## Clear Aligners and TSADs for the Treatment of a Skeletal Class II Malocclusion with Severe Overjet and Deep Overbite

#### Abstract

*History:* A 42-year-old male presented for orthodontic consultation with a severe Class II malocclusion, overjet of 14mm, and a deep bite with flared anterior teeth. His chief complaints were poor esthetics and masticatory function.

**Diagnosis and Etiology:** Flared, gapped, and over-erupted upper anterior teeth resulted in a severe overjet of 14mm. Lower anterior teeth were also over-erupted, impinging on the upper anterior palate and resulting in an overbite of 8mm. Gingival recession was found along the palatal surfaces of the upper incisors. No significant mobility of anterior teeth was observed. Long, narrow upper dental arch with mesially rotated UR5 was noted, as well as Class II molar relationship on the left side, Class II canine relationships on both sides, and a skeletal Class II malocclusion (ANB, 6°). The probable etiology for the increased overjet included external factors such as thumb-sucking in childhood and existing habits like mouth-breathing, which led to overeruption of upper anterior teeth (internal factors). Loss of proper overjet led to overeruption of lower anterior teeth, which developed into deep bite.

**Treatment:** A non-surgical, non-extraction orthodontic treatment protocol with aligners and temporary skeletal anchorage devices (TSADs) was generated. Intraoral scanning for digital impressions, full records, and prescription form were submitted for Invisalign comprehensive clear aligners. A set of 34 aligners for the first phase was designed. The attachments were bonded on the second visit, TSADs were inserted in the infrazygomatic crest (IZC) bilaterally, and early Class II elastics were used. On completion of the first set of aligners, a significant improvement on overjet and overbite, de-rotation of UR5, and Class I molar and canine relationships on both sides were achieved.

Outcomes: Treatment goals were achieved after 18 months of treatment with clear aligners. (J Digital Orthod 2022;68:4-18)

#### Key words:

Skeletal Class II malocclusion, Class II molar relationship, curve of Spee, vertical dimension of occlusion (VDO), TSADs, Class II elastics, overjet, overbite

#### Introduction

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). Teeth are numbered 1-8 from the midline in each quadrant.

A 42-year-old male presented with chief complaints of incompetent lips, flared and gapped anterior teeth, reduced lower facial height, severe deep bite and overjet, and a retrognathic mandible. He was previously seen by other orthodontists and dentists. Different treatment plans were suggested, such as extraction of flared teeth with restoration by fixed bridges or implant supported prosthesis and even orthognathic surgery. Oral soft tissues, periodontium, frenum, and gingival health were all within normal limits (WNL). No significant mobility of flared teeth was noticed. Oral hygiene was very good. No significant medical or dental histories were noted.

#### Diagnosis and Etiology

Pre-treatment facial and intraoral photographs (Fig. 1) showed a convex profile with incompetent lips and



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incisors with gum recession at the palatal surfaces, a mesially rotated UR5, as well as over-erupted lower anteriors and impingement in the upper arch. In centric occlusion, molar relationship on the left side

protrusive upper incisors. Additional pre-treatment intraoral photographs (Fig. 2) showed an overjet of 14mm, overbite of 8mm, long and narrow upper arch with flared, over erupted, and gapped upper



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



**Fig. 2:** Photographs show the increased overbite and overjet as well as a deep curve of Spee.

and canine relationships on both sides were Class II (Fig. 1). A severely deep curve of Spee was shown when patient was asked to bite in an edge-to-edge occlusion (Fig. 2). Upper and lower midlines were in coincidence.

The patient complained about occasional pain and discomfort in the temporo-mandibular joints (TMJs). He also reported a mouth-breathing habit since childhood because of chronic nasal congestion and recurrent pharyngitis. Pre-treatment panoramic and cephalometric radiographs are shown in Figs. 3 and 4 respectively. Cephalometric analysis (Table 1) showed a hypodivergent skeletal Class II pattern with a retrognathic mandible that was manifested as a large overjet of 14mm. The ANB angle was 6°, the FMA angle was 25°, upper incisors were proclined 123°, and



**Fig. 3:** Pre-treatment panoramic radiograph

the lower incisors were proclined 97° to the mandibular plane. The cephalometric analysis is summarized in Table 1. The American Board of Orthodontics (ABO) Discrepancy Index (DI) was 33, as documented in Worksheet 1 at the end of this report.

#### **Treatment Objectives**

In order to improve esthetics for the patient's smile, treatment objectives were set to correct the vertical



**Fig. 4:** Pre-treatment cephalometric radiograph

CEPHALOMETRIC SUMMARY			
	PRE-TX	POST-TX	DIFF.
SKELETAL ANALYSIS			
SNA° (82°)	80°	80°	0°
SNB° (80°)	74°	76°	2°
ANB° (2°)	6°	4°	2°
SN-MP° (32°)	32°	34°	2°
FMA <sup>°</sup> (25 <sup>°</sup> )	25°	27°	2°
DENTAL ANALYSIS			
U1 TO NA mm (4mm)	10	2	8
U1 TO SN° (104°)	123°	97°	26°
L1 TO NB mm (4mm)	5	5.5	0.5
L1 TO MP° (90°)	97°	98°	1°
FACIAL ANALYSIS			
E-LINE UL (-1mm)	1	-3	4
E-LINE LL (0mm)	0	-1.5	1.5
%FH: Na-ANS-Gn (53%)	55%	56%	1%
Convexity:G-Sn-Pg' (13°)	24°	17°	7°

**Table 1:** Cephalometric summary

dimension of occlusion (VDO) in the anterior segment, by improving the overjet and overbite via intrusion of the over-erupted upper and lower anteriors, retraction of the proclined upper anteriors, and correction of the Class II molar and canine relationships to Class I. In addition to the difficulty in closing the lips and incising food, the patient's chief concerns included esthetics (Figs. 1 and 2). Orthognathic surgery was previously suggested by three other orthodontists, but the patient declined that option because it was too aggressive. He also refused extraction of the proclined teeth because of good periodontal condition and the absence of teeth mobility. Thus, a light-forced orthodontic treatment using clear aligners (Invisalign®, Align Technology Inc., Santa Clara, Calif) was proposed to meet the patient's needs.

#### Treatment Goals :

- 1. Improve overjet and overbite.
- 2. De-rotate UR5.
- 3. Achieve Class I molar and canine relationships on both sides.
- 4. Close spaces in the upper anteriors.

#### **Treatment Strategies :**

- 1. Intrude and retract the upper anteriors.
- 2. Intrude lower anteriors.
- 3. Early Class II elastics
- 4. IZC screws for intra-arch anchorage with Class II elastics

#### **Treatment Progress**

A dental scan with iTero Element II (Align Technology Inc., San Jose, Calif) was taken, and full records were submitted to start the analysis and planning of the case. Instructions to the CAD (computer aided design) designer were given as follows: de-rotate UR5, expand the upper arch, intrude and retract upper anterior teeth, intrude lower anterior teeth, and achieve Class I molar and canine relationships. Class II correction was simulated with precision cuts. The third Clincheck



**Fig. 5:** Posttreatment facial and intraoral photographs



**Fig. 6:** Posttreatment overjet and curve of Spee



**Fig. 7:** Posttreatment panoramic radiograph



**Fig. 8:** Posttreatment cephalometric radiograph



**Fig. 9:** Posttreatment smile of the patient

(Align Tech Inc., San Jose, Calif) confirmed the desired biomechanics design, and the outcome was approved.

A total of 53 aligners were used: 34 in the first phase and 19 in the second phase for refinement. A

one-week aligner change protocol was used. The treatment began with the delivery of first aligners without placing any attachments for one week to allow the patient to adapt to speech articulation and assure comfort. The patient was instructed to wear the aligners for 22 hours per day, and was advised to remove them for eating and brushing teeth only.

One week later, attachments were bonded with SDR bulk-fill flowable composite (SDR flow+, Dentsply Sirona, Konstanz, Germany) as follows (Fig. 10):

Upper arch:

- 1. Optimized multiplane attachment on UR6, UR7, UL6, and UL7
- 2. Optimized root control attachment on UR4 and UL3
- 3. Precision cut mesial hook on UR3 and UL3
- 4. Optimized attachment on UL1 and UL5
- 5. Optimized deep bite attachment on UL4

#### Lower Arch:

- 1. Optimized multiplane attachment on LL6 and LL7
- 2. Precision button cutout on LL6 and LR6
- 3. Optimized rotation attachment on LL4, LL5, and LR5
- 4. Optimized twin root control attachment on LL3
- 5. Power ridge for lingual root torque control on LL2
- 6. Optimized root control attachment on LR4



**Fig. 10:** The initial Clincheck views show the pre-treatment teeth position (blue) and simulated final position (white)

On the same visit, two IZC screws (2x12-mm, OrthoBoneScrew<sup>®</sup>, iNewton, Inc., Hsinchu City, Taiwan) were installed. Elastics (Moose, 5/16-in, 6 oz, Ormco, CA) were hooked from upper canine to the IZC screw bilaterally (Fig. 11). The patient was given instructions on how to hook elastics, and was requested to keep them hooked at all times and to change them every 8 hours after they were taken off to eat or brush teeth. At week 8, a button was attached on the buccal surface of UR5, and an elastic (Chipmunk, 1/8-in, 3.5 oz) was hooked from UR5 to the IZC screw on the right side to help rotate UR5. A cutout in the aligner at the corresponding site of the button was created. Class II elastics from lower first

molars to upper canines were also initiated. Periosteal perforation was performed between the roots of lower anteriors and around the root of UR5, with the use of an 1.5x8-mm bone screw (Smart Anchor, GNI Co. Ltd., South Korea) after application of local anesthesia (Fig. 12). The patient was asked to do clenching exercise using an aligner seater for ten times on each anterior tooth to accelerate intrusion. At week 12, lingual buttons were attached on the lingual surfaces of UR5 and UR3, and elastic closing chain was placed to create a moment of force together with the elastic on buccal surface to accelerate rotation. Another two Chipmunk elastics were introduced from buttons on lower 1<sup>st</sup> molars to



**Fig. 11:** TSADs in the IZC and Class II elastics

upper canines. Composite buttons were placed on the upper canines, and cutouts were made at the corresponding position of the hooks on the aligners to transform the hooks to buttons. At week 20, the buttons on the lingual surfaces were removed, and the use of Class II elastics continued until the end of the first phase at aligners #34.

A careful assessment of the results were carried out. The overjet and overbite were substantially improved, Class I molar and canine relationships were achieved on both sides. However, posterior open bite on the buccal side of the molar area were observed on both sides. New digital scans and photos were taken and submitted for additional aligners for the second phase of treatment plan. The patient was instructed to wear the last aligners of the first phase and keep Class II elastics hooked at night only until the arrival of the new aligners. A new ClinCheck® was generated and modified to meet the following requirements:

- 1. Further intrusion of upper and lower anteriors
- 2. Extrusion of posterior upper and lower teeth



**Fig. 12:** Periosteal perforation between the roots of lower anteriors

- 3. Lingual root torque on upper incisors
- 4. Buccal root torque on upper and lower molars

Modifications in the aligner features were as follows :

- 1. Existing attachment were left on UR7, UR6, UR4, UL2-5, UL7, LL7, LL3, LR4, and LR5
- 2. New optimized rotation attachment on UR5
- 3. New horizontal rectangular attachment on UR3, LR6, and LL6
- 4. Button cutout on UR3 and UL3
- 5. New optimized root control attachment on UR2 and LR3
- 6. Power ridge for lingual root torque control on UR1 and UL1
- 7. New optimized deep bite attachment on UL6 and LL5
- 8. New optimized multiplane attachment on LR7

The additional set of 19 refinement aligners arrived after four weeks, and the new attachments were placed according to the new template. Class II elastics (Fox, 1/4-in, 3.5 oz, Ormco, CA) were advised to be used full time while wearing the aligners. At week 8 of the additional aligners, two bone screws sized 1.5x8-mm (Smart Anchor, GNI Co. Ltd., South Korea) were inserted labially between the roots of upper central and lateral incisors on both side, cuts were made on the lingual surfaces of the aligners, and two Fox elastics were advised to be used from these screws to the cuts to support intrusion of upper anteriors (Fig. 13). In the bilateral posterior segments, Moose elastics were used in V shape from the IZC screw to the lower molars and then to upper canines to support extrusion of lower molars, together with the elastic from IZC screw to upper canines. This pattern was used for four weeks only. At aligners #12 of the second phase, the patient was advised to continue with Class II elastic pattern only in the posterior segment. At aligners #16 all bone screws were removed, and the patient was advised to wear the remaining aligners with a two-week changing frequency. After aligners #19, all the planned goals were achieved with excellent results. All attachments and buttons were removed, and final records of photos, X-ray, and digital scans for clear retainers were taken. The patient was advised to wear aligners #19 of the second phase full time to hold the teeth in place while waiting for the retainers.

#### Retention

Digital scans for clear removable retainers were taken with iTero scanner. Clear overlay retainers (Vivera, Align Technology, San Jose, Calif) were delivered after two weeks for full time wear for one month. After



**Fig. 13:** TSADs and elastics in the upper labial

one month the patient was seen, and cuts were made manually for Class II elastics to be used at night only with Fox elastics (Fig. 14)

#### **Treatment Results**

Posttreatment documentation of photographs (Figs. 5 and 6), radiographs (Figs. 7 and 8), cephalometric measurements (Table 1), and superimposed cephalometric tracings (Fig. 15) indicated that both the overbite and overjet were within normal ranges. Class I molar and canine relationships on both sides were achieved. Retraction of upper anteriors was successful, and spaces were eliminated. Lower anteriors was intruded, and the curve of Spee were flattened. Two sets, a total of 53 aligners for both arches over 18 months produced a final result as planned in treatment goals and close to the original 3D ClinCheck projection.

#### Discussion

The biomechanics of clear aligners could be described as a sequence of crown tipping and root



**Fig. 14:** Clear retainers (Vivera) with bite ramps and Elastics

uprighting.<sup>1</sup> Aligner therapy is a good approach for resolving vertical discrepancies such as deep bite and open bite. Successful treatment results using clear aligners to correct these discrepancies have been reported in the literature.<sup>2</sup> For the current case, intrusion of upper and lower anterior teeth was initiated from the beginning of the treatment, which was accelerated by micro perforation (Fig. 12)<sup>3</sup> and clenching exercises.<sup>4</sup> The biomechanics of the assisted flapless corticotomy, or micro-osteoperforation, is developed based on the understanding of the regional acceleratory phenomenon (RAP). The RAP is a collection of a physiological healing process that is characterized by tissue remodeling and manifested as transient bursts of osteoclastic and osteoblastic activities, increased levels of local and systemic inflammatory markers, which then causes an accelerated bone turnover and decreased bone density.<sup>5</sup>

When dealing with Class II malocclusion, the treatment with clear aligners offers different possible mechanisms: 1. distalization, 2. molar de-rotation, 3. elastic intermaxillary correction (jump), 4. extractions, 5. mandibular advancement, and 6. orthognathic surgery.<sup>6</sup> In this case, Class II correction was induced by elastic jump effect from early Class II elastic with IZC screws which produced intra-arch anchorage to retract upper anteriors together with Class II elastic from lower molars (Fig. 11). The elastic effect is simulated on virtual setups by a jump-like shift of occlusion from Class II to Class I to allow easier visualization. Elastic wear is recommended from the start of the treatment. Despite the extensive use of Class II elastics, little evidence is known about their effects in enhancing the sagittal bite jump in adults. Retraction of upper anteriors induced relative extrusion. After the first set of aligners, overjet and overbite were improved, which improved the esthetics of the patient's smile significantly (Fig. 10), but posterior open bite on both sides was observed. Three probable reasons were suggested: 1. inadequate intrusion of lower anteriors, which induced premature occlusal contact in the anterior and absence of contact in the posterior segments; 2. loss of torque of upper anterior teeth during their retraction and long-term use of Class II elastics; and 3. buccal tipping of upper molars during expansion, which produced relative intrusion of buccal cusps of the molars 7

Additional aligners were requested, and a new ClinCheck was generated to overcome these side effects with the objectives to: 1. further intrude upper and lower anteriors; 2. add lingual root torque and power ridges in the upper anteriors, and 3. add buccal root torque and extrude molars. To achieve the desired treatment goals, there should be a prescribed overcorrection in leveling the mandibular curve of Spee within the ClinCheck treatment plan, and the extrusion of the mandibular first molars should be considered.<sup>8</sup> The clinician should also consider using auxiliary appliances to improve mandibular curve of Spee leveling.<sup>9</sup> For the current case, the correction was done by additional aligners, and at the end of the second phase, very good results were achieved with normal values of overbite and overjet, as well as flattened curve of Spee, closed buccal spaces, and favorable occlusion with Class I canine and molar relationships on both sides.

Two mechanisms were used to succeed in this case. The first objective was intrusion of anterior teeth to flatten the curve of Spee, and the second was the use of IZC screws for intra-arch anchorage. Early Class II elastics and later on retraction of upper anteriors contributed to the correction. They were also used in the second phase for closing the buccal space. The Class II elastics induced mandibular auto-rotation, which contributed to the improvement of sagittal relation and the final Class I occlusion. The DI score of this case was 33, which is not considered to be an easy case, and yet satisfactory esthetic results were achieved. The cephalometric superimpositions (Fig. 15) show the improvement of the upper incisal



Fig. 15:

Superimposed cephalometric tracings show the dentofacial changes after 18 months of treatment (red) compared to the pre-treatment position (black). See text for details.

inclination, angulation, and the vertical relation, which was enhanced by intrusion of both upper and lower incisors. All these factors contributed to the correction of the overjet and overbite.

#### Conclusions

Clear aligners are a therapeutic modality that can be effectively employed for non-extraction treatment of Class II with severe overjet and overbite. Flattening curve of Spee<sup>10</sup> is the key objective for deep bite treatment, which was mainly corrected by intrusion of upper and lower anterior teeth. For proclined upper anterior teeth with severe overjet, retraction and intrusion can be achieved simultaneously as long as lingual root torque is controlled. With careful evaluation of anterior teeth during retraction, relative extrusion and additional intrusion of teeth was accomplished to achieve the desired overbite. Class II correction with elastics by virtual bite jump can be achieved in adults with excellent patient compliance and early introduction in the treatment.

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Discrepancy	Ind	ex Worksheet	
TOTAL D.I. SCORE		33	
<u>OVREJET</u>			
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	=	5	
<b>OVERBITE</b>			
0 - 3 mm.	=	0 pts.	
3.1 - 5 mm.	=	2 pts.	
5.1 - 7 mm.	=	3 pts.	
Impinging (100%)	=	5 pts.	
Total	=	5	
ANTERIOR OPEN E	BITE		
0 mm. (Edge-to-edge), 1 pt. per tooth Then 1 pt. per additional full mm. Per tooth			

Total



=

=

#### LATERAL OPEN BITE

2 pts. per mm. Per tooth

Total

0

#### **<u>CROWDING</u>** (only one arch)

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

l'otal	
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#### **OCCLUSION**

=	0 pts.	
=	2  pts. per side  2	pts.
=	4 pts. per side	pts.
=	1 pt. per mm additional	pts.
=	2	
	= = =	= 0 pts. = 2 pts. per side _2 = 4 pts. per side = 1 pt. per mm additional = 2

LINGUAL POSTI	ERIOR X-BITE	
1 pt. per tooth	Total	= 0
BUCCAL POSTE	RIOR X-BITE	
2 pts. Per tooth	Total	= 2
<u>CEPHALOMETR</u>	<b><u>RICS</u></b> (See Instruc	tions)
$ANB \ge 6^\circ \text{ or } \le -2^\circ$		= 4 pts.
Each degree < -2	° x 1 pt.	=
Each degree $> 6^{\circ}$	x 1 pt.	=
SN-MP		
$\geq$ 38°		= 2 pts.
Each degree > 38	3° x 2 pts.	=
$\leq 26^{\circ}$		= 1 pt.
Each degree < 26	5° x 1 pt.	=
1 to MP $\ge$ 99°		= 1 pt.
Each degree > 99	9° x 1 pt.	=
	Total	= 4

#### **<u>OTHER</u>** (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 (≥ 3mm)	@ 2 pts. =_	
Missing teeth (except 3 <sup>rd</sup> molars)	_ x 1 pt. =_	
Missing teeth, congenital	x 2  pts. =	
Spacing (4 or more, per arch)	x 2  pts. =	8
Spacing (Mx cent. diastema ≥2mm)	@ 2 pts. =_	2
Tooth transposition	x 2  pts. =	
Skeletal asymmetry (nonsurgical tx)	@ 3 pts. =_	
Addl. treatment complexities 2	$x^{2} pts. =$	4

## Identify: Skeletal Class II with 14mm overjet is an indication of orthognathic surgery.

Total

14

=



in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## **IBOI Pink & White Esthetic Score**

Total Score =



1. Pink Esthetic Score





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





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

Total =

1

Total =		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

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

# HARNONY<sup>™</sup> Ergonomic Instrument Designed with TrueFit<sup>™</sup> Technology



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#### Chair-side observation



Insignia Lecture, Chair–side observation Chris' Lecture: Digital Orthodontics with TAD





#### VISTA Lecture & workshop Chris' Lecture:

#### **VISTA for Impacted Cuspids**

- \* The topics for VISTA workshop:
- 1. VISTA with screw placement
- 2. VISTA with connective tissue graft
- 3. Suture technique



#### Prof. Dr. Paulo Fernandes Retto, Portugal

<sup>•</sup>Dr. Angle would be glad to know that contemporary orthodontics has a professional as Chris Chang!"

Digital Orthodontics, OBS & VISTA



Keynote workshop (Optional) by Newton's A team

- 1. Patient clinical records management
- 2. Patient communication presentation
- 3. Basic animations and visual aids

#### Dr. Rungsi Thavarungkul, Thailand

"If you think this is a computer course that will show you step-by-step how to use the application, please reconsider. If you want to improve communication in your practice, and with patients, this 8-hour course is definitely worth it."

#### KFYNOTF





#### Dr. Chris Chang

CEO, Beethoven Orthodontic and Implant Group. He 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.

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

Bite Turbo 3.0 Autoclavable!

A simple and powerful tool to correct severe deep bite and cross efficiently. The handle of Bite Turbo 3.0 is now autoclavable with non-slip design. 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. rthoBoneScrew

## 2022-2023 第十四年度 **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:

**2022** 5/10、6/7、7/12、8/16、9/6、10/4、11/15、12/6 **2023** 1/10、2/7、3/7

- ▶ 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

全新的第十四年度 2022-23 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。
- 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。

2022-23 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。







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