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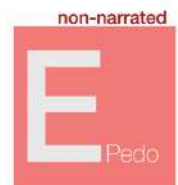
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2. Simple and effective anchorage system
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1. Simplify your system
2. Extraction vs. non-extraction

Practice: Case report demo

## Module 6 - 7/21 (A班) | 9/22 (B班)

1. Class III correction
2. Class II correction

Topic: Early orthodontic treatment (曾淑萍醫師)

## Module 7 - 8/18 (A班) | 10/20 (B班)

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2. Lower impaction
3. Gummy smile correction

Topic: Modified VISTA (蘇釜璋醫師)

## Module 8 - 9/15 (A班) | 11/3 (B班)

1. ABO DI, CRE workshop
2. Open bite

Topic: Modified 2X4 appliance in ortho treatment (徐玉玲醫師)

## Module 9 - 9/29 (A班) | 12/1 (B班)

1. Implant-ortho combined treatment
2. Asymmetry

Topic: Interdisciplinary approach (邱上珍醫師)

## Module 10 - 10/13 (A班) | 12/15 (B班)

1. Minor surgeries in orthodontics
2. Digital orthodontics

Topic: Ortho-viewed interdisciplinary treatment (徐重興醫師)

## Module 11 - 11/10 (A班) | 12/22 (B班)

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2. Keys to aligner learning

Topic: Pre-aligner treatment (林詩詠醫師)

▲ Special lecture: 1:30-2:30 pm

時間：週四全天 (9 am - 5 pm)

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## Lower First Molar Extraction to Treat a Class III Malocclusion with Three-Dimensional Problems

### Abstract

**Introduction:** A 24-year-old female presented with chief complaints of protruded chin, protrusive lower lip, and poor smile esthetics.

**Diagnosis:** Cephalometric analysis showed a skeletal Class III relationship (SNA, 81°; SNB, 84°; ANB, -3°) with high mandibular plane angle (SN-MP, 50°). An intraoral assessment revealed bilateral Class III malocclusion with anterior crossbite (UR1, UR2, UR3, UL1, UL2, and UL3), and the lower midline was deviated 1.5mm to the right. Mild crowding was present in the lower anterior dentition. The Discrepancy Index (DI) was 61.

**Treatment:** A Damon® system appliance with passive self-ligating brackets was applied to correct the dental malocclusion after extracting four molars (UR8, UL8, LR6, and LL6). Posterior bite turbos and early light short Class III elastics were used to correct the anterior crossbite. Space closing and midline correction were also accomplished with elastics. The active treatment time was 29 months. The dentition was aligned, and space was created for an implant-supported prosthesis (ISP) to restore UL6.

**Results:** Retraction of the lower anterior segment and adjacent lip was achieved to improve the profile. After 29 months of active treatment, this severe skeletal malocclusion was corrected to an excellent Cast-Radiograph Evaluation (CRE) of 23 points and a Pink and White esthetic score of 9. No root resorption nor periodontal problems were noted.

**Conclusions:** This case report demonstrates the use of passive self-ligating appliances to resolve skeletal and dental Class III malocclusions without orthognathic surgery. (J Digital Orthod 2022;67:50-66)

**Key words:**

Skeletal Class III, full-cusp Class III, non-surgical treatment, anterior crossbite, torque selection, bite turbos

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

Class III malocclusions are challenging particularly when combined with vertical problems, e.g., deep bite. For mature adults, using camouflage treatment as an alternative to orthognathic surgery has long been debated.<sup>1</sup> Orthognathic surgery certainly has

specific advantages when the patient needs a skeletal correction; however, the expense and surgical morbidity are unattractive aspects. This is the main reason that camouflage treatment was developed - to achieve a compromised but acceptable outcome.<sup>2</sup> Camouflage treatments, with or without extractions, are usually accomplished with intermaxillary Class III elastics, with the whole maxillary dentition as anchorage to retract the mandibular arch.<sup>3</sup> Class III camouflage treatment with extractions can improve the ANB angle and decrease facial convexity with little or no change in the vertical dimension of the occlusion (facial

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**Chris H. Chang,**

*Founder, Beethoven Orthodontic Center*

*Publisher, Journal of Digital Orthodontics (Center right)*

**W. Eugene Roberts,**

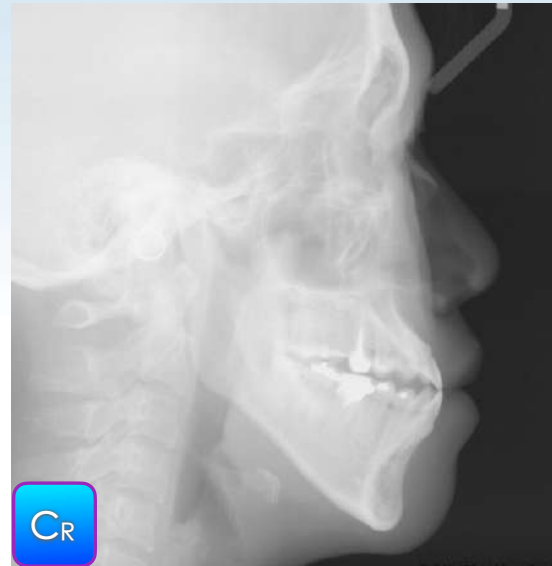
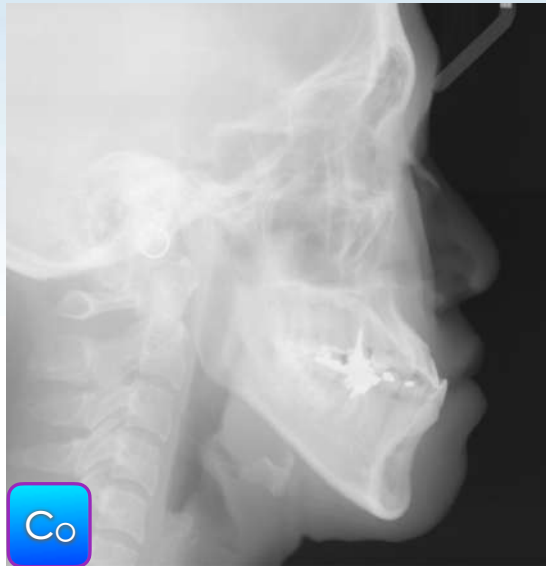
*Editor-in-Chief, Journal of Digital Orthodontics (Right)*



height).<sup>4-9</sup> With careful selection and diagnosis, 92% of adult patients with Class III malocclusion can be effectively treated with orthodontic therapy alone.<sup>1</sup> This case report documents the conservative management of an adult skeletal Class III malocclusion complicated with anterior crossbite, posterior crossbite, and deep bite



■ Fig. 1: Pre-treatment facial and intraoral photographs in centric occlusion ( $C_0$ )



■ 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. 1). Conservative camouflage treatment was the patient's preference.

## Diagnosis and Etiology

A 24yr-11mo-old female presented for orthodontic consultation with the following chief concerns: protruded chin, protrusive lower lip, and poor smile esthetics (Fig. 1). No contributing medical or dental history was reported. The facial profile was less convex than normal (Fig. 2). An intraoral examination

revealed an anterior crossbite from UR3 to UL3 and posterior crossbite from UR5 to UR7 (Fig. 3; Table 1). The overjet was -3mm, and the overbite was 6mm. Mild crowding (1mm) was found in the mandibular arch, and a ~3mm diastema was present in the maxillary arch. The molar relationship was full-cusp Class III on both sides (Fig. 1). The lower midline was shifted 1.5mm to the right.

There were no signs nor symptoms of temporomandibular disorder (TMD). The panoramic



■ Fig. 3: Three-dimensional problems included transverse posterior crossbite (left), sagittal anterior crossbite (center), and vertical deep bite (right).

radiograph showed the UL6 was missing (Fig. 4). The pre-treatment cephalometric radiographs and intraoral examination revealed: (1) an orthognathic profile in  $C_R$  position, (2) 3mm anterior functional shift, and (3) near Class I buccal relationships in  $C_R$  (Fig. 2). The cephalometric analysis (Table 1) documented an ANB angle of  $-3^\circ$  and protruded lower lip (3.5mm to the E-Line). A careful evaluation of the Discrepancy Index ( $DI = 61$ )<sup>10</sup> (Worksheet 1) and Lin's 3-Ring Diagnosis (Fig. 5) indicated conservative treatment was feasible. However, according to Chang's Extraction Decision Chart (Table 2), extractions were needed to manage the high mandible angle, flared anterior inclination, and the ill-fitted prostheses on LL6 and LR6.

## Treatment Objectives

1. Correct the anterior and posterior crossbite.
2. Maintain the straight profile in  $C_R$  position.
3. Achieve Class I canine and molar relationships.
4. Create ideal overjet (OJ) and overbite (OB).



■ Fig. 4: Pre-treatment panoramic radiograph

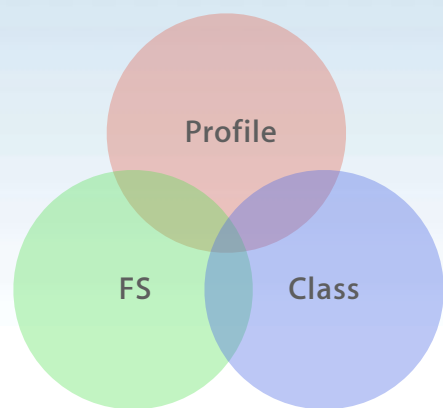
## Treatment Plan

The plan for this camouflage treatment was to resolve the Class III relationship by retracting the lower arch and correcting the anterior and posterior crossbite. Extraction of the UR8, UL8, LR6, and LL6 was scheduled to relieve the crowding and retract the lower lip. Create space between UL5 and UL7 in order to restore the UL6 with an implant-supported prosthesis (ISP). Use posterior bite turbos and elastics to assist with the correction, and rectify molar relationship using Class III elastics. Low-torque and standard brackets were selected for the upper

CEPHALOMETRIC SUMMARY			
SKELETAL ANALYSIS			
	PRE-TX	POST-TX	DIFF.
SNA° ( $82^\circ \pm 4$ )	81°	82°	1°
SNB° ( $80^\circ \pm 4$ )	84°	82°	2°
ANB° ( $2^\circ \pm 4$ )	-3°	0°	3°
SN-MP° ( $32^\circ \pm 6$ )	50°	51°	1°
FMA° ( $25^\circ \pm 6$ )	43°	44°	1°
DENTAL ANALYSIS			
U1 TO NA mm ( $4\text{mm} \pm 3$ )	9	7	2
U1 TO SN° ( $104^\circ \pm 4$ )	111°	107°	4°
L1 TO NB mm ( $4\text{mm} \pm 3$ )	10	5	5
L1 TO MP° ( $90^\circ \pm 4$ )	78°	60°	18°
FACIAL ANALYSIS			
E-LINE UL ( $-1\text{mm} \pm 2$ )	1	0	1
E-LINE LL ( $0\text{mm} \pm 2$ )	3.5	-1	4.5
%FH: Na-ANS-Gn ( $53\% \pm 3$ )	57%	51%	6%
Convexity:G-Sn-Pg' ( $13^\circ$ )	3°	5°	2°

■ Table 1: Cephalometric summary





**Profile:** Orthognathic profile at C<sub>R</sub> position  
**Class:** Canine and molar Class I relationship at C<sub>R</sub> position  
**FS:** Functional shift (C<sub>O</sub>≠C<sub>R</sub>)

Fig. 5: The Class III diagnostic system of John Lin

	Ext	Non
Profile	Protrusive	<b>Straight</b>
Md. angle	<b>High</b>	Low
Bite	Open	<b>Deep</b>
Ant. inclination	<b>Flaring</b>	Flat
Crowding	> 7 mm	<b>None</b>
Decay/ missing	<b>Present</b>	?
P't perception	<b>OK</b>	No
Etc...		

Table 2: Chang's Extraction Decision Table

anterior teeth, and high-torque for the lower anterior teeth, respectively, to compensate for the side effects of Class III elastic mechanics.

Treatment Alternatives

LeFort I orthognathic surgery with bilateral sagittal split osteotomy (BSSO) was the surgical treatment option for the patient. However, the patient was concerned about the risk of surgical complications so she preferred non-surgical options.

Treatment Progress

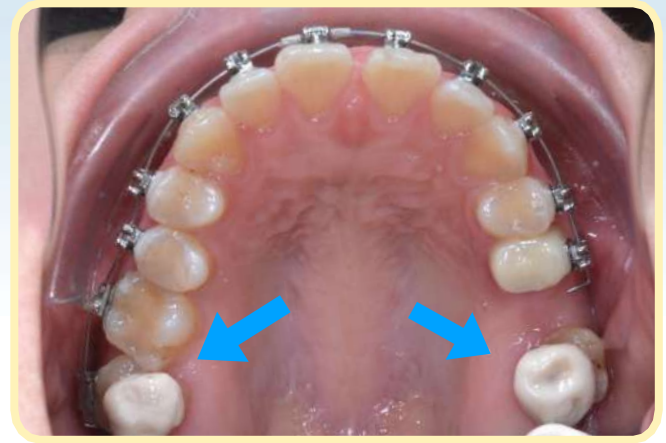
A 0.022-in slot Damon Q® fixed appliance (Ormco, Glendora, CA) with passive self-ligating (PSL) brackets was selected along with all specified archwires and orthodontic auxiliaries.

Before active orthodontic treatment, the patient was referred to extract the UR8, UL8, LR6, and LL6. 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. Upside-down low-torque brackets were bonded on the lower anterior teeth to serve as high-torque brackets (Fig. 6) to help avoid torque loss during the retraction of the lower arch.

After one month of aligning and leveling the lower arch, the upper dentition was also bonded with PSL brackets. Standard torque brackets were used on all upper teeth except for the maxillary lateral incisors, which were bonded with low-torque brackets to counteract the side effects of Class III mechanics. At the same appointment, two occlusal bite turbos were constructed with Fuji II® type II glass ionomer cement (GC America, Alsip IL) on the UR7 and UL7 to open the intermaxillary space for correction of the anterior crossbite (Fig. 7).



**Fig. 6:**  
Low-torque brackets were bonded upside down to express high-torque in the lower anterior teeth.



**Fig. 7:**  
Posterior bite turbos (blue arrows) were bonded on the maxillary arch to open the bite.

Early light short Class III elastics (Quail 3/16-in 2 oz, Ormco) were used for 3 months to correct the anterior crossbite. In the 4<sup>th</sup> month of treatment, a positive overjet was achieved, and thus the bite turbos were removed.

In the 8<sup>th</sup> month, leveling and alignment was completed. Both archwires were changed to 0.017x0.025-in TMA. Class III elastics (Fox, 1/4-in, 3.5-oz; Ormco) were used bilaterally for four months to achieve canine Class I occlusion (Fig. 8).

In the 12<sup>th</sup> month, lingual buttons were placed on the lingual surfaces of LL5, LL8, LR5, and LR8. Power chains were hooked between the buttons in order to prevent molar rotation during the closure of extraction spaces (Fig. 9). At the same time, an open coil spring was used to create space at the UL6 extraction site. In the 19<sup>th</sup> month, an implant-supported prosthesis (ISP) was installed to restore the UL6 (Fig. 10). A crestal incision was performed lingual to the center of the edentulous ridge, and a full thickness mucoperiosteal flap was reflected. After that, a surgical guide pin was placed to check with a



**Fig. 8:**  
Five-ring power chains were applied bilaterally to close extraction spaces, and Class III elastics were used to adjust canine and molar relationships.

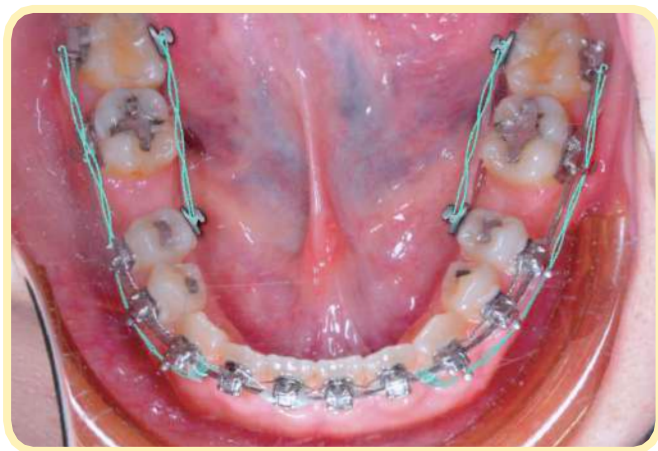
periapical X-ray film, which showed the mesiodistal angulation with no penetration into the sinus. An implant fixture (4.3x10-mm OsseoSpeed™TX, Dentsply International, York, PA) was installed according to the manufacturer's instructions, and a healing abutment (ø5.0xH5.0-mm) was placed. The

soft tissue flap was repositioned and closed with interrupted 4-0 sutures.

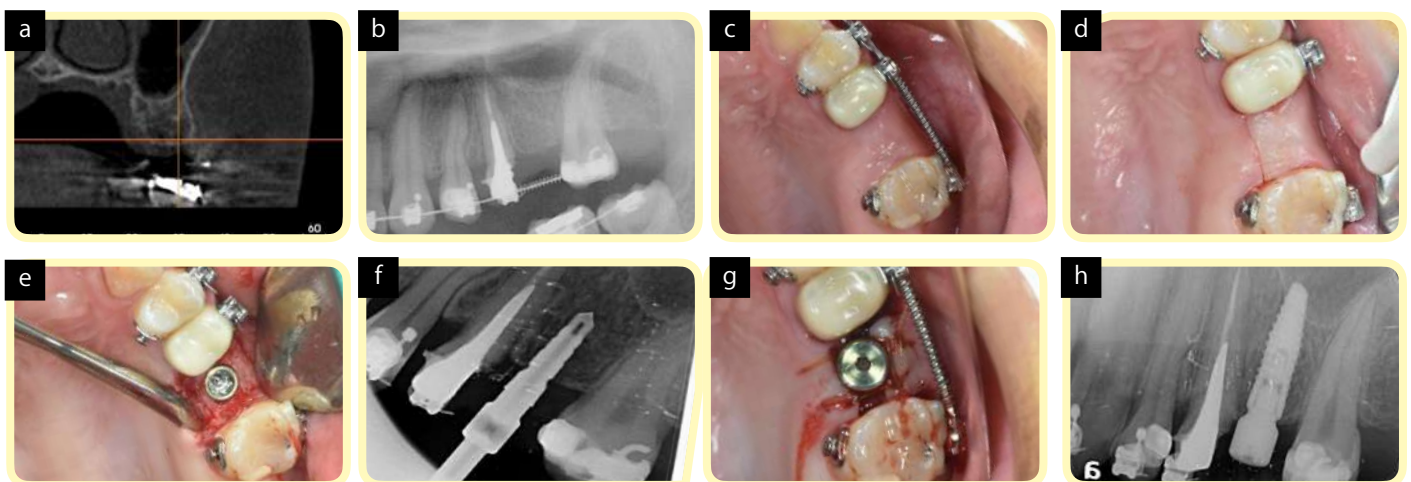
In the 22<sup>nd</sup> month, the mandibular extraction spaces were closed. After 29 months of active treatment, all fixed appliances were removed. A direct impression was made after 3 months, and new clear retainers were prepared after the delivery of the UL6 prosthesis. Posttreatment records are documented in Figs. 11-14.

### Results Achieved

Facial esthetics and Class III malocclusion were significantly improved after 29 months of active treatment (Fig. 11). The canine relationships were corrected to Class I, and the molar relationship was significantly improved. The posttreatment panoramic radiograph documented acceptable root parallelism except for LR6 (Fig. 13). The superimposed cephalometric tracings showed the protracted LR7



**Fig. 9:**  
Buccal-lingual mechanics was facilitated to close the extraction space in the mandibular arch after 12 months of treatment.



**Fig. 10:** Steps involved in the placement of the implant are illustrated as follows:  
(a)&(b) Pre-operative radiographic examination for implant site. (c) UL6 extraction site was prepared as implant space. (d) Incisions were performed lingual to the mid-crestal and sulcular for flap reflection. (e) Occlusal view of implant fixture. (f) A guide pin was placed to check the axial direction and depth. (g) The healing abutment was placed. (h) Post-operative periapical X-ray shows good parallelism.





■ **Fig. 11:** Posttreatment facial and intraoral photographs

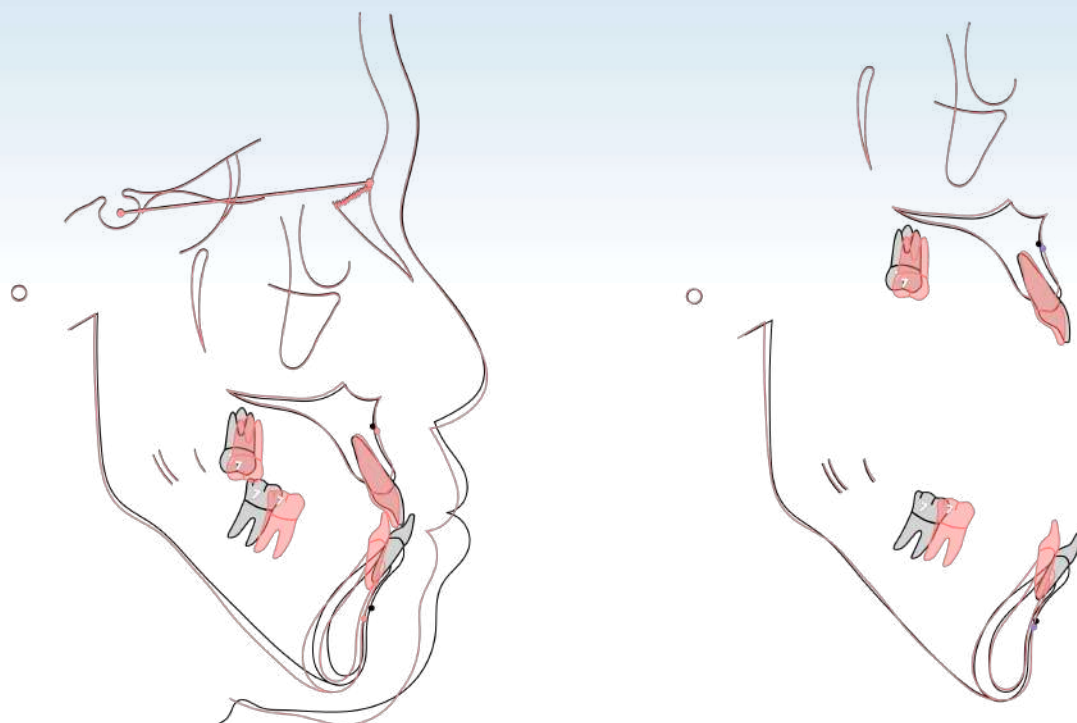
(6mm) as a result of closing the extraction spaces with elastic force (Fig. 12). The axial inclination of the upper incisor (U1-SN) decreased  $4^{\circ}$  after treatment ( $111^{\circ}$  to  $107^{\circ}$ ), and the axial inclination of the lower incisors (L1-MP) was inevitably tipped lingually ( $78^{\circ}$  to  $60^{\circ}$ ). The upper and lower lips were both retruded following the retraction of the anterior segments. The mandibular plane angle (SN-MP) was well-maintained (Table 1). The Cast-Radiograph Evaluation (CRE) score was 23 points, as shown in

the supplementary Worksheet 2.<sup>11</sup> The Pink and White dental esthetic score was 9 points (Worksheet 3).<sup>12</sup> The patient was pleased with the final result.

## Retention

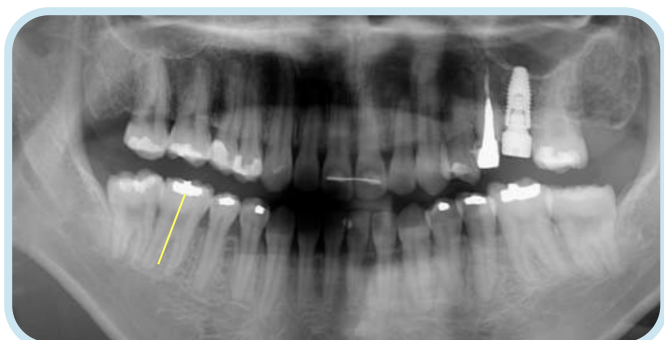
To prevent relapse of crowding, a fixed retainer was placed on the lingual surfaces from UR2 to UL2 of the maxillary arch. Two ESSIX® overlay retainers (Dentsply Sirona, Harrisburg, PA) were provided to retain the





■ 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 6mm protraction of the L7s, which was a benefit from the L6 extractions. However, inevitable lingual tipping of the lower incisors occurred due to the Class III mechanics.



■ Fig. 13:

Posttreatment panoramic radiograph. Note root parallelism of LR6 was compromised.



■ Fig. 14: Posttreatment cephalometric radiograph

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.

## Discussion

The American Association of Oral and Maxillofacial Surgeons recommends orthognathic surgery if the horizontal overjet is zero or negative and the A-P molar discrepancy is  $\geq 4$ mm Class III. However, a substantial functional shift may accentuate a dental discrepancy such as anterior crossbite.<sup>12</sup> A non-surgical treatment may be feasible by correcting the shift and increasing the lower facial height. Although Class III camouflage treatment is often challenging for orthodontists, an accurate diagnosis and appropriate treatment plan usually results in favorable non-surgical outcomes.

A Class III malocclusion like the current case puts practitioners at the intersection between a surgical and a non-surgical solution. This is when the 3-Ring Diagnosis developed by John Lin is particularly helpful for treatment planning (Fig. 5).<sup>13,14</sup>

For this patient, the mandible was fully grown before treatment. Therefore, the orthognathic facial profile in centric relation ( $C_R$ ) position implied a good prognosis with camouflage treatment. It was carried out with a satisfactory result in only 29 months without orthognathic surgery (Figs. 11-14). Treatment progress is documented in Figs. 15-18. The major problems in this case were: (1) the full-cusp Class III malocclusion, (2) anterior crossbite and deep bite (6mm), as well as (3) missing UL6.

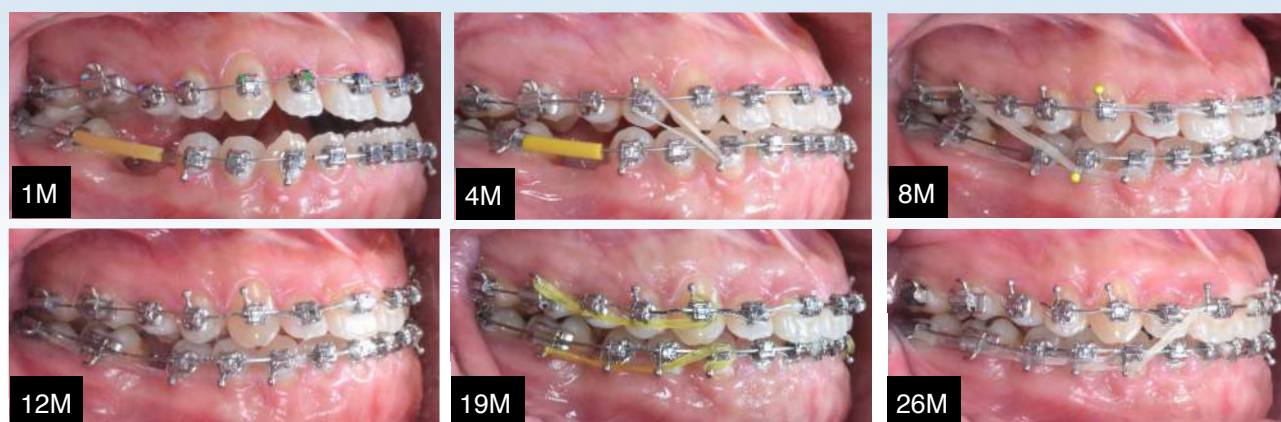
## Full-Cusp Class III Malocclusion

In order to correct the anterior crossbite and improve the posterior intercuspation, Chang's Extraction Decision Table (Table 2) was used to assess the necessity for extractions. The factors favoring extractions were the high mandibular plane and anterior incisal inclination. In Class III camouflage treatments, U5 and L4 extractions are a common solution. For this case, LL6 and LR6 had compromised restorations so they were extracted instead of L5s. Furthermore, extraction of UR8 and UL8 was indicated because of their unusually small size. The patient was open to extractions so UR6, UR8, and UL8 were removed to provide space to correct the severe skeletal malocclusion ( $DI = 61$ ).

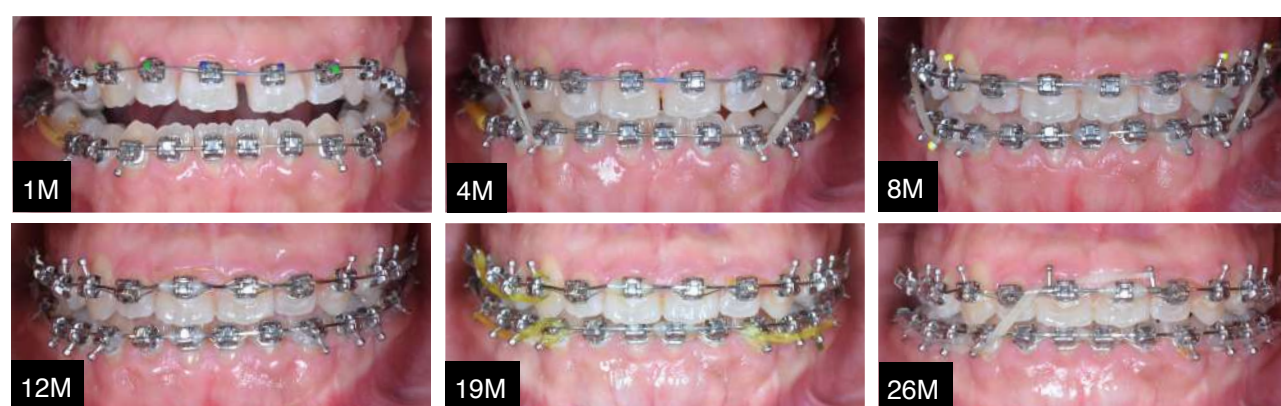
## Anterior Crossbite and Deep Bite Correction

For the anterior crossbite correction, bite turbos were placed on the occlusal surfaces of the maxillary molars to open the bite (Fig. 7).<sup>15</sup> Once sufficient intermaxillary space was created, a Ni-Ti archwire was placed into the brackets to align and level the dentition without the risk of occlusal interference. Bite turbos (glass ionomer cement occlusal bite raisers) were bonded on the posteriors rather than anteriors due to the big negative overjet.

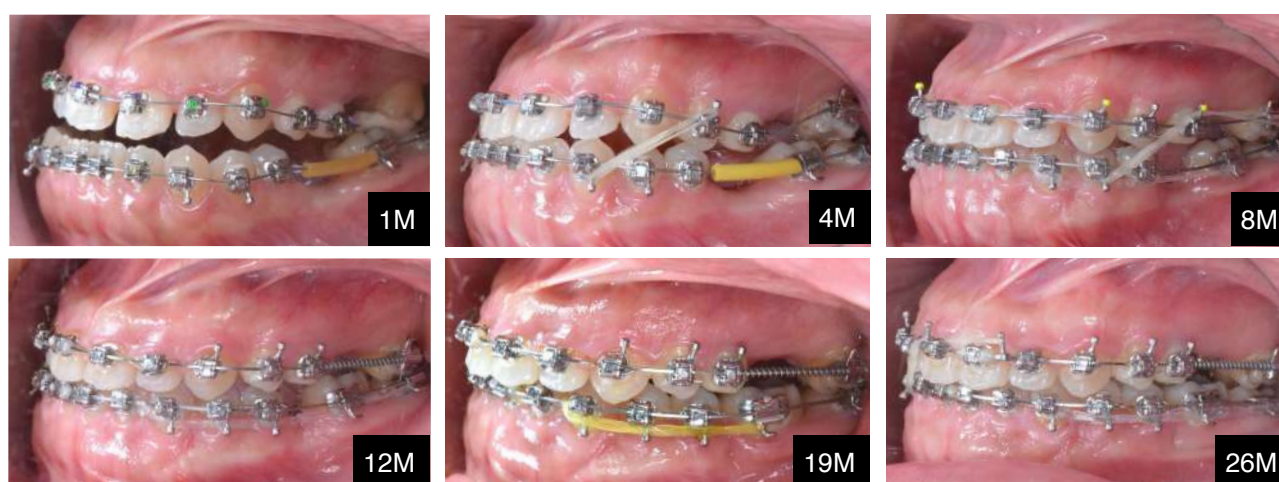
The protocol for bite turbos was necessary to correct the anterior crossbite<sup>16</sup> because they: (1) prevent premature occlusal contact on brackets, (2) control wear on the teeth particularly with parafunction, (3) facilitate arch development, and (4) create interocclusal space for the crossbite correction.



**Fig. 15:**  
Treatment progression from the right buccal view. Z-type elastics were used to correct the midline deficiency as shown at 26 months (26M).

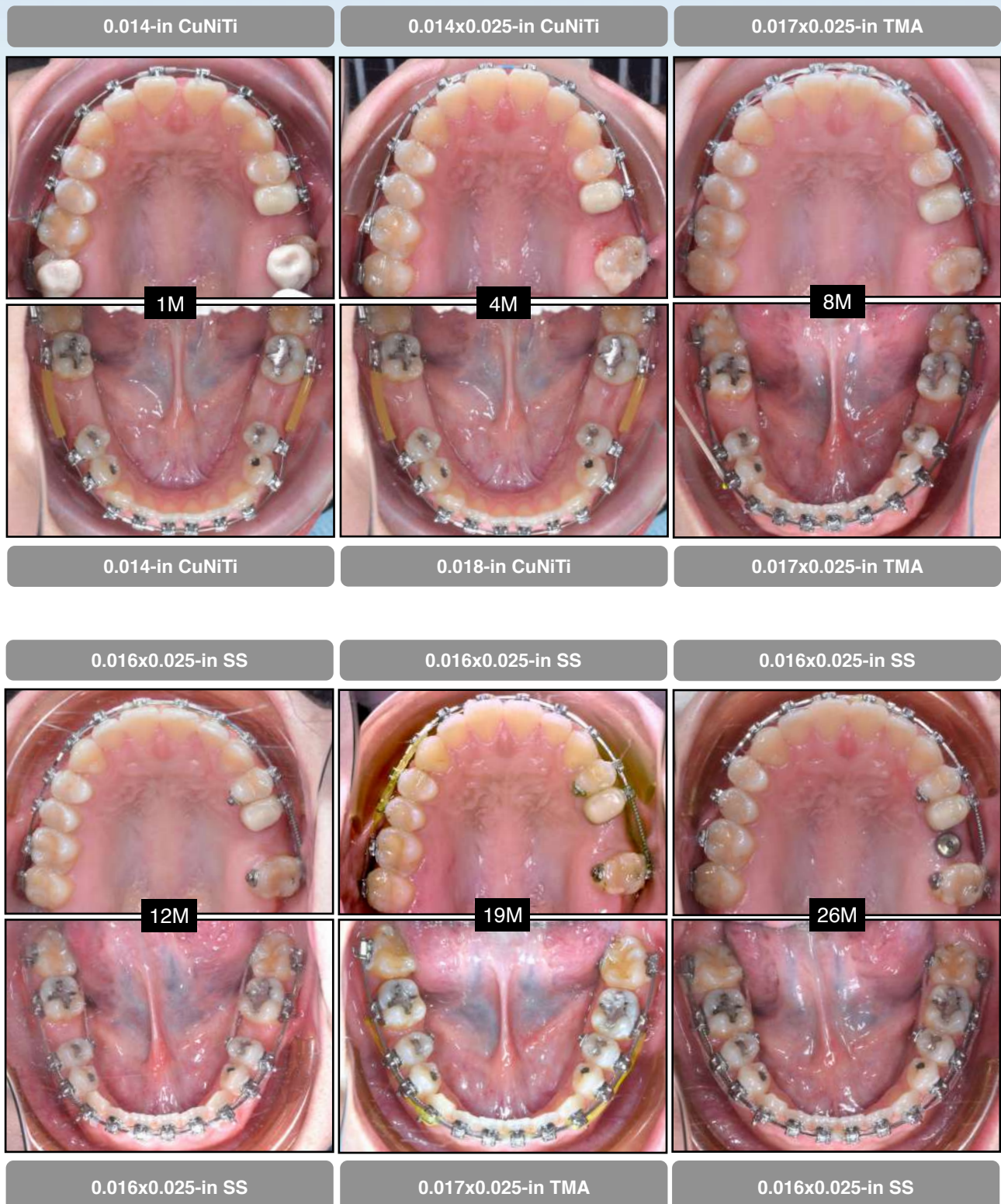


**Fig. 16:**  
Treatment progression from the frontal view. High torque brackets for the lower arch and low or standard torque brackets for the upper incisors were chosen to compensate for the reaction of Class III elastics mechanics.



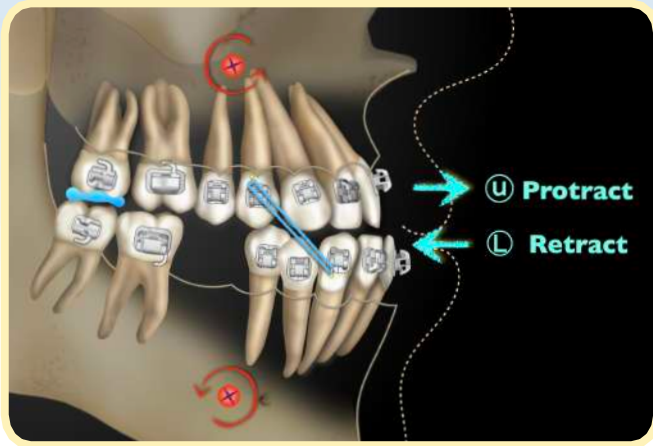
**Fig. 17:** Treatment progression from the left buccal view. From the 12<sup>th</sup> month, an open coil spring was used to increase space for UL6 ISP placement.





■ Fig. 18: Treatment progression from the upper and lower occlusal views





**Fig. 19: Class III elastic mechanics**  
*a counterclockwise rotation appears in the lower arch when using Class III elastics. The bracket selection should be high-torque (HQ) for the lower anterior and low-torque (LQ) for the upper anterior segments to counteract the force.*

Bite turbos can be placed in the anterior or posterior segments of either arch; however, there are some limitations: it is best to avoid (1) weak teeth, such as upper lateral incisors, (2) endodontically treated, periodontally compromised dentition, (3) teeth with large restorations or temporary crowns, (4) isolated teeth subject to high stress, and (5) target teeth that are to be moved. When the occlusion is disoccluded, make sure the bite opening is bilateral and comfortable for the patient. For the present case, it was necessary to level and align multiple teeth, so the bite turbos were placed on the second molars. Opening the bite accelerated the initial stage of the orthodontic treatment. In this case, only three months were required to correct the anterior crossbite with the posterior bite turbos and Class III elastics.

In general, Class III elastics protract the upper arch, retract the lower arch, tip the upper incisors labially, and tip the lower incisors lingually (Fig. 19).<sup>17</sup> To

counteract the adverse effects of Class III elastics, resistant anterior moments in the braces and archwires are required.<sup>3</sup> Therefore, high-torque brackets (low-torque brackets placed upside down) were chosen for the lower anterior teeth to prevent decreased axial inclination. On the other hand, low-torque or standard-torque brackets were selected for the upper anterior segment.

### Buccal-Lingual Mechanics

In camouflage treatments, extraction of molars instead of premolars provides more space, which can be used to produce dental compensation for the jaw discrepancy. Another benefit is decreasing the retroclination of the lower anterior teeth. However, the molar extraction approach is expected to increase the treatment time by 6-8 months.<sup>18</sup> The method of buccal-lingual mechanics is effective in closing the remaining extraction spaces. The mechanics were performed with power chains, which were hooked not only between the brackets on the buccal side but also between the lingual buttons (Fig. 9). There are three benefits of this method: (1) it prevents molar rotations during closure of the extraction spaces; (2) continuous light force of the power chains helps avoid root resorption; and (3) its operation is simple, reducing chair time for the patient.

### Conclusions

This difficult skeletal malocclusion was treated to an acceptable result without orthognathic surgery in only 29 months. With Chang's Extraction Decision Table (Table 2), a feasible treatment plan was completed with an esthetic outcome. In retrospect,

the key to success was using posterior bite turbos together with Class III elastics. A major compromise was the 60° L1-to-MP angle. Therefore, long-term follow-up is indicated to assure the continuous stability and maintenance of the occlusion.

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# Discrepancy Index Worksheet

TOTAL D.I. SCORE

61

**OVREJET**

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

=

12

**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

=

0

**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 _____ pts.
Full Class II or III	=	4 pts. per side <u>8</u> pts.
Beyond Class II or III	=	1 pt. per mm. additional _____ pts.

Total

=

8

**LINGUAL POSTERIOR X-BITE**

1 pt. per tooth

Total

=

3

**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  $< -2^\circ$  1 x 1 pt.= 1Each degree  $> 6^\circ$  \_\_\_\_\_ x 1 pt.

= \_\_\_\_\_

SN-MP

 $\geq 38^\circ$ = 2 pts.Each degree  $> 38^\circ$  12 x 2 pts.= 24 $\leq 26^\circ$ 

= 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

=

31

**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. = 1

Missing teeth, congenital \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Spacing (4 or more, per arch) \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Spacing (Mx cent. diastema  $\geq 2$ mm) @ 2 pts. = 2

Tooth transposition \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Skeletal asymmetry (nonsurgical tx) @ 3 pts. = \_\_\_\_\_

Addl. treatment complexities \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Identify:

Total

=

3

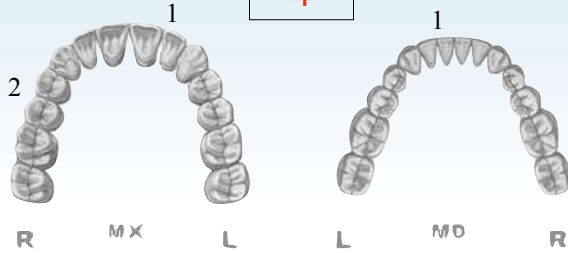
## Cast-Radiograph Evaluation

Total Score:

23

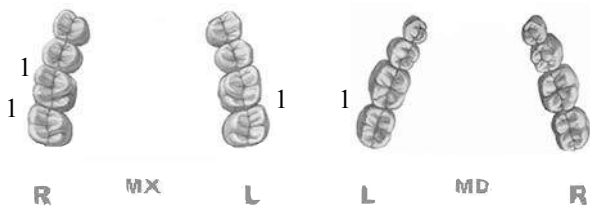
### Alignment/Rotations

4



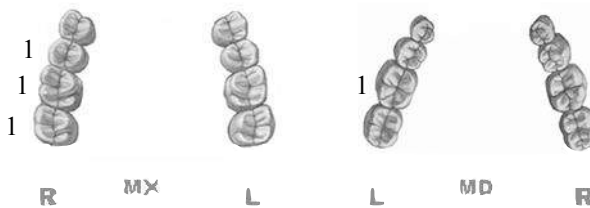
### Marginal Ridges

4



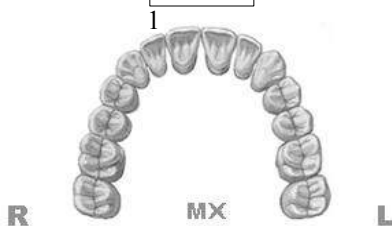
### Buccolingual Inclination

4



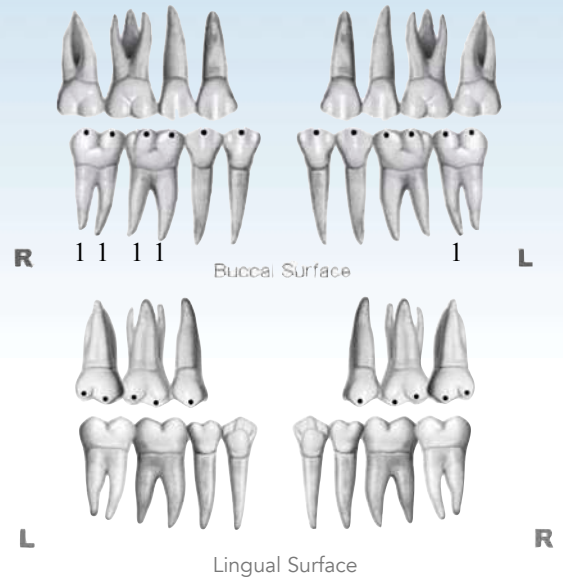
### Overjet

1



### Occlusal Contacts

5



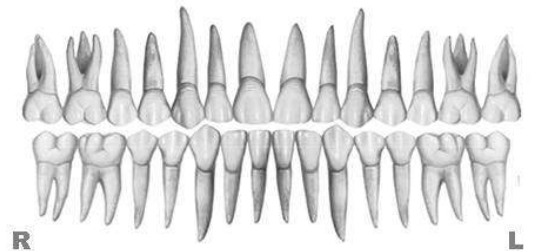
### Occlusal Relationships

4



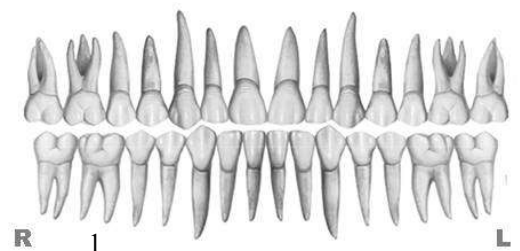
### Interproximal Contacts

0



### Root Angulation

1



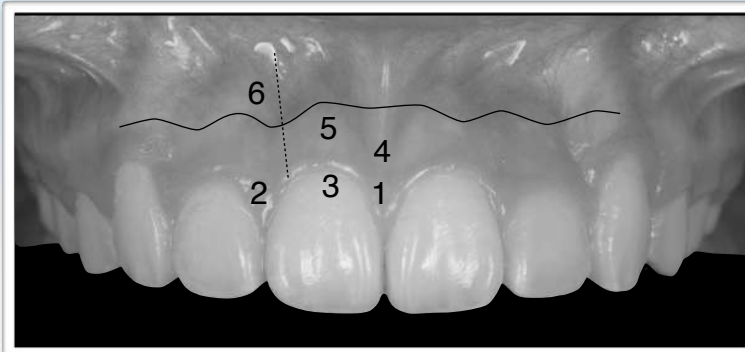
**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.



# IBOI Pink and White Esthetic Score

Total Score = **9**

## 1. Pink Esthetic Score

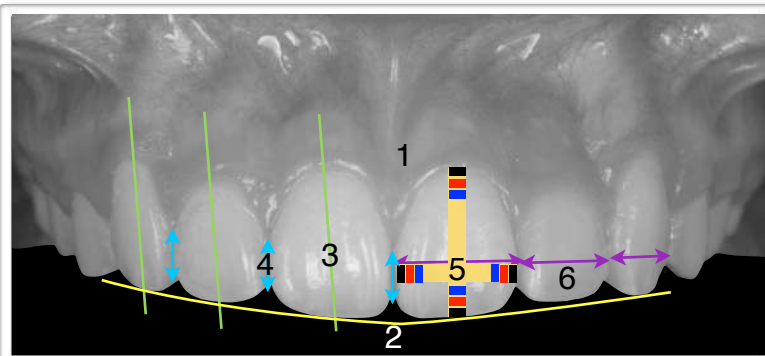


Total = **1**

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

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

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



Total = **8**

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



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\* TADs made of Ti alloy have a lower failure rate compared to SS when placed in thin cortical bone. These results are consistent with a biocompatibility-related tendency for less bone resorption at the bone screw interface.  
Reference: Failure Rates for SS and Ti-Alloy Incisal Anchorage Screws: Single-Center, Double Blind, Randomized Clinical Trial (J Digital Orthod 2018;52:70-79)

\*\* The overall success rate of 93.7% indicates that both SS and TiA are clinically acceptable for IZC BSs.

Reference: Failure rates for stainless steel versus titanium alloy infrazygomatic crest bone screws: A single-center, randomized double-blind clinical trial (Angle Orthod 2019;89(1):40-46)

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#### External dimensions (wxhxd):

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#### Power consumption:

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#### Water consumption:

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#### Connectivity:

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#### Green light

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#### Yellow light

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#### Red light

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#### Preset cycles:

• **Instruments** 20 min at 40°C

• **Burs** 10 min at 40°C

• **Impression tray holder**  
40 min at 60°C

• **Cement remover** 10 min at 30°C

• **Plaster remover** 30 min at 60°C

• **Prostheses** 40 min at 60°C