Aligner Treatment for Class III Malocclusion with Anterior Crossbite

Abstract

Introduction: A 19-year-old male came for consultation for a protrusive mandible and an unesthetic smile. He was previously advised against his preference for clear aligner therapy by other orthodontists.

Diagnosis & Etiology: His facial profile was concave, and the cephalometric analysis indicated a skeletal Class III relationship (ANB -2°). The diagnosis was a skeletal Class III malocclusion with an anterior crossbite and an overjet of -2mm. No functional shift was noted. The molar relationships were end-on Class III bilaterally.

Treatment: The treatment plan was to retract the lower arch with aligners. Class III intermaxillary elastics were added to increase anchorage. Occlusal attachments were installed on the LL6 and LR6 to correct the anterior crossbite. In the 9th month, the anterior crossbite was resolved. The patient finished his first set of aligners in the 14th month. A refinement phase was then initiated to improve the final occlusal outcome.

Results: The total treatment time was 19 months. Overall, the case, with a Discrepancy Index (DI) of 11, was treated to a Cast-Radiograph Evaluation (CRE) of 6 and a Pink & White esthetic score of 2. (J Digital Orthod 2021;63:42-56)

Key words:
Aligner, Class III malocclusion, anterior crossbite, Class III intermaxillary elastics, occlusal attachment

Introduction

The dental nomenclature used in 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, the permanent teeth are numbered 1-8.

Aligners have been evolving for years. In the beginning, they could only treat mild malocclusion cases.[1,2] Considerable effort explored the possibilities and limitations of aligners. Although research in 2017 implied there were still many limitations,[3] the advancement of materials, artificial intelligence, and experience with more difficult cases has considerably extended the capability of aligner treatment.[4-7] Class III camouflage treatment is common but challenging when using braces.[8-10] Aligners combined with Class III intermaxillary elastics is not common. Treatment strategies for correcting anterior crossbites with a deep bite are even more unusual.

This case report describes the non-surgical treatment of a Class III jaw relationship with end-on Class III molar relationship and a Discrepancy Index of 11. With proper design of a Class III mechanism, this interesting case was completed with a normal occlusion and good esthetic results.

■ Fig. 1:

Bear Chen,
Associate Director, Beethoven Orthodontic Center (Left)

Chris H. Chang,
Founder, Beethoven Orthodontic Center
Publisher, Journal of Digital Orthodontics (Center)

W. Eugene Roberts,
Editor-in-Chief, Journal of Digital Orthodontics (Right)

History and Etiology

A 19-year-old male sought orthodontic consultation for a protrusive mandible and unesthetic smile. No contributing medical or dental histories were reported. A clinical examination revealed a concave facial profile and lower lip protrusion. From the frontal view, his face was symmetrical. When he smiled, the upper

■ Fig. 1:
Pre-treatment facial and intraoral photographs. The facial profile was concave. UR1 and UL1 were blocked in by restorations on the LR1 and LL1. There was an end-on Class III relationship bilaterally.

central incisors were barely visible. Intraorally, the molar relationships were bilateral end-on Class III. The upper central inciosrs were significantly extruded about 4mm to the maxillary occlusal plane. It follows that there was a 4mm discrepancy between the gingival levels of the upper central incisors and lateral incisors. The UL1 was worn away on the disto-incisal angle. A dynamic examination of mandibular motion revealed a functional shift from left to right. The LL1 and LR1 were splinted crowns and all 3rd molars were present (*Figs. 1 and 2*).

The cephalometric analysis indicated skeletal Class III (*ANB -2°*) and the FMA were normal (*30°*). The upper and lower incisor axes were both upright (*Fig. 3; Table 1*). The upper lip was 5mm behind the E-line, resulting in a relatively protrusive lower lip.

The patient's mouth opening was 40mm without a deviation. Although the condylar shapes were asymmetrical, the temporomandibular joint (*TMJ*) clinical examination did not reveal any clicking,

■ *Fig. 3:*
Pre-treatment cephalometric radiograph. Overjet was -4mm, and overbite was 6mm. The lower lip was more protrusive than the upper lip.

crepitation, or pain with palpation in the porus acusticus externus. However, a compressed disc space was noted on the right side, indicating a functional shift (*Fig.4*).

■ *Fig. 2:*
Left: The panoramic film showing the endodontically-treated LR1 and LL1 were splinted together with single crowns.
Center: UR1 and UL1 were extruded 4mm. UL2 disto-incisal angle was worn.
Right: In a lateral view, all upper incisors were in full or partial crossbite. The cervical third of the central incisors could barely be seen.
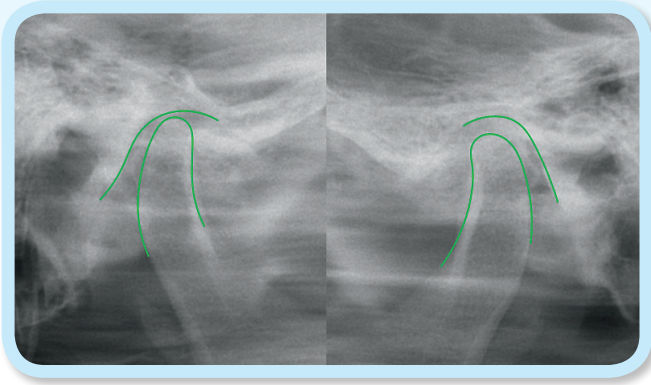
TMJ transcranial radiographs show asymmetrical condyle heads. The right one was compressed due to anterior crossbite, which may imply functional shift. To verify that, a C_O/C_R discrepancy test was necessary.

Diagnosis

Skeletal:

- Sagittal relationship: *Skeletal Class III, protruded mandible*
- Mandibular plane angle: *Normal*

Dental:

- Occlusion: *End-on Class III bilaterally*
- Overjet/overbite: *-4mm/6mm*

Facial:

- Convexity: *Concave*
- Lip protrusion: *Protrusive lower lip (3mm)*

The American Board of Orthodontics (*ABO*) Discrepancy Index (*DI*) was 11, suggesting the malocclusion would be more readily treated with fixed appliances, compared to aligners. Details for the DI are shown in the supplementary Worksheet 1.

Treatment Objectives

The treatment objectives were to: (*1*) correct the crossbite, (*2*) establish functional Class I molar and canine relationships, (*3*) retrude the lower lip, and (*4*) align the upper and lower midlines.

Treatment Plan and ClinCheck

The treatment was designed to first retract the lower arch about 2mm and then expand it 2mm. Incisor

CEPHALOMETRIC SUMMARY			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA° (82°)	82°	82°	0
SNB° (80°)	84°	84°	0
ANB° (2°)	-2°	-2°	0
SN-MP° (32°)	30°	31°	1°
FMA° (25°)	23°	24°	1°
DENTAL ANALYSIS			
U1 To NAmm (4mm)	4	8	4
U1 To SN° (104°)	100°	112°	12°
L1 To NBmm (4mm)	3	1	2
L1 To MP° (90°)	82°	69°	13°
FACIAL ANALYSIS			
E-LINE UL (-1mm)	-5	-5	0
E-LINE LL (0mm)	0	-3	3
%FH: Na-ANS-Gn (53±3%)	52%	53%	1%
Convexity: G-Sn-Pg' (13°)	4°	5°	1°

■ *Table 1:*

Pre- and post-treatment cephalometric analysis. ANB remains unchanged. However, the angle of U1 to SN increased 12°, and the angle of L1 to MP decreased 13°. The lower lip was retracted 3mm.

■ *Fig. 5*: *ClinCheck*
  42 stages were designed to treat the patient. The following goals were prescribed. (1) Expand and retract the lower arch by 2mm and 1mm respectively. (2) Intrude the upper and lower incisors. (3) Perform precision cuts on both lower canines, with cutouts on both upper molars for Class III intermaxillary elastics. (4) Overcorrect the overjet with 0.5mm overbite.

intrusion planned was 4 and 2mm for the upper and lower arches, respectively. Class III intermaxillary elastics were planned for occlusal attachments to correct the anterior crossbite. The aligner treatment was set to finish with a 0.5mm overbite and 0.5mm overjet. 42 stages were designed to solve the malocclusion, 10 days for each stage. Additional aligners could be needed (*Fig. 5*).

Treatment Alternatives

The patient refused fixed appliance treatment although that was clearly the most efficient approach.

Orthognathic surgery would be the best way to correct the skeletal discrepancy and asymmetry, but it is expensive and risky. The patient flatly refused.

Treatment Process

All attachments were bonded in the 2nd stage, and the patient was instructed to use the aligner seater every time he wore the aligners.

By the 11th stage (*3rd month*), the occlusal attachments were prescribed on the LR6 and LL6 to open the occlusion. Meanwhile, the upper central incisors started to flare (*Fig. 6*).

By the 17th stage (*6th month*), the UR6 and UL6 buccal side of the aligners were cut out, and buttons for Class III intermaxillary elastics were bonded. Precision cuts were designed on LR3 and LL3 (*Fig. 7*).

By the 26th stage (*9th month*), the anterior crossbite was corrected, and the molar relationships were Class I (*Fig. 8*).

■ *Fig. 6:*
   In stage 11, virtual occlusal attachments were placed on LR6 and LL6 to disocclude the arches. The aligner was strong enough to confront the force of occlusion; therefore, it was not necessary to bond a resin core on the occlusion. Hence, the patient was more comfortable inserting and removingthe aligners. An excellent disocclusion effect due to occlusal attachments is shown in the frontal view on the right.

By the 42nd stage (*14th month*), nearly all the problems were solved (*anterior crossbite, Class III, deep bite*). When the results were compared with ClinCheck®, they were very similar. Because the objective was to overcorrect overjet and overbite, additional aligners were needed for finishing (*Fig. 9*). There were nine additional aligner stages.

After 19 months of active treatment, all appliances were removed, and retention was accomplished with upper and lower clear overlay Vivera® retainers.

■ *Fig. 7*:
   Cutouts were made on the UR6 and UL6, and then buttons were bonded. Precision cuts were made on the LR3 and LL3. Class III intermaxillary elastics were prescribed for full-time wear.

Treatment Results

The patient was well satisfied with his esthetic and functional occlusion (*Fig. 10-12*). The Class III malocclusion was successfully resolved, and the protrusion of the mandible improved considerably. No temporary skeletal anchorage devices (*TSADs*) were placed. The anterior crossbite, functional Class I molar position, and canine relationships were successfully established. Excellent dental alignment was achieved as evidenced in the ABO CRE score of 6 points, shown in the supplementary Worksheet 2.

■ *Fig. 8:*
   With a correctly designed orthodontic mechanism, the end-on Class III, anterior crossbite, and deep bite were all resolved with 26 stages (9 months).

■ *Fig. 9 :*
42 stages were designed to treat the patient, and the result was nearly identical to the ClinCheck®. The patient wore the aligners full time, except when eating and brushing teeth. Good patient compliance was the key to successful treatment.

The superimposed cephalometric tracings show that the proclination and intrusion of the upper incisors, as well as the retroclination of the lower incisors, were the keys to this case (*Fig. 11*). Due to the Class III intermaxillary elastics, the occlusal plane rotated counter-clockwise. Furthermore, the increase of vertical dimension rotated the mandible clockwise. The ANB remained unchanged. The FMA increased 1° (*Table 1; Fig. 11*). The post-treatment TMJ transcranial radiographs show the condylar heads returned to a symmetrical morphologic and kinematic relationship (*Fig. 13*). The patient did not report any TMD signs or symptoms before, during, or after treatment. The post-treatment panoramic film shows good parallelism of all teeth except UL4 and UL5 (*Fig. 14*).

■ *Fig. 10:*
Post-treatment cephalomatric radiograph shows an orthognathic profile and Class I molar relationship. The anterior overjet was normal.

The Pink and White dental esthetic score is 2 points, as shown in the supplementary Worksheet 3.

Discussion

Opening the occlusion is the key to correcting crossbites, both anterior and posterior. When using brackets, glass-ionomer cement can be placed on the occlusal surfaces of the lower posterior teeth to correct anterior crossbites. To increase the efficiency, power ridges help with torque control (*Fig. 15*). An inclined bite plate can be created on the lower incisors. Also, the patient must be instructed to hook Class III intermaxillary elastics and use a tongue depressor everyday (*Fig. 16*).[9,11]

However, when using aligners, a bite plate cannot be used as it is impossible to wear the aligners and bite plate at the same time. Fortunately, an occlusal attachment on teeth can be designed to function as a bite turbo.

The greatest advantage of digital orthodontics is that tooth movements can be predicted. As indicated in the current patient's simulated animation, the duration of the crossbite correction would be from stage 11 to stage 26, so the occlusal attachments on LL6 and LR6 were placed during these stages to open the occlusion. The occlusal attachment is not like other optimized attachments for tooth movement; bonding of occlusal attachments is not necessary. All that was needed was the shape of the


Pre-Tx
Post-Tx
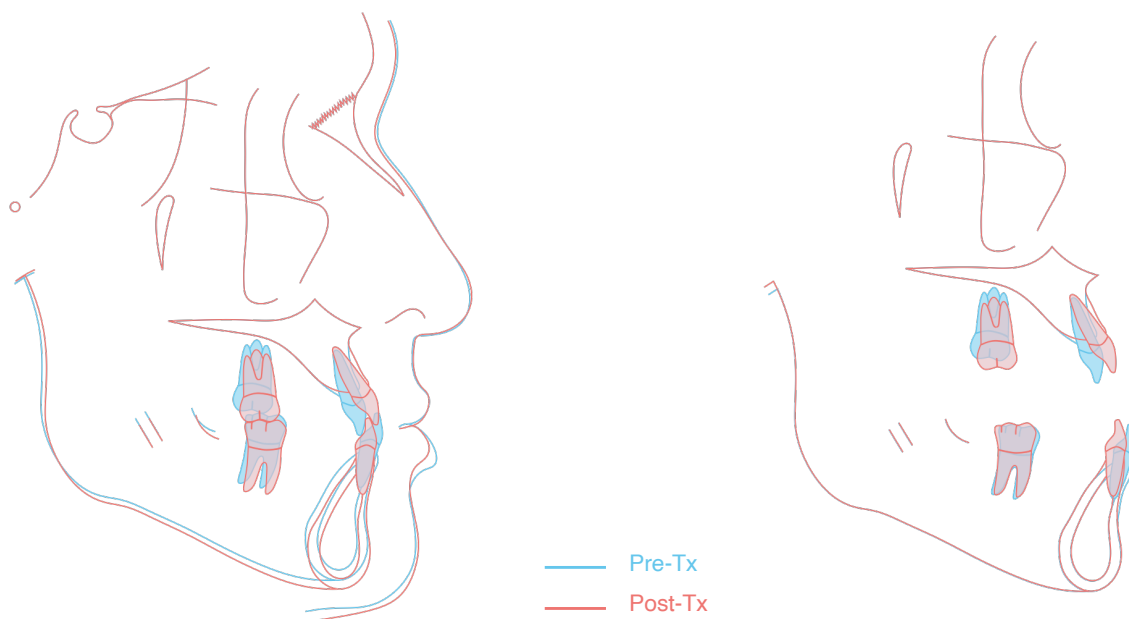
■ *Fig. 11:*
Superimposed tracings indicate that the mandible moved in a clockwise direction due to counterclockwise rotation of the occlusal plane. The upper molars were extruded, and the upper incisors were flared and intruded. The U1-SN angle increased by 12°, and the L1-MP angle decreased by 13°. Although FMA increased, the patient did not complain about any TMJ discomfort.

■ *Fig. 12*: *Post-treatment facial and intraoral photographs document the outcomes.*

After 19 months of active treatment, the anterior crossbite, full-cusp Class III, and concave facial profile were corrected to a satisfactory result, with a good occlusal relationship. Open bite, which is common in Class III camouflage treatment, did not occur. The gingival level of the upper anterior teeth was aligned symmetrically. The curve of Spee was flattened.
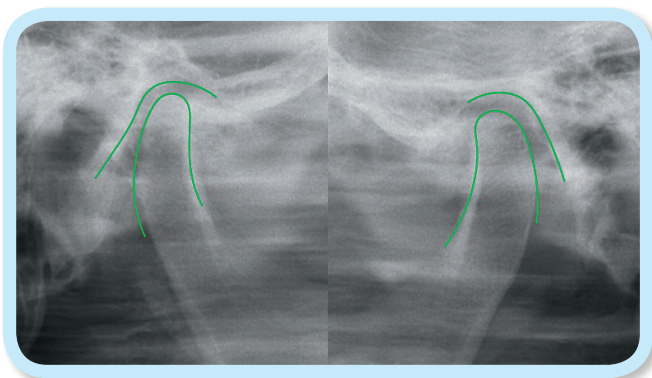
■ *Fig. 13*:

TMJ transcranial radiographs show that the right condyle compression was relieved after correction of the anterior crossbite.
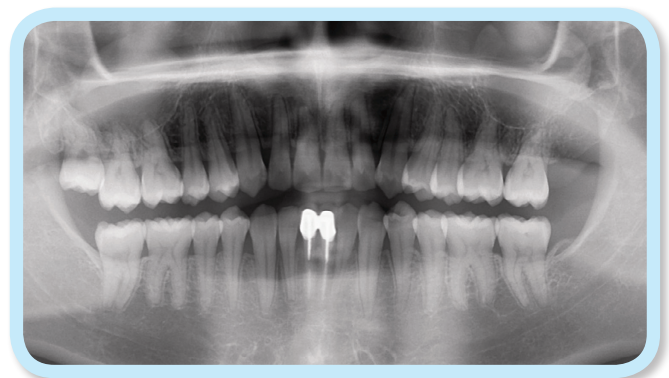
■ *Fig. 14*:

Post-treatment panoramic film shows good parallelism of all roots with mild root resorption. Extraction of the UR8 was suggested.
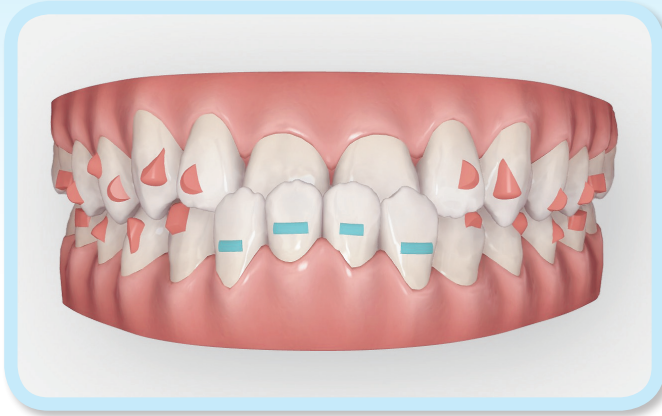
■ *Fig. 15:*
Power ridges are necessary if torque control is critical, especially for Class III and Class II mechanisms with a large scale of movement. For this patient, loss of torque on the lower anterior teeth (caused by Class III intermaxillary elastics) and lower arch retraction was expected, so power ridges were placed on the lower anterior teeth to increase torque.

■ *Fig. 16:*
To treat the anterior crossbite, an inclined bite plate was built on the lower anterior teeth to disocclude the arches. When combining Class III intermaxillary elastics and buccal shelf screws, many severe Class III malocclusions can be treated using camouflage treatment.

occlusal attachment on the aligner to separate both arches during wear. In addition, the patient must be instructed to wear Class III intermaxillary elastics and use tongue depressors daily. With these tools, it took only six months to correct the anterior crossbite.

When crossbite is encountered, it is usually accompanied by tooth attrition, meaning that these teeth are located in the path of mandibular movement. Unless mal-positioned teeth are corrected, attrition will likely reoccur. This patient's disto-incisal angle was worn, but it was decided not to restore it at the beginning of treatment. It was restored after the crossbite was corrected and prior to the 2nd treatment scan (*Fig. 9*).

The major treatment objective was proclining the upper incisors and retroclining the lower incisors.[8] The first step was to retract the lower molars. The aligners utilized other teeth in the same arch to provide anchorage to push the molars backwards up to 2mm. However, the anchorage was not enough to retract the premolars, so additional anchorage was needed from intermaxillary elastics or TSADs.[12] Therefore, the patient was instructed to wear Class III intermaxillary elastics to retract the lower premolars from stage 17 onwards. Since this was a Class III camouflage treatment, every necessary step to compensate for side effects was taken. It was important to control torque loss in the lower anterior teeth; therefore, power ridges were necessary to flare the lower anterior teeth. Nevertheless, the loss of the torque was still quite significant ($82° \rightarrow 69°$) (*Figs. 11 and 15; Table 1*).

In 2014, G5 was introduced by Invisalign to resolve

deep bites. By combining optimized attachments on the premolars with the pressure area on the incisors' lingual surfaces, a force from the aligners is produced, which can go through the long axis of the incisors. By extruding the premolars and intruding the incisors, the curve of Spee can be flattened and the overbite decreased (*Fig. 17*).[13,14] Using ClinCheck, absolute intrusion of the upper and lower incisors was planned. However, the superimposition (*Fig. 11*) shows the extrusion of the upper molars and the flaring of the upper incisors produced a relative intrusion of the upper incisors. Intrusion was also noted, for intrusion of the upper and lower incisors. It is clear that G5 flattens the occlusal plane by intruding incisors and extruding molars. Absolute intrusion of incisors with no change in the molars as predicted by ClinCheck did not occur.

Conclusions

With proper mechanics, Class III malocclusions with anterior crossbite can be resolved with aligners.

There are many differences between braces and aligners, but the treatment principles are the same overall. Orthodontists can therefore explore and extend the possibilities of for orthodontic treatment no matter what type of appliances are used.

Acknowledgment

References

1. Phan X, Ling PH. Clinical limitations of invisalign. J Can Dent Assoc (Tor) 2007;73(3):263–6.
2. Lagravère MO, Flores-Mir C. The treatment effects of Invisalign orthodontic aligners: a systematic review. J Am Dent Assoc 2005;136(12):1724–9.
3. Zheng M, Liu R, Ni Z, Yu Z. Efficiency, effectiveness and treatment stability of clear aligners: A systematic review and meta-analysis. Orthod Craniofac Res 2017;20(3):127–33.
4. Herrero DP, Chang CH, Roberts WE. Severe malocclusion with openbite, incompetent lips and gummy smile (DI 29) treated in 16 months with clear aligners to a board quality result (CRE 18). Int J Orthod Implant 2017;48:74–94.
5. Ojima K, Sugawara J, Nanda R. Anchorage of TADs using

■ *Fig. 17*:

Left: G5 - Optimized attachments on the premolars were placed to help intrude the anterior teeth.

Center & Right: In ClinCheck, the upper incisors were first flared, and then intruded 4mm. The lower incisors were intruded 2mm.

aligner orthodontics treatment for lower molars distalization. In: Nanda R, Uribe F, Yadav, editors. Temporary anchorage devices in orthodontics. Elsevier. 2020. p.305–19.

6. Ojima K, Dan C, Nishiyama R, Ohtsuka S, Schupp W. Accelerated extraction treatment with Invisalign. J Clin Orthod 2014;48(8):487–99.

7. Guarneri MP, Oliverio T, Silvestre I, Lombardo L, Siciliani G. Open bite treatment using clear aligners. Angle Orthod 2013;83(5):913–9.

8. Proffit WR, Fields HW. Chapter 8: Orthodontic treatment planning limitations, controversies, and special problems. In: Proffit WR, Fields HW, Sarver DM, editors. Contemporary orthodontics. 4th ed. St. Louis: Mosby Elsevier. 2007.

9. Tseng LLY, Chang CH, Roberts WE. Diagnosis and conservative treatment of skeletal Class III malocclusion with anterior crossbite and asymmetric maxillary crowding. Am J Orthod Dentofac Orthop 2016;149(4):555–66.

10. Chen C-H, Chang CH, Roberts WE. Probable airway etiology for skeletal Class III openbite malocclusion with posterior crossbite: camouflage treatment with extractions. J Digit Orthod 2019;54:54–76.

11. Tseng L, Chang CH, Roberts WE. A minimally invasive approach for anterior crossbite correction without surgery and screws. J Digit Orthod 2020;57:76–92.

12. Schupp W. Accelerated Invisalign treatment of patients with a skeletal Class III. 2017;1(1):37–57.

13. Sandra Tai. Deep bite treatment. In: Clear aligner technique 1st ed. Hanover Park, IL, USA: Quintessence Publishing. 2018. p.95–112.

14. Chang M-J, Chen C-H, Chang C-Y, Lin S-Y, Chang CH, Roberts WE. Introduction to Invisalign Smart technology: attachments design, and recall-checks. J Digit Orthod 2019;54:80–95.

Discrepancy Index Worksheet

TOTAL D.I. SCORE **11**

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   =   **4**

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   =   **0**

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

Total   =   **4**

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° _____ x 2 pts. = _____

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

1 to MP ≥ 99°   =   1 pt.

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

Total   =   **0**

OTHER   (See Instructions)

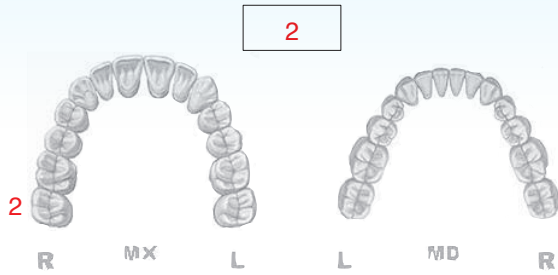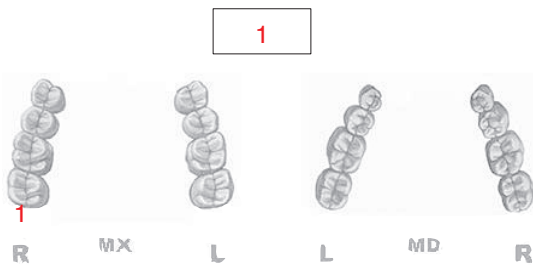|		
Supernumerary teeth	_____ x 1 pt. =	_____
Ankylosis of perm. teeth	_____ x 2 pts. =	_____
Anomalous morphology	_____ x 2 pts. =	_____
Impaction (except 3rd molars)	_____ x 2 pts. =	_____
Midline discrepancy (≥3mm)	@ 2 pts. =	_____
Missing teeth (except 3rd molars)	_____ x 1 pts. =	_____
Missing teeth, 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   =   **0**
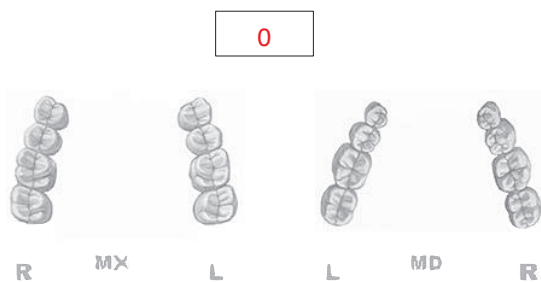
Cast-Radiograph Evaluation

Total Score: 6

Occlusal Contacts

0

R   L
Buccal Surface

L   R
Lingual Surface

Alignment/Rotations

2

2

R   MX   L   L   MD   R

Marginal Ridges

1

1

R   MX   L   L   MD   R

Occlusal Relationships

1

R   1   L

Buccolingual Inclination

0

R   MX   L   L   MD   R
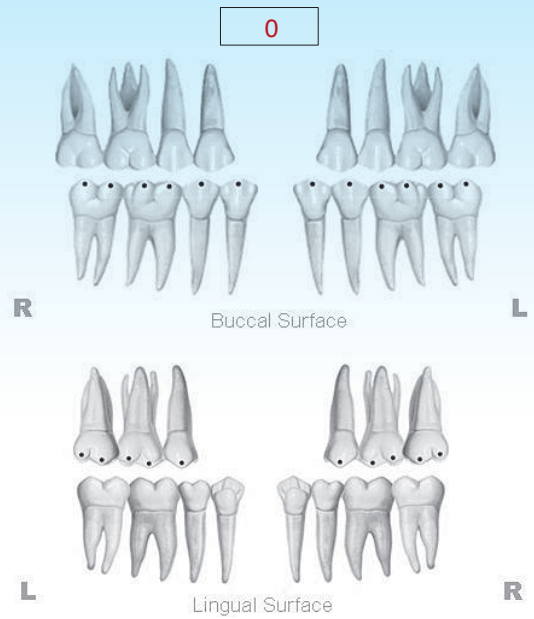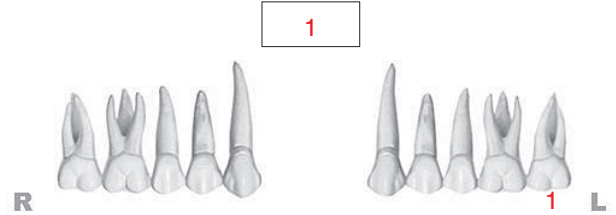
Interproximal Contacts

0

R   L

Overjet

0

R   MX   L

Root Angulation

2

2

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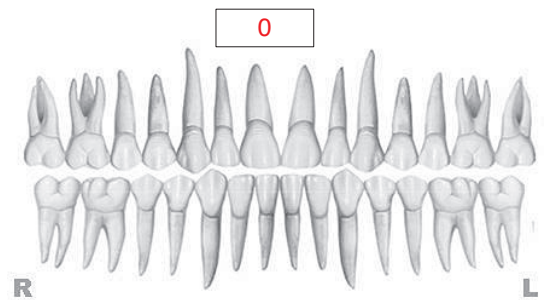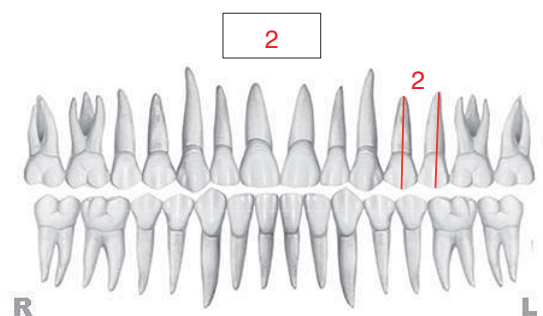
INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink & White Esthetic Score (Before Surgical Crown Lengthening)

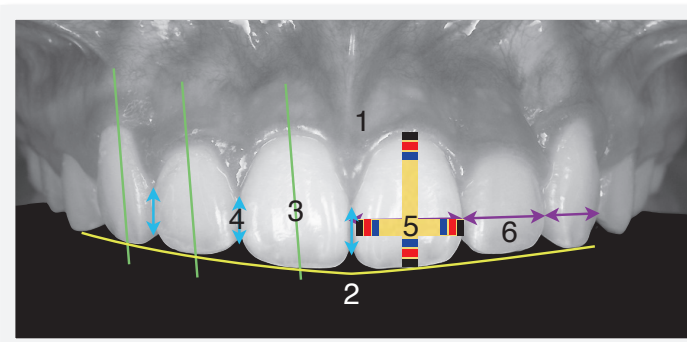**Total Score: =** 2

1. Pink Esthetic Score
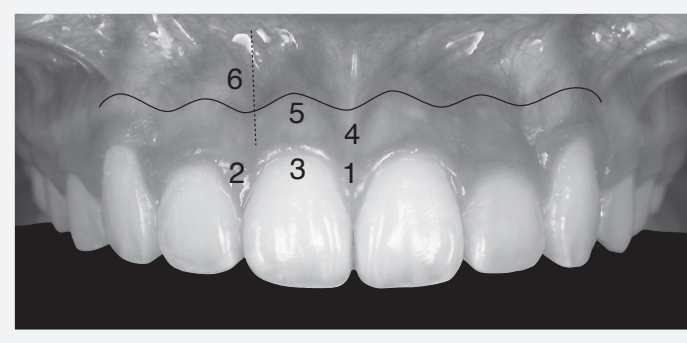
Total = 1

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

	0	1	2
1. M & D Papilla	(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-esthetics)

Total = 1

	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 (1:0.8)	0	1	2
6. Tooth to Tooth Proportion	0	1	2

	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 (1:0.8)	0	(1)	2
6. Tooth to Tooth Proportion	(0)	1	2

Products
Dental Products Essential Kit
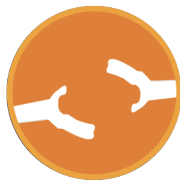
(NEW)
Double Retractors 2.0 Autoclavable!
Double Retractors x2, Black Board x2

While keeping the same lip & cheek two-way design, the new Double Retractors 2.0 is upgraded to medical grade PPSU. This new material is more durable, resilient and most importantly, autoclavable. Its smooth edges and translucent quality make it the best aid to perfect intra-oral photography.

Stainless Steel Mirror

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

Bite Turbo 2.0
Handle x1, BT molds x6, BT extended molds x6, Button molds x6

A simple but power set of tools to correct severe deep bite and cross efficiently. The bite turbos and lingual button molds, made with silicon and filled with flowable resin, can be reused and adjusted depending on treatment progress. The longer one allows you to solve all kinds of deep bite and large horizontal overjet.

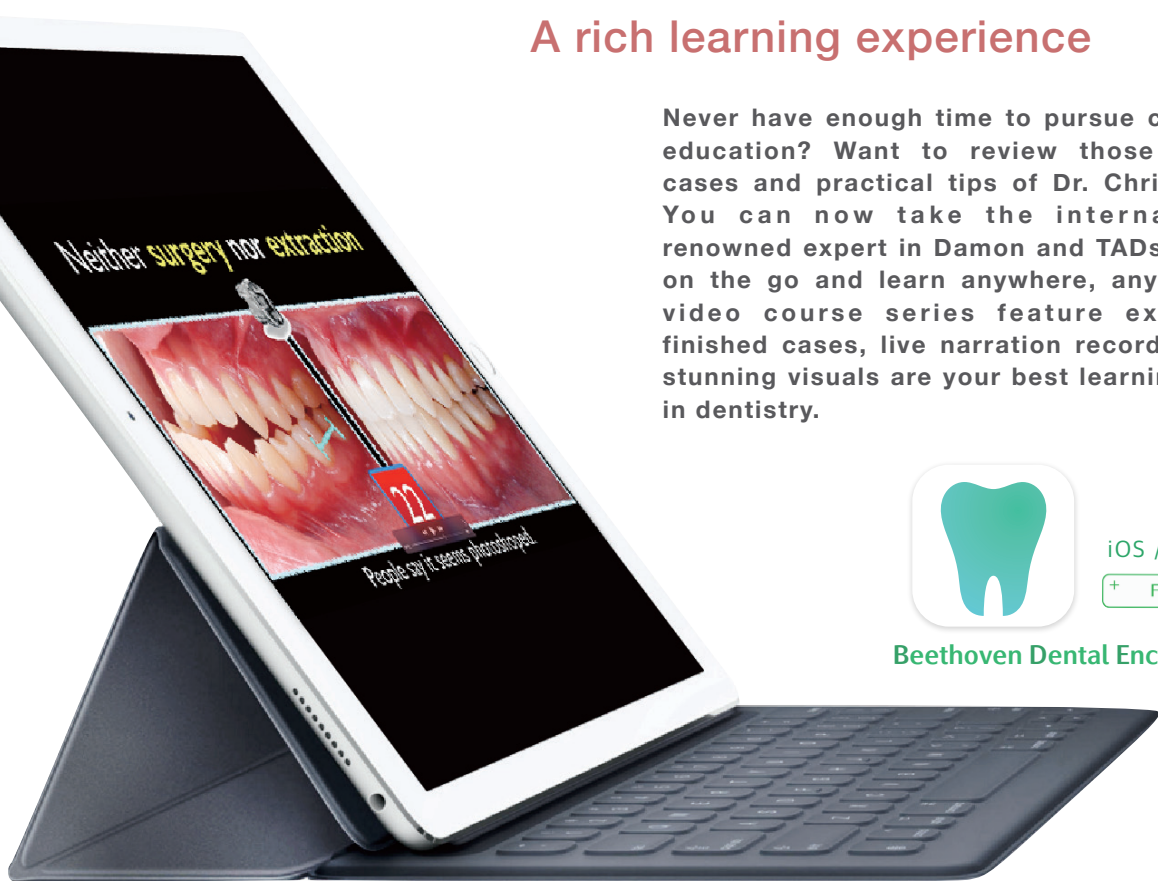OBS OrthoBoneScrew

e-Courses
A rich learning experience

Never have enough time to pursue continuing education? Want to review those amazing cases and practical tips of Dr. Chris Chang? You can now take the internationally renowned expert in Damon and TADs with you on the go and learn anywhere, anytime. The video course series feature excellently finished cases, live narration recordings, and stunning visuals are your best learning source in dentistry.
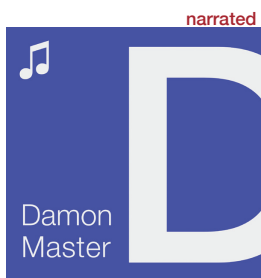
iOS / Android
+ Free App

Beethoven Dental Encyclopedia

▶ Series

narrated	narrated	narrated	non-narrated	non-narrated
Damon Master	E-Lecture	OBS (TAD)	Finishing (12 seasons)	Implant Forum (9 seasons)

non-narrated	non-narrated	non-narrated	non-narrated
Assistant	E-Ortho	E-Implant	E-Pedo

Note:
1. Most video courses are available in both English and Chinese and are sold separately.
2. Damon Master and OBS (TAD) are renewed annually and each renewal is to be purchased separately with a 50% discount.

2021-2022 第十三年度
貝多芬 矯正精修班

時間：週二上午 09:00-12:00
地點：金牛頓教育中心（新竹市建中一路 25 號 2 樓）

上課日期：

2021　6/8、7/13、8/24、9/14、10/19、11/9、12/14

2022　1/11、2/15、3/15、4/12

- ▸ 09:00 ~ 10:00　精選文獻分析
- ▸ 10:00 ~ 10:30　精緻完工案例
- ▸ 10:50 ~ 12:00　臨床技巧及常犯錯誤分享

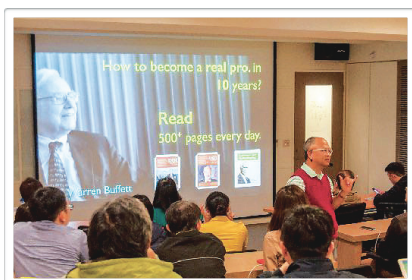全新的第十三年度 2021-22 貝多芬精修班，是由國際知名講師張慧男醫師主持，並偕同貝多芬牙醫團隊住院醫師群共同主講。

每月一次的課程之中，包含了：

1. 精選矯正權威期刊 AJODO 的文章做文獻分析與評讀。
2. 精緻完工 ABO 案例報告，其中因應數位矯正的世界趨勢，Insignia 與 Invisalign 病例為課程探討的主要內容之一。
3. 分享臨床上常犯的錯誤以及解決方法。

2021-22 貝多芬精修班內容豐富精彩，讓您經由每個月一次的課程，在面對各式的臨床案例時，更能游刃有餘、得心應手。

學習目的：

研讀最新趨勢文章可以窺知世界文獻公認的治療方式，而藉由評論文章的優缺點不僅能夠訓練判斷與思考能力，更可以清楚比較作法上的不同，達到完整理解治療方向、內容與穩定性的目標。

報名專線：03-5735676 #201　蔡佳汶