

# 2025 张慧男正畸大师班

第四届



全新重启的 2025 贝多芬张慧男正畸大师系列课程是由国际知名讲师张慧男医师亲自规划及授课，课程特色强调由临床病例带动诊断、分析、治疗计划拟定与执行技巧。

本年度特别新增两天的课程，加入最新的隐形牙套内容，让学员可以物超所值地学习最新正畸趋势！透过数位视频反覆观看，课堂助教协助实操，让学员在短时间能快速上手，感染“热爱正畸学，热爱学正畸”的热情。

名额有限，一年仅有一次机会完整体验正畸大师课程，错过只能等明年喽！

2024/12月课程地点：五星级厦门五缘湾凯悦酒店（厦门，湖里区，湖里区日圆二里五号）  
(后续课程地点待公布)

## 课程 1 - 6/1, 12/22('24)

1. 如何选择第一个病例:建立自信
2. 精准的托槽定位法
3. 高效正畸治疗“四步法”
4. 病例总结和讨论
5. 托槽粘结+BT(合垫)+头影测量

练习：临床摄影技术

## 课程 2 - 6/2, 12/23('24)

1. 简单高效的支抗系统的运用
2. 拔牙与否的诊断分析
3. 病例总结和讨论
4. 实操：微种植支抗系统 + 间隙关闭法 + 牵引钩的使用 + 弹簧的使用

练习：头影测量；完成患者照片记录（模板）

## 课程 3 - 6/22

1. 戴蒙系统的诊断与微调
2. 正畸完成后的效果评判
3. 病例总结和讨论
4. 实操：弓丝的弯制和固定保持器的制作

练习：指导患者拍照记录（用自己的时间）；修图技术

## 课程 4 - 6/23

1. 完美的结束：病例演示
2. 保持和复发：病例演示
3. 病例总结和讨论
4. 实操：演讲演示

练习：演示病例报告

## 课程 5 - 7/20

1. 正畸中生物力学的诊断分析
2. 正畸中软组织和硬组织的诊断分析
3. 青少年与成人正畸的诊断分析
4. 病例总结和讨论

练习：病例报告

## 课程 6 - 7/21

1. 对于拥挤病例拔牙与否的诊断分析
2. 如何实现上颌的压入
3. 如何实现下颌的压入
4. 病例总结和讨论

文献探讨：托槽的定位；埋伏尖牙的正畸

## 第三届学员补课日期：

2024/12/22-23

(第三届学员可参加本届实体课程，需事先登记以利教室准备。)

## 本届学员方案二选一：

1. 参加 2024/12/22-23 实操课程，2025/6/1-2 可现场听课复习不实操
2. 参加 2025/6/1-2 现场实操课程

## 课程 7 - 9/14

1. 缺失牙的正畸分析：前牙缺失 vs. 后牙缺失
2. 反合的正畸分析：前牙反合 vs. 后牙反合
3. 病例总结和讨论

文献探讨：尖牙替代缺失的侧切牙的正畸分析

## 课程 8 - 9/15

1. 高角开合与低角深覆合病例的诊断分析
2. 美国正畸协会，DI CRE 分值测量实操
3. 病例总结和讨论

文献探讨：DI & CRE 文献

## 课程 9 - 10/12

1. 如何改善露龈笑；矫治器拆除的注意事项
2. 正畸结束时的微调
3. 病例总结和讨论

文献探讨：完美的正畸效果（良好的咬合；前牙的美学效果）

## 课程 10 - 10/13

1. 联合种植支抗的正畸治疗
2. 多学科联合治疗成人复杂病例
3. 病例总结和讨论

文献探讨：IDT

## 课程 11 - 11/16

1. 隐形牙套正畸
2. 隐形牙套及其挑战

文献探讨：隐形正畸前置治疗

## 课程 12 - 11/17

1. 隐形牙套结合支抗钉治疗
2. 隐形牙套力学

文献探讨：（待公布）

课程含案例互动与模型实操，并赠课程电子书讲义、课程视讯。  
(赠送之课程视讯提供两年时间串流观看)



报名专线

金牛顿艺术科技

Newtonsa

何进辉

18960059996

潘超

18170078338

邱强

13509310501

苏佩玟

15280211624



## 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!



# DAMON™ 2

## Damon Q2 Brackets

### Bondable Tube

.022 (G/O, Accent, Peerless)



**A Damon Copper Ni-Ti Wire**

size .014 / .014 x .025

**B Damon Stainless Steel Wire**

size .016 x .025

**C Damon TMA Low-Friction Wire**

size .017 x .025



- Brackets x 200個
- Tubes x 80個
- Archwires A x 40條, B x 20條, C x 20條

**10人份套組 特價NT\$149,999/組**

- Brackets x 600個
- Tubes x 240個
- Archwires A x 120條, B x 60條, C x 60條

**30人份套組 特價NT\$369,999/組**

# DAMON™ CLEAR 2

## Damon Clear2 / Clear Brackets

### Bondable Tube

.022 (G/O, Accent, Peerless)



**A Damon Copper Ni-Ti Wire**

size .014 / .014 x .025

**B Damon Stainless Steel Wire**

size .016 x .025

**C Damon TMA Low-Friction Wire**

size .017 x .025



- Brackets x 200個
- Tubes x 80個
- Archwires A x 40條, B x 20條, C x 20條

**10人份套組 特價NT\$189,999/組**

- Brackets x 600個
- Tubes x 240個
- Archwires A x 120條, B x 60條, C x 60條

**30人份套組 特價NT\$459,999/組**



PACKAGES

Zoo Pack Elastics

Intraoral Elastics

Power Chain

Generation II  
(open / close / wide)

套組內容

- Zoo Pack Elastics x 5盒
- Power Chain x 5卷



定價NT\$30,000/組 | 套組價NT\$16,500/組

Enlight Sample Kit

Enlight Syringe Refill

Highly Filled Light-Cure Adhesive

套組內容

- Enlight Syringe x 4支
- Ortho Solo x 2瓶



定價NT\$14,600/組 | 套組價NT\$7,600/組

ARCHWIRES

Damon Copper Ni-Ti

size .014 / .014 x .025



定價NT\$3,300/盒 | 買3送1 | 買10送6

Damon TMA Low-Friction

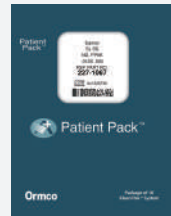
size .016 x .025 / .017 x .025  
Non-Colored



定價NT\$6,900/盒 | 買3送1 | 買10送6

Damon Stainless Steel

size .016 x .025 / .019 x .025



定價NT\$2,700/盒 | 買3送1 | 買10送6

Broad Copper Ni-Ti

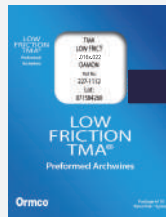
size .016 / .016 x .022



定價NT\$3,300/盒 | 買3送1 | 買10送6

Broad TMA Low-Friction

size .016 x .022



定價NT\$6,500/盒 | 買3送1 | 買10送6

Broad Ni-Ti

size .016 x .022



定價NT\$3,100/盒 | 買3送1 | 買10送6

TUBES

BONDABLE TUBE

.018 / .022, G/O



定價NT\$400/個 | 買20人份送20人份

BONDABLE TUBE

.018 / .022, Accent



定價NT\$400/個 | 買20人份送20人份

BONDABLE TUBE

.018 / .022, Peerless



定價NT\$420/個 | 買20人份送20人份

# Non-Extraction Treatment of a Class II Openbite with Amelogenesis Imperfecta

## Abstract

**Introduction:** A 15 year-7 month-old female with a history of amelogenesis imperfecta (AI) presented with chief complaints of poor dental esthetics and anterior openbite.

**History and Etiology:** AI is a hereditary disorder that is usually manifested as an autosomal dominant trait involving defective ENAM gene(s). For the present patient, deficient enamel resulted in decreased biologic width of the epithelial attachment, in addition to dental attrition that reduced the heights of clinical crowns. Selective crown lengthening and complete provisional restoration were required. Habitual interdental tongue posture, which may reflect a history of airway compromise, resulted in an anterior openbite that induced posterior mandibular rotation to produce a long face.

**Diagnosis:** AI-related enamel deficiency has compromised the periodontium and dentition. Facial form was convex ( $12^\circ$ ) with increased lower facial height (59.5%) and a steep mandibular plane angle (FMA,  $37.5^\circ$ ). Cephalometrics revealed a protrusive maxilla (SNA,  $84.5^\circ$ ), retrusive mandible ( $77.5^\circ$ ), and an intermaxillary discrepancy of  $7^\circ$  (ANB). The bilateral Class II malocclusion was complicated with anterior openbite, canted occlusal plane, and mandibular deviation to the left. The Discrepancy Index (DI) was 62.

**Treatment:** Crown lengthening surgery and revised provisional restorations established a healthy periodontium in preparation for orthodontics treatment. A fixed passive self-ligating appliance, with high torque brackets in the upper anterior segment, was bonded on both arches. Anchorage to intrude upper molars was provided with bilateral infra-zygomatic crest (IZC) bone screws. After initial orthodontic alignment, interproximal space was increased as needed with elastic separators to prepare gingival margins, and a new set of optimized provisional restorations was fabricated. Orthodontic finishing was accomplished with the same fixed appliance.

**Results:** Crown lengthening produced healthy periodontium with proper biological width in preparation for full provisional restoration and orthodontic alignment. As upper molars were intruded, the mandible rotated anteriorly, and the lower facial height decreased as lip and chin protrusion increased. This challenging openbite malocclusion, with a Discrepancy Index (DI) of 62, was treated in 22 months to an excellent outcome: Cast-Radiography Evaluation (CRE) score of 11 and Pink & White dental esthetic score of 1. An upper removable retainer was provided for night-time wear.

**Conclusions:** A patient with AI and an anterior openbite malocclusion was treated to a stable occlusion with a passive self-ligating fixed appliance and IZC bone screw anchorage. Interdisciplinary treatment with periodontics and prosthodontics was required before and after orthodontic therapy to appropriately restore dentofacial esthetics and function. (*J Digital Orthod* 2024;74:38-58; reprinted from *J Digital Orthod* 2020;57:4-23)

### Key words:

Class II, openbite, occlusal cant, bimaxillary protrusion, molar intrusion, infrazygomatic crest screw, amelogenesis imperfecta, therapeutic provisional restoration

**Yu-Hsin Huang,**

*Diplomate, International Association of Orthodontists and Implantologists  
(Upper left)*

**Kim-Choy Low,**

*Prosthodontist, Dr. Lin and Partners Dental Office (Upper center)*

**Po-Jan Kuo,**

*Periodontist, Jing-Jong Lin Orthodontic Clinic (Upper right)*

**John Jin-Jong Lin,**

*Examiner, Journal of Digital Orthodontics  
Director, Jin-Jong Lin Orthodontic Clinic (Lower left)*

**W. Eugene Roberts,**

*Editor-in-chief, Journal of Digital Orthodontics (Lower right)*



## History and Etiology

A 15 year-7 month-old (15y7m) female with a history of amelogenesis imperfecta (AI) presented with a Class II malocclusion, crowding,

asymmetric anterior open bite, enamel deficiency, periodontal impairment, and compromised provisional crowns (Figs. 1-4). Clinical and radiographic evaluation revealed a long face,



■ **Fig. 1:** Pre-treatment facial and intraoral photographs, 15y7m of age



■ **Fig. 2:** Facial and intraoral photographs after the initial periodontal and restorative treatment, 17y4m of age

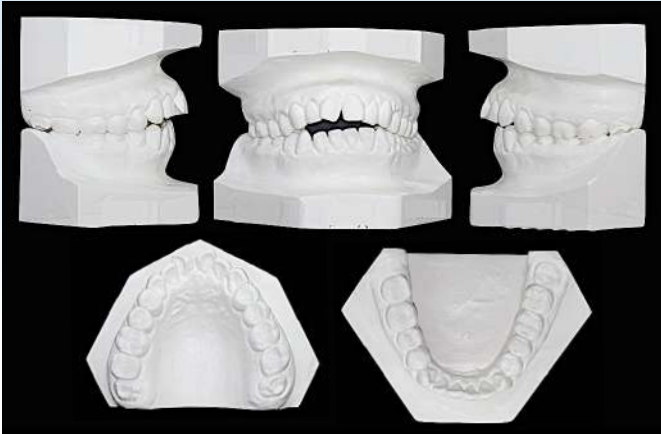
protrusive lips, excessive mentalis strain, and excessive maxillary gingival exposure (gummy smile). An occlusal cant and mandibular deviation to the left were also noted (Table 1; Figs. 2, 4 and 6). The patient had additional concerns about tooth sensitivity, poor dental esthetics, and unclear pronunciation of the sounds [s] and [z]. Panoramic radiography was consistent with AI: reduced thickness and radio-opacity of enamel, as well as tight proximal contacts in the posterior region, pulpal calcification, and root anomalies.

## Diagnosis

Clinical examination, photography, casts, radiographs and cephalometrics (Figs. 1-6; Table 1) documented the following:

Facial:

- Length: *Long face (LHF, 59.5%), relatively short upper lip, incompetent lip*



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

- Protrusion: Facial convexity (12°), hypermentalistic strain for lip closure, flat chin, and relatively protrusive lips (1mm U, 3mm L to the E-Line).
- Symmetry: Maxillary dental midline, canted occlusal plane, and mandibular deviation to the left (Fig. 2)
- Smile: Excessive gingival exposure with an anterior openbite

Skeletal:

- Intermaxillary Relationship: Protrusive maxilla (SNA, 84.5°), retrusive mandible (SNB, 77.5°) and intermaxillary skeletal discrepancy (ANB, 7°)
- Mandibular Plane: Excessive (SN-MP, 45°, FMA, 37.5°)
- Vertical Dimension of Occlusion (VDO): Excessive ANS-Gn segment (59.5% of the Na-ANS-Gn dimension)
- Symmetry: Maxilla deviated to the left with a 4° counterclockwise occlusal cant



■ Fig. 4: Pre-treatment panoramic radiograph

CEPHALOMETRIC SUMMARY			
SKELETAL ANALYSIS			
	PRE-TX	POST-TX	DIFF.
SNA° (82°)	84.5°	84.5°	0°
SNB° (80°)	77.5°	78.5°	1°
ANB° (2°)	7°	6°	1°
SN-MP° (32°)	45°	44°	1°
FMA° (25°)	37.5°	36.5°	1°
DENTAL ANALYSIS			
U1 TO NA mm (4 mm)	6.5	4.5	2
U1 TO SN° (110°)	108.5°	102°	6.5°
L1 TO NB mm (4 mm)	10	11	1
L1 TO MP° (90°)	85.5°	86°	0.5°
FACIAL ANALYSIS			
E-LINE UL (-1mm)	1	-0.5	1.5
E-LINE LL (0 mm)	3	2	1
%FH: Na-ANS-Gn (53%)	59.5%	59%	0.5%
Convexity: G-Sn-Pg' (13°)	12°	5°	7°

■ Table 1: Cephalometric summary



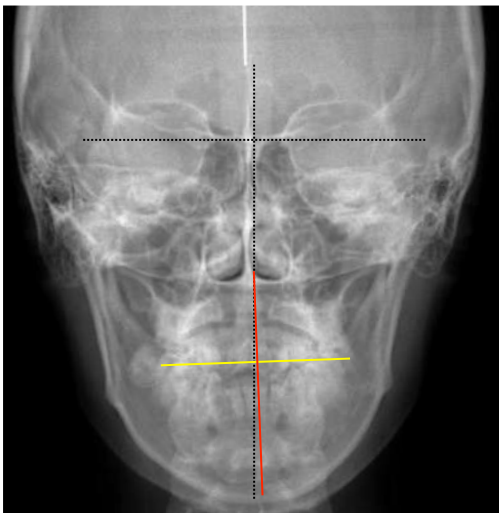


■ Fig. 5: Pre-treatment cephalometric radiograph

- Missing/Unerupted/Impacted: *Impacted LR8 (Fig. 4)*
- Morphology: *Enamel hypoplasia and hypomineralization*
- Symmetry: *Upper midline deviated 1mm to the right with a 4° occlusal cant*
- ABO Discrepancy Index (DI) of 62, as documented in Worksheet 3

Facial Esthetics:

- Convex with incompetent lips
- Protrusive upper and lower lips (1 and 3 mm to the E-Line, respectively)



■ Fig. 6: An anterior-posterior cephalometric radiograph documents facial asymmetry, occlusal canting and mandibular deviation.

### Treatment Alternatives

Females over 15 years of age are usually skeletally mature, so treatment options are similar to other non-growing adults. The anterior open bite could be corrected with fixed appliances and two-jaw orthognathic surgery: (1) 3-piece Le Fort I maxillary advancement osteotomy for expansion of the posterior segments, (2) down-fracture of the maxillary anterior segment, and (3) bilateral sagittal split osteotomy for autorotation of the mandible. Another approach is orthodontic treatment with extraction of four premolars to upright maxillary incisors, close spaces, and retract anterior segments to close the anterior open bite and reduce protrusion. An alternate form of camouflage treatment is a non-extraction orthodontic treatment combined with bone screws to intrude the posterior teeth, increase the overbite, and

Dental:

- Classification: *Class II buccal segments (6 mm bilaterally)*
- Overbite: *-5 mm*
- Overjet: *2 mm*

improve the open bite.<sup>1,2</sup> The treatment options as illustrated in Fig. 7 are summarized bellow:

- Option 1: Initial dental alignment, orthognathic surgical correction, and finishing
- Option 2: Extract four first premolars, place fixed appliances, and close extraction spaces. Bone screws can be used as supplemental anchorage.<sup>1,2</sup>
- Option 3: Use infra-zygomatic crest (IZC) bone screws to intrude the posterior maxillary dentition and retract the anterior segment.<sup>3</sup>

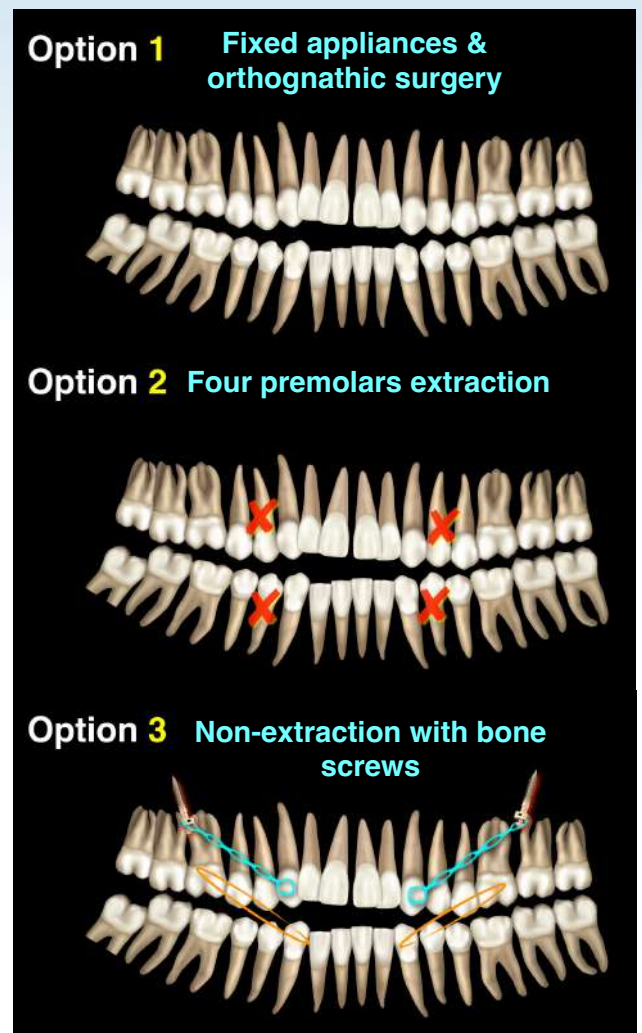
The patient chose the third option because it was deemed the least invasive.

### Specific Objectives of Treatment

1. Expand both arches.
2. Align and level.
3. Correct the anterior openbite.
4. Improve facial and lip protrusion.

### Treatment Progress

Prior to orthodontics, periodontal crown lengthening was performed to correct biologic width as needed. An optimal soft tissue response was achieved in 21 months by combining periodontal and prosthetic treatment, and then orthodontic therapy commenced. A 0.022-in slot Damon Q® fixed appliance system (Ormco, Glendora, CA) with passive self-ligating (PSL) brackets was bonded on both arches. A standard torque appliance was utilized except for high torque brackets in the maxillary anterior segment. The maxillary arch was bonded



■ Fig. 7:  
Three treatment options are illustrated in panoramic drawings.

first, and a 0.013-in copper-nickel-titanium (CuNiTi) archwire was placed (Figs. 8-9). The lower molars were separated on the mesial and distal surfaces (Fig. 10) to provide space for banding. Ten days later, a standard torque appliance was bonded on the entire lower arch, and a 0.013-in CuNiTi archwire was placed (Fig. 11). One month later (2M), the brackets on UR1, UR3, UL1 and LL3 were repositioned, and a 0.016-in CuNiTi archwire was inserted in the lower arch. The following month



■ **Fig. 8:** A progressive sequence of occlusal photographs show treatment progress from 1-7 months (M).

(3M), the UR2 bracket was repositioned, and the patient was referred for third molar extraction. One month later (4M), an intra elastic (Fox 1/4-in, 3.5-oz) was placed from UR3 to UL3. Provisional restoration on LR3 was defective (Fig. 12), so the patient was referred for restorative care. Five months (5M) into treatment, a 0.014x0.025-in CuNiTi upper archwire was inserted, and IZC bone screws were placed to initiate retraction of the upper arch (Fig. 13).<sup>4</sup>

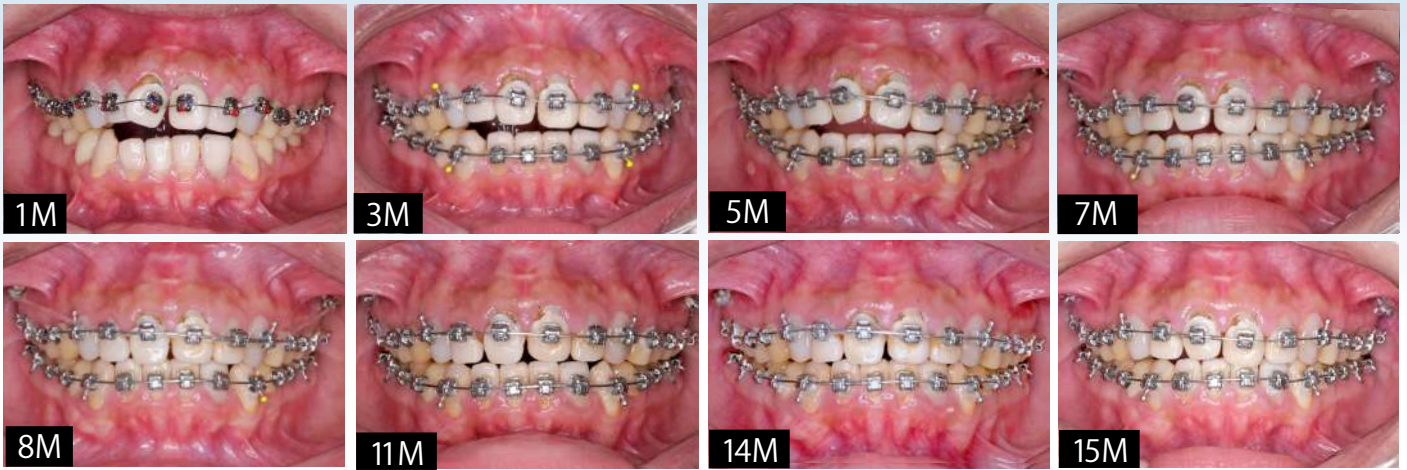
Two months later (7M), the upper archwire was increased to 0.018-in CuNiTi, and a 0.014x0.025-in CuNiTi was placed in the lower arch. To close anterior interproximal spaces, elastic chains were placed from canine to canine in both arches. In addition, anterior horizontal elastics (Fox 1/4-in, 3.5-oz) were utilized from canine to canine.

One month later (8M), archwires were changed to a 0.014x0.025-in and 0.018-in CuNiTi in the lower and upper arches, respectively. Interproximal reduction (IPR) of enamel thickness was performed in the lower anterior segment. Two months later (10M), the brackets on UR5, UR2, UR1 and LL2 were repositioned, and both arches were engaged with 0.014x0.025-in CuNiTi archwires. Elastic chains were utilized to consolidate both arches, and Class II elastics were placed. In the 14<sup>th</sup> month (14M) of

treatment, anterior horizontal elastics (Fox 1/4-in, 3.5-oz) were applied to complete openbite correction.<sup>5</sup> Fifteen months (15M) into treatment, the provisional restorations were replaced and rebonded with similar PSL brackets (Figs. 14 and 15). Seven months later (22M), fixed appliances were removed, and an upper removable retainer was delivered. The archwires and treatment sequence are summarized in Table 2.

## Results Achieved

After 22 months of active treatment, the periodontally and restoratively compromised malocclusion (DI of 62, Worksheet 1) was corrected to a near ideal result: cast-radiograph evaluation (CRE) of 11 (Worksheet 2),<sup>6</sup> and a Pink & White esthetic score of 1 (Worksheet 3).<sup>7</sup> Non-extraction alignment and IZC bone screw anchorage reduced facial height (0.5°), convexity (5°), and the MPA (1°) (Table 1). Consistent with conservative correction of anterior openbite,<sup>8,9</sup> the axial inclination of maxillary incisors was decreased 6.5° to 102° (Fig. 16). Excessively upright upper incisors were masked with restorative veneers at the end of treatment (Fig. 17). As shown in Figs. 18-23 and Table 1, outcomes for specific treatment objectives<sup>6</sup> are outlined below:



■ **Fig. 9:** A progressive sequence of frontal intraoral photographs document treatment progress from 1-15 months (M).

Maxilla (all three planes):

- A-P: Maintained
- Vertical: Maintained
- Transverse: Maintained

Mandible (all three planes):

- A-P: Maintained
- Vertical: Maintained
- Transverse: Maintained

Maxillary Dentition:

- A-P: Incisors and molars retracted
- Vertical: Molars intruded/Incisors maintained
- Inter-molar/Inter-canine Width: Maintained/Expanded

Mandibular Dentition:

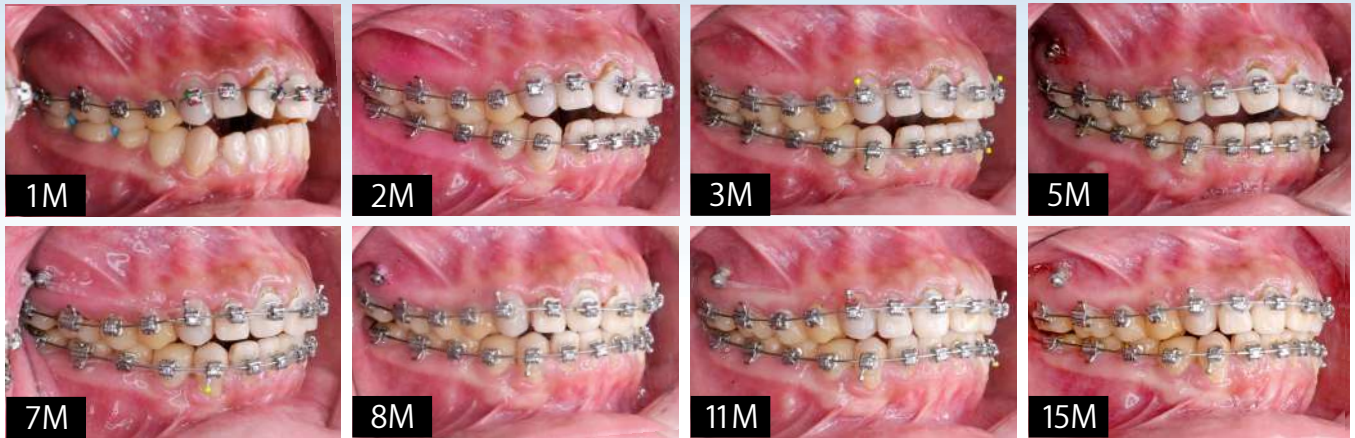
- A-P: Retracted
- Vertical: Intruded
- Inter-Molar/Inter-Canine Width: Expanded

Facial Esthetics:

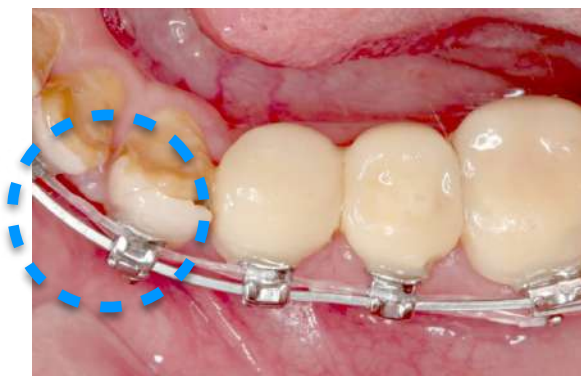
- Both upper and lower lips were retracted



■ **Fig. 10:** Blue elastic separators are placed mesial and distal to the lower first molars to prepare restorative margins for provisional restorations. Later bonding of lower first molars was successful. No bands were used.



■ **Fig. 11:** A progressive sequence of right buccal photographs document treatment progress from 1-15 months (M).



■ **Fig. 12:** The provisional veneer on LR3 was cracked and displaced.



■ **Fig. 13:** IZC bone screws were placed buccally to the upper molars.

## Discussion

Etiology of anterior openbite is an interdental tongue posture that often reflects a past or present airway compromise. Swallowing requires a tongue thrust to seal the oral cavity. The tongue thrust is commonly thought to be the proximal cause of the openbite, but Proffit et al.<sup>10</sup> have clearly shown that the constant force of soft tissue *posture* is more efficient than the intermittent force of a tongue thrust for producing openbite malocclusion. Anterior openbite is often associated with increased FMA, reduced inter-incisal angle, increased lower facial height, and incompetent lips.<sup>8,9</sup> This morphologic pattern compromises both dentofacial esthetics and functional occlusion. Affected individuals experience difficulty incising food, and articulating the normal sounds of speech. Repetitive mechanical loading of a tongue thrust may contribute to periodontal compromise.<sup>10</sup>

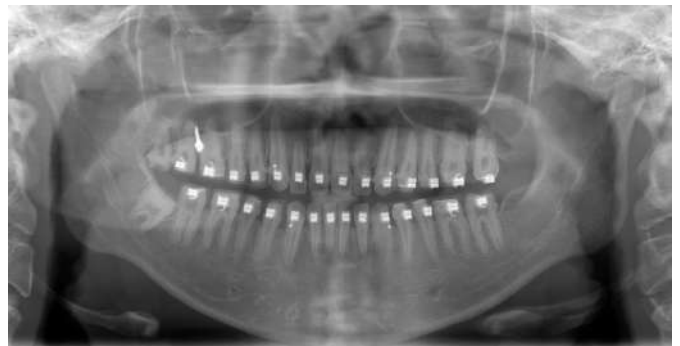
There are many treatment options for correcting anterior openbite: fixed appliances with/without extractions, multi-loop edgewise archwires,

functional appliances, high-pull headgear and/or bite blocks. Some malocclusions are exacerbated with growth. Severe openbite may require a combination of orthodontics and orthognathic surgery. The most common surgical procedure is a Le Fort I osteotomy with posterior maxillary impaction and/or bimaxillary osteotomy.<sup>8,9</sup> Orthognathic surgery for openbite correction may be unstable. Proffit et al.<sup>10</sup> found maxillary impaction was less prone to relapse (7% overbite decrease) compared to two-jaw surgeries (12% overbite decrease). Teittinen et al.<sup>11</sup> compared maxillary impaction and mandibular rotation to close anterior openbite. The maxilla tends to relapse vertically, but the mandible experienced both vertical and sagittal changes, particularly with two-jaw procedures. Furthermore, Frey et al.<sup>12</sup> described a greater relapse tendency for counter-clockwise rotation of the mandible. Overbite relapse is a statistically significant problem following orthognathic surgery.<sup>13</sup> In the past decade, skeletal anchorage devices have evolved to intrude molars for achieving improvement in occlusion, facial height and lateral profile.<sup>14-17</sup> Bone screws and miniplates are stationary osseous anchorage for retraction and intrusion of the dentition. The surgical procedure for miniplate placement is more invasive and relatively complicated, compared to self-drilling screws that penetrate the soft tissue. The latter are inserted directly into cortical bone and have a very high rate of success.<sup>17,18</sup> No surgical flap or pilot drilling are necessary. Avoiding the trauma and pain of more extensive surgery is an attractive feature, and an additional advantage is the simple removal of the screw without anesthesia after treatment.

The extra-alveolar location of the bone screw permits selective retraction and intrusion of the

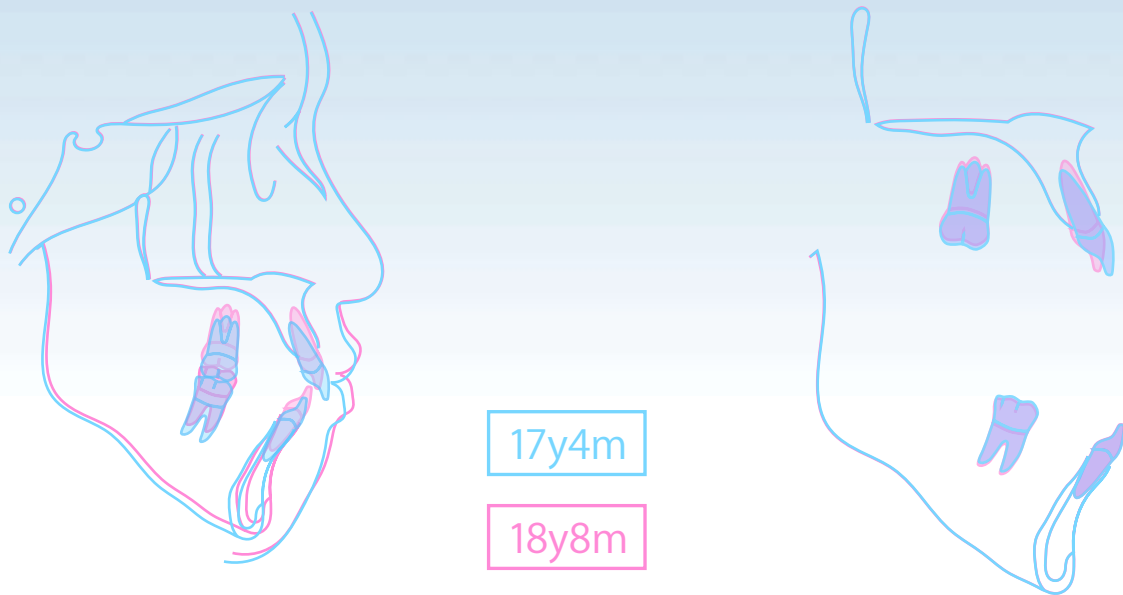


**Fig. 14:** Progress cephalometric radiograph at 14 months shows dentofacial changes.



**Fig. 15:** Progress panoramic radiograph at 14 months documents initial orthodontic alignment.

dentition.<sup>18,19</sup> When combined with the Damon PSL appliance, a light force can expand (develop) a narrow arch without periodontal compromise.<sup>20</sup> Sequential or simultaneous correction in three planes of space with bone screw anchorage is more effective than routine fixed appliance therapy,

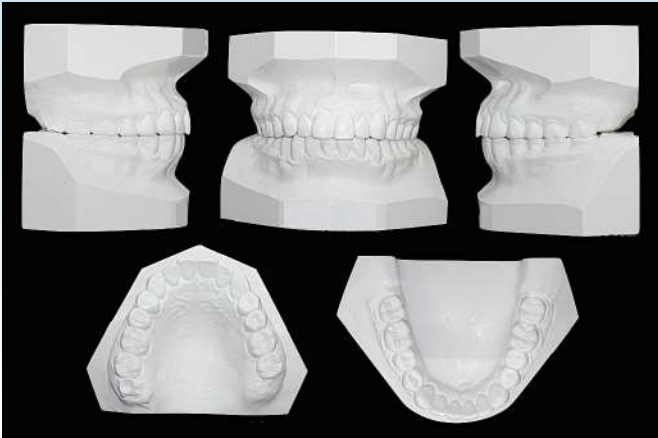


■ **Fig. 16:**

*Superimposition of cephalometric tracings (17y4m and 18y8m) reveals 16 months of progress. Note that the mandible has rotated anteriorly (counter-clockwise). See text for details.*



■ **Fig. 17:** Post-treatment facial and intraoral photographs



■ **Fig. 18:** Post-treatment dental models (casts)

and is much less traumatic compared to orthognathic surgery.<sup>18-20</sup>

Amelogenesis imperfecta (AI) is usually an autosomal dominant trait affecting all teeth.<sup>10</sup> Lack of enamel may result in dental attrition and compromise of the epithelial attachment. Crown lengthening and extensive restorative dentistry are often required prior to orthodontics (Figs. 24 and 25).<sup>21,22</sup> Periodontal and radiographic evaluation suggested that a passive eruption mechanism contributes to the compromised gingival and osseous relationships.<sup>23</sup> For the current patient, the periodontium presented with a wider band of keratinized tissue and osseous crest at about the same level as the cemento-enamel junction (CEJ). The periodontal surgical procedure included thinning of both soft and hard tissue to minimize rebound of the apically repositioned gingiva soft tissue. The improved periodontal contours facilitate oral hygiene and result in a more esthetic outcome prior to orthodontic treatment.<sup>24</sup>

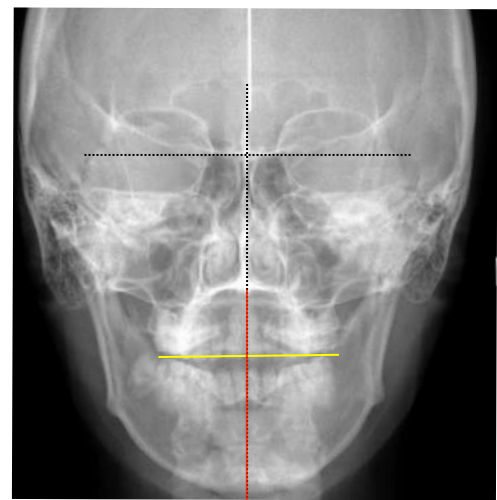
The crown lengthening procedure apically repositioned the gingiva on an osseous base that was reduced to provide for adequate biologic width.



■ **Fig. 19:** Post-treatment panoramic radiograph

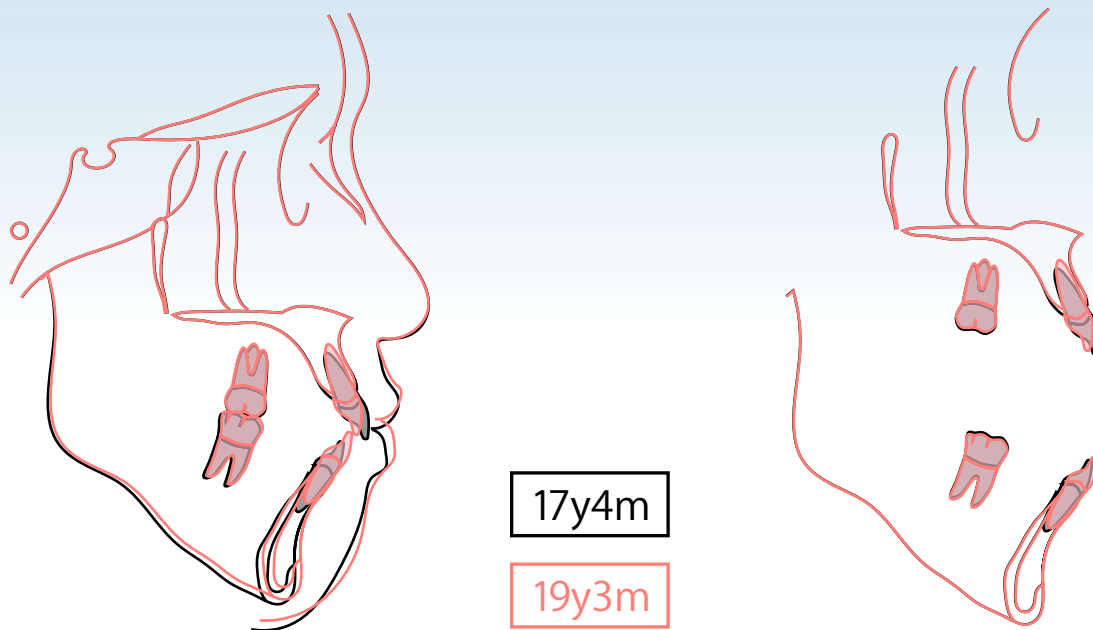


■ **Fig. 20:** Post-treatment cephalometric radiograph



■ **Fig. 21:** A post-treatment anteroposterior cephalometric radiograph with superimposed reference lines shows a near ideal dentofacial symmetry. Compare to Fig. 6, and see text for details.



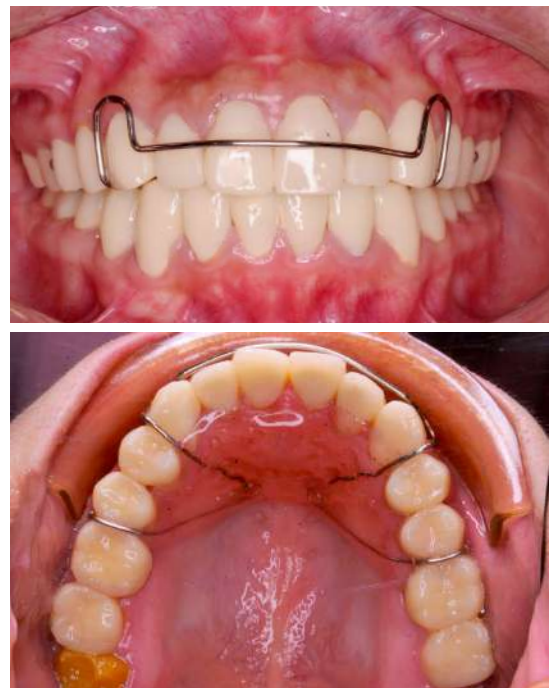


■ **Fig. 22:**

*Cephalometric tracings superimposed on the anterior cranial base (left), maxilla (upper right), and mandible (lower right) show dentofacial changes during active orthodontic treatment. The black tracing at 17y4m is the start, and the red tracing at 19y3m is the finish. See text for details.*

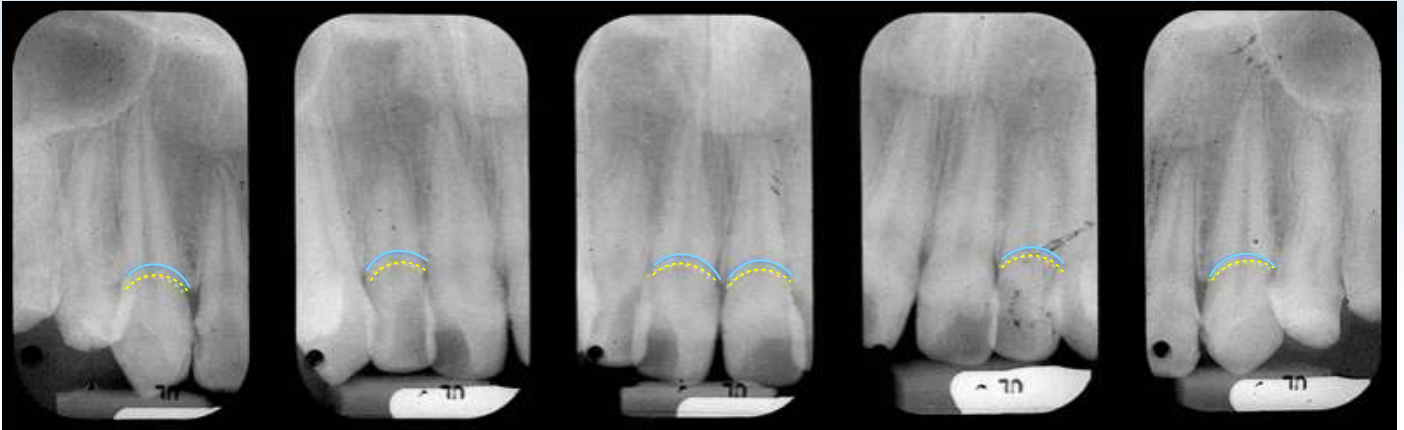
Under local anesthesia, the location of the anatomical CEJ and alveolar bone crest were determined using a periodontal probe. Sub-marginal parabolic incisions corresponding to the anatomical CEJ reproduced the natural scalloping of a gingival margin (Fig. 26). After full-thickness gingival flap elevation, an osteotomy was performed to provide at least 3mm clearance between the bone crest and the desired level of gingival margin. Vertical grooving and radicular blending of bone created a physiological morphology with appropriate root prominence (Fig. 27). The flap was closed with dissolvable sutures and covered with a periodontal dressing.

Crown lengthening exposed the margins of defective restorations and rough enamel surfaces (Fig. 28). It is important to correct the biologic,



■ **Fig. 23:**

*Orthodontic correction was maintained with an upper removable retainer. See text for details.*



■ Fig. 24:

*Intraoral radiographs prior to treatment were used to assess the morphology of the anatomical cemento-enamel junction (aCEJ) and alveolar bone crest (ABC). The blue lines mark the ABC, and the yellow dotted lines mark the aCEJ. Note the distance (ABC-aCEJ) is less than 2mm, which is a biologic width violation that induces inflammation. See text for details.*

functional, and esthetic deficits prior to initiating orthodontics (Fig. 2).<sup>25</sup> Health of the periodontium was maintained with provisional restorations that had physiologic contours and gingival embrasures.<sup>26</sup> Auto polymerized polymethyl methacrylate [PMMA] was the restorative material of choice because of adequate strength and good color stability. An indirect-direct technique with a provisional shell was used to produce the provisional prostheses.

A previously fabricated custom shell for each tooth was relined intra-orally immediately after tooth preparation was completed. The indirect-direct procedure reduced chair time. It is important to adequately seat the shell during the reline procedure to decrease adjustments as well as to control heat generation and chemical irritation. The indirect approach with PMMA as a reline material reduces polymerization shrinkage compared with the direct technique. After the reline and

adjustment procedures, the surface of the provisional crowns were polished to facilitate soft tissue healing along the desired cervical contours.<sup>27</sup> This method is well suited for helping resolve anterior openbite restoratively.<sup>28</sup> After fourteen months of orthodontic alignment, a second set of provisional restorations was constructed. Each tooth was restored as ideally as possible to facilitate the final interdigitation, overjet, and overbite during orthodontic finishing (Fig. 16). The provisional restorations were adjusted as desired by the patient, so they could serve as the pattern for the permanent restorations. This approach fulfilled the patient's needs for a harmonious and healthy dentition.

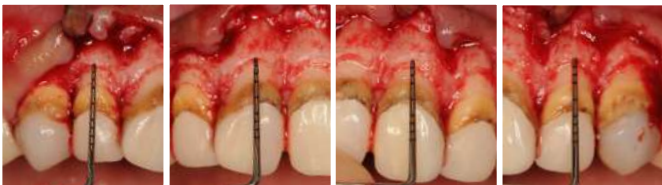
In interpreting Figure 22, it is important to understand that the mandible was rotated clockwise due with thick posterior provisional restorations to provide adequate strength. Future permanent crowns will have thinner occlusal



**Fig. 25:**  
Initial photographs of the maxillary anterior segment show the swelling and inflamed gingiva that is characteristic of an inadequate biologic width. See text for details. (Courtesy of Dr. Po-Jan Kuo)



**Fig. 26:**  
A surgical flap is raised with an internal bevel incision between the line angles of each tooth. See text for details.



**Fig. 27:**  
Reduction osteotomy of the alveolar crest in the maxillary anterior segment increases the distance from ABC to aCEJ to  $\leq 3$  mm for each tooth. See text for details.



**Fig. 28:**  
Left view shows healing 2 weeks post-operatively, and the right view documents pink, healthy gingiva 4 weeks after surgery.

surfaces, so the mandible will rotate anteriorly (counter-clockwise) to improve the facial profile.

## Conclusions

An AI compromised dentition developed into a complex malocclusion that required interdisciplinary treatment to achieve an optimal esthetic and functional outcome. Provisional restorations supported by healthy periodontium were the prerequisite for orthodontic alignment. A passive self-ligating appliance with IZC bone screw anchorage achieved optimal dentofacial form and function. To facilitate optimal finishing, a new set of provisional restorations was constructed after 14 months of orthodontic alignment. Carefully coordinated periodontal, restorative and orthodontic treatments were required to achieve a near ideal outcome.

## Acknowledgment

Thanks to Dr. Rungsi Thavarungkul for the beautiful illustrations and to Mr. Paul Head for proofreading this article.

## References

1. Lin JJ. Creative orthodontics blending the Damon system and TADs to manage difficult malocclusions. Taiwan: Yong Chieh Enterprise; 2017.
2. Huang YH, John Lin JJ, Roberts WE. Periodontally-compromised Class II malocclusion with early loss of both L6s and the UL3: Class III elastics for L6 space

### Archwire Sequence Chart

Clinicians: Dr. John Jin-Jong Lin

Patient: Miss Lo

Maxillary Archwire Mandibular Archwire

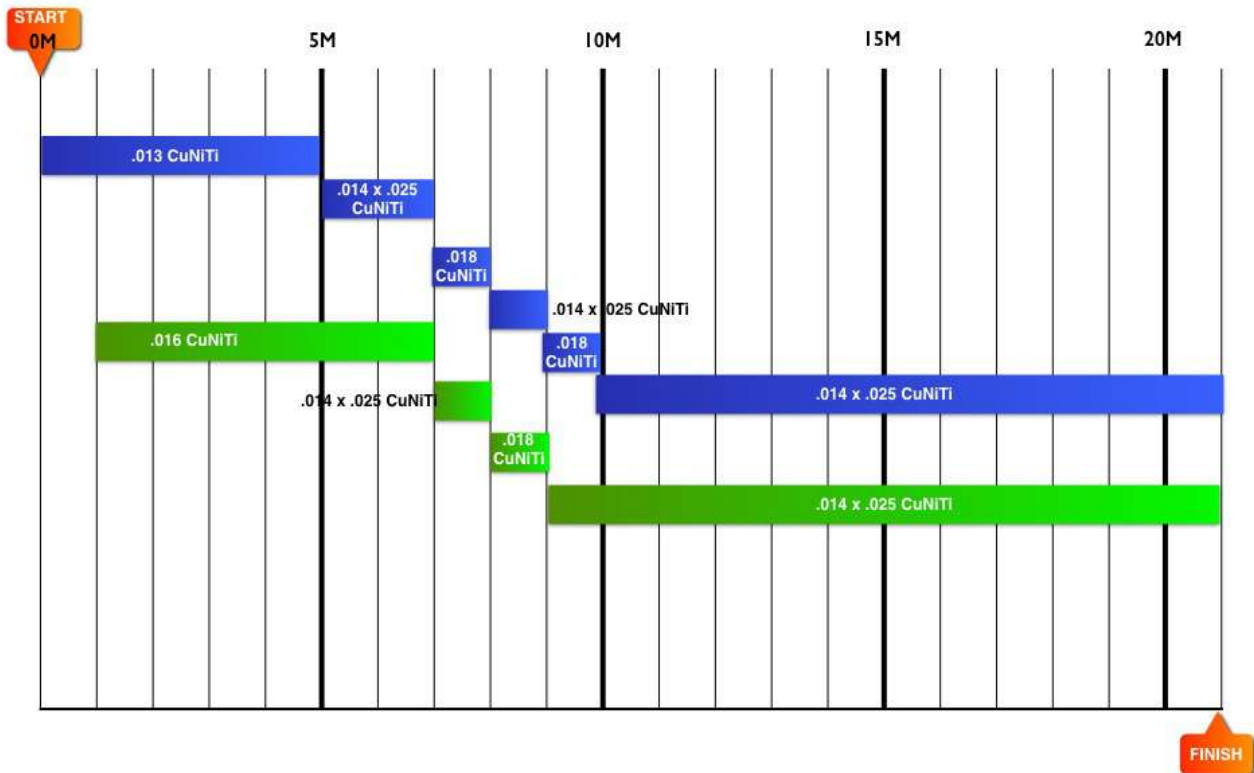


Table 2: Archwire sequence chart: timing of the mechanics for both arches

- closure and retraction of the maxillary arch with IZC bone screws. *Int J Orthod Implantol* 2017;47:4-24.
- Lin JJ, Roberts WE. Guide for infra-zygomatic screws: reliable maxillary arch retraction. *Int J Orthod Implantol* 2017;46:4-16.
- Chang MJ, Lin JJ, Roberts WE. Probable airway etiology for a severe Class III openbite malocclusion: conservative treatment with extra-alveolar bone screws and intermaxillary elastics. *Int J Orthod Implantol* 2017;45:4-20.
- Steffen JM, Haltom FT. The five-cent tooth positioner. *J Clin Orthod* 1987;21:528-529.
- Chang CH, Roberts WE. *Orthodontics Vol. 1* [E-reader version]. Hsinchu: Newton's A; 2012.
- Su B. IBOI Pink & White esthetic score. *Int J Orthod Implantol* 2012;28:96-101.
- Reichert I, Figel P, Winchester L. Orthodontic treatment of anterior openbite: a review article - Is surgery always necessary? *Oral Maxillofac Surg* 2014;18(3):271-7.
- Burford D, Noar JH. The causes, diagnosis and treatment of anterior open bite. *Dent Update* 2003 Jun;30(5):235-41.

10. Proffit WR, Fields HW, Larson B, Sarver DM. *Contemporary Orthodontics*, 6<sup>th</sup> ed. St. Louis: Elsevier Inc., 2019.
11. Teittinen M, Tuovinen V, Tammela L, Schätzle M, Peltomäki T. Long-term stability of anterior open bite closure corrected by surgical-orthodontic treatment. *Eur J Orthod* 2012;34(2):238-43.
12. Frey DR, Hatch JP, Van Sickels JE, Dolce C, Rugh JD. Alteration of the mandibular plane during sagittal split advancement: short- and long-term stability. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2007;104(2):160-9. Epub 2007 Apr 11.
13. Maia FA, Janson G, Barros SE, Maia NG, Chiqueto K, Nakamura AY. Long-term stability of surgical-orthodontic open-bite correction. *Am J Orthod Dentofacial Orthop* 2010;138(3):254.e1-254.e10; discussion 254-6.
14. Kuroda S, Sugawara Y, Tamamura N, Takano-Yamamoto T. Anterior open bite with temporomandibular disorder treated with titanium screw anchorage: evaluation of morphological and functional improvement. *Am J Orthod Dentofacial Orth* 2007;131(4):550-60.
15. Xun C, Zeng X, Wang X. Microscrew anchorage in skeletal anterior open-bite treatment. *Angle Orthod* 2007;77(1):47-56.
16. Scheffler NR, Proffit WR, Phillips C. Outcomes and stability in patients with anterior open bite and long anterior face height treated with temporary anchorage devices and a maxillary intrusion splint. *Am J Orthod Dentofacial Orthop* 2014;146(5):594-602.
17. Chang MJ, Chang CH, Roberts WE. Nonsurgical treatment of anterior open bite malocclusion. *Int J Orthod Implantol* 40:44-63.
18. Chang CH, Liu SY, Roberts WE. Primary failure rate for 1680 extra-alveolar mandibular buccal shelf miniscrews placed in movable mucosa or attached gingiva. *Angle Orthod* 2015;85:905-910.
19. Lin JJ, Roberts WE. CBCT imaging to diagnose and correct the failure of maxillary arch retraction with IZC screw anchorage. *Int J Orthod Implantol* 2014;35:4-17.
20. Kuo PJ, Lin JJ, Chang NNS, Roberts WE. Periodontics and orthodontics: low forces, expansion, protraction and control of gingival recession. *J Digital Orthod* 2018;52:4-19.
21. Gargiulo AW. Dimensions and relations of the dentogingival junction in humans. *J Periodontol* 1961;32:264.
22. Vacek JS, Gher ME, Assad DA, Richardson AC, Giambarresi LI. The dimensions of the human dentogingival junction. *Int J Periodontics Restorative Dent* 1994;14(2):154-65.
23. Coslet JG, Vanarsdall R, Weisgold A. Diagnosis and classification of delayed passive eruption of the dentogingival junction in the adult. *Alpha Omegan* 1977;7(37):24-8.
24. Newcomb GM. The relationship between the location of subgingival crown margins and gingival inflammation. *J Periodontol* 1974;45(3):151-4.
25. Chen CF, Hu JC, Bresciani E, Peters MC, Estrella MR. Treatment considerations for patient with amelogenesis imperfecta: a review. *Braz Dent Sci* 2013;16(4):7-18.
26. Stetler KJ, Bissada NF. Significance of the width of keratinized gingiva on the periodontal status of teeth with submarginal restorations. *J Periodontol* 1987;58(10):696-700.
27. Gunay H, Seeger A, Tschernitschek H, Geurtsen W. Placement of preparation line and periodontal health - a

prospective 2-year clinical study. *Int J Perio Rest Dent* 2000;20:173-181.

28. Shih YH, Lin JJ, Roberts WE. Conservative correction of severe skeletal Class III open bite: 3 force vectors to reverse the dysplasia by retracting and rotating the entire lower arch. *Int J Orthod Implantol* 38:4-18.



# Discrepancy Index Worksheet

**TOTAL D.I. SCORE** 62

**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 = 3

**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 = 21

**LATERAL OPEN BITE**

2 pts. per mm. Per tooth

Total = 0

**CROWDING** (only one arch) 6 mm (upper)

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

Total = 4

**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. \_\_\_\_\_ pts.  
additional

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  $\geq 6^\circ$  or  $\leq -2^\circ$  7 = 4 pts.

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

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

SN-MP

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

Each degree  $> 38^\circ$  7 x 2 pts. = 14

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

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

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

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

Total = 21

**OTHER** (See Instructions)

Supernumerary teeth \_\_\_\_\_ x 1 pt. = \_\_\_\_\_

Ankylosis of perm. Teeth \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Anomalous morphology \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Impaction (except 3<sup>rd</sup> molars) \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Midline discrepancy ( $\geq 3\text{mm}$ ) @ 2 pts. = \_\_\_\_\_

Missing teeth (except 3<sup>rd</sup> molars) \_\_\_\_\_ x 1 pt. = \_\_\_\_\_

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

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

Spacing (Mx cent. diastema  $\geq 2\text{mm}$ ) @ 2 pts. = \_\_\_\_\_

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

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

Addl. treatment complexities 1 x 2 pts. = 2

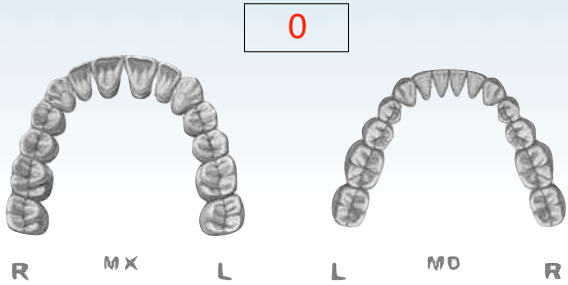
Identify: Amelogenesis imperfecta

Total = 5

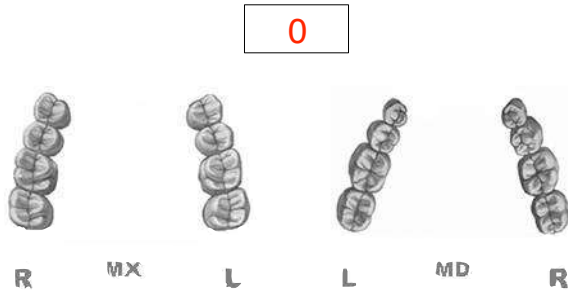
# Cast-Radiograph Evaluation

Total Score: 11

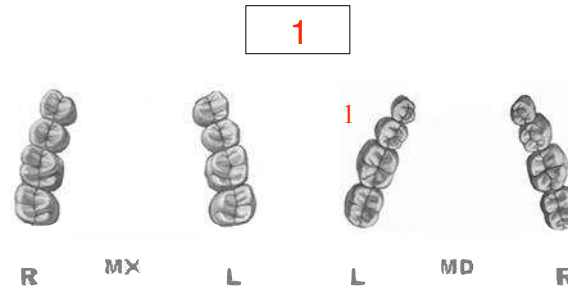
## Alignment/Rotations



## Marginal Ridges



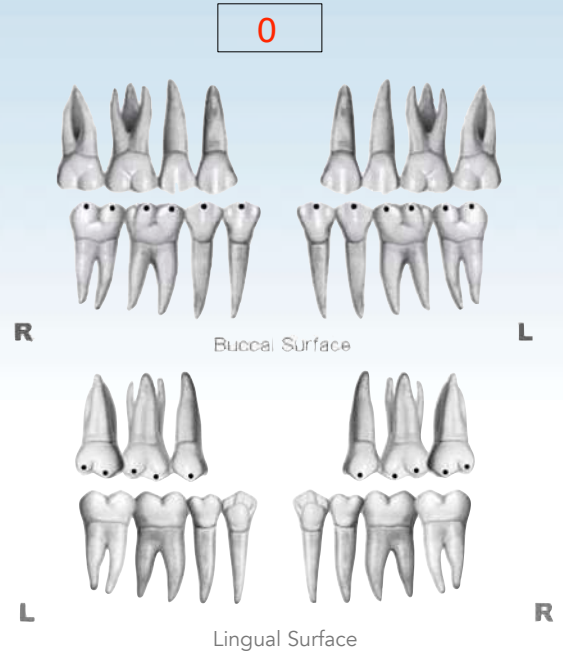
## Buccolingual Inclination



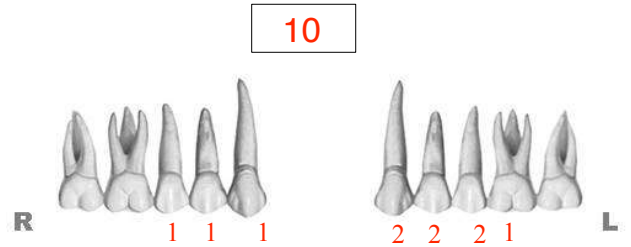
## Overjet



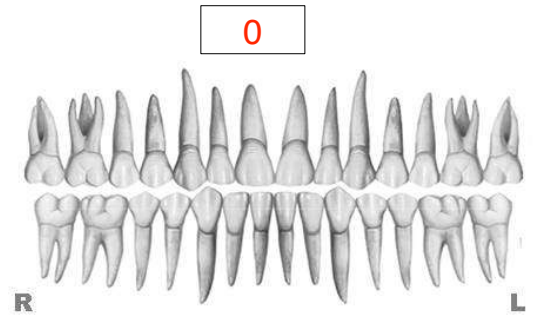
## Occlusal Contacts



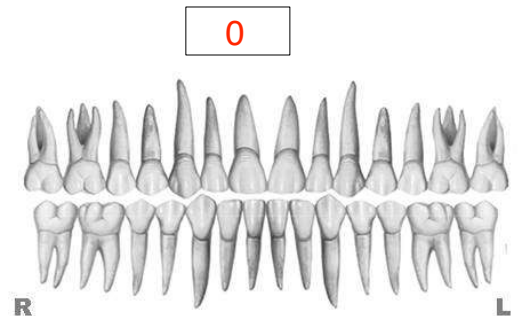
## Occlusal Relationships



## Interproximal Contacts



## Root Angulation



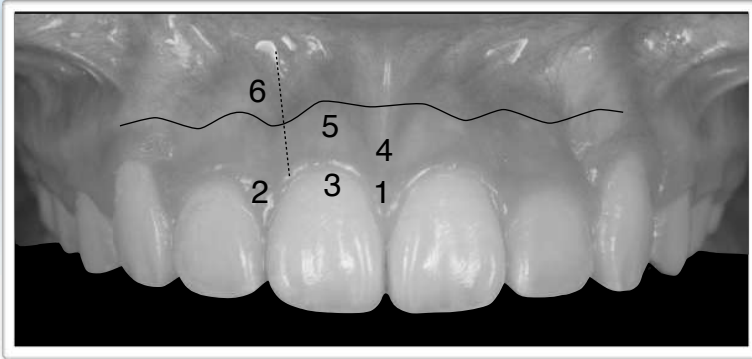
**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.



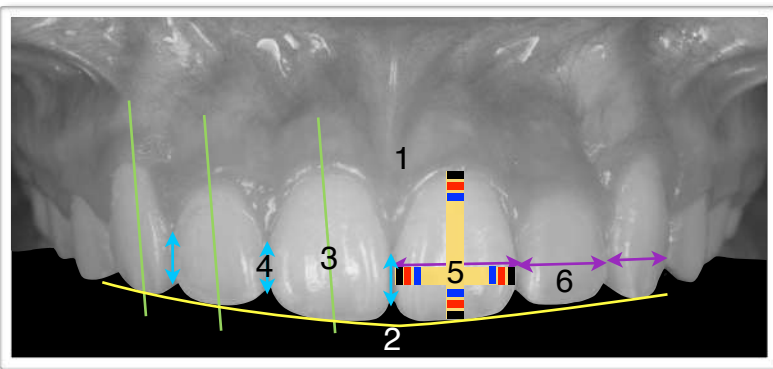
# IBOI Pink & White Esthetic Score

Total Score = 1

## 1. Pink Esthetic Score



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



Total = 1

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 = 0

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

Key Opinion Leader

**Dr. Rino Burkhardt**

Swiss perio kit developed in collaboration with Swiss Perio Group



Focus on:  
**Microsurgery**



Country: **Switzerland**



Favourite Instrument:  
**Microsurgical Anatomical Plier  
SPTPDAPV**



Website:  
[www.swissperio.com](http://www.swissperio.com)



Inspired by:  
**Jan Lindhe**



My surgical instruments are the sensory-motor extension of my hands.

Dr. Rino Burkhardt



## SWISS PERIO KIT FEATURES AND BENEFITS

### SPECIFIC DESIGNED INSTRUMENTS

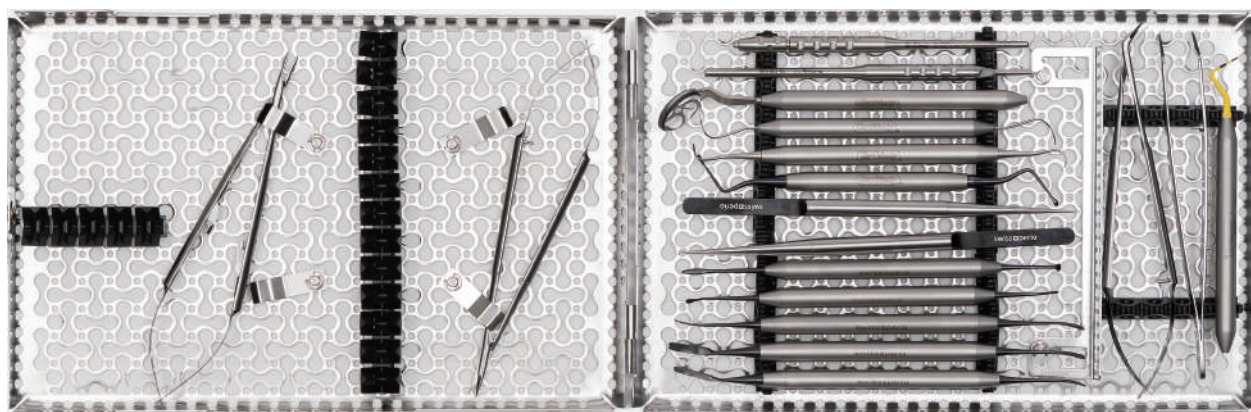
- Less tissue trauma by refined working ends.
- Ultimate manufacturing tolerances for precise handling.
- Easy to clean.

### BLACK INSTRUMENTS / BLACK LINE EXTENSION

- More contrast between the instrument and the tissue.
- Avoid light reflection.
- More sharpened than standard.

### BALANCED WEIGHT

More control and precision in specific and delicate microsurgery procedures.



### SPKITUS

SWISS PERIO KIT US VERSION

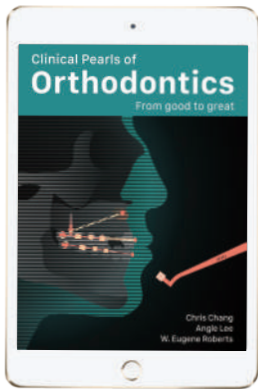
(器械盒為示意圖)



# e-Books

Learn it your favorite way!

## Best of all



**+ BUY BOOK**

This book requires iBooks 3.0 or later and iOS 5.0 or later.

The World's Best e-Textbook

## Beethoven Dental Encyclopedia e-Books collection

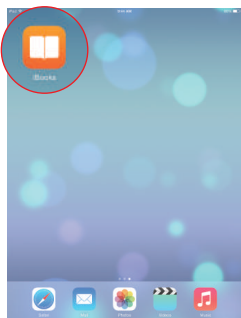
Beethoven Orthodontic and Implant Group has been publishing the International Journal of Orthodontics and Implantology since 2007. This Journal features excellently finished case reports evaluated by objective grading systems. **The Orthodontics and Implant Dentistry eBook series** is a special selection of exciting cases with interactive functions and multimedia resource. Once opening this book, your understanding of dentistry will never be the same!

Now available in **iBooks Store** in **51** countries:

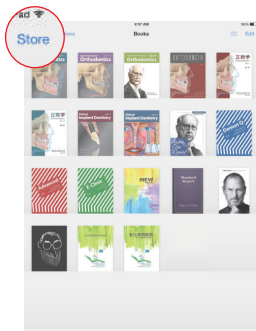
Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Bulgaria, Canada, Chile, Colombia, Costa Rica, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, El Salvador, Estonia, Finland, France, Germany, Greece, Guatemala, Honduras, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Mexico, Netherlands, New Zealand, Nicaragua, Norway, Panama, Paraguay, Peru, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States, and Venezuela.



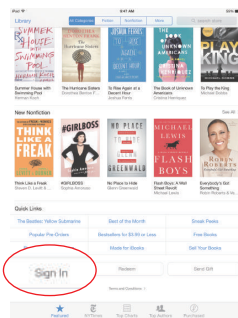
## Step-by-step Instructions



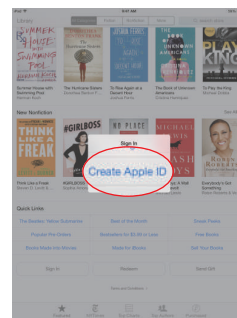
1. Launch "iBooks" app on your iPad.



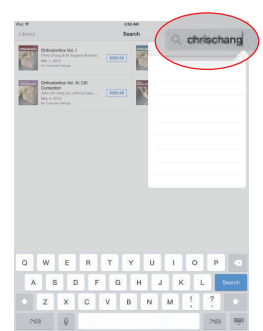
2. Click "Store."



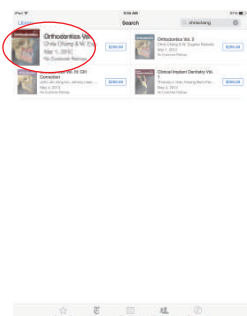
3. "Sign in" with your Apple ID.



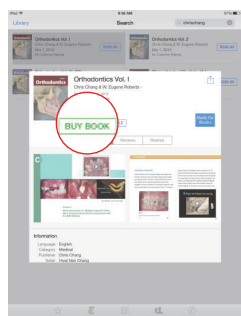
4. "Create Apple ID" if you don't have one.



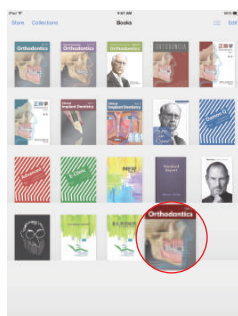
5. Search for "chrischang."



6. Click the book's icon.



7. Check the price and click "BUY BOOK."



8. Once downloaded, click the book's icon to launch the e-book and enjoy.

If you are interested in our paid video or medical products, contact [inewton.dental@gmail.com](mailto:inewton.dental@gmail.com) for more information.

+886-3-573-5676

[orthobonescrew.com](http://orthobonescrew.com)

iNewton

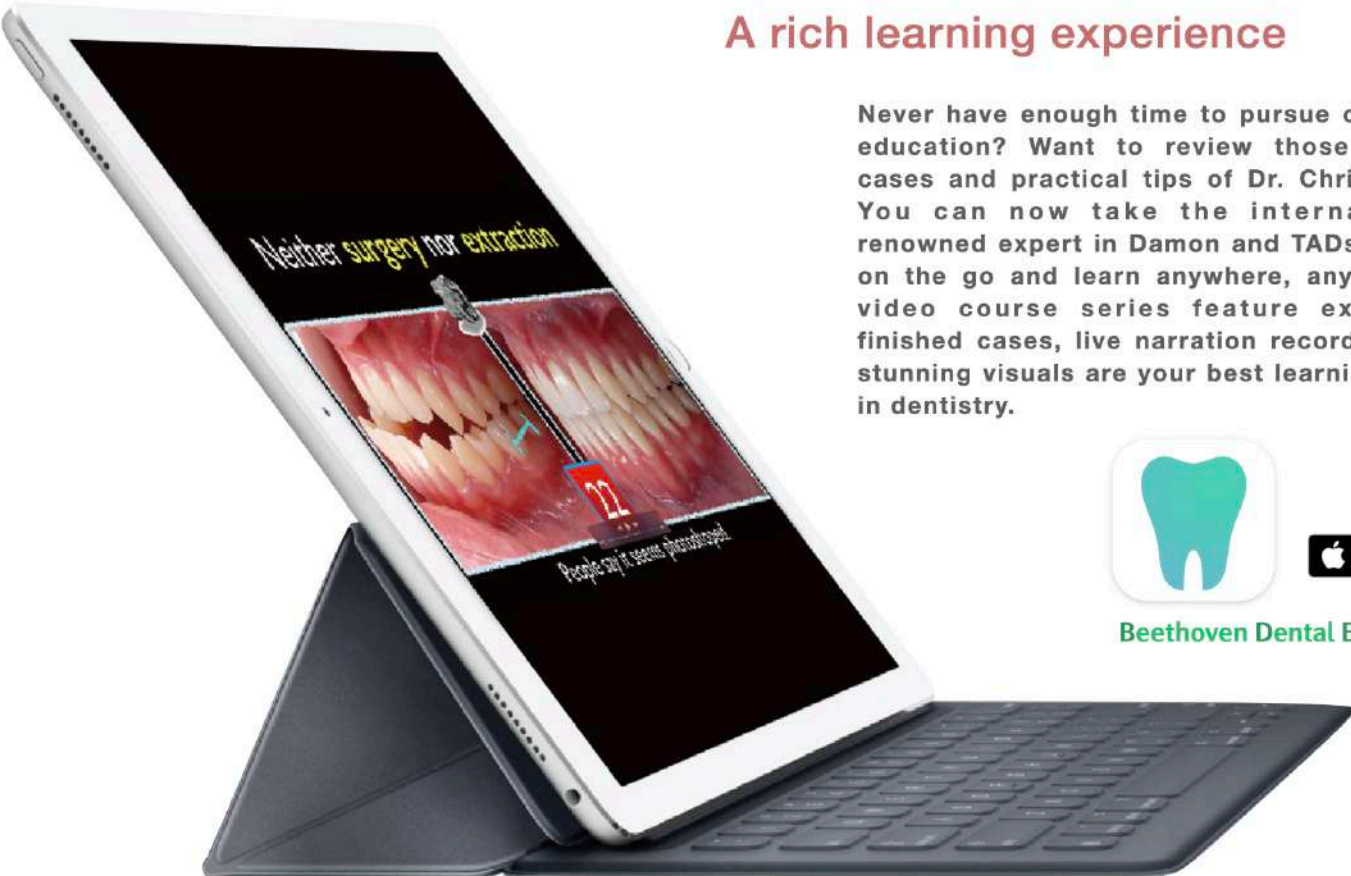
# e-Courses

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.



Beethoven Dental E-Learning



**Series** Each video course is valid for 3 years



**Damon Master**



**E-Lecture**



**OBS (TAD)**



**Finishing**  
(14 seasons)



**Implant Forum**  
(9 seasons)



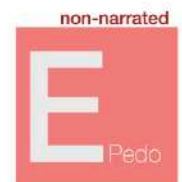
**Assistant**



**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.