Skeletal Class III Malocclusion with a High Mandibular Plane Angle Treated with Four First Premolar Extractions

Abstract

History: *An 18yr-8mo-old female presented with chief complaints of a prognathic mandible and a protrusive lower lip.*

Diagnosis: *Cephalometric analysis revealed a skeletal Class III relationship (SNA, 75.5˚; SNB 77.5˚; ANB, -2˚), as well as reduced facial convexity (-1˚) and a high mandibular plane angle (SN-MP, 39˚). A functional shift was noted. The upper and lower midlines were both deviated 2 mm to the right of the facial midline, and the chin was also shifted to the right. An intraoral assessment revealed a bilateral full-cusp Class III malocclusion with anterior crossbite. Mild crowding was evident in the upper and lower arches. The Discrepancy Index (DI) was 30.*

Treatment: *A Damon® system appliance with passive self-ligating brackets was applied to correct the malocclusion after extraction of four first premolars. Anterior bite turbos and early light short Class III elastics were used to correct the anterior crossbite. Space closing was also accomplished with elastics. The active treatment was 29 months with no temporary skeletal anchorage devices used.*

Results: *Improved dentofacial esthetics and occlusal function were achieved after the treatment. The overjet was corrected, and the lower lip was retruded. The Cast-Radiograph Evaluation (CRE) score was 16, and the Pink and White esthetic score was 2. The posttreatment panoramic radiograph shows complete space closure and good root parallelism.*

Conclusions: *This case report demonstrates that the use of passive self-ligating brackets helps resolve skeletal and dental Class III malocclusion. Neither orthognathic surgery nor temporary skeletal anchorage devices were necessary. (J Digital Orthod 2023;70:4-21)*

Key words:
Skeletal Class III, full-cusp Class III, anterior crossbite, midline deviation, passive self-ligating brackets, temporary skeletal anchorage devices (TSADs)

** The dental nomenclature for this case report is a modified Palmer notation with four quadrants: upper right (UR), upper left (UL), lower right (LR), and lower left (LL). Teeth are numbered 1-8 from the midline in each quadrant.*

Introduction

The patient was an 18 year-8 month-old female with chief complaints of a prognathic mandible and a protrusive lower lip. The pre-treatment facial and intraoral photographs are documented in Fig. 1.

During oral examination, an anterior crossbite was the most obvious feature. Furthermore, a bilateral full-cusp Class III malocclusion was also noted. Mild crowding appeared in the upper and lower dentitions. A skeletal Class III malocclusion was confirmed according to the results of the cephalometric analysis.

After a thorough analysis of the clinical data, orthognathic surgery was considered unnecessary. Therefore, two camouflage treatment options were carefully considered: extraction and non-extraction.

After discussing the pros and cons of each option with the patient, the treatment plan which involved

Hsuan Cheng Chu,
Training Resident, Beethoven Orthodontic Center (Left)
Chun-Hung Chen,
Associate Director, Beethoven Orthodontic Center (Center left)
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)

extraction of four first premolars was chosen. After 29 months of active treatment, an excellent result was achieved without temporary skeletal anchorage devices (TSADs).

Diagnosis

The cephalometric analysis (Fig. 2; Table 1) revealed a skeletal Class III malocclusion (ANB, -2°). The mandibular plane angle was high (SN-MP, 39°; FMA,

Fig. 1: *Pre-treatment facial and intraoral photographs*

32˚). The lower incisor was slightly flared (L1-to-MP, 93˚), and the upper incisor had a decreased axial inclination (U1-to-SN, 102.5˚). There were no signs of Class III dental compensation. The facial profile was concave (G-Sn-Pg', -1˚) with a retrusive upper lip (-3 mm to the E-line) and a protrusive lower lip (1 mm to the E-line). An increased vertical dimension of occlusion was revealed (%FH: Na-ANS-Gn, 55%).

The panoramic radiograph (Fig. 3) was consistent with good dental health. No dental caries was present, and no periodontal bone destruction was detected. Three wisdom teeth were either fully or partially erupted and reasonably well-aligned (Fig. 3). Plaster casts revealed a negative overjet, mild crowding in the upper and lower arches (upper: 4 mm, lower: 3 mm), and bilateral full-cusp Class III molar relationship (Fig. 4). Temporomandibular joint (TMJ) morphology was normal in the open and closed positions (Fig. 5). There were no signs nor symptoms of temporomandibular dysfunction (TMD).

The upper and lower midlines were deviated 2 mm to the right of the facial midline. The chin was also shifted 2 mm to the right. Gingivitis was present

Fig. 2: *Pre-treatment cephalometric radiograph*

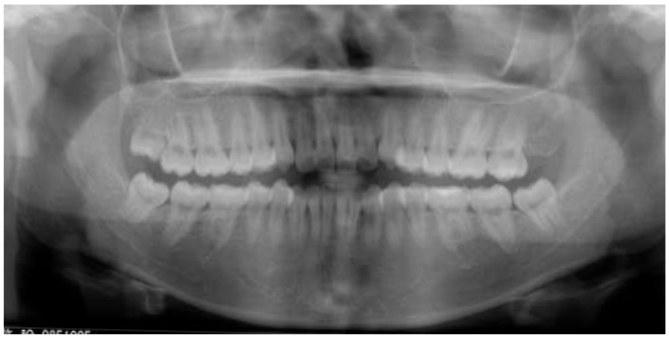


Fig. 3: *Pre-treatment panoramic radiograph*

CEPHALOMETRIC SUMMARY			
SKELETAL ANALYSIS			
	PRE-TX	POST-TX	DIFF.
SNA˚ (82˚)	75.5˚	75.5˚	0˚
SNB˚ (80˚)	77.5˚	77.5˚	0˚
ANB˚ (2˚)	-2˚	-2˚	0˚
SN-MP˚ (32˚)	39˚	37˚	2˚
FMA˚ (25˚)	32˚	30˚	2˚
DENTAL ANALYSIS			
U1 TO NA mm (4mm)	8	6	2
U1 TO SN˚ (104˚)	102˚	107˚	5˚
L1 TO NB mm (4mm)	7.5	1	6.5
L1 TO MP˚ (90˚)	93˚	86˚	7˚
FACIAL ANALYSIS			
E-LINE UL (-1mm)	-3	-4	1
E-LINE LL (0mm)	1	-4	5
%FH: Na-ANS-Gn (53%)	55%	55%	0%
Convexity:G-Sn-Pg' (13˚)	-1˚	-1˚	0˚

Table 1: *Cephalometric summary*

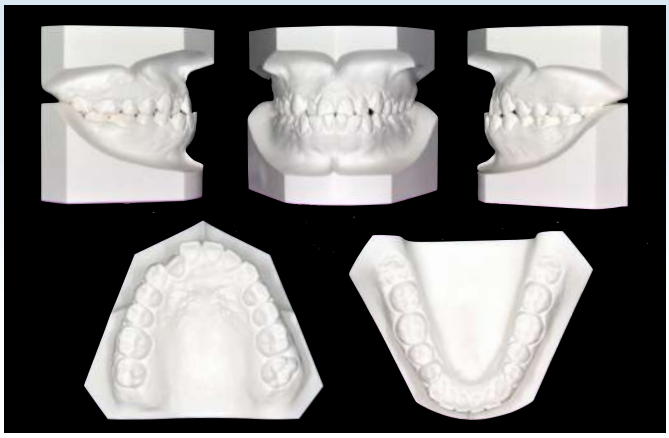


Fig. 4: *Pre-treatment study models (casts)*

Fig. 5 :
Pre-treatment TMJ transcranial radiographs show the right (R) and left (L) sides in the rest and open positions. From the left to right are: right TMJ rest, right TMJ open, left TMJ open, and left TMJ rest.

around UR2 and lower anterior teeth. A mild functional shift (2 mm anteriorly) was noted (Fig. 6).

The American Board of Orthodontics (ABO) Discrepancy Index (DI) was 30 as shown in the subsequent Worksheet 1.[1] The most significant problem was the anterior crossbite (10 points).

Treatment Objectives

1. Correct the anterior crossbite by retracting the lower anterior teeth.

Fig. 6:
Functional shift: (left) Centric relation; (right) Centric occlusion

2. Improve facial esthetics, and correct the protrusive lower lip.

3. Achieve Class I molar and canine relationships.

Treatment Alternatives

According to Lin's 3-Ring Diagnosis,[2] orthognathic surgery was unnecessary, so two camouflage treatment options were considered.

Option 1: Extract 3rd molars to provide space for lower arch retraction, and use TSADs on the buccal shelves as anchorage. This option has the advantage of extracting fewer teeth than option 2.

However, the disadvantages are obvious:

1. It is time-consuming to retract the whole lower arch and relieve the crowding.

2. It is an inefficient approach to correct the lower lip protrusion. Option 1 achieves less lower incisor retraction than option 2.

Option 2: Extract all 1st premolars and 3rd molars to relieve crowding, and correct the molar relationships by moving the upper molars anteriorly and retracting the lower anterior teeth.

The advantages of this option are more efficient lower lip retraction and faster crowding relief due to 1st premolar extraction spaces. The disadvantage is that more extractions are required.

After a thorough clinical data analysis and discussion with the patient, option 2 was chosen - extraction of all 1st premolars and 3rd molars. Anterior bite turbos and Class III elastics were also used to assist with the correction.

Treatment Progress

The archwire sequence is summarized in Table 2; treatment progress is documented from the right buccal, frontal, left buccal, upper occlusal, and lower occlusal views, respectively (Figs. 7-11). The detailed treatment mechanics are presented in Table 3.

A 0.022-in Damon® Q fixed appliance (Ormco, Brea, CA) with passive self-ligating (PSL) brackets was

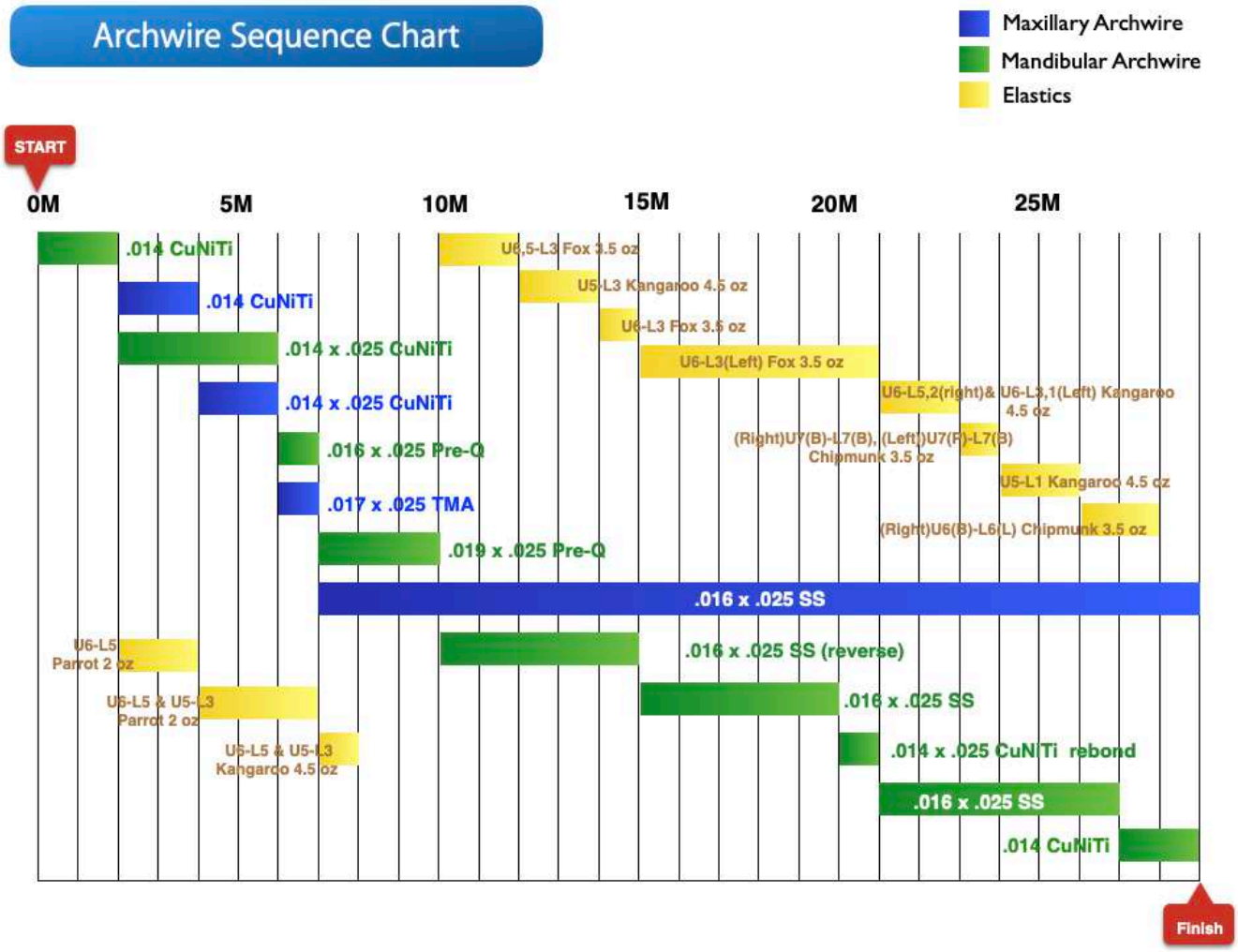


Table 2:
The archwire sequence chart is a treatment timeline for the procedures involved in managing the malocclusion: archwire changes, adjustments, and elastics. Posterior intermaxillary relationships were corrected with contraction adjustments. (Pre-Q = pre-torqued)

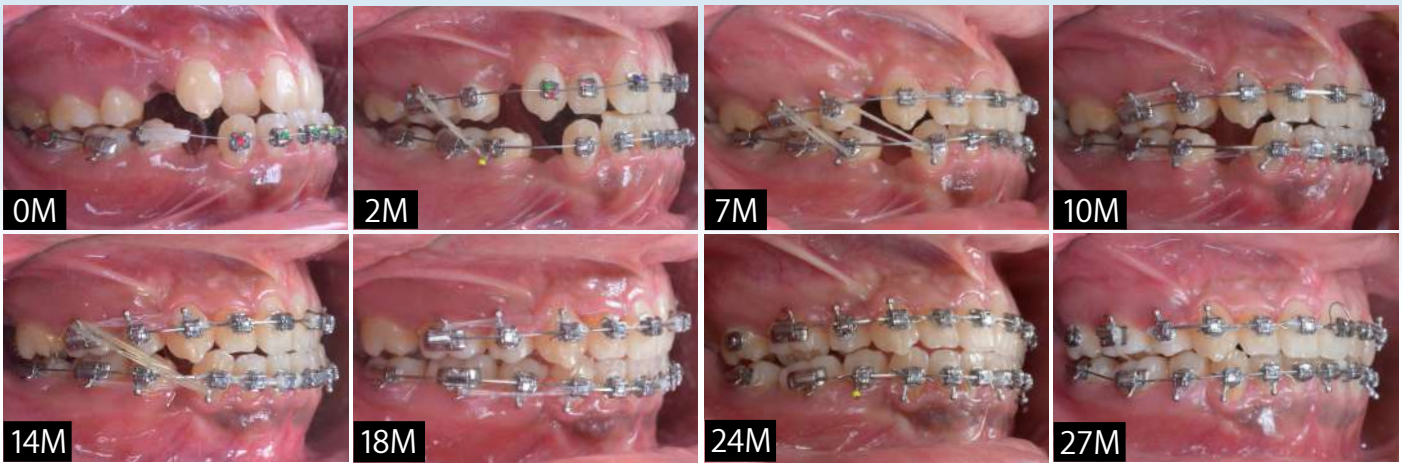


Fig. 7: Treatment progression from the right buccal view is shown from the start (0M) to twenty-seven months (27M) of treatment.

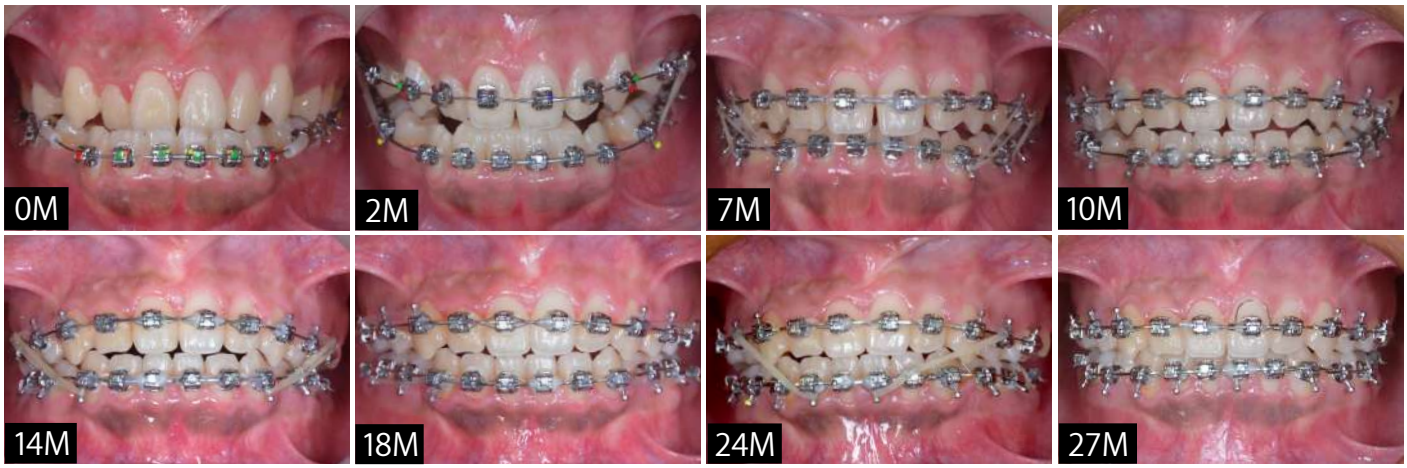


Fig. 8: Treatment progression from the frontal view is shown from the start (0M) to twenty-seven months (27M) of treatment.

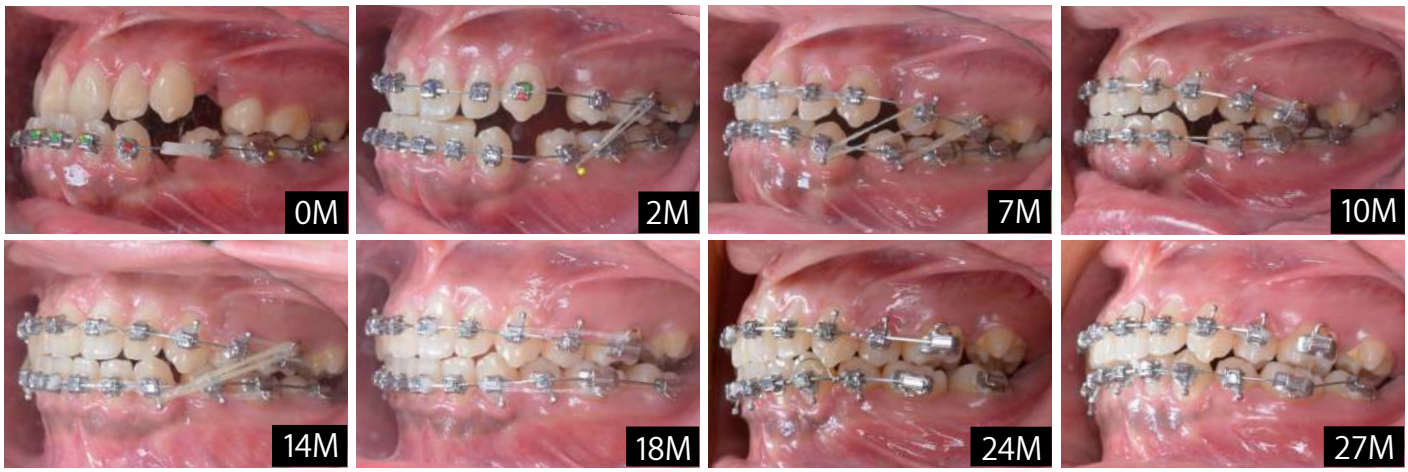


Fig. 9: Treatment progression from the left buccal view is shown from the start (0M) to twenty-seven months (27M) of treatment.

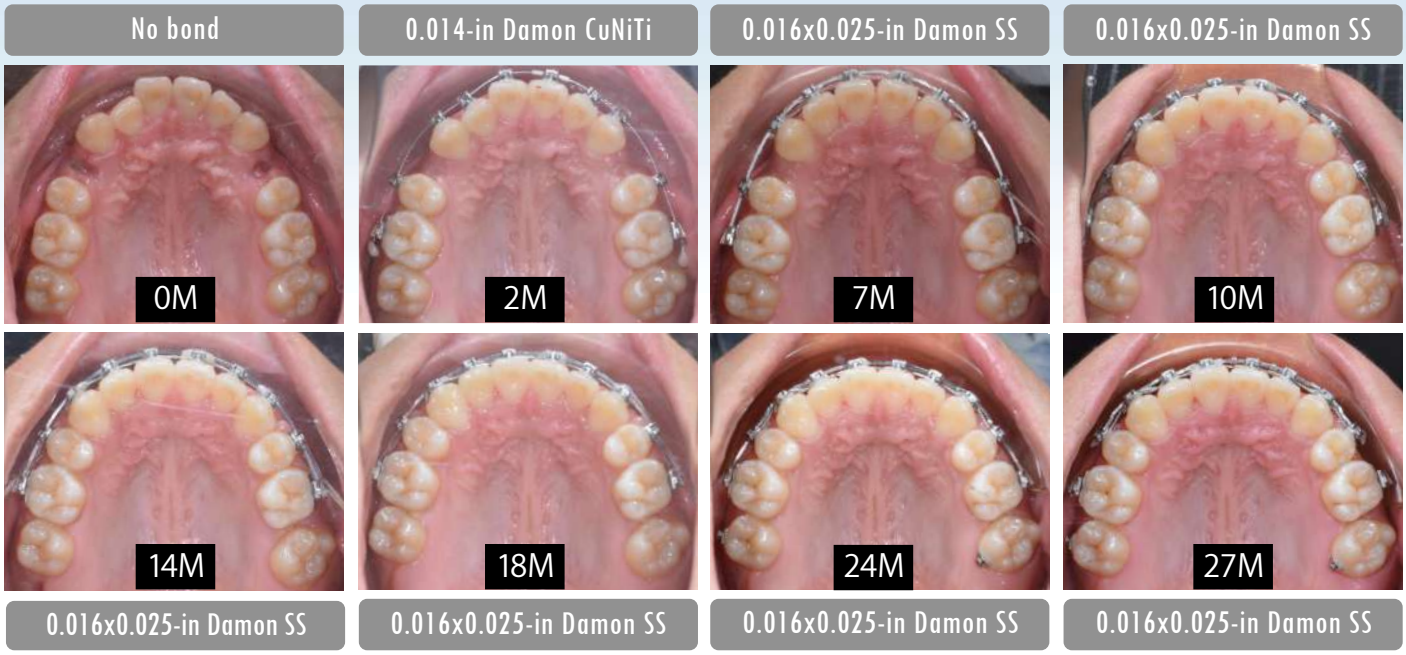


Fig. 10: Treatment progression from the maxillary occlusal view is shown from the start (0M) to twenty-seven months (27M) of treatment.

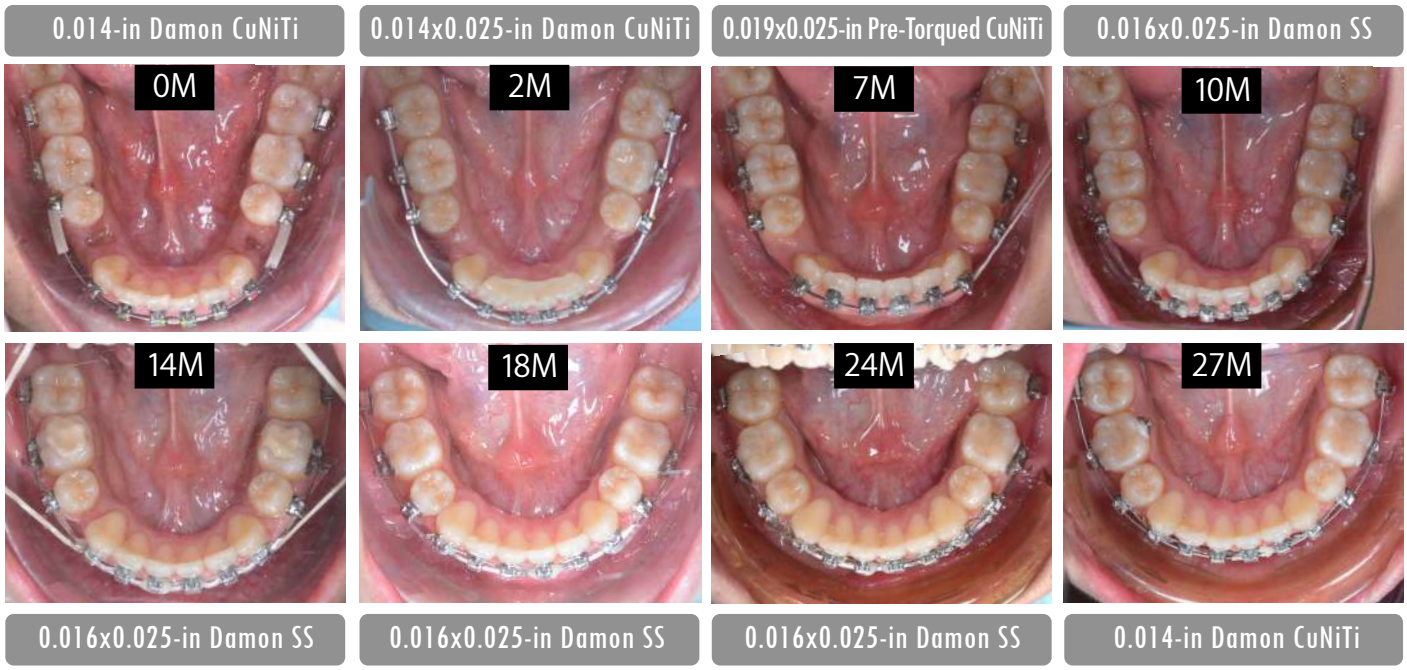


Fig. 11: Treatment progression from the mandibular occlusal view is shown from the start (0M) to twenty-seven months (27M) of treatment.

Appointment	Archwire	Notes
1 (0 month)	L : 0.014-in CuNiTi	L4s were extracted prior to treatment. Bond all lower teeth except L8s, which were planned to be extracted. High torque brackets were selected.
2 (2 months)	U: 0.014-in CuNiTi L : 0.014x0.025-in CuNiTi	U4s were extracted prior to treatment. Bond upper teeth except U7s due to the anomalous morphology of UL7. High torque brackets were selected for canines, and standard torque brackets for incisors. Build anterior bite turbos on lingual side of lower incisors to facilitate overjet correction. Start using early light short Class III elastics (Parrot, 5/16-in, 2-oz) from U6s to L5s to retract mandibular anteriors.
3 (3 months)		Rebond UL6 to adjust tooth position.
4 (4 months)	U : 0.014x0.025-in CuNiTi	Apply Class III elastics (Quail, 3/16-in, 2-oz) from U6s to L5s and from U5s to L3s to retract mandibular anteriors. Put drop-in hooks on U5s and L3s to facilitate placement of elastics. Start using power chains to close spaces.
5 (6 months)	U: 0.017x0.025-in TMA L : 0.016x0.025-in pre-torqued CuNiT	The negative overjet was corrected; anterior bite turbos were removed. Use pre-torqued archwire on the lower arch to compensate the side effects of Class III elastics.
6 (7 months)	U: 0.016x0.025-in SS L: 0.019x0.025-in pre-torqued CuNiT	Change Quail (3/16-in, 2-oz) Class III elastics to Kangaroo (3/16-in, 4.5-oz). Place stronger pre-torqued archwire on lower arch to further control the side effects of Class III elastics. Reactivate power chains to close spaces.
7 (8 months)		Stop Class III elastics. / Reactivate power chains to close spaces.
8 (10 months)	L: 0.016x0.025-in SS (reversed)	Restart Class III elastics (Fox,1/4-in, 3.5-oz) from U5s, U6s to L3s. Bent the lower archwire with reverse Curve of Spee to correct the drawbridge effect resulted from space-closing mechanics. Add 15˚ buccal crown torque for LL1, LL2, LR1, and LR2 with a 3rd order bend.
9 (12 months)		Apply Class III elastics from U5s to L3s (Kangaroo, 3/16-in, 4.5-oz). Place posterior bite turbos on LR6 and LL6. Replace power chains to close spaces.
10 (14 months)		Replaced Class III elastics (Fox,1/4-in, 3.5-oz) from U6s to L3s. Close space with power chains and power tubes.
11 (15 months)	L: 0.016x0.025-in SS	Applied Class III elastics (Fox, 1/4-in, 3.5-oz) from U6 to L3(left side) to correct Class III malocclusion. Replaced power chains and power tubes to close spaces. Changed lower archwire to normal non-reverse-Curve-of-Spee 0.016x0.025-in Stainless Steel wire.

Table 3: *Detailed treatment sequence for all procedures (Continued on the next page)*

Appointment	Archwire	Notes
12 (16 months)		Remove posterior bite turbos. Replace power chains and power tubes to close spaces.
13 (18 months)		Close space with power chains.
14 (19 months)		Replace power chains and power tubes to close spaces.
15 (20 months)	L : 0.014x0.025-in CuNiTi	Rebond LL3, LL6, LL7, and LR5 to adjust tooth positions.
16 (21 months)	L : 0.016x0.025-in SS	Change Fox (1/4-in, 3.5-oz ,left side only) Class III elastics to Kangaroo(3/16-in, 4.5-oz, bilateral) to correct Class III malocclusion.
17 (23 months)		Place buttons on UR7 (buccal side (B)) and UL7 (palatal side (P)) to facilitate elastics placement. Apply elastics (Chipmunk, 1/8-in, 3.5oz) from UR7(B) to LR7(B). Apply elastics (Kangaroo, 3/16-in, 4.5-oz) from UL7(P) to LL7(B). Cut the lower archwire from L6s. Replace power chains to close spaces.
18 (24 months)		Overjet was relapsed to -0.5 mm. Apply Class III elastics from U5s to L1s (Kangaroo, 3/16-in, 4.5-oz) to correct the negative overjet. Use torquing spring on LR3 to increase buccal root torque.
19 (25 months)		Archwire adjustment to correct the position of UR1 and UR2.
20 (26 months)		Place buttons on LR6(lingual side) to facilitate elastics placement. Apply Chipmunk (1/8-in, 3.5oz) from UR6 (B) to LR6 (L) to correct buccal crossbite. Remove torquing spring on LR3. Adjust archwire to correct the position of LL3.
21 (27 months)		Use torquing spring on UL1 to increase lingual root torque. Cut the upper archwire from U5s to facilitate occlusion adjustment.
22 (28 months)		Stop elastics. Adjust archwire to correct UR1 position.
23 (29 months)		All appliances removed. Anterior fixed retainers bonded. Removable clear overlay retainers delivered for both arches. Instructions provided for home hygiene and maintenance of the retainers.

Table 3: *Detailed treatment sequence for all procedures (Continued from the previous page)*

selected along with all specified archwires and orthodontic auxiliaries. At the start of treatment, brackets were bonded on all lower teeth except L4s and L8s. High-torque brackets were placed on the lower canines, and low-torque brackets were bonded upside down on the lower incisors to provide additional lingual root torque. The purpose of this bracket selection was to facilitate more lingual root movement of the lower anterior teeth to offset the unwanted side effects of Class III elastics and space-closing mechanics.

Two months later, brackets were bonded on all upper teeth except U4s and UR8. Standard-torque brackets were placed on the upper incisors, and high-torque brackets were placed on the upper canines. This choice of upper bracket torque selection was based on experience. Class III elastics flare the upper anterior teeth more, so low-torque brackets are more suitable. However, the space-closing mechanics may tip the upper anterior posteriorly; therefore, high-torque brackets are more appropriate. Based on these mechanics, standard torque brackets were chosen for the upper incisors as a trade-off option. High torque brackets were selected for the upper canines to prevent their roots from striking the buccal cortical bone and producing space-closing problems.

The initial upper archwire was 0.014-in copper-nickel-titanium (CuNiTi). The upper archwire sequence was 0.014x0.025-in CuNiTi, 0.017x0.025-in TMA, and 0.016x0.025-in SS. Early light Class III elastics (Quail, 5/16-in, 2-oz; Ormco) and bite turbos were placed on lingual side of the lower incisors to correct the anterior crossbite starting from the second month of treatment. By the 6th month, the anterior crossbite was already corrected.

The lower archwire sequence in the first nine months was 0.014-in CuNiTi, 0.014x0.025-in CuNiTi, 0.016x0.025-in pre-torqued CuNiTi, and 0.019x0.025-in pre-torqued CuNiTi.

In the 10th month, the lower archwire was changed to a 0.016x0.025-in stainless steel (SS) wire, which was narrowed and bent with a reverse curve of Spee to correct the bowing effect from the mechanics. After the severe curve of Spee was corrected, the 0.016x0.025-in SS archwire was changed back to a flat orientation. Thereafter, the sequence for the lower archwire was 0.014x0.025-in CuNiTi (due to bracket position adjustment), 0.016x0.025-in SS, and 0.014-in CuNiTi for detailing.

All fixed appliances were removed after 29 months of active treatment. All four 1st premolar extraction spaces were closed. Retention was accomplished with fixed and clear overlay retainers on both arches .

Treatment Results

Both arches were well aligned in a Class I occlusion with coincident dental midlines (Figs. 12-14). The overjet was corrected, and the lower lip protrusion was improved. The posttreatment panoramic radiograph shows complete space closure and no significant periodontal bone loss. Root parallelism was acceptable. A little root resorption was noted on the lower incisors. The L3s and LR5 experienced moderate root resorption. The posttreatment cephalometric radiograph documents the dentofacial correction in profile and in occlusion (Figs. 15 and 16).

Fig. 12: *Posttreatment facial and intraoral photographs document 29 months of active treatment.*

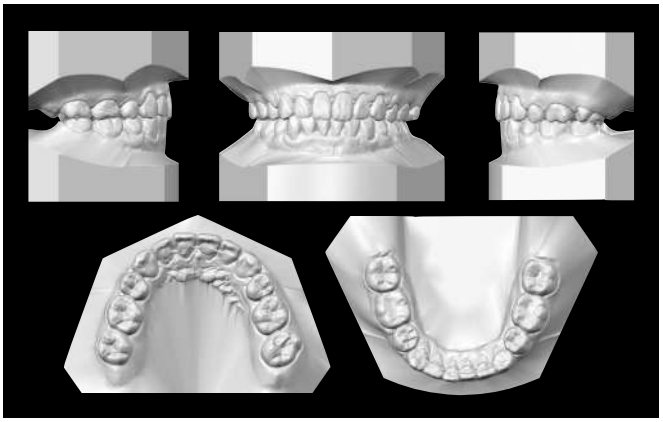


Fig. 13: *Posttreatment model(3-D image)*

Fig. 14: *Posttreatment panoramic radiograph*

Fig. 15: *Posttreatment cephalometric radiograph*

The superimposed cephalometric tracings show: (1) lower lip retracted, (2) lower incisors retracted and lingually tipped, and (3) Class III molar relationship corrected mainly by mesial movement of the upper molars.

The ABO Cast-Radiograph Evaluation score was 16 points, as shown in the supplementary Worksheet 2.[3] The major discrepancies were: (1) marginal ridge discrepancy (5 points), (2) mild posterior open bite (4 points), and (3) imperfect Class I occlusal relationship (3 points) as well as rotation of 2nd molars (3 points). This result is good according to the level of treatment complexity. The dental esthetics were acceptable as documented by the Pink and White esthetic score of 2, shown in the supplementary Worksheet 3.[4]

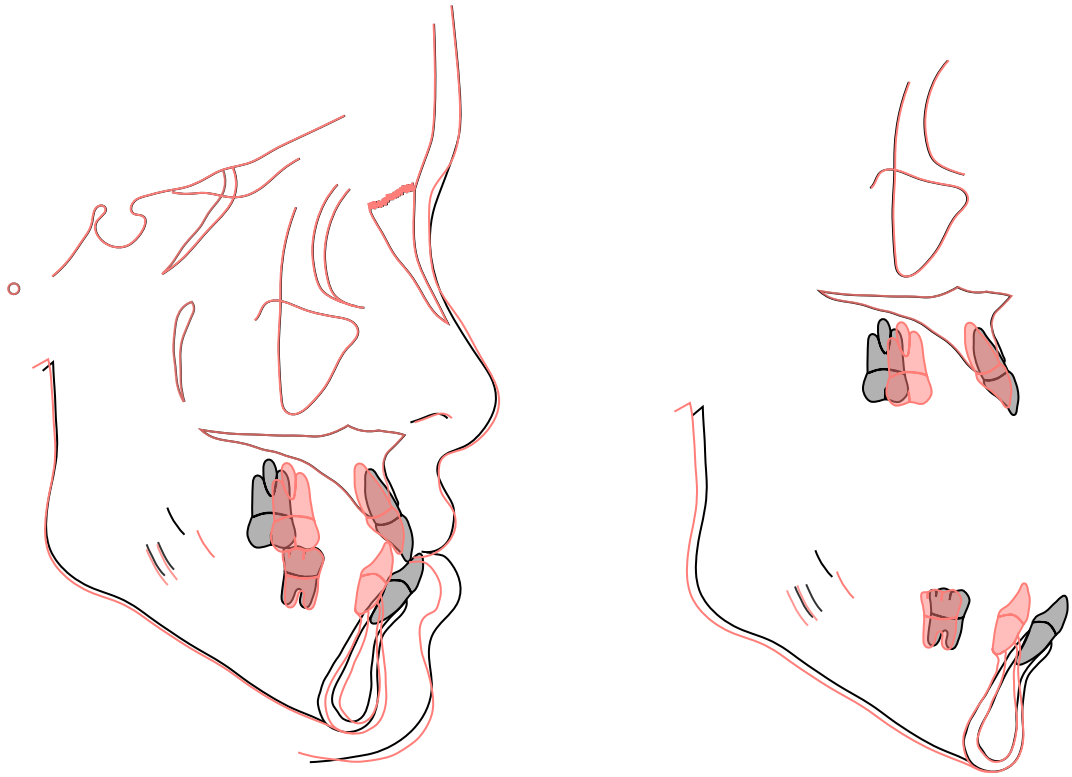


Fig. 16: *Cephalometric tracings are superimposed to show dentofacial changes from the start (black) to the end (red) of treatment.*

This camouflage treatment procedure required 29 months of active treatment, and the patient was well pleased with the outcome.

Retention

Fixed retainers were bonded on the lingual surfaces of all maxillary incisors and mandibular anterior teeth. Clear overlay retainers were delivered for both arches, and the patient was instructed to wear them full time for the first 6 months and nights only thereafter. Instructions were provided for oral hygiene and maintenance of the retainers.

Discussion

Class III malocclusion treatment is challenging primarily due to inadequate diagnosis.[5] A method called 3-Ring Diagnosis,[2] developed by John Lin, is an effective method for identifying Class III malocclusions that are amenable to conservative therapy (Fig. 17). According to Lin's 3-Ring Diagnosis, with the mandible in centric relation, there are three good indicators for non-surgical treatment: 1. orthognathic profile in C_R, 2. buccal segments that are approximately Class I, and 3. anterior functional shift to C_O. This patient had two of the three favorable indicators for non-surgical treatment: orthognathic profile in C_R and functional shift to C_O (Figs. 6 and 18). Therefore, after considering the morbidity of surgery, camouflage treatment options were recommended to and accepted by the patient.

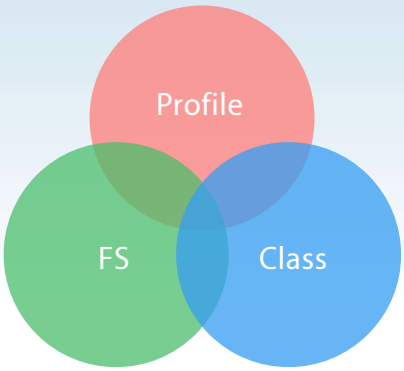


Fig. 17:
Lin's Three-Ring Diagnosis System assesses the potential for conservative correction of a Class III malocclusion with an anterior crossbite. Favorable factors are:
1. profile of the face is acceptable when the mandible is positioned in centric relation (C_R),
2. Class I buccal segments in C_R, and
3. functional shift (FS) is present from C_R to centric occlusion (C_O).

Fig. 18:
Facial profile was acceptable (orthognathic) when the mandible is positioned in the centric relation (C_R) position.

(1) Torque selection of brackets: Consider Class III mechanics and space-closing mechanics

Class III camouflage treatment usually involves intermaxillary Class III elastics which can result in increased axial inclination of the maxillary incisors

and decreased axial inclination of the mandibular incisors,[6] particularly when there is an underlaying Class III skeletal discrepancy.[7,8] If Class III mechanics are considered separately, it is wise to choose low-torque brackets on the upper anterior teeth and high torque on the lower anterior teeth. However, such space closing mechanics often cause torque issues. When closing extraction spaces, it is often necessary to use high torque brackets to increase the lingual root torque on the anterior teeth to avoid increased tipping during space closure. Therefore, bracket torque selection for the upper anterior teeth is problematic. Fortunately, experience shows that placing standard torque brackets on the upper incisors and high torque brackets on the upper canines results in good outcomes.

(2) Correction of anterior crossbite and lower lip protrusion

It is advisable to correct anterior crossbite by retracting the lower anterior teeth when the lower lip is protrusive. To correct the anterior crossbite, anterior bite turbos were placed on the lingual surface of the lower incisors in order to open the bite (Fig. 8). If possible, lower anterior bite turbos are preferred[2] since they facilitate closure of the posterior bite using early light short Class III elastics.[9,10] In this case, it only took 4 months to correct the anterior crossbite. First premolar extraction facilitated retraction of lower anterior teeth. The correction of the lower lip protrusion is then a natural consequence.

(3) Correction of full-cusp Class III molars

Class III mechanics not only retracts the lower incisors but also protracts the upper molars, which is beneficial for achieving a Class I molar relationship. In this case, the protraction of the upper molars was striking (Fig. 16). If the upper 2nd premolars were extracted instead of 1st premolars, a Class I molar relationship would have been easier to achieve; however, it would have been harder to control over-flaring the upper anterior teeth and to resolve the crowding.

Conclusions

Treatment of skeletal Class III malocclusion is a complex treatments that requires careful and thorough evaluation. Lin's Three-Ring Diagnosis System is useful for determining whether the case can be managed conservatively or not. As is clearly shown in this case, it is more beneficial for the patient to choose a conservative approach than to undergo orthognathic surgery. After thorough analysis, planning, and communication, the 1st premolars were extracted to provide spaces for lower lip retraction, to relieve the crowding, and to correct the molar relationship. The active treatment time was 29 months, and both the patient and the clinician were very pleased with the outcome.

References

1. Cangialosi TJ, Riolo ML, Owens SE Jr et al. The ABO discrepancy index: A measure of case complexity. Am J Orthod Dentofacial Orthop 2004;125(3):270–8.

2. Lin JJ, Liaw JL, Chang CH, Roberts WE. Class III Correction Orthodontics. Taipei, Taiwan: Yong Chieh Enterprise Co, Ltd.; 2013.

3. Casko JS, Vaden JL, Kokich VG, Damone J, James RD. American board of orthodontics: Objecting grading

system for dental casts and panoramic radiographs. Am J Orthod Dentofacial Orthop 1998;114(5):589–99.

4. Su B. IBOI Pink and White esthetic score. Int J Orthod Implantol 2013;28:80-85.

5. Yeh HY, Lin JJ, Roberts WE. Conservative adult treatment for severe Class III openbite malocclusion with bimaxillary crowding. Int J Orthod Implantol 2014;34:12–25.

6. Ferreira FPC,Goulart M da S, de Almeida-Pedrin RR, Conti AC de CF, Cardoso M de A. Treatment of Class III malocclusion: atypical extraction protocol. Case Rep Dent 2017:ID 4652685.

7. Lin JJ. Creative orthodontics blending the Damon System & TADs to manage difficult malocclusion. 3rd ed. Taipei, Taiwan: Yong Chieh; 2017. p.259-276.

8. Lin JJ. The most effective and simplest ways for treating severe Class III without extraction or surgery. Int J Orthod Implantol 2014;33:4-18

9. Kondo E. Muscle wins! Treatment in clinical orthodontics (WL Graber & TJ Aoba Eds.). Seoul, South Korea: DaehanNarae Publishing, Inc.; 2008.

10. Pitts T. Begin with the end in mind: Bracket placement and early elastics protocols for smile arc protection. Clinical Impression 2009;17(1):4-13.

Discrepancy Index Worksheet

TOTAL D.I. SCORE 30

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 = 10

OVERBITE

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

Total = 0

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 = 2

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 8 pts.
Beyond Class II or III	=	1 pt. per mm. additional _____ pts.

Total = 8

LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = 0

BUCCAL POSTERIOR X-BITE

2 pts. Per tooth Total = 0

CEPHALOMETRICS (See Instructions)

ANB ≥ 6° or ≤ -2° = 4 pts.

Each degree < -2° _____ x 1 pt. = _____

Each degree > 6° _____ x 1 pt. = _____

SN-MP

≥ 38° = 2 pts.

Each degree > 38° 1 x 2 pts. = 2

≤ 26° = 1 pt.

Each degree < 26° _____ x 1 pt. = _____

1 to MP ≥ 99° = 1 pt.

Each degree > 99° _____ x 1 pt. = _____

Total = 8

OTHER (See Instructions)

Supernumerary teeth	_____ x 1 pt.	= _____
Ankylosis of perm. Teeth	_____ x 2 pts.	= _____
Anomalous morphology	1 x 2 pts.	= 2 UL7
Impaction (except 3rd molars)	_____ x 2 pts.	= _____
Midline discrepancy (≥ 3mm)	@ 2 pts.	= _____
Missing teeth (except 3rd molars)	_____ x 1 pt.	= _____
Missing teeth, congenital	_____ x 2 pts.	= _____
Spacing (4 or more, per arch)	_____ x 2 pts.	= _____
Spacing (Mx cent. diastema ≥2mm)	@ 2 pts.	= _____
Tooth transposition	_____ x 2 pts.	= _____
Skeletal asymmetry (nonsurgical tx)	@ 3 pts.	= _____
Addl. treatment complexities	_____ x 2 pts.	= _____

Identify:

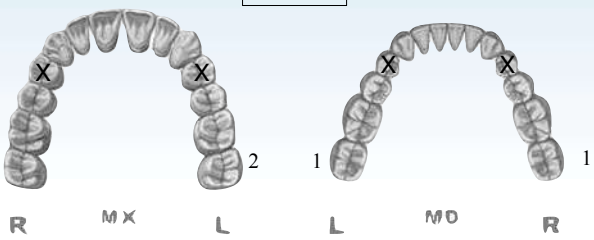
Total = 2

Cast-Radiograph Evaluation

Total Score: 16

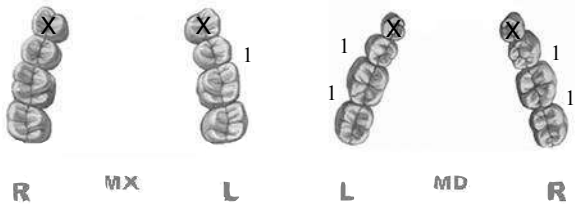
Alignment/Rotations

4



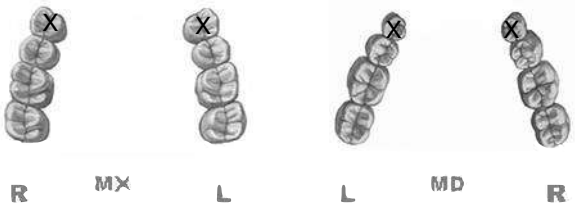
Marginal Ridges

5



Buccolingual Inclination

0

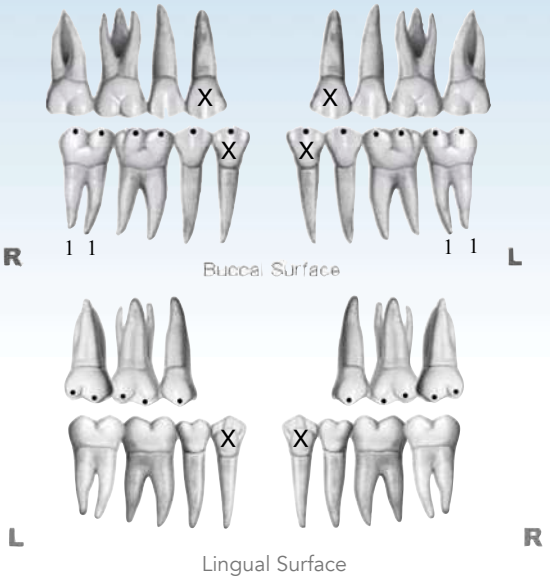


Overjet

0

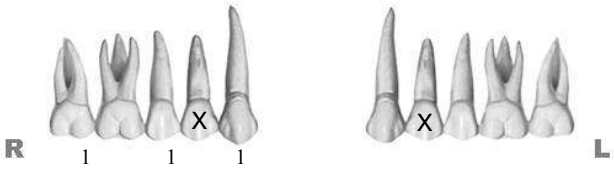
Occlusal Contacts

4



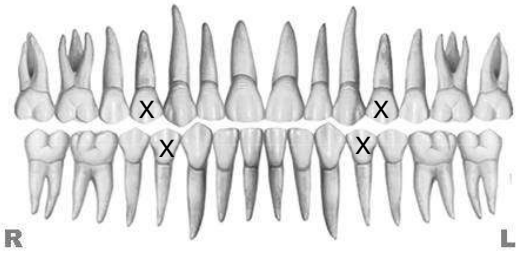
Occlusal Relationships

3



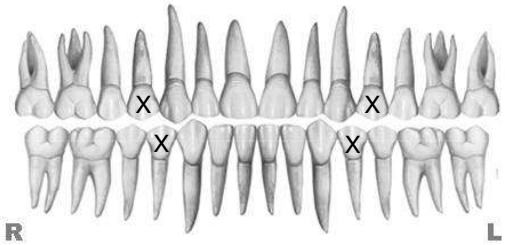
Interproximal Contacts

0



Root Angulation

0



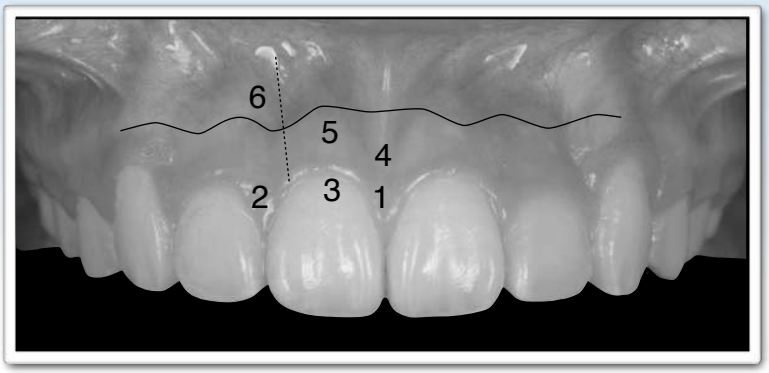
INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink and White Esthetic Score

Total Score = 2

1. Pink Esthetic Score

Total = 1

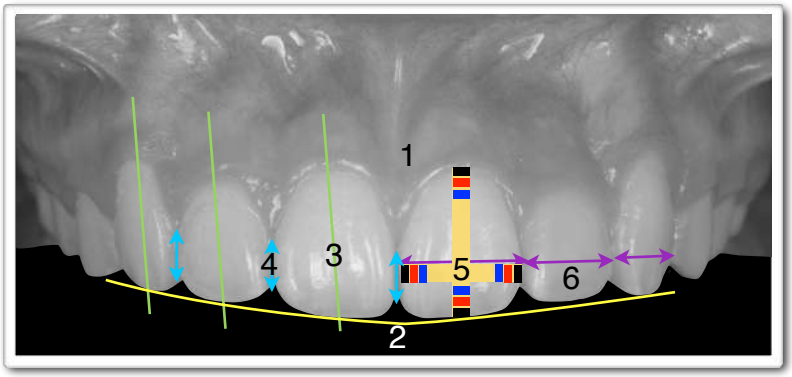


1. M and D Papillae	0	1	2
2. Keratinized Gingiva	0	1	2
3. Curvature of Gingival Margin	0	1	2
4. Level of Gingival Margin	0	1	2
5. Root Convexity (Torque)	0	1	2
6. Scar Formation	0	1	2

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 = 1



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

iworkshop.beethoven.tw

Dental Clinic Established 1996
Beethoven

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

+886-3-5735676 #218 Annie

course@newtonsa.com.tw

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. 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.

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

Prof. Dr. Paulo Fernandes Retto, Portugal

IMPACTION

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

VISTA

Vertical Incision Subperiosteal Tunnel Access

iNewton

Dental Products

Must-Have Secret Weapons

Autoclavable

Double Retractors 2.0

Double Retractors x2, Black Board x2

While keeping the same lip & cheek two-way design, the new Double Retractors 2.0 is upgraded to medical grade PPSU.

NEW

Stainless Steel Mirror 2.0

Strong, durable stainless steel, autoclave-proof, the specially designed size, improved shape and thickness ensure maximum intra-oral view without sacrificing patient comfort.

Bite Turbo 3.0

Handle x1, BT molds x6, BT extended molds x6, Button molds x6

Designed by Dr. Chris Chang, the new Bite Turbo 3.0 allows you to solve all kinds of deep bite and large horizontal overjet. A simple and powerful tool you should add to your kit!

orthobonescrew.com +886-3-5735676 inewton.dental@gmail.com

2023 一年一度 預報享優惠價 Damon Master Program


+


全新改版的 2023 年貝多芬高效 Damon 矯正大師系列課程，是由**國際知名講師張慧男醫師親自規劃及授課**，課程特色強調由臨床病例帶動診斷、分析、治療計畫擬定與執行技巧，本年度亦特別加入最新的**數位矯正與隱形牙套**的內容，並邀請了貝多芬牙科集團各院院長演講**特別矯正專題**。

此外，透過數位影片反覆觀看，結合矯正與電腦教學，課堂助教協助操作，讓學員在短時間能快速上手，感染**「熱愛矯正學，熱愛學矯正」**的熱情。

名額有限，一年僅有一次機會在台完整體驗 Damon 矯正大師課程，錯過只能等明年囉！

Module 1 - 4/13

1. Selecting your ideal first case
2. Bonding position
3. Bonding + BT + ceph tracing
4. TADs + space closing + hook + spring
5. Finishing bending & fixed retainer

Practice: Clinical photography (黃亭雅, 陳韻如醫師)

Module 2 - 5/11

1. Four stages of efficient orthodontic treatment
2. Simple and effective anchorage system
3. Extraction vs. non-extraction analysis

Practice: Patient photo management (金牛頓工程師)

Module 3 - 6/8

1. Soft & hard tissue diagnostic analysis
2. Big overjet correction
3. Damon diagnosis & fine-tuning

Practice: Ceph tracing (金牛頓工程師)

Module 4 - 6/29

1. Excellent finishing
2. Retention & relapse

Practice: Ceph superimposition & measurement (金牛頓工程師)

Module 5 - 7/13

1. Simplify your system
2. Extraction vs. non-extraction

Practice: Case report demo (陳俊宏醫師)

▲ **Computer training (Mac): 1:30-3:00 pm**

Module 6 - 7/27

1. Class III correction
2. Class II correction

Topic: Early orthodontic treatment (曾淑萍醫師)

Module 7 - 8/10

1. Upper impaction
2. Lower impaction
3. Gummy smile correction

Topic: Modified VISTA (蘇荃璋醫師)

Module 8 - 8/24

1. ABO DI, CRE workshop (林彥君醫師)
2. Open bite

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

Module 9 - 9/7

1. Implant-ortho combined treatment
2. Asymmetry

Topic: Impacted cuspid treatment (張譯文, 張瑜珍, 黃亭雅, 陳韻如醫師)

Module 10 - 9/21

1. Minor surgeries in orthodontics
2. Digital orthodontics

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

Module 11 - 9/28

1. Aligner & TADs
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）

地點：金牛頓藝術科技（新竹市建中一路 25 號 2 樓）

費用含課程視訊*、iPad、課程電子書與材料。

*贈送之課程視訊提供兩年時間串流觀看。

報名專線 湧傑 Yong Chieh

北區 邵美珍	中區 張馨云	南區 蔡淑玲
02-27788315 #120	04-23058915	07-2260030

LINE@ 官方帳號

Facebook 官方帳號