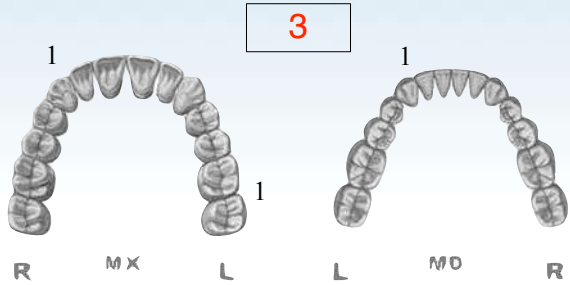
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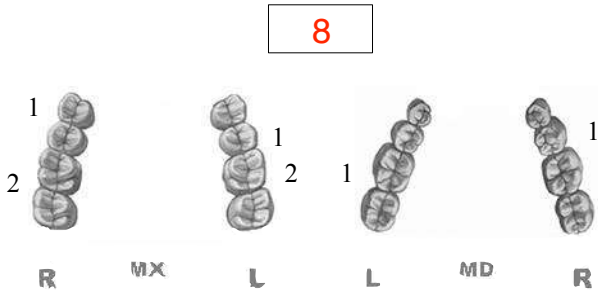
# Cast-Radiograph Evaluation

Total Score: 23

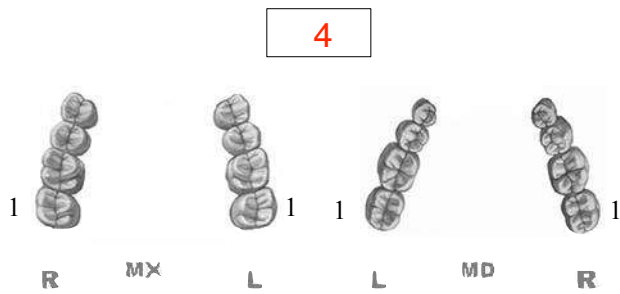
## Alignment/Rotations



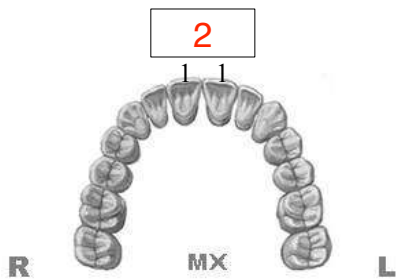
## Marginal Ridges



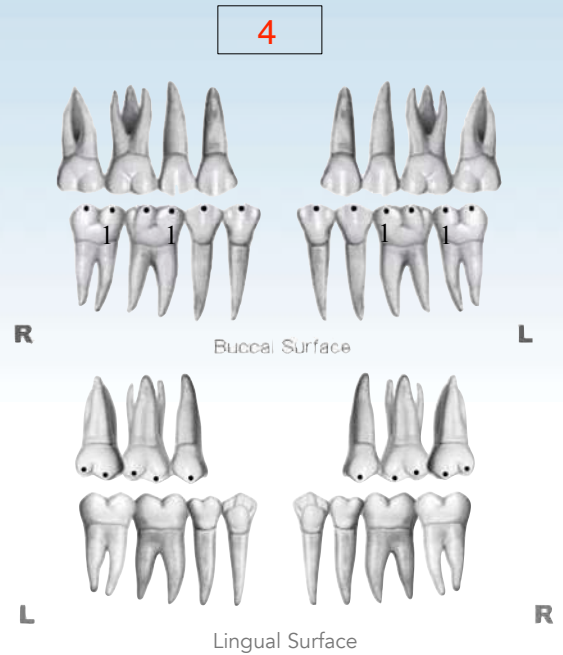
## Buccolingual Inclination



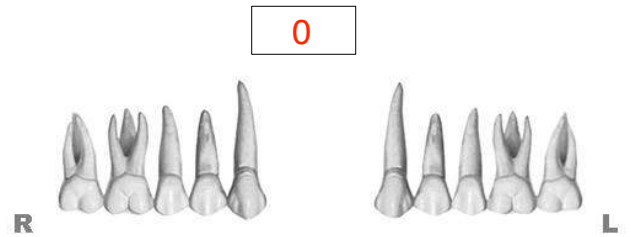
## Overjet



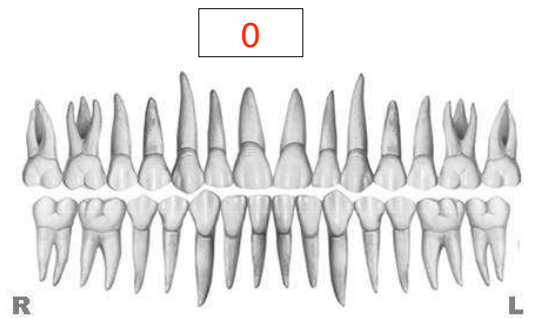
## Occlusal Contacts



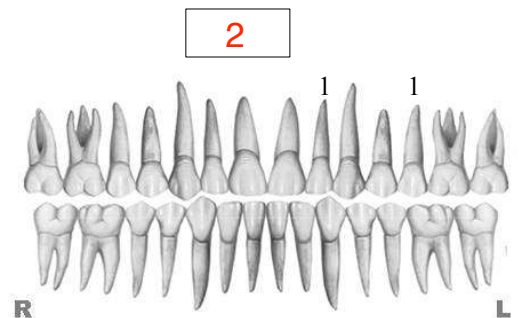
## Occlusal Relationships



## Interproximal Contacts



## Root Angulation



**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## IBOI Pink & White Esthetic Score

Total Score = 3

### 1. Pink Esthetic Score

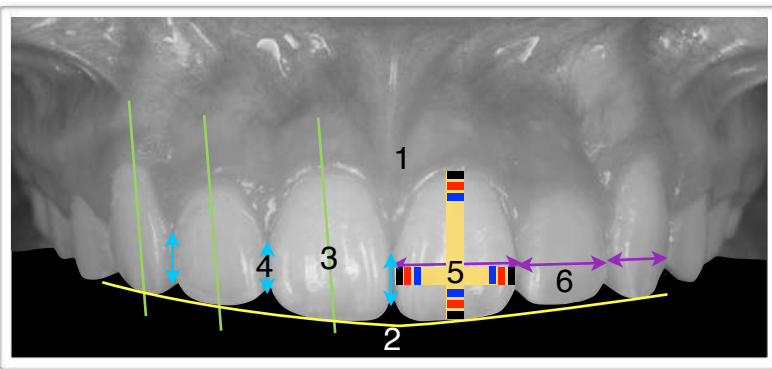


1. M & D Papillae	0	1	2
2. Keratinized Gingiva	0	1	2
3. Curvature of Gingival Margin	0	1	2
4. Level of Gingival Margin	0	1	2
5. Root Convexity (Torque)	0	1	2
6. Scar Formation	0	1	2

Total = 1

1. M & D Papillae	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
2. Keratinized Gingiva	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
3. Curvature of Gingival Margin	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	2
4. Level of Gingival Margin	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
5. Root Convexity (Torque)	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
6. Scar Formation	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2

### 2. White Esthetic Score (for Micro-esthetic)



1. Midline	0	1	2
2. Incisor Curve	0	1	2
3. Axial Inclination (5°, 8°, 10°)	0	1	2
4. Contact Area (50%, 40%, 30%)	0	1	2
5. Tooth Proportion	0	1	2
6. Tooth to Tooth Proportion	0	1	2

Total = 2

1. Midline	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
2. Incisor Curve	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	2
3. Axial Inclination (5°, 8°, 10°)	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
4. Contact Area (50%, 40%, 30%)	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	2
5. Tooth Proportion	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
6. Tooth to Tooth Proportion	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2



## Screws & Aligners

# International Workshop

### Beethoven International Workshop

demonstrates how to incorporate TADs and minor surgeries in complex orthodontic treatment. Experienced practitioners get to (1) learn firsthand from the world-renowned orthodontist and lecturer, Dr. Chris Chang, (2) observe management secrets behind a highly efficient clinic, and (3) take home effective clinical tips developed by the Beethoven group to take your clinical results to the next level!



### Observership at Beethoven

Chair-side observation of Dr. Chang's clinical treatment and patient communication



### Master-level TAD Learning

Identify various clinical indicators for TADs and master application skills



### All New Hands-on Workshop

Custom-made model designed by Dr. Fernando Rojas-Vizcaya for realistic impaction treatment practice



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Hsinchu, Taiwan



**Screws & Aligners**

**Keynote**  
(optional)

**2026**

Dec 01-03

Dec 04



*“Dr. Angle would be glad to know that contemporary orthodontics has a professional as Chris Chang!”*



Prof. Dr. Paulo Fernandes Retto, Portugal



**Dr. Chris Chang**

DDS, PhD. ABO certified, Angle Midwest member, director of Beethoven Orthodontic Center, Taiwan

Dr. Chang received his PhD in bone physiology and Certificate in Orthodontics from Indiana University in 1996. As publisher of Journal of Digital Orthodontics—a journal for interdisciplinary dental treatment, he has been actively involved in the design and application of orthodontic bone screws.



## Course Schedule

D  
A  
Y

1

**Chair-side observation**

D  
A  
Y

2

**Lecture, chair-side observation**

Lecture topic: **Screws & Aligners**

D  
A  
Y

3

**VISTA & 4 other minor surgeries for orthodontic practice**

Hands-on workshop

D  
A  
Y

4

**Keynote workshop**

(optional) conducted by Newton's A team



# IMPACTION



**VISTA** ✓

Vertical Incision Subperiosteal Tunnel Access

