

# Non-Extraction Treatment with Bite Turbo for Pseudo-Class III Malocclusion in Adult

## Abstract

**Introduction:** A 42-year-old female presented with chief complaints of protruded chin, crowded anterior teeth, and poor smile esthetics.

**Diagnosis:** Cephalometric analysis showed a skeletal Class III tendency (SNA, 80°; SNB, 83°; ANB, -1°) with normal mandibular plane angle (SN-MP, 38°). An intraoral assessment revealed end-on Class III malocclusion on the left side with anterior crossbite (UR1, UR2, and UL1), and the lower midline was deviated 0.5 mm to the right. Mild crowding was present in the upper and lower anterior dentition. The Discrepancy Index (DI) was 24.

**Treatment:** A Damon® system appliance with passive self-ligating brackets was applied to correct the dental malocclusion. Posterior and anterior bite turbos were used to correct the anterior crossbite. Interproximal reduction (IPR) was used to relieve crowding. Space closing and midline correction were also accomplished with elastics. The active treatment time was 18 months. The dentition was aligned, and all spaces created by IPR were closed.

**Results:** Retraction of the lower anterior segment and lower lip was achieved to improve the profile. After 18 months of active treatment, this pseudo-Class III malocclusion was corrected to an excellent Cast-Radiograph Evaluation (CRE) of 10 points and a Pink and White esthetic score of 6. No root resorption nor periodontal problems were noted.

**Conclusion:** This case report demonstrates the use of a passive self-ligating appliances to resolve pseudo-Class III malocclusion in an adult patient without the intervention of orthognathic surgery. (*J Digital Orthod* 2023;71:4-21)

### Key words:

Skeletal Class III, non-surgical treatment, anterior crossbite, torque selection, bite turbos, interproximal reduction

The dental nomenclature for this report is a modified Palmer notation with four oral quadrants: upper right (UR), upper left (UL), lower right (LR), and lower left (LL). From the midline, permanent teeth are numbered 1-8, e.g., a lower right first molar is LR6.

## Introduction

Angle defined Class III malocclusion as an abnormal jaw relationship where all mandibular teeth occlude more mesially by the width of one bicuspid or more in normal occlusion.<sup>1</sup> The etiology of this condition is classified into three categories: functional, skeletal,

and dental. Functional malocclusion is associated with abnormal tongue placement or neuromuscular conditions, while skeletal malocclusion occurs when the maxilla is underdeveloped and/or the mandible is overdeveloped. Dental malocclusion, on the other hand, is caused by ectopic palatal eruption of maxillary incisors or early loss of lower deciduous molars.<sup>2</sup> Class III malocclusions of dental origin often require a significant functional shift of the mandible to achieve posterior occlusion, which is why they are described as pseudo-Class III.<sup>3</sup> When the mandible position is closed and presented in centric relation (C<sub>R</sub>), the incisors exhibit an end-to-end relationship,

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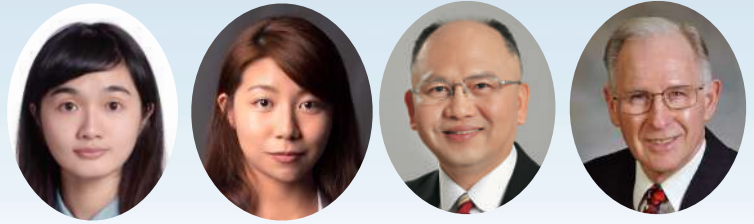
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and molars are usually Class I. Pseudo-Class III patients with an acceptable, orthognathic profile in Cr usually have a good prognosis following conservative treatment to resolve the anterior crossbite.<sup>3,4</sup>

This case report documents the conservative management of an adult skeletal Class III malocclusion complicated with an anterior crossbite and deep bite (Fig. 1). Conservative camouflage treatment was the patient's preference.



■ Fig. 1: Pre-treatment facial and intra-oral photographs in centric occlusion (Co)

## Diagnosis and Etiology

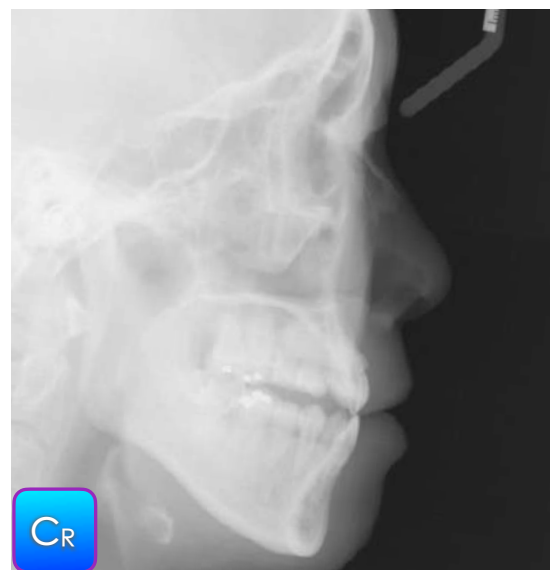
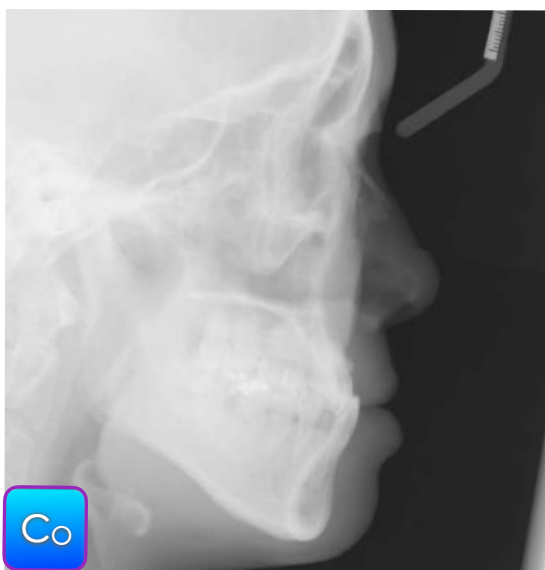
A 42yr-4mo-old female presented for orthodontic consultation with chief complaints of anterior crossbite and crowding (Fig. 1). No contributing medical or dental histories were reported. The facial profile was slightly less convex than normal. The patient had an uneven smile, with the left side slightly higher (Fig. 1). The plaster casts revealed an anterior crossbite from UR2 to UL1 (Fig. 3). The overjet was -1 mm, and the overbite was 6 mm. Mild crowding (2 mm) was found in the mandibular arch. The occlusion revealed an asymmetrical molar relationship: Class I on the right and end-on Class III on the left (Fig. 3). The lower midline was shifted 1 mm to the right.

There were no signs nor symptoms of temporomandibular disorder (TMD). The panoramic radiograph showed the LL8 was impacted (Fig. 4).

The pre-treatment cephalometric radiographs and intraoral examination revealed: (1) an orthognathic profile in  $C_R$  position, (2) 3 mm anterior functional shift, and (3) anterior teeth were edge-to-edge in  $C_R$  (Fig. 2). The cephalometric analysis (Table 1) documented an ANB angle of  $-1^\circ$ , a SN-MP angle of  $38^\circ$ , and lingually-tipped maxillary and mandibular incisors (U1-SN  $93^\circ$ , L1-MP  $75^\circ$ ). The American Board of Orthodontic (ABO) Discrepancy Index (DI)<sup>5</sup> was 24 points (Worksheet 1). As suggested by Lin's 3-Ring Diagnosis, conservative treatment was feasible.

## Treatment Objectives

1. Maintain the straight profile in  $C_R$  position.
2. Correct Class III malocclusion on the left side.
3. Correct the anterior crossbite.
4. Create an ideal overjet (OJ) and overbite (OB).



■ Fig. 2:

Pre-treatment cephalometric radiographs are compared in centric occlusion ( $C_O$ ) and centric relation ( $C_R$ ). In the  $C_R$  position, the incisors are in an end-to-end relationship, and the facial profile is acceptable.



■ Fig. 3: Pre-treatment study models (casts)

5. Increase the axial inclination of the maxillary incisors.

### Treatment Plan

The plan for this camouflage treatment was to resolve the Class III relationship by retracting the lower arch and correcting the anterior crossbite. Extraction of LL8 and interproximal reduction (IPR) were scheduled to relieve the crowding and retract the lower lip. Anterior and posterior bite turbos were planned to assist with the correction, and Class III elastics would rectify the molar relationships.

### Treatment Alternatives

Extraction of the four premolars is a viable approach to correct the anterior crossbite and relieve the crowding. The advantages of this option are a straighter facial profile and reduced time for relieving the crowding. However, the patient preferred a non-extraction option.



■ Fig. 4: Pre-treatment panoramic radiograph

CEPHALOMETRIC SUMMARY			
	PRE-TX	POST-TX	DIFF.
<b>SKELETAL ANALYSIS</b>			
SNA° (82° ±4)	80°	82°	2°
SNB° (80° ±4)	81°	80°	1°
ANB° (2° ±4)	-1°	1°	2°
SN-MP° (32° ±6)	38°	40°	2°
FMA° (25° ±6)	31°	33°	2°
<b>DENTAL ANALYSIS</b>			
U1 TO NA mm (4mm ±3)	2.5	4	1.5
U1 TO SN° (104° ±4)	93°	100°	7°
L1 TO NB mm (4mm ±3)	4	2	2
L1 TO MP° (90° ±4)	75°	74°	1°
<b>FACIAL ANALYSIS</b>			
E-LINE UL (-1mm ±2)	-3	-2	1
E-LINE LL (0mm ±2)	2	0	2
%FH: Na-ANS-Gn (53% ±3)	55%	56%	1%
Convexity:G-Sn-Pg' (13°)	2°	7°	5°

■ Table 1: Cephalometric summary

## Treatment Progress

A 0.022-in slot Damon Q® fixed appliance (Ormco, Glendora, CA) with passive self-ligating (PSL) brackets was selected along with all specified archwires and orthodontic auxiliaries.

Before active orthodontic treatment, the patient was referred to extract LL8. Two weeks later, Damon Q® 0.022-in PSL brackets (Ormco, Glendora, CA) were bonded on the lower teeth with a 0.014-in CuNiTi archwire engaged. Standard torque was selected for the brackets. At the same time, posterior bite turbos were bonded on LR6 and LL6 (Fig. 5).

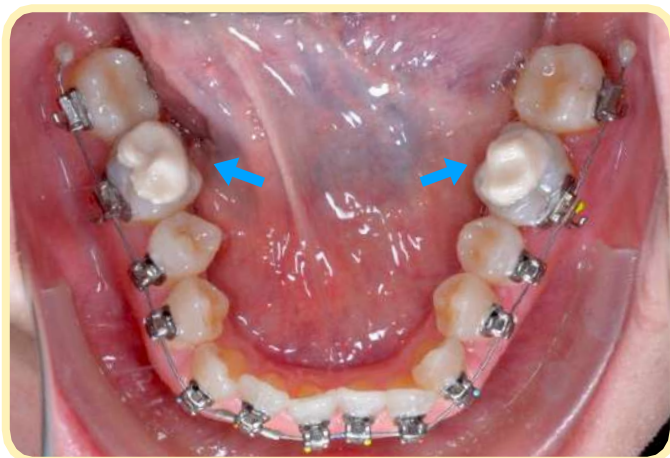
After one month of aligning and leveling the lower arch, the upper dentition was also bonded with PSL brackets. Low torque brackets were used on the upper anterior teeth to counteract the side effects of Class III mechanics. At the same appointment, anterior bite turbos were constructed with flowable resin on the LR2, LR1, and LL1 to open the intermaxillary space for

correction of the anterior crossbite after alignment of the lower incisors (Fig. 7).

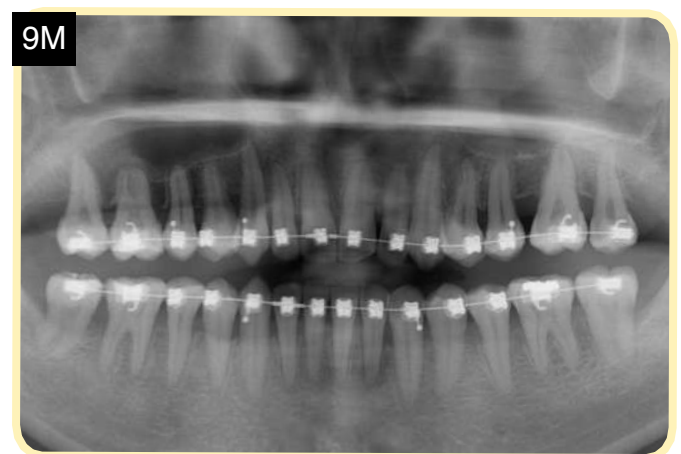
Early light short Class III elastics (Quail, 3/16-in, 2 oz; Ormco) were used for 2 months to correct the anterior crossbite. In the 3<sup>rd</sup> month of treatment, the overjet and overbite were well improved, and thus the bite turbos were removed.

In the 5<sup>th</sup> month, both archwires were changed to 0.014x0.025-in NiTi. Class III elastics (Quail, 3/16-in, 2 oz; Ormco) were used bilaterally from U6s to L3s for four months to achieve Class I molar relationship.

In the 9<sup>th</sup> month, a panoramic film revealed that root parallelism could be improved (Fig. 6); therefore, the brackets on UR1, UR2, UR7, UL1, and LR5 were rebonded. At the same time, unilateral elastics (Fox, 1/4-in, 3.5-oz; Ormco) from UR3 to LR6 and LR7 were used to correct the midline discrepancy. In the 11<sup>th</sup> month, IPR was performed to reduce the black triangles (Fig. 8), and a power chain was stretched from LR6 to LL6 to facilitate space closure.



**Fig. 5:** Posterior bite turbos (glass ionomer cement (GIC II) (blue arrows) were bonded on the mandibular arch to open the bite.



**Fig. 6:** Panoramic film in the 9<sup>th</sup> month (9M) shows discrepancy in root parallelism.



**Fig. 7:** Anterior bite turbos (flowable resin) were bonded on the LR2, LR1, and LL1 to open the bite. Early light short Class III elastics (Quail, 3/16-in, 2-oz; Ormco) were used to correct the anterior cross bite.

In the 12<sup>th</sup> month, the spaces were closed and the leveling and alignment was completed. Both archwires were changed to 0.016x0.025-in SS. In the 15<sup>th</sup> month, IPR was performed again to reduce the black triangles from LR2 to LL2. In the 17<sup>th</sup> month, the archwires on the posterior teeth were cut off, and short elastics were used to close the posterior open bite (Figs. 16 and 17). After 18 months of active treatment, all fixed appliances were removed, and fixed retainers were bonded on the lingual surfaces of all incisors in the maxillary arch, as well as from canine to canine in the mandibular arch. Upper and

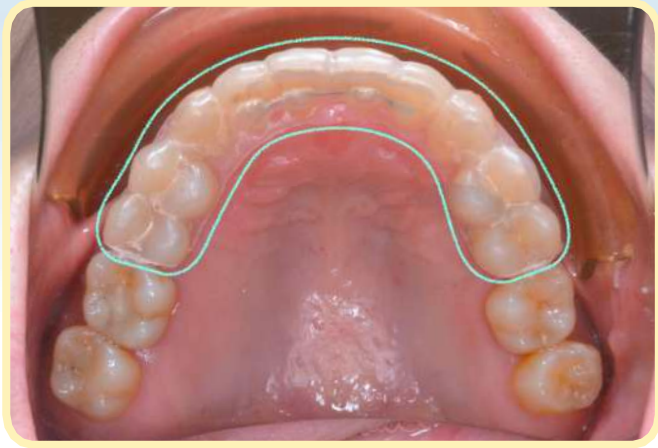
lower clear overlay retainers were delivered, with the posterior parts cut off to facilitate occlusal settling (Fig. 9).

### Results Achieved

Facial esthetics and the anterior crossbite were significantly improved after 18 months of active treatment (Fig. 11). The molar relationships were corrected to Class I. The posttreatment panoramic radiograph documented acceptable root parallelism (Fig. 13). The superimposed cephalometric tracings



**Fig. 8:** In the 11<sup>th</sup> month, a power chain was applied between LR6 and LL6 to close IPR spaces, and unilateral elastics (Fox, 1/4-in, 3.5-oz; Ormco) from UR3 to LR6 and LR7 were used to correct the midline deficiency.



**Fig. 9:**  
The clear overlay retainer on the molars was removed to facilitate occlusal settling.

showed proclined maxillary incisors (1.5 mm) as a result of anterior crossbite correction (Fig. 12). The axial inclination of the upper incisors (U1-SN) increased 7° after treatment (93° to 100°), and the axial inclination of the lower incisors (L1-MP) was maintained (75° to 74°). The lower lip was retruded

following the retraction of the anterior segments. The mandibular plane angle (SN-MP) was well-maintained (Table 1). The Cast-Radiograph Evaluation (CRE)<sup>6</sup> score was 10 points, as shown in the supplementary Worksheet 2. The Pink and White dental esthetic score was 6 points (Worksheet 3).<sup>7</sup> The patient was pleased with the final results. The treatment was concluded in only 18 months without orthognathic surgery. Full treatment progress is documented in Figs. 15-18.

### Retention

To prevent relapse of crowding, a fixed retainer was placed on the lingual surfaces from UR2 to UL2 and LR2 to LL2. Two ESSIX® overlay retainers (Dentsply Sirona, Harrisburg, PA) were provided to retain the leveling and alignment of the dentition. The patient was instructed to use the overlay retainers full time for the first month and only while sleeping thereafter.



**Fig. 10:**  
Use Lin's 3-ring diagnosis to distinguish pseudo- from skeletal Class III malocclusions. The three diagnostic criteria in  $C_R$  are facial profile and ANB angle (left), a near Class I buccal occlusion in  $C_R$  (center), and functional shift  $C_R \rightarrow C_O$  (right).



■ Fig. 11: Posttreatment facial and intraoral photographs

## Discussion

In the treatment of Class III malocclusions, camouflage treatment is often challenging for orthodontists. The orthodontists need an accurate diagnosis and an appropriate treatment plan to achieve favorable non-surgical outcomes. Lin's 3-ring diagnosis is the most effective guide to distinguish pseudo- from true skeletal Class III malocclusions (Fig. 10).<sup>8</sup>

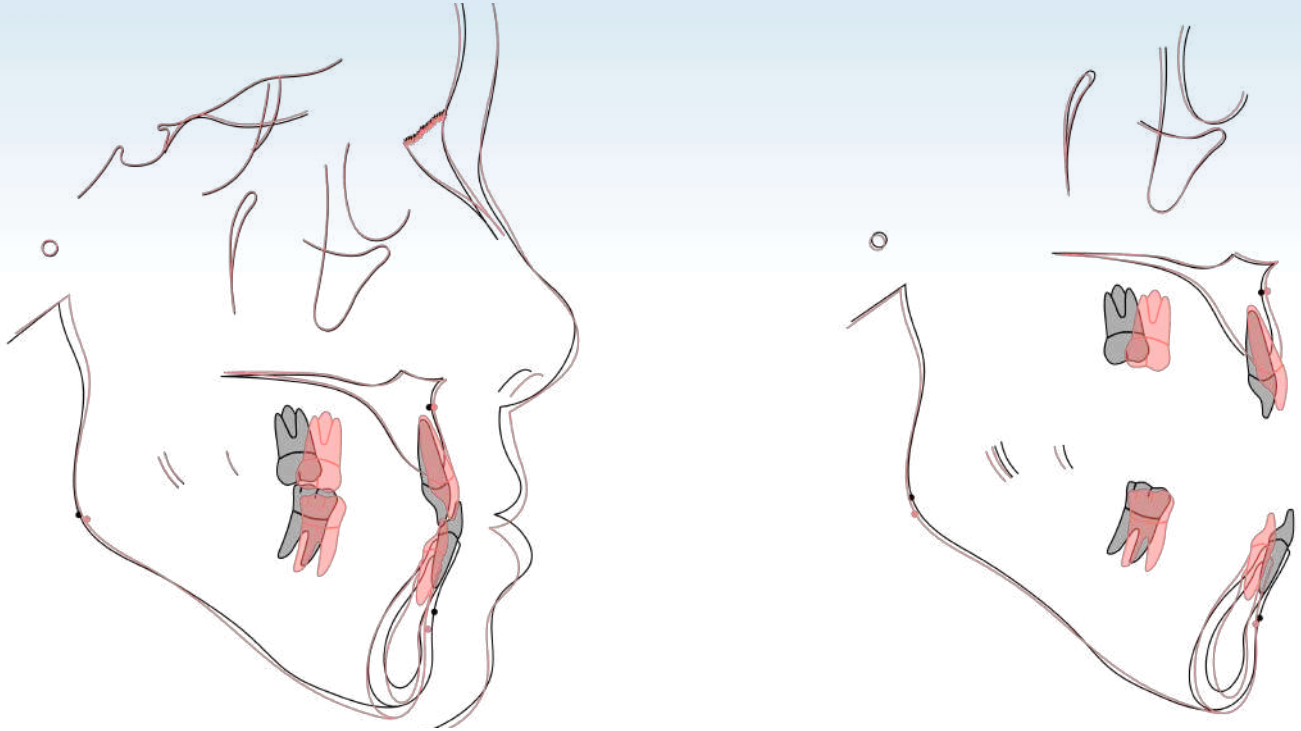
## Profile

Most patients with pseudo-Class III malocclusion could perform a functional shift and have orthognathic facial profiles in  $C_R$ , even if their ANB angles exceed  $-2^\circ$ . These patients tend to respond favorably to dentoalveolar treatment.

## Classification

A positive prognostic indicator for conservative treatment is to check if the patient could achieve Class I occlusion in  $C_R$ .





■ Fig. 12:

Superimposed cephalometric tracings (black: pre-treatment; red: posttreatment) show that the pre-treatment Class III molar relationship was corrected to Class I due to Class III elastic mechanics. Inevitable lingual tipping of the lower incisors occurred due to Class III mechanics; however,  $1^\circ$  is well acceptable.



■ Fig. 13:

Posttreatment panoramic radiograph. Note marginal ridge discrepancy between LL6 and LL7 was compromised.



■ Fig. 14: Posttreatment cephalometric radiograph

## Functional Shift

The presence of occlusal interference is associated with the point of initial contact while lower incisors completing to  $C_0$ . Anterior incisors presenting  $C_R \rightarrow C_0$  shift is another positive indicator for conservative treatment prognosis. Assessing the ANB angle on a cephalometric radiograph taken with the occlusion in  $C_R$  provides a more accurate evaluation of the skeletal issue. A Class III malocclusion with an anterior functional shift is more likely to respond positively to conservative therapy. In this case, patient's mandible had fully grown before treatment, and her orthognathic facial profile in  $C_R$  position implied a good prognosis with camouflage treatment; therefore, it could be considered a viable option (Fig. 10).

## Deep Bite Correction and Anterior Crossbite

For the anterior crossbite correction, posterior bite turbos were placed on the occlusal surfaces of the mandibular molars to open the bite at the beginning of the treatment procedure (Fig. 5).<sup>9</sup> One month later, anterior inclined bite turbos were constructed with flowable resin to open the intermaxillary space for correcting the anterior crossbite, as well as improving the upper incisors. Once sufficient intermaxillary space was created, CuNiTi archwires worked efficiently to align and level the dentition without occlusal interference.<sup>10</sup>

## Posterior Bite Turbos

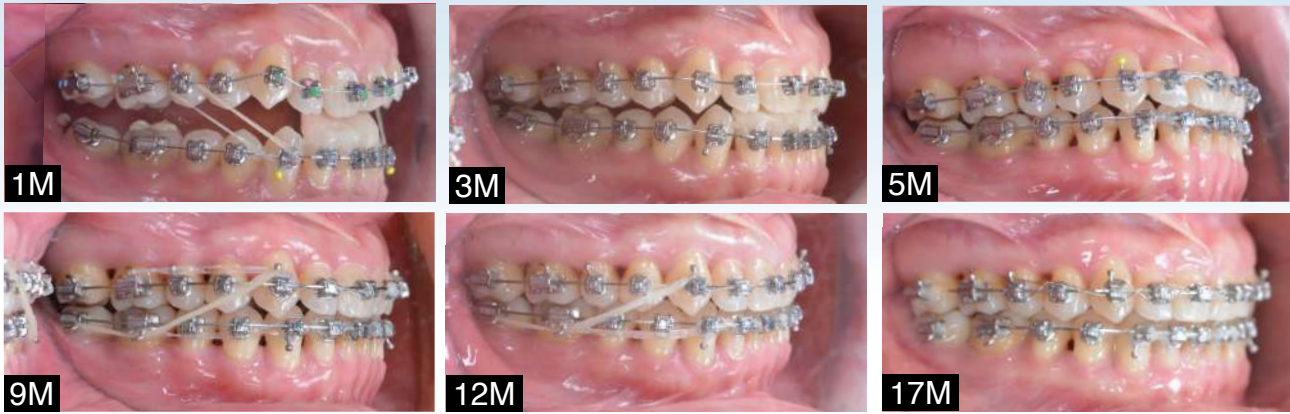
Bite turbos, which are designed to help correct bite issues, can be positioned in the anterior or posterior segments of either arch. Nevertheless, certain

limitations should be taken into account when considering this treatment option. Specifically, it is not advisable to place bite turbos on (1) weak teeth, such as upper lateral incisors, (2) teeth that have undergone endodontic treatment or have periodontal issues, (3) teeth with extensive restorations or temporary crowns, (4) isolated teeth that are subject to high stress, and (5) teeth that are intended to be moved as part of the overall treatment plan.<sup>11</sup>

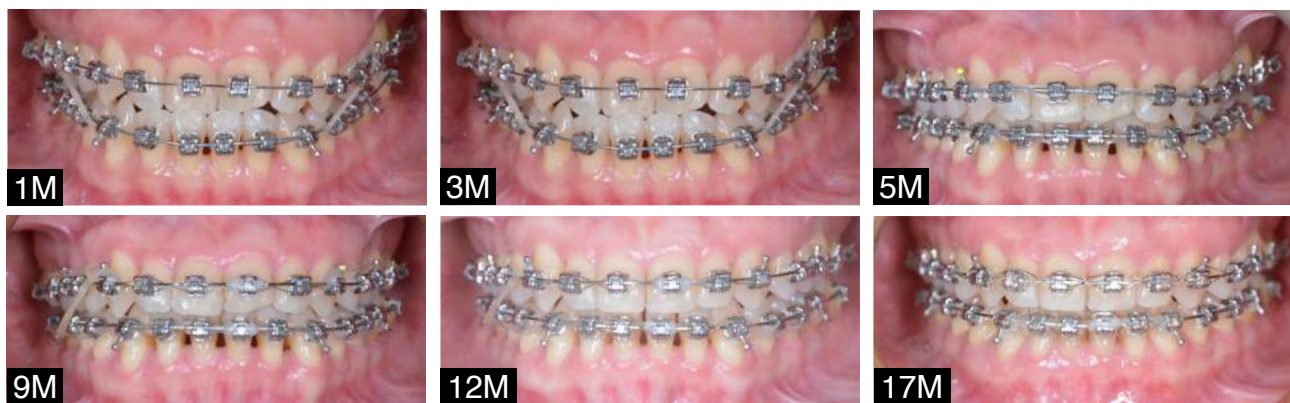
The protocol for bite turbos was necessary to correct the anterior crossbite.<sup>12</sup> This is because these devices serve a number of important functions, including (1) avoidance of premature occlusal contact on brackets, (2) minimizing wear on the teeth, especially in patients who have parafunctional habits, (3) promoting arch development, and (4) creating the necessary interocclusal space for successful correction of the crossbite. By following a well-designed protocol for the placement and use of bite turbos, orthodontic professionals can help patients achieve improved dental function and esthetics, while minimizing the risk of complications and other adverse outcomes.<sup>13</sup>

## Anterior Bite Turbos

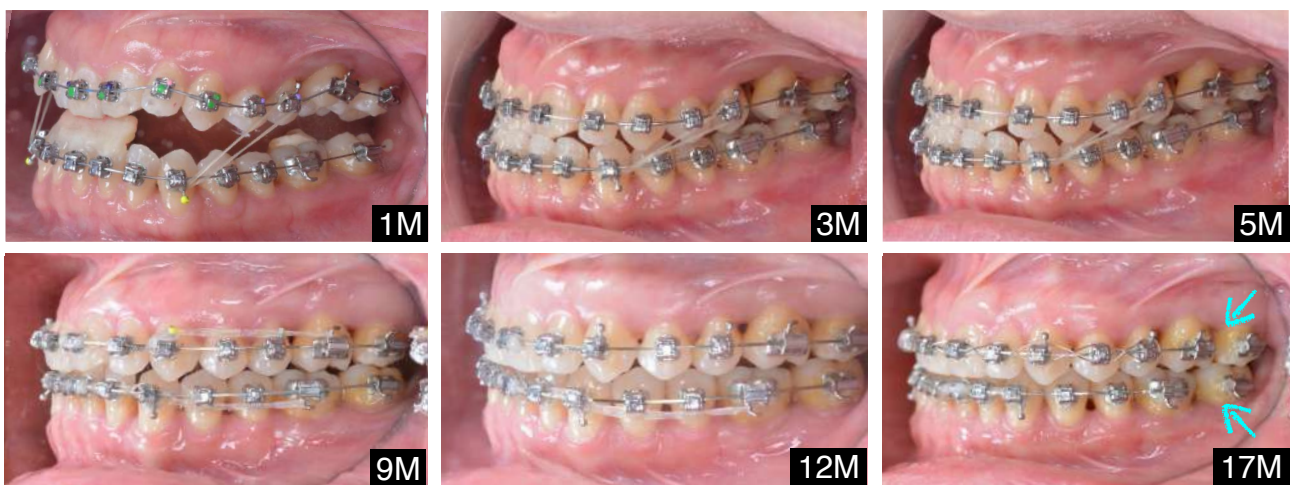
When it comes to solving anterior crossbites, utilizing bite turbos on the lower incisors can be an effective treatment approach. Flowable resin is often the ideal material for constructing lower anterior bite turbos, as it allows for easy adjustment and manipulation to achieve the desired bite opening. Additionally, the vertical dimension of the bite turbo should be carefully



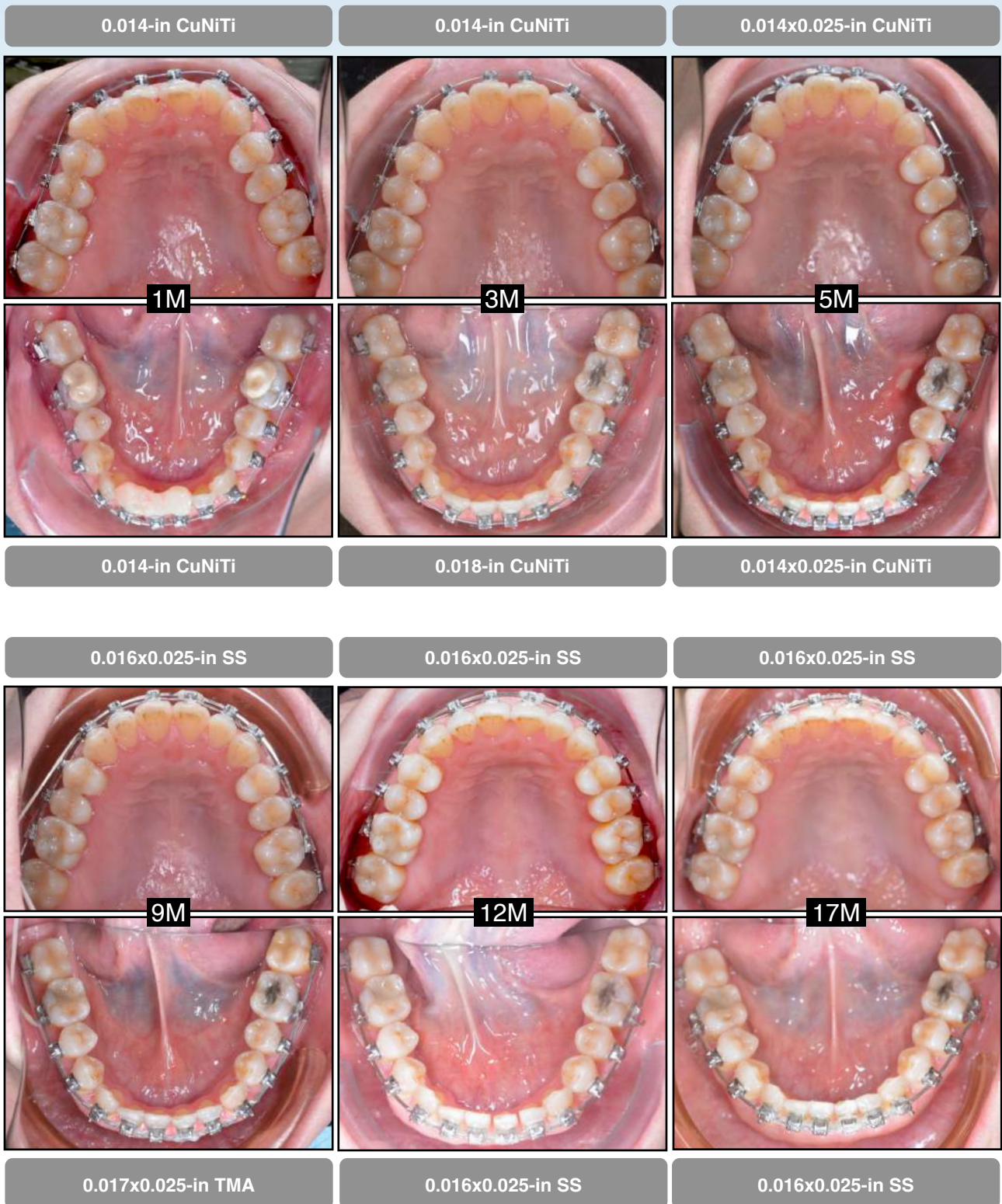
■ Fig. 15: Treatment progression - right buccal view: anterior bite turbos were used to correct the anterior cross bite as shown in the first month (1M).



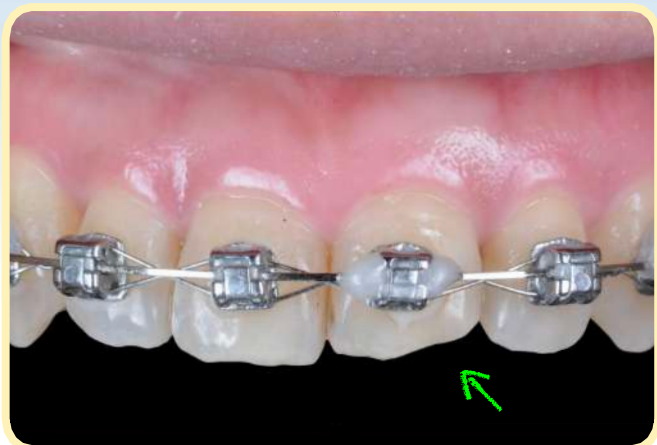
■ Fig. 16: Treatment progression - frontal view: in the 11<sup>th</sup> and 15<sup>th</sup> months, IPR was performed to reduce the black triangles.



■ Fig. 17: Treatment progression - left buccal view: in the 17<sup>th</sup> month, the archwires on the posterior teeth were cut off (blue arrows), and early light short Class III elastics (Quail, 3/16-in, 2-oz; Ormco) were used to close the posterior open bite.



■ Fig. 18: Treatment progression - upper and lower occlusal views with archwire sizes specified in grey labels



**Fig. 19:** This patient's UL1 was worn at the disto-incisal angle (left; green arrow), and was arranged to be repaired with composite resin after the crossbite was corrected (right; red arrow).

designed to open the intermaxillary space, ensuring proper occlusion and alignment during the active orthodontic treatment. By using anterior bite turbos in Class III situation, orthodontic professionals can help patients achieve improved dental function and esthetics.<sup>14</sup>

An anterior inclined bite turbo is a good treatment choice for the patients with:<sup>15</sup>

- retroclined maxillary anterior teeth with an anterior crossbite with or without functional shift,
- well-aligned mandibular anterior teeth without proclination,
- normal to deep overbite, and
- average to horizontal growth patterns.

Anterior inclined bite turbos are fixed onto lower anterior teeth with flowable resin. Appropriate angulation between the inclined plane and the upper anterior teeth should be determined by the

vertical discrepancy between the maxillary and the mandibular arches. Most anterior dental crossbites can be corrected within 3–4 weeks using an inclined plane.<sup>16</sup>

When the occlusion is disoccluded, ensure the bite opening is bilateral and comfortable for the patient. In this case, the bite turbo opened the bite to accelerate the initial stage of the orthodontic treatment. At the same time, intermaxillary Class III elastics were used with the whole maxillary dentition acting as anchorage to retract the mandibular dentition. Only three months were required to correct the anterior crossbite with the bite turbos and Class III elastics acting together to level and align multiple teeth efficiently.

### Tooth Attrition

Tooth attrition often accompanies an anterior crossbite, as the affected teeth are subject to wear from mandibular movement. If the correction of anterior crossbite fails then the teeth can result in



■ Fig. 20: One-year (left), two-year (middle), and four-year follow-up photographs (right) show the occlusion was settled naturally (yellow arrows).

continued attrition. Although this patient had worn disto-incisal angle on UL1, it was decided to delay restoration until the anterior crossbite was corrected (Fig. 19). This approach ensures that the restoration will not be subject to the same forces that caused the initial wear, leading to a more favorable long-term outcome.

### Posterior open bite after active treatment

A posterior open bite (POB) is a dental condition characterized by the failure of one or more teeth in the posterior buccal segments to reach occlusion, while there is an incisal contact.<sup>17</sup> In this case, uprighting of the lingually inclined upper anteriors and correcting the anterior crossbite may change the position of the temporomandibular joint and the angle of the occlusal plane, which caused the posterior open bite.<sup>18</sup> The way to solve the POB after the treatment was to trim the upper clear retainer to uncover the posterior teeth that were not in occlusion (Figs. 9 and 20).

### Conclusions

The successful treatment for challenging skeletal malocclusion was completed in only 18 months without orthognathic surgery. By using both anterior

and posterior bite turbos combined with Class III elastics, the patient was treated to an acceptable result. One of the main issues after active treatment - the posterior open bite, was effectively resolved by trimming the posterior parts of the clear overlay retainer. However, to ensure the ongoing stability and maintenance of the occlusion, long-term follow-up was necessary. The use of clear retainer, coupled with careful monitoring every 6 months allowed for a successful outcome in this complex case.

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# Discrepancy Index Worksheet

TOTAL D.I. SCORE 24

**OVERJET**

- 0 mm. (edge-to-edge) =
- 1 - 3 mm. = 0 pts.
- 3.1 - 5 mm. = 2 pts.
- 5.1 - 7 mm. = 3 pts.
- 7.1 - 9 mm. = 4 pts.
- > 9 mm. = 5 pts.

Negative OJ (x-bite) 1 pt. per mm. Per tooth =

Total = 10

**OVERBITE**

- 0 - 3 mm. = 0 pts.
- 3.1 - 5 mm. = 2 pts.
- 5.1 - 7 mm. = 3 pts.
- Impinging (100%) = 5 pts.

Total = 3

**ANTERIOR OPEN BITE**

0 mm. (Edge-to-edge), 1 pt. per tooth  
Then 1 pt. per additional full mm. Per tooth

Total = 0

**LATERAL OPEN BITE**

2 pts. per mm. Per tooth

Total = 2

**CROWDING** (only one arch)

- 1 - 3 mm. = 1 pt.
- 3.1 - 5 mm. = 2 pts.
- 5.1 - 7 mm. = 4 pts.
- > 7 mm. = 7 pts.

Total = 1

**OCCLUSION**

- Class I to end on = 0 pts.
- End on Class II or III = 2 pts. per side 2 pts.
- Full Class II or III = 4 pts. per side \_\_\_\_\_ pts.
- Beyond Class II or III = 1 pt. per mm. additional \_\_\_\_\_ pts.

Total = 2

**LINGUAL POSTERIOR X-BITE**

1 pt. per tooth Total = 0

**BUCCAL POSTERIOR X-BITE**

2 pts. Per tooth Total = 0

**CEPHALOMETRICS** (See Instructions)

ANB  $\geq 6^\circ$  or  $\leq -2^\circ$  = 4 pts.

Each degree  $< -2^\circ$  \_\_\_\_\_ x 1 pt. = \_\_\_\_\_

Each degree  $> 6^\circ$  \_\_\_\_\_ x 1 pt. = \_\_\_\_\_

SN-MP

$\geq 38^\circ$  = 2 pts.

Each degree  $> 38^\circ$  \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

$\leq 26^\circ$  = 1 pt.

Each degree  $< 26^\circ$  \_\_\_\_\_ x 1 pt. = \_\_\_\_\_

I to MP  $\geq 99^\circ$  = 1 pt.

Each degree  $> 99^\circ$  \_\_\_\_\_ x 1 pt. = \_\_\_\_\_

Total = 6

**OTHER** (See Instructions)

- Supernumerary teeth \_\_\_\_\_ x 1 pt. = \_\_\_\_\_
- Ankylosis of perm. Teeth \_\_\_\_\_ x 2 pts. = \_\_\_\_\_
- Anomalous morphology \_\_\_\_\_ x 2 pts. = \_\_\_\_\_
- Impaction (except 3<sup>rd</sup> molars) \_\_\_\_\_ x 2 pts. = \_\_\_\_\_
- Midline discrepancy ( $\geq 3$ mm) @ 2 pts. = \_\_\_\_\_
- Missing teeth (except 3<sup>rd</sup> molars) \_\_\_\_\_ x 1 pt. = \_\_\_\_\_
- Missing teeth, congenital \_\_\_\_\_ x 2 pts. = \_\_\_\_\_
- Spacing (4 or more, per arch) \_\_\_\_\_ x 2 pts. = \_\_\_\_\_
- Spacing (Mx cent. diastema  $\geq 2$ mm) @ 2 pts. = \_\_\_\_\_
- Tooth transposition \_\_\_\_\_ x 2 pts. = \_\_\_\_\_
- Skeletal asymmetry (nonsurgical tx) @ 3 pts. = \_\_\_\_\_
- Addl. treatment complexities \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Identify:

Total = 0



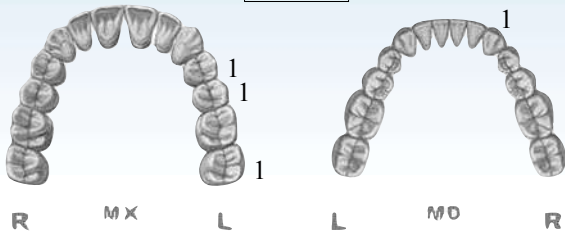
# Cast-Radiograph Evaluation

Total Score:

10

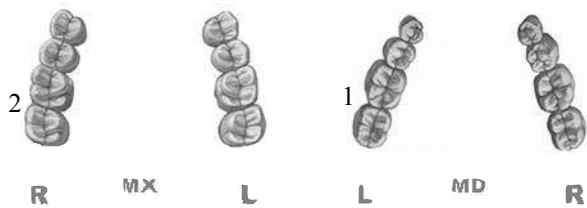
## Alignment/Rotations

4



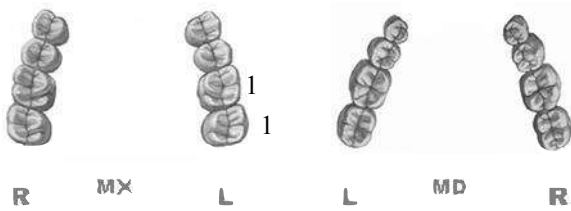
## Marginal Ridges

3



## Buccolingual Inclination

2



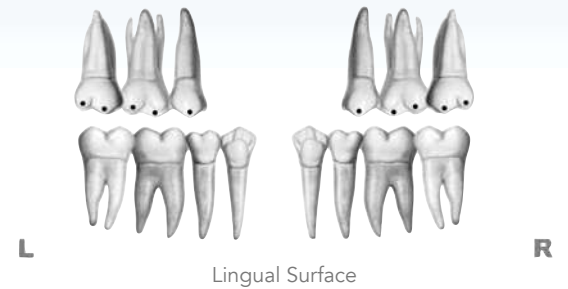
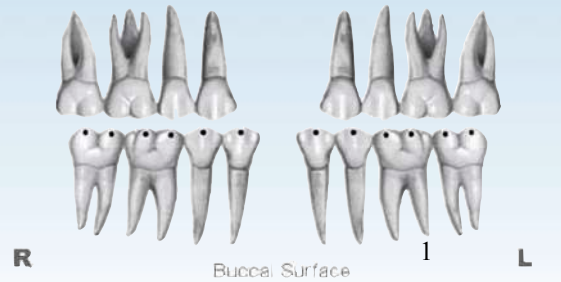
## Overjet

0



## Occlusal Contacts

1



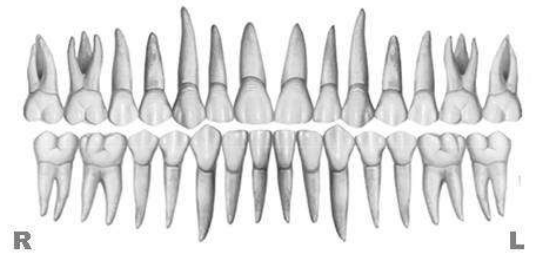
## Occlusal Relationships

0



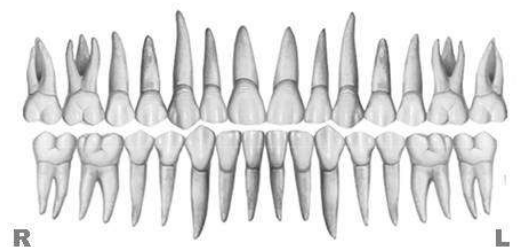
## Interproximal Contacts

0



## Root Angulation

0

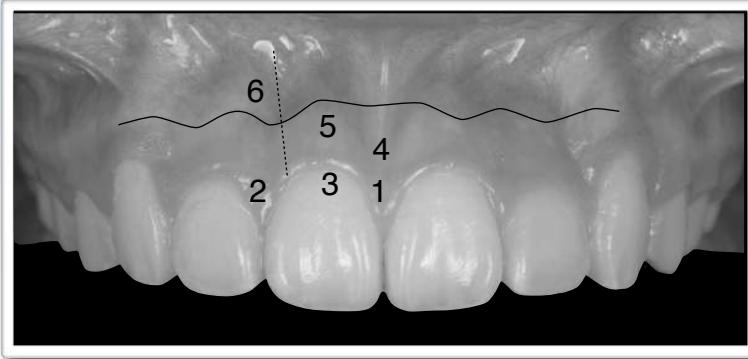


**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## IBOI Pink and White Esthetic Score

Total Score = 6

### 1. Pink Esthetic Score

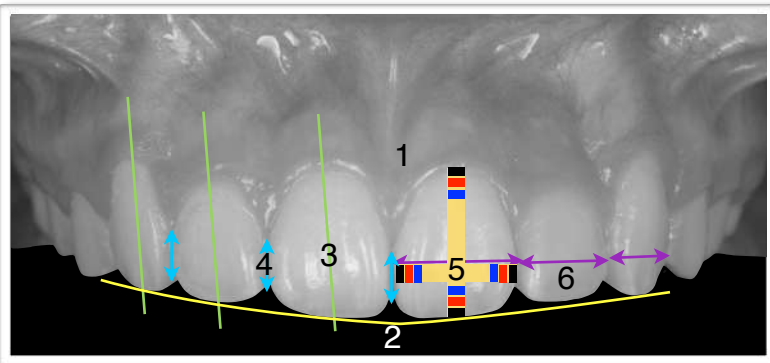


Total = 2

1. M and 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

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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

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



Total = 4

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

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



## 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



2024

Screws & Aligners

Nov 12-14

Keynote (optional)

Nov 15

Course fees\*:

Day 123 USD **3,950** (Early bird rate\*) USD ~~4,600~~

Day 4 USD **500** (Early bird rate\*) USD ~~700~~

\* Fees cover local transportation, meals and three nights of shared accommodation (double occupancy). Airport pick up is available upon request with additional charges.

\* Early bird rate ends two months prior to the course date.

*“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

DAY

**1 Chair-side observation**

DAY

**2 Lecture, chair-side observation**

Lecture topic: **Screws & Aligners**

DAY

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

Hands-on workshop

DAY

**4 Keynote workshop**

(optional) conducted by Newton's A team



# IMPACTION



**VISTA** ✓

Vertical Incision Subperiosteal Tunnel Access

