

18-year Follow Up of two Siblings  
with Class III Malocclusion

Dr. John Lin

Treatment of Bimaxillary Protrusion and Facial  
Asymmetry with Extractions and Interradicular TADs

Drs. Johnny JL Liaw & W. Eugene Roberts

A Class III Mutilated Malocclusion Treated with  
Orthodontics and an Implant-Supported Prosthesis

Drs. Yu Lin Hsu, Chris Chang, & W. Eugene Roberts

# IJOI

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Congratulations to our new iAOI Diplomates who recently passed their board certification examinations at the 1<sup>st</sup> Annual Meeting of the International Association of Orthodontists and Implantologists (iAOI) in Taipei, 2012.

First row (from left to right): Drs. Ming Jen Chang, Shu Ping Tseng, Sabrina Huang, Ming Chen Lee, Wei Lun Peng, and Hsin Yin Yeh (Diplomates); Second row (from left to right): Drs. Bill Su (Diplomate), Kwang Bum Park (Examiner), Thomas Han (Examiner), John Jin-Jong Lin (Examiner), Susan Wu (Examiner), Chris Chang (Examiner), and Yu Lin Hsu (Diplomate).

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2013~2014

熱愛學矯正

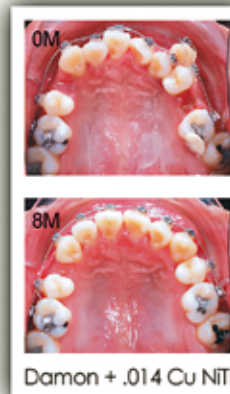
## 張慧男 博士



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## 學會開始做矯正需多久?

39小時讓您入門矯正。本課程採高效學習法及高效矯正簡報法 - Keynote, 在舒適、輕鬆的環境下, 學會簡單有效的矯正方法, 教室與診間結合, 讓您現學現用, 立即熟悉各種習得的技巧, 而不需太多課後複習。全程以 In-Office Training 方式, 用病例帶動分析、診斷, 治療計畫與療程技巧, 每一步驟皆以圖片及影片教學, 讓您很難錯失任何環節, 更沒有聽不清楚或無法理解的可能。為提高課後自我學習及臨床印證之效率, 另備有教學電子檔, 供學員家中研習。我們的終極目標是: 用最短時間、最輕鬆的方式, 讓每位學員 - 熱愛矯正學、熱愛學矯正。



## Damon矯正課程

使用最新一代矯正器 Damon Q 進行課程,  
 歡迎舊生報名參加。

台北 (二)	台中 (四)	NEW LECTURE	LAB
1 6/4/13	6/13/13	理想入門病例+Damon Q點著	Bonding (Damon Q) + BT
2 6/25	6/27	快速矯正療程四部曲	Ceph + Photo
3 7/2	7/4	簡捷有效的錨定系統	Damon + OrthoBoneScrew I
4 7/16	7/18	不拔牙與拔牙分析	Damon + OrthoBoneScrew II
5 7/23	7/25	Damon 診斷流程及微調	Finish Bending
6 8/6	8/8	完工檢測及報告示範	Fixed Retainer (FR)
7 8/13	8/15	維持及復發; 病例示範	Presentation Demo
8 8/27	9/5	矯正力學及診斷分析 (1)	DDX + Case Reports I
9 9/3	9/26	軟硬組織及診斷分析 (2)	DDX + Case Reports II
10 9/17	10/3	兒童矯正及診斷分析 (3)	DDX + Case Reports III
11 9/24	10/17	成人矯正及診斷分析 (4)	DDX + Case Reports IV

## 矯正植體課程

【課程】9:00 - 12:00  
 【實習】13:30 - 20:00

新竹(三) 2013 10/16 (含午、晚餐)

## International workshop

Keynote & management  
 OrthoBoneScrew & Damon

2013  
 A班 6/18-20  
 B班 11/19-21

## 矯正進階課程

【新竹】9:00 - 12:00  
 【高雄】14:00 - 17:00

以病例討論為主軸, 培養學員如何正確診斷及快速排除  
 臨床疑點, 課程中亦訓練每位學員善用 Keynote。

新竹 (四)	NEW Paper Reviews	Topics & Case Demo
1 7/11/13	Bracket Placement	Crowding: Ext. vs. Non-ext.
2 8/1	Impacted Canines	Upper Impacted Teeth
3 8/29	Canine Substitution	Lower Impacted Teeth
4 9/12	Missing 2nd Premolar	Missing: Ant. vs. Post.
5 11/7	DI Workshop	Crossbite: Ant. vs. Post.
6 12/12	CRE Workshop	Open Bite High Angle
7 1/16/14	Excellence in Finishing (occlusion)	Deep Bite Low Angle
8 2/27	Excellence in Finishing (esthetics & perio)	Gummy Smile & Canting
9 3/13	Ortho-Perio-Restore Connection	Esthetic Finishing (Transposition)
10 4/10	Adjunct to Perio	Implant-Ortho
11 4/24	Unhappy Patient	IDT - Adult Complex

## 助理訓練課程

【課程】10:00 - 14:30  
 【實習】15:00 - 20:00

每梯次共兩堂課程與技術操作, 內含  
 照相技術、Morph 與公關衛教之電腦  
 資料處理; 另安排一次診所見習。



新竹(五) 2013 10/11、18 (含午、晚餐)

## 課程資訊

## 上課地點

【台北】  
 恆毅資訊中心 畢卡索廳  
 / 台北市復興北路99號12樓  
 (捷運南京東路車站旁)

【新竹】  
 金牛頓藝術科技公司  
 / 新竹市建中一路25號2樓

【台中】  
 中國文化大學台中教育中心  
 / 台中市西屯區中港路二段  
 128之2號3樓

【高雄】  
 國立科學工藝博物館-南館  
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\* 每次上課請依最新一期  
 IJOI 公告為主

## 矯正精修課程

【課程】9:00 - 12:00

協助每位學員了解由古典到現代之文獻, 進而應用於實際  
 病例; 並藉由DI及CRE讓精緻完工 (Excellent Finishing) 變成  
 易達到的目標。

新竹(二) 精修V 6/11/13 7/9 8/20 9/10 10/8 11/5 12/17 1/7/14  
 3/11 4/15 5/13

## To lead, rewrite the rules

To conclude a fruitful 2012, I am very proud to report that the International Association of Orthodontics and Implantology has successfully built up three innovative pillars, which provide a strong support for future teaching and learning.

*The first pillar is the role of our examiners.* We believe that in order to examine, one has to be first examined. Experience doesn't always equal the knowledge necessary to validate today's technologies. Therefore, all of our examiners have to first successfully present their work before examining others'.

Thanks to our examiners Drs. Thomas Han, Kwang Bum Park and John Lin for being such exemplary role models.

*The second pillar is the examination process.* All cases are evaluated by the ABO grading system, the most reliable system to study treatment results, which we have now integrated into our certification process. Furthermore, material to be examined is posted on YouTube one week beforehand, to give examiners and audience sufficient time to study and analyze the case and treatment process in detail. The efficiency of the Q and A section certainly speaks for itself, as everyone can easily hit the point.

Congratulations to all the examinees. You should be very proud of your achievements

*The third pillar is publication.* All diplomats have published at least three articles in IJOI, which are then subsequently transformed into 3-D iBook format and launched on iBookstore. We truly believe this 3-D electronic publication can change learning and teaching, as it is by far the fastest and best way to reach end users around the world.

With these three innovative pillars, we can continue to build an even stronger roof for our members to enjoy learning and teaching underneath, allowing us to stay on top. As Steve Jobs once said, *"To lead, rewrite the rules"*.

Join us. This small step of joining our certification process, may turn out to be a quantum leap in your career.

*Chris Chang* DDS, PhD, Publisher

### 3 Editorial

#### LIVE FROM THE MASTER

- 4 18-year Follow Up of two Siblings with Class III Malocclusion

#### IAOI CASE REPORT

- 24 Treatment of Bimaxillary Protrusion and Facial Asymmetry with Extractions and Interradicular TADs
- 36 A Class III Mutilated Malocclusion Treated with Orthodontics and an Implant-Supported Prosthesis
- 62 Nonsurgical Treatment of a Class III Patient with Bilateral Open Bite Malocclusion
- 76 A treatment of a bimaxillary protrusion case with canine substitution and impacted third molar uprighting

#### FEATURE

- 90 Beethoven-A Learning Organization

#### FEEDBACK FROM THE WORLD

- 98 Feedback on the Book "Orthodontics"
- 99 Feedback from the Keynote Workshop
- 100 Feedback from the International Damon & OBS Workshop



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## 18-year Follow Up of two Siblings with Class III Malocclusion

### (A) Introduction

Treatment of skeletal Class III malocclusion with conventional orthodontic appliances usually requires orthognathic surgery. If patients have an acceptable profile, temporary anchorage devices (TADs)<sup>1</sup> and passive self ligating brackets, including the Damon system,<sup>1</sup> are viable alternatives for some Class III malocclusions.

Early treatment of severe (*skeletal*) Class III malocclusion with the so-called orthopedic appliances, such as face masks, has been reported. However, long term follow up studies found relapses due to late mandibular growth.<sup>2</sup> It is difficult to predict facial growth, but longitudinal long term follow up of patients with Class III malocclusions provides insight into the optimal management of these challenging malocclusions.

This case report documents the treatment, relapse and retreatment of two siblings over a period of 18-years. The emphasis will be on the need for early treatment,<sup>3, 4, 5, 6</sup> the importance of the E-space management and the MEAW effect of the Damon system.<sup>1</sup>



Initial examination indicated that the older brother (*left*), aged 6-year-7-month, had a moderate anterior crossbite and midline deviation with an orthognathic profile. His younger sister (*right*), presented at age 2-year-11-month with a more severe anterior crossbite and midline deviation with a more prognathic mandible.



Dr. John Jin-Jong Lin  
MS, Marquette University  
Chief Consultant of IJOI  
President of TAO ( 2000~2002 )  
Author of *Creative Orthodontics*



## (B) Case 1: The older brother



### ■ 6y7m

A mild mesial step relationship of the primary second molars was noted bilaterally. The lower dental midline was deviated 2mm to the left of the upper dental midline. The left upper primary incisors were in crossbite. The frontal view of the face revealed that the chin was deviated to the left and the lateral view showed an orthognathic profile.



### ■ 9y7m

The chin point was deviated to the left, and the lateral profile was slightly prognathic. The mesial step relationship of the primary second molars had worsened. All the erupted maxillary permanent incisors were in crossbite, and the lower dental midline deviation to the left was more pronounced.





#### ■ 12y4m

All the primary teeth exfoliated. Some residual E-space was present in the right lower premolar region. Traditional edgewise orthodontic treatment began to resolve the anterior crossbite by closing the E-space and correcting the dental midline. The chin point was still deviated to the left and the lateral prognathic profile was more pronounced.



#### ■ 13y10m

Closing the right lower E-space produced a Class I occlusion, but the chin point was still deviated to the left and the mandible was slightly prognathic.



#### ■ 14y4m

6 months later, the occlusion has relapsed to an edge to edge incisal relationship, and the lower dental midline was deviated 1mm to the left. The problems arising from late mandibular growth were explained to the parents and patient, however, retreatment was not indicated until the completion of at least most of the mandibular growth.



The chin point remained deviated to the left, and the lateral profile was moderately prognathic.



#### ■ 17y9m

The chin point was still deviated to the left and there was a slightly prognathic facial profile. The right buccal segment had evolved into a 5mm Class III molar relationship and the lower dental midline deviation had increased to 3mm.



#### ■ 20y3m

The mandibular deviation, midline discrepancy, and facial profile was unchanged since the previous records obtained at 17y9m of age. Since the patient was not concerned with the mandibular deviation, mandibular prognathism or lip protrusion, non-extraction orthodontic treatment without orthognathic surgery was planned.



#### ■ 21y2m

Second stage, nonextraction orthodontic treatment was with a full fixed appliance (*Damon II, Ormco*).





#### ■ 21y2m - 21y7m - 21y8m - 21y10m

The patient was very cooperative in wearing intermaxillary elastics, so after 10 months of orthodontic treatment, a Class I occlusion was achieved.



#### ■ 22y

Although a Class I occlusion was achieved, the lower dental midline remained slightly deviated to the left. The deviation of chin point to the left side was minor, as was the protrusion of lips. The profile remained mildly prognathic. Overall, the patient was very satisfied with the final result, which was well interdigitated Class I occlusion.





#### ■ 24y10m

After 2 years and 10 months, the treatment result was stable, except for a moderate relapse of the right buccal segment into a slight Class III molar and canine relationship. The midline deviation to the left had increased to 2 mm and the chin was more prominent. The profile was slightly prognathic. Despite the minor relapse, the patient was satisfied with the overall result.



#### ■ 22y-22y11m-23y9m-24y10m

The patient was 22 years old when the retreatment was completed, because no further mandibular growth was anticipated. However, the lower midline continued to deviate to the left side and the overbite decreased.



## Discussion of Case 1

### What we can learn from this case:

- (1) Due to late mandibular growth, treatment of Class III malocclusion during adolescence may relapse.
- (2) The deviated chin and dental midline discrepancy were clearly evident when the patient was only 6 years and 7 months old. These characteristics continued to predominate as the patient grew older.
- (3) The correction of the dental midline discrepancy could have been facilitated by placing a lingual arch to preserve his right mandibular E-space at around age 11 before the primary molars exfoliated.
- (4) Although the E-space was not fully preserved in this case, the first phase of orthodontic treatment did benefit from the E-space that remained.
- (5) Correction of anterior crossbite often results in proclined upper incisors. If the E-spaces are preserved, the lower incisors can be retracted to help correct the crossbite with little or no need for Class III elastics. That approach would avoid the undesirable side effect of anterior tipping of upper incisors. In addition, over-correction of midline could be achieved easily.
- (6) The correction of this asymmetric Class III malocclusion relapsed in only 6 months due at least partially to the continuing mandibular growth. If retreatment were to begin at age 14 years, the late mandibular growth would have compromised the treatment result again.<sup>2</sup> Therefore, second stage treatment is recommended only after mandibular growth is completed.
- (7) The retreatment was completed in only 10 months, indicating that the Damon system can generate MEAW-like effects.<sup>1</sup>
- (8) The second stage treatment was finished when the patient was 22 years old, after his mandibular growth appeared to be completed, the follow up examination indicated that dentally the lower dental midline relapsed to the left again. For better long term treatment result, over-correction is recommended.
- (9) It is difficult to provide a thorough diagnosis based on the primary dentition. A more definitive diagnosis can be made when all the permanent teeth are present, as in this case at the age of 12 years old. Until a proper diagnosis can be provided, clinicians should not begin any early orthopedic correction.



## (C) Case Report 2: The younger sister



## ■ 2y11m

The patient was only 2-year-11-month but she exhibited cooperative behavior during examination and record collection. The frontal view of the face revealed that the chin was deviated to the left side, and the profile was prognathic. The lower dental midline was deviated to the left of the upper dental midline. An apparent mesial step relationship of the second deciduous molar was found on the right side buccal occlusion, and the lower deciduous canines were in a significant Class III relationship. The mesial step buccal occlusion was less severe on the left side.



## ■ 8y8m

The chin point was deviated to the left and the lateral profile was prognathic. A full cusp Class III malocclusion was noted bilaterally, and the lower dental midline was deviated 1mm to the left. Large mandibular deciduous second molars were present, so a lingual holding arch was placed to preserve the E-spaces bilaterally.





#### ■ 9y7m

The chin point was still deviated to the left side but the dental midlines were coincident. The permanent premolars have erupted, and the E-spaces were preserved in the lower arch.



#### ■ 10y2m - 10y3m - 10y7m - 11y

The use of traditional edgewise brackets, combined with the available lower E-spaces, helped retract the protruded lower dentitions to almost edge to edge without the use of Class III elastics.



#### ■ 11y6m

After 1 year and 3 months of treatment, the anterior crossbite was corrected primarily by the closure of E-spaces with minimal use of Class III elastics. Thus, the undesired side effect of antero tipping (*proclination*) of upper incisors was avoided. After the first stage treatment, the parents were informed that despite the successful correction of anterior crossbite, the deviation of lower midline and chin point persisted, and the correction would probably deteriorate with late mandibular growth.<sup>2</sup> Follow up evaluation for retreatment was indicated.



#### ■ 12y2m

Eight months after active treatment, the lower dental midline deviation to the left increased and the overbite became edge to edge. The profile remained prognathic.





- **16y7m** Both the anterior crossbite and the prognathic mandible have become more prominent.



- **18y3m**

After reevaluation, the parents and patient were informed that surgical correction was indicated if an orthognathic profile was the ultimate treatment goal. The parents and patient accepted the prognathic profile and requested orthodontic treatment only.



- **18y3m** Cephalogram and Panorex.



#### ■ 18y5m

Start of the second stage orthodontic treatment. A fixed appliance (*Damon II brackets, Ormco*) was bonded on both arches.



#### ■ 18y3m - 18y5m - 18y6m - 18y9m

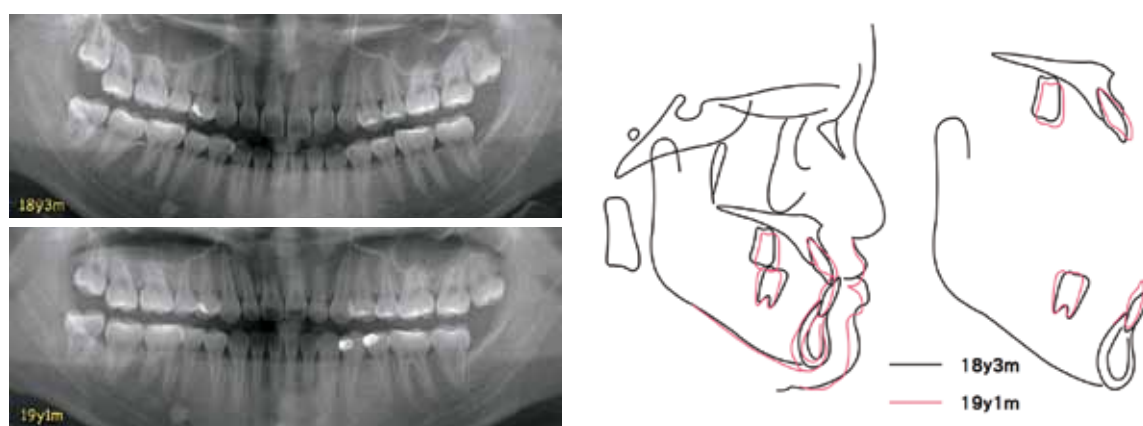
With the patient's excellent cooperation in wearing Class III elastics, and the MEAW effects of the Damon system,<sup>1</sup> the Class III malocclusion was corrected to Class I in only 4 months.





### ■ 19y1m

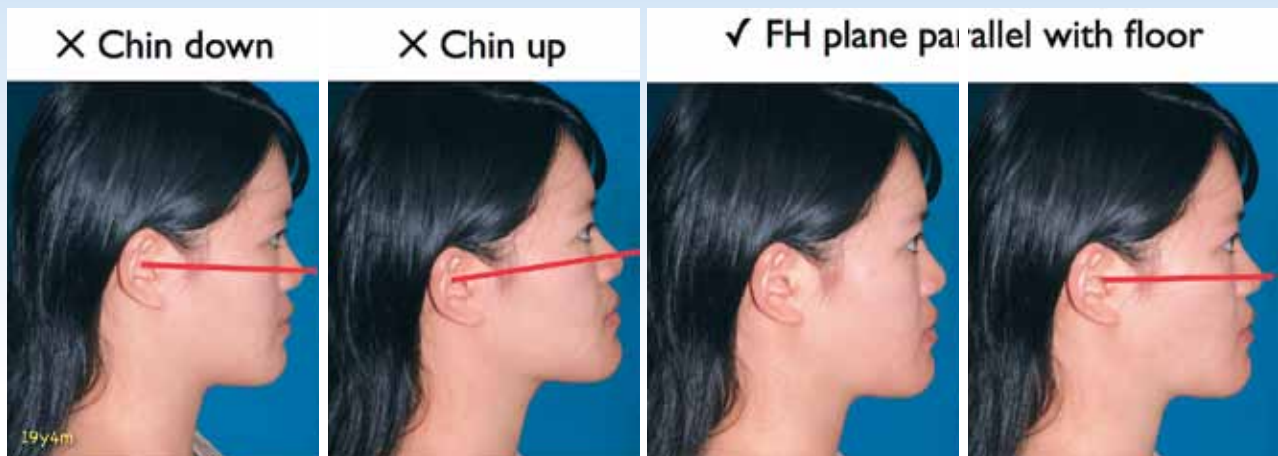
After 8 months of active treatment, ideal overbite and overjet were created, and the dental midline was almost coincident. Although the patient's lateral profile remained prognathic, it was acceptable for the patient and her parents.



### ■ 18y3m vs 19y1m Cephalometric superimposition

The panoramic view clearly indicated that the lower molars were tipped back distally, similar to the MEAW effect, resulting in the final Class I relationship. The occlusal plane was rotated counterclockwise due to the tip back of the lower molars and extrusion of lower incisors. Both the right lower third molar and upper right third molar were in a good position, so they were retained.

The presence of a lower third molar did not prevent tip back and retraction of the whole lower dentition.



#### ■ 19y4m

When taking clinical profile photographs, the patients' head should keep in a natural position, defined as the Frankfort horizontal plane parallel to the floor. When the chin is tilted downward, it tends to appear orthognathic and more prognathic when tilted upward.



#### ■ 20y7m

At the 18-month follow up examination, both the overbite and overjet decreased



#### ■ 19y1m vs 20y7m

The cephalometric comparison revealed significant reduction of the overbite and overjet.



## Discussion of Case 2

### What we can learn from this case:

- (1) This patient already exhibited characteristics of skeletal Class III malocclusion in the early primary dentition stage. After informing the parents about the possibility of late mandibular growth, only minor orthodontic alignment was done. No aggressive extra-oral appliances such as chin cup or face mask were used. This case was treated with Damon II brackets, and there was only one torque option available in Taiwan at that time. Therefore low torque brackets couldn't be applied to the upper incisors. Nowadays, the Damon Q system provides various torque options. If the author were to retreat this patient, upside down standard brackets would be used to express super low torque effect on the upper incisors. When combined with the use of .019x.025" stainless steel wire on the upper arch, the forward proclination of upper incisors due to the application of Class III elastics can be better controlled. In this case, the upper incisor tipped anteriorly as demonstrated by the cephalometric tracings, but it was not apparent clinically. The patient was very satisfied with the treatment result.
- (2) If early treatment were to be conducted during early mixed dentition, there would have been no E-space present. The treatment would rely on Class III elastics, leading to severe proclination of the upper incisors. In this case, the first stage treatment didn't begin until permanent premolars were present. The anterior crossbite was corrected primarily by retracting the lower anterior segment. Therefore, the proclination of upper incisors was relatively insignificant.
- (3) After the patient turned 18 years old, the Class III malocclusion relapsed and deteriorated. Since the patient was indifferent to her prognathic profile, orthodontics only treatment was indicated. With the Damon system's MEAW effect,<sup>1</sup> the Class III malocclusion was swiftly corrected in just 8 months. It would probably have been a longer and much more difficult treatment if traditional edgewise brackets had been used.
- (4) Many clinicians suggest that the correction of Class III malocclusion should start as early as possible.<sup>3, 4, 5,</sup>  
<sup>6</sup> However, that approach usually results in significant protrusion of the upper incisors. Moreover, future mandibular growth may further compromise the result, and complicate second stage treatment.
- (5) In this case the Class III malocclusion was easily and simply corrected by Damon II brackets without rapid palatal expansion. In fact, most Taiwanese Class III patients don't require upper arch expansion. When the Class III relationship is corrected, there is no posterior crossbite, in most cases.

- (6) When taking clinical photographic records, one should always ensure patients' lateral profile view is in a natural head position, i.e. Frankfurt horizontal plane parallel to the floor.
- (7) Overcorrection of the anterior crossbite and midline discrepancy is indicated because Class III malocclusions usually have a tendency to relapse..

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## 2013 Beethoven International Damon & OBS Workshop

### OrthoBoneScrew and Damon workshop

includes two half-day lectures, two half-day chair-side observation sessions, one model practice and one case discussion session.

Registration fees cover local transportation, meals and two nights of shared accommodation (double occupancy). Airport pick up is available upon request with additional charges.

### Keynote Presentation workshop

includes 6.5 hours of lecture and hands-on practice, focusing on improving your professional digital communication skills. The workshop adopts the Macintosh (Apple) system and its native presentation software, Keynote 09. Registration fees cover meals and one night of shared accommodation (double occupancy).

### Registration:

A 50% deposit is required to complete registration. To make a payment by wire, please contact Ms. Rita at [rita@newtonsa.com.tw](mailto:rita@newtonsa.com.tw) or call +886-3-5735676 for more information.

Dear Chris:

[...] My development as lecturer and orthodontist has evolved greatly. Thanks to this great experience, I came back from Taiwan with the best and latest technique knowledge, valuable and practical tools, including how to make successful presentations using the resources of MAC technology—rightly led by you in your country. I have also received invaluable and unparalleled academic material on the proper use, benefits and applications of mini-implants.

I will always be thankful not only to you but also to your friendly and dedicated wife, your clinic team in which I found a model for organization, care and functionality. I will never forget all the attentions received and all the time spent on my professional development regardless of the multiple occupations and other responsibilities you all have[...].



Dr. Patricia Vergara Villarreal (right)  
Orthodontist, the Military University.CIEO. of Bogota

Dear Chris:

[...] I can only say that the Workshop exceeded my expectation and it was truly amazing. Lectures by the world class orthodontists (Dr. Chris Chang and Dr. John Lin), and wealth of knowledge from your many years of dedication, wisdom, and clinical experiences were evident through the cases you presented. I am also very much appreciative of the opportunity to observe you actively and effortlessly practicing what you teach through the chair-side observation session held in your very busy practice.

First, as an innovative educator, you encouraged us to be innovative. Second, you taught us your system and showed us tools in Damon and OBS for us to succeed and duplicate it in each of our own practices. Third, you motivated us to continue to continually improve the system. Personally, I am very grateful and thankful for these three pieces of advice you gave to us[...].



John K.S. Tong, DDS, MAGD  
Cupertino, California USA





## 2013 Workshop Dates: 6/18-20, 11/19-21



### LECTURER: Dr. Chris Chang

President of the Beethoven Orthodontic Center. He received his PhD in bone physiology and Certificate in Orthodontics from Indiana University in 1996. As publisher of *International Journal of Orthodontics & Implantology* and author of *3D iBooks Ortho*, he has been actively involved in the design and application of bone screws.



### LECTURER: Dr. John Lin

President of the Jin-Jong Lin Orthodontic Clinic. Dr. Lin received his MS. from Marquette University and is an internationally renowned lecturer. He's also the author of *Creative Orthodontics* and chief consultant to *International Journal of Orthodontics & Implantology*.

#### Day 1



- 13:00—14:00 Welcome Lunch
- 14:00—14:40 Orientation
- 14:40—15:00 Introduction of Beethoven Dental Group
- 15:00—18:30 Chair-side observation

#### Day 2

- 9:00—10:30 Optimized Orthodontic Treatment I  
*Dr. Chris Chang*
- 10:30—11:00 Break
- 11:00—12:30 Optimized Orthodontic Treatment II  
*Dr. Chris Chang*
- 12:30—13:50 Lunch
- 14:00—15:00 Screw Model Practice
- 15:00—18:30 Chair-side observation



#### Day 3

- 09:00—10:00 6 Essentials of the new Damon Q
- 10:00—10:10 Break
- 10:10—12:30 Damon + Screw *Dr. John Lin*
- 12:30—13:30 Lunch

#### Day 3



- 14:00—15:30 Introduction of Keynote:  
Organize your patient files for presentation
- 15:30—15:45 Break
- 15:45—17:00 Key Presentation Principles I

#### Day 4

- 09:00—10:00 Key Presentation Principles II
- 10:00—10:10 Break
- 10:10—11:30 Make it Visual
- 11:30—13:30 Lunch





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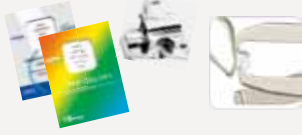




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# Treatment of Bimaxillary Protrusion and Facial Asymmetry with Extractions and Interradicular TADs

## History And Etiology

A 21 year old male, with a family history of Class III malocclusion, sought consultation for protrusion and imbalance of the lower face. Despite an apparent Class III skeletal pattern (*Table 1*), clinical examination revealed a Class I dental relationship, complicated by anterior openbite tendency, midline deviation, facial asymmetry, and bimaxillary protrusion (*Figs.1-3*). Note that the right buccal segment appears to be Class III due to the angulation of the photograph (*Fig. 2*), but the direct buccal view of the articulated casts (*Fig. 3*) shows that the relationship is actually Class I. This discrepancy demonstrates that casts are more reliable than intraoral photographs for diagnosis of intermaxillary occlusion in the sagittal plane.

The soft tissue type for this patient was thick, suggesting that maximal retraction of dentition was necessary to achieve an esthetic profile. For maximum retraction of the maxillary incisors, extraction of all four first premolars was indicated. However, maxillary buccal segments have less anchorage value than those in the mandible,<sup>1</sup> so temporary anchorage devices (TADs) were required in both arches to maintain the Class I occlusion while correcting the bimaxillary protrusion to improve the profile. The expected results and limitations of treatment were discussed with the patient and his parents. It was assumed that the patient's



■ Fig. 1: Pretreatment facial photographs



■ Fig. 2: Pretreatment intraoral photographs



■ Fig. 3: Pretreatment study models

Johnny JL Liaw, Director, Beauty Forever Dental Clinic (left)  
W. Eugene Robert, Consultant,  
*International Journal of Orthodontics & Implantology* (right)



■ Fig. 4: Posttreatment facial photographs



■ Fig. 5: Posttreatment intraoral photographs



■ Fig. 6: Posttreatment study models

growth was complete, but it would be carefully monitored because of the family history of Class III malocclusions.

The patient was treated to an optimal result as documented in Figs. 4-6. The cephalometric and panoramic radiographs document the pre-treatment condition and the post-treatment results (Figs. 7-8). The cephalometric tracings before and after treatment are superimposed in Fig. 9. Cephalometric measurements (Table 1) document the Class III skeletal pattern of the patient.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	80°	79°	1°
SNB°	81°	82°	1°
ANB°	-1°	-3°	2°
SN-MP°	37.5°	35.5°	2°
FMA°	32.5°	30.5°	2°
DENTAL ANALYSIS			
U1 TO NA mm	21 mm	14 mm	7 mm
U1 TO SN°	128°	122°	6°
L1 TO NB mm	15 mm	21 mm	6 mm
L1 TO MP°	100°	80°	20°
FACIAL ANALYSIS			
E-LINE UL	2 mm	0 mm	2 mm
E-LINE LL	10 mm	3 mm	7 mm

■ Table. 1: Cephalometric summary





■ Fig. 7: Pretreatment pano and ceph radiographs



■ Fig. 8: Posttreatment pano and ceph radiographs



■ Fig. 9:  
Superimposed tracings showed maximal retraction on both arches and total arch distalization in the lower arch after complete space closure.

## Diagnosis

### Skeletal:

- Skeletal Class III (  $SNA\ 80^\circ$ ,  $SNB\ 81^\circ$ ,  $ANB\ -1^\circ$  )
- High mandibular plane angle ( $SN-MP\ 37.5^\circ$ ,  $FMA\ 32.5^\circ$ )
- Mild facial asymmetry: chin deviated to the left

### Dental:

- Bilateral Class I buccal segments
- Increased axial inclination (*flaring*) of maxillary incisors
- The OJ was 0.5mm; OB was <0.5mm and there was an anterior openbite tendency
- Symmetrical square shape archform in both arches
- 4mm space deficiency in the upper arch
- 6mm space deficiency in the lower arch
- Upper dental midline was coincident with facial midline.
- Lower dental midline was shifted to the right by 2mm.
- All four third molars were present, both lower third molars were mesio-angular impacted.

### Facial:

- Convex profile
- Bimaxillary protrusion

The ABO Discrepancy Index (DI) score was 8 points as shown in the subsequent worksheet. Although the DI for this case is less than 10, the required amount of incisor retraction for this patient was quite a challenge.

## Specific Objectives Of Treatment

### Maxilla (*all three planes*):

- A - P: Maximal retraction of the alveolar process
- Vertical: Intrude anterior alveolar process

- Transverse: Maintain

### Mandible (*all three planes*):

- A - P: Maximal retraction of the anterior alveolar process
- Vertical: Maintain
- Transverse: Maintain

### Maxillary Dentition:

- A - P: Maximal retraction of the incisors
- Vertical: Maintain
- Transverse: Maintain

### Mandibular Dentition:

- A - P: Maximal retraction
- Vertical: Maintain
- Transverse: Maintain

### Facial Esthetics:

- Maximal retraction of the lips for profile improvement

## Treatment Plan

The treatment plan for this patient was extraction of all four first premolars, and maximal reaction of the anterior segments with TADs anchorage in both arches to: 1. reduce the bimaxillary protrusion, 2. correct molar Class III relationship and 3. midline discrepancy. The upper and lower TADs were installed early in the treatment, but were used alternately based on the treatment goals of various stages of treatment. Initially, the lower TADs were used to retract lower anterior teeth to obtain positive overjet. Upper and lower TADs were used to retract the arches simultaneously to reduce the protrusion. When all the spaces were closed, the distal forces were applied asymmetrically using the upper left and lower right TADs as anchorage, to correct the dental midline discrepancy. Asymmetrical intermaxillary elastics were required to supplement the anchorage.



## Appliances And Treatment Progress

A modified Alexander prescription was used. The slot sizes of the anterior teeth (*canine to canine*) were .018", while the slot sizes of the posterior teeth were .022". The initial archwires for both arches were .016" NiTi. The second archwires were .016x.022" SS for both arches. Two miniscrews (1.2mm in diameter, 9mm in length, *Absoanchor, Korea*) were installed between the roots of the lower second premolars and first molars bilaterally before the start of lower space closure (*Fig. 10*). NiTi tension coil springs were attached from the miniscrews to bilateral lower lateral incisors, while lower anterior teeth were tied together with figure-8- fixation, to close the extraction space. One month later, two miniscrews were installed on the upper posterior area between the roots of the first and second molars. Upper and lower space closure proceeded simultaneously (*Fig. 11*). The extraction spaces on the upper arch were closed in 7 months, and an additional 9 months was required for the lower arch to complete space closure.

After all the spaces were closed, the upper and lower dental midline were not coincident. The upper left and lower right NiTi coil springs were retained to use for midline correction (*Fig. 12*). The asymmetrical application of the miniscrew anchorage in conjunction with asymmetrical intermaxillary elastics (*Fig. 13*) corrected the dental midlines eight months later. Interproximal reduction was also performed on the lower anterior teeth during this period to reduce black triangles. The treatment was finished and all

the appliances were removed after 30 months of active treatment.

## Results Achieved

### Maxilla (*all three planes*):

- A - P: Retraction of the anterior alveolar process
- Vertical: Intruded the anterior alveolar process
- Transverse: Maintain

### Mandible (*all three planes*):

- A - P: Retraction of the anterior alveolar process
- Vertical: Maintain
- Transverse: Maintain

### Maxillary Dentition:

- A - P: Retraction of incisors
- Vertical: Intrude anterior segment
- Transverse: Maintain

### Mandibular Dentition:

- A - P: Retraction
- Vertical: Maintain
- Transverse: Maintain

### Facial Esthetics:

- Improved due to correction of bimaxillary protrusion

## Retention

Upper and lower clear removable retainers were delivered, and the patient was instructed to wear the retainers full time for first 6 months, and nights only thereafter. In addition, the patient was instructed in proper home hygiene and maintenance of the



■ Fig. 10: Two miniscrews were installed between lower second premolars and lower first molars for maximal retraction of lower incisors.



■ Fig. 11: Space closure with miniscrew anchorage were proceeded on both arches for maxmal retraction.



■ Fig. 12:  
After all the spaces were closed, the upper and lower dental midlines were not coincident. The force system was changed to be asymmetrical for midline correction.



■ Fig. 13:

Besides asymmetrical application of miniscrew anchorage, asymmetrical interarch elastics were also used to correct dental midline discrepancy.

retainers. Subsequently, Hawley retainers were delivered for nocturnal wear in both arches for long-term retention.

### Final Evaluation Of Treatment

The ABO Cast-Radiograph Evaluation score was 7 points, with most of the points reflecting problems in root angulation. Discrepancies in root angulation were noted in both arches, particularly the lower right first molar and upper left first molar. Cephalometric superimpositions showed maximal anchorage on the upper arch and distal tipping of mandibular molars to increase the amount of lower incisor retraction.

Overall, this severe protrusion case was treated in 30 months to an appropriate facial and dental result. The 5.5 years follow-up records (Figs. 14-15) show a stable occlusion and harmonious facial profile.



■ Fig. 14:

5.5 years post-treatment facial photographs



■ Fig. 15:

5.5 years post-treatment intraoral photographs



## Discussion

Bimaxillary protrusion is common in Asian patients of all skeletal types. For skeletal Class I cases, the required amount of incisor retraction is expected to be the same for both arches. However, the anchorage value for the upper molars is less than that for lower molars because of the weaker bone density in the maxilla compared to the mandible.<sup>1</sup> Moreover, the geometry of the root morphologies of upper molars is more prone to lose anchorage by rotating around the palatal root. On the other hand, the difference between size and torque demand on the upper incisors and lower incisors makes the anchorage requirement higher in the upper arch than in the lower arch. Hence, miniscrews are often needed in the upper posterior area to reinforce anchorage on the upper arch.

For Class II cases, the required anchorage, critical for Class II correction and reduction of protrusion, is even higher in the upper arch. As for Class III cases, the limiting factor is usually the amount of retraction in the lower arch because of the limited thickness of the alveolar process in the symphyseal area. If the amount of retraction of the lower dentition is not adequate, the upper molars are doomed to move forward to achieve a molar Class I relationship. Therefore, anchorage reinforcement in the lower arch is critical for the profile improvement of the Class III protrusion cases.

Profile changes are also influenced by soft tissue

thickness.<sup>2</sup> The thicker the soft tissues, the less the profile is flattened after extraction treatment. The factors influencing retraction of upper lip include retraction of U1 incisal edge during treatment, pretreatment soft tissue thickness at subnasale, pretreatment upper lip thickness and vertical growth of nose during treatment. The amount of upper lip retraction is related to:

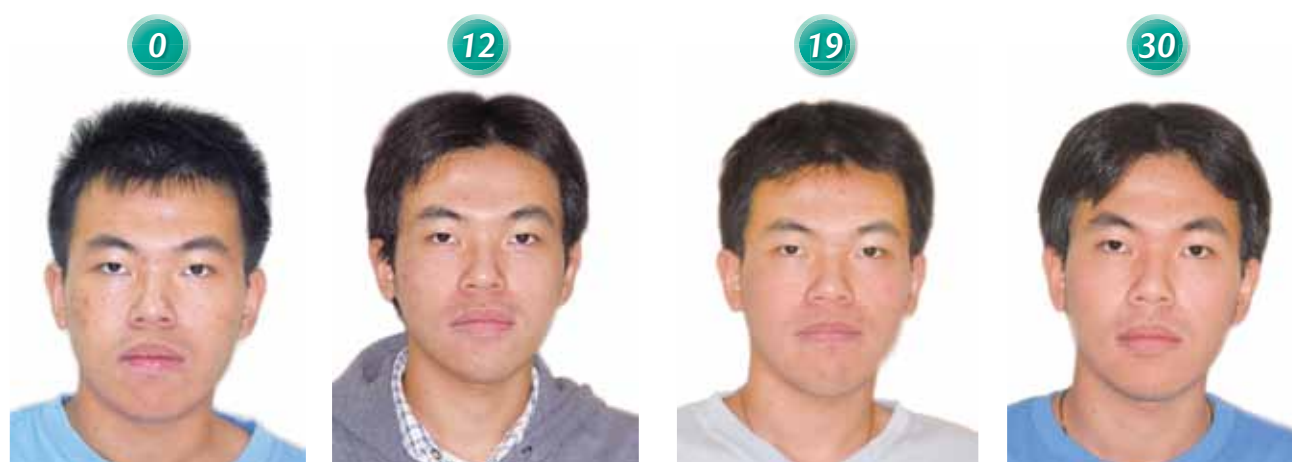
1. maxillary incisal edge retraction,
2. thickness of soft tissue at “subnasale” before treatment (*thinner tissue retracts more*),
3. thickness of the upper lip before treatment (*thinner lips retract more*), and
4. amount of nasal growth during the treatment period (*lips appear flatter as the nose increase in prominence*).

The soft tissue is quite thick for this patient, so the amount of profile change is decreased relative to incisor retraction. In order to correct the lip protrusion, more incisor retraction is needed. Mini-implant anchorage is a good tool for maximal retraction of the incisors in both arches.

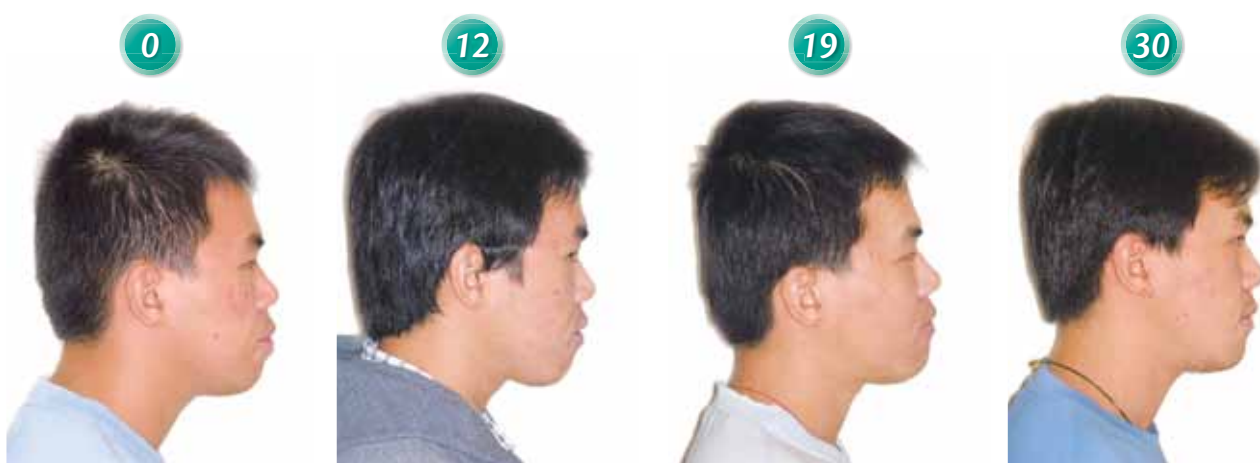
Sugawara's study<sup>3</sup> stated that the average amount of lower molar retraction with miniplate anchorage is 3.5mms at crown level and 1.8mms at root level. The amount of lower molar retraction in this

case was around 4mm, which resulted in nearly 6mm of the lower incisor retraction. This was the key element of the profile improvement in this case. The efficacy of miniscrew anchorage is the same as miniplate anchorage in terms of profile retraction in protrusion cases. The current position of miniscrews might limit further distal movement of lower molars. Extra-alveolar miniscrews buccal to the dental arches would allow for retraction of the

entire dental arches. This approach avoids the risk of root contact with miniscrews during active tooth movement. However, it is important for clinicians to recognize the limitations of the mechanics employed. Although maximal retraction is desired for many protrusion cases, the profile change should be evaluated periodically during treatment. If no further improvement occurs over a 6 month period, it is usually wise to terminate treatment (Figs. 16, 17).



■ Fig. 16: Progressive records of frontal profile



■ Fig. 17: Progressive records of lateral photographs



Dental midline deviation can be corrected after space closure with asymmetrical applications of miniscrew anchorage.<sup>4</sup> However, correction of the midline as the spaces are closed is the best approach. When there is no space for differential tooth movement, the arches may be skewed or tipped by continuing midline correction mechanics. Although the skeletal asymmetry was not improved, a camouflaged dental compensation was achieved efficiently with the help of miniscrew anchorage. With the asymmetric distal force applied to the upper left and lower right miniscrews, in conjunction with asymmetrical interarch elastics, the midline discrepancy was corrected 6 months later. However, these mechanics resulted in distal tipping of both molars (Fig. 8).

## Conclusion

Maximal retraction of both arches, with extractions and TADs for supplementing anchorage, provided good profile improvement for bimaxillary protrusion. Continued asymmetrical forces with the TADs and intermaxillary elastics corrected the midline discrepancy, but compromised the axial inclination of molars in the anchorage segments.

## Acknowledgment

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2. Yamada K, Kuroda S, Deguchi T, Takano-Yamamoto T,

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3. Sugawara J, Daimaruya T, Umemori M, Nagasaka H, Takahashi I, Kawamura H, Mitani H. Distal movement of mandibular molars in adult patients with the skeletal anchorage system. *Am J Orthod Dentofacial Orthop* 2004;125(2):130-8.
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## Discrepancy Index Worksheet

**TOTAL D.I. SCORE** 10
**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 = 0
**OVERBITE**

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

 Total = 0
**ANTERIOR OPEN BITE**

 0 mm. (edge-to-edge), 1 pt. per tooth  
 then 1 pt. per additional full mm. per tooth

 Total = 0
**LATERAL OPEN BITE**

2 pts. per mm. per tooth

 Total = 0
**CROWDING** (only one arch)

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

 Total = 4
**OCCLUSION**

Class I to end on	=	0 pts.
End on Class II or III	=	2 pts. per side <u>2</u> pts.
Full Class II or III	=	4 pts. per side <u>    </u> pts.
Beyond Class II or III	=	1 pt. per mm. <u>    </u> pts. additional

 Total = 2
**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  $\leq -2^\circ$  = 4 pts.

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

 Each degree  $> 6^\circ$       x 1 pt. =     
**SN-MP**
 $\geq 38^\circ$  = 2 pts.

 Each degree  $> 38^\circ$  1 x 2 pts. = 2
 $\leq 26^\circ$  = 1 pt.

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

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

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

 Total = 4
**OTHER** (See Instructions)

Supernumerary teeth		x 1 pt. = <u>    </u>
Ankylosis of perm. teeth		x 2 pts. = <u>    </u>
Anomalous morphology		x 2 pts. = <u>    </u>
Impaction (except 3 <sup>rd</sup> molars)		x 2 pts. = <u>    </u>
Midline discrepancy ( $\geq 3$ mm)	@ 2 pts. = <u>    </u>	
Missing teeth (except 3 <sup>rd</sup> molars)		x 1 pt. = <u>    </u>
Missing teeth, congenital		x 2 pts. = <u>    </u>
Spacing (4 or more, per arch)		x 2 pts. = <u>    </u>
Spacing (Mx cent. diastema $\geq 2$ mm)	@ 2 pts. = <u>    </u>	
Tooth transposition		x 2 pts. = <u>    </u>
Skeletal asymmetry (nonsurgical tx)	@ 3 pts. = <u>    </u>	
Addl. treatment complexities		x 2 pts. = <u>    </u>

Identify:

 Total = 0

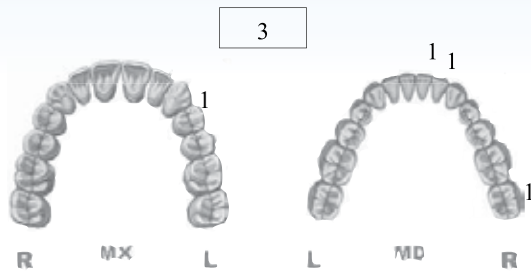


## Cast-Radiograph Evaluation

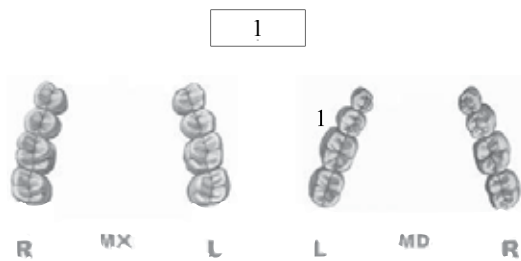
Case # 3 Patient

Total Score: **7**

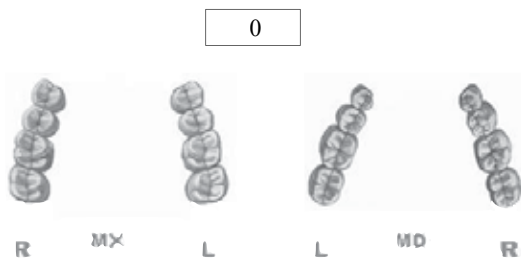
### Alignment/Rotations



### Marginal Ridges



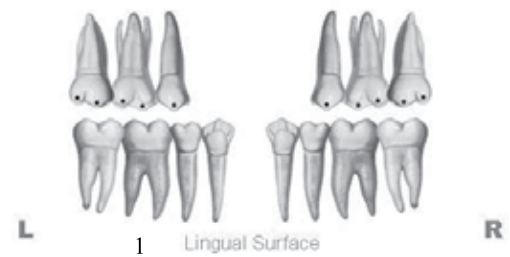
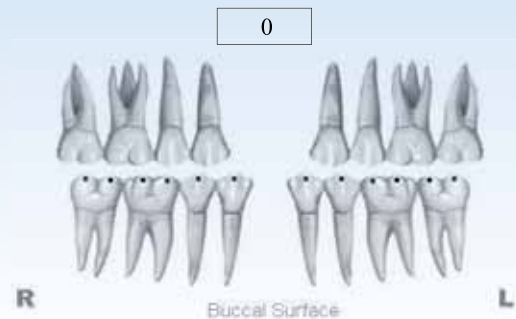
### Buccolingual Inclination



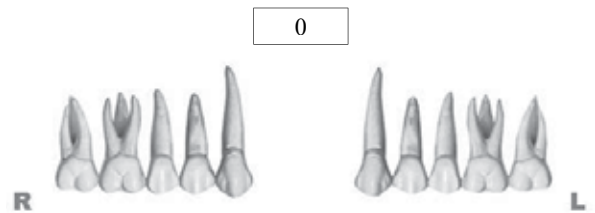
### Overjet



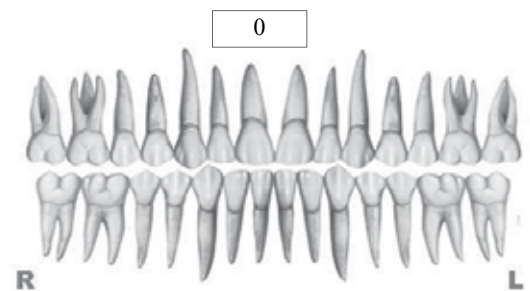
### Occlusal Contacts



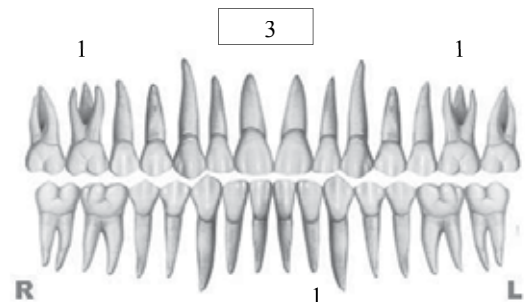
### Occlusal Relationships



### 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.

# A Class III Mutilated Malocclusion Treated with Orthodontics and an Implant-Supported Prosthesis

## History And Etiology

A 24 year old female was referred by her dentist for orthodontic consultation (Fig. 1). Her chief concern was difficulty in incising food and chewing with her posterior missing teeth (Figs. 2-3). There was no contributory medical history, but she had an extensive dental treatment history involving extractions, endodontics and multiple restorative procedures. To restore optimal occlusal function, an interdisciplinary treatment plan was proposed that included orthodontics, implant site preparation, an implant-supported prosthesis, and new crowns on the maxillary incisors. The patient was treated to an optimal result as documented in Figs. 4-9. The details of diagnosis and treatment will be discussed below.

## Diagnosis

Cephalometric and panoramic radiographs (Fig. 7) document the complexity of the malocclusion. Following extraction of the maxillary right first molar, the second molar moved mesially and the maxillary sinus enlarged, so that there was inadequate alveolar bone to serve as an implant site. To place an implant-supported prosthesis in the maxillary right quadrant, a sinus lift bone graft or orthodontic site development is required.



Fig 1: Pretreatment facial photographs



Fig. 2: Pretreatment intraoral photographs



Fig. 3: Pretreatment study models



Dr. Yu Lin Hsu, Lecturer, Beethoven Orthodontic Course (right)  
 Dr. Chris HN Chang, Director, Beethoven Orthodontic Center (middle)  
 Dr. Eugene W. Roberts, Consultant,  
 International Journal of Orthodontics & Implantology (left)



Fig. 4: Posttreatment facial photographs



Fig. 5: Posttreatment intraoral photographs



Fig. 6: Posttreatment study models

#### Skeletal:

- Skeletal Class III (  $SNA\ 86^\circ$ ,  $SNB\ 87^\circ$ ,  $ANB\ -1^\circ$  )
- Insufficient bone height for implants in areas #13 & 15

#### Dental:

- Right Class I molar relationship
- Left Class III canine relationship
- Missing teeth #1, 5, 13, 15, 16, 19, 32
- Anterior cross bite of #6 - 10
- Posterior cross bite of #4
- Crowding in the mandibular arch
- Dental Midlines: maxillary 2mm right of the facial midline, mandibular 3mm right of the maxillary midline.
- Ill-fitting prostheses restoring #7, 8, 9, 10
- Incomplete endodontic treatment of #6

#### Facial:

- Straight profile with slightly protrusive lower lip
- Facial asymmetry: chin point deviated to right (Fig. 10)

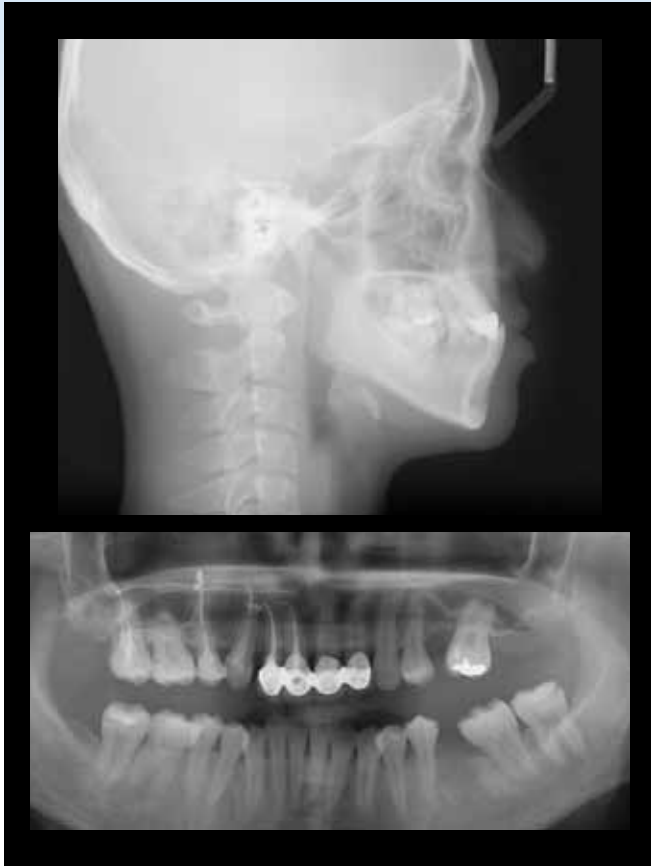
### Specific Objectives Of Treatment

#### Maxilla ( all three planes ):

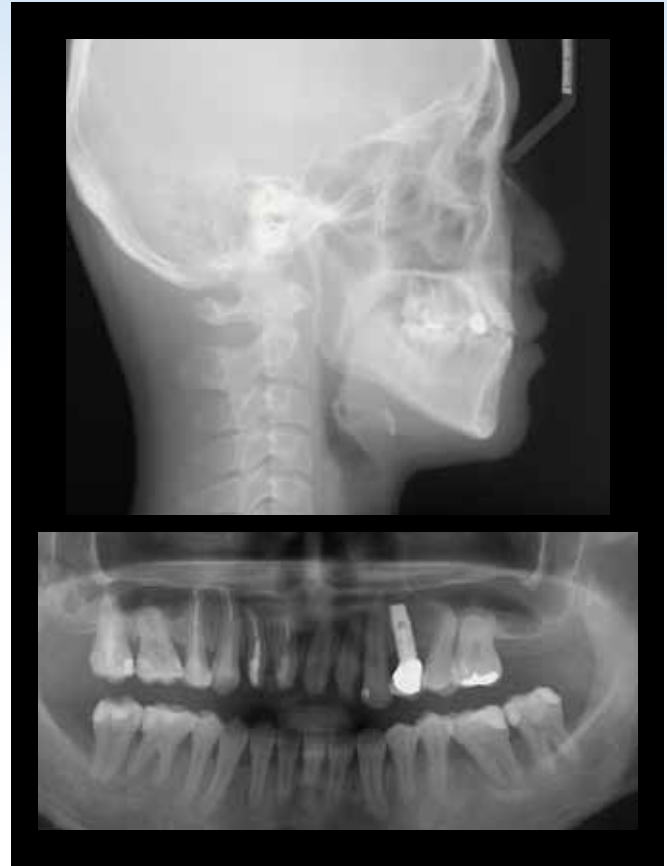
- A - P: Maintain
- Vertical: Maintain
- Transverse: Maintain

#### Mandible ( all three planes ):

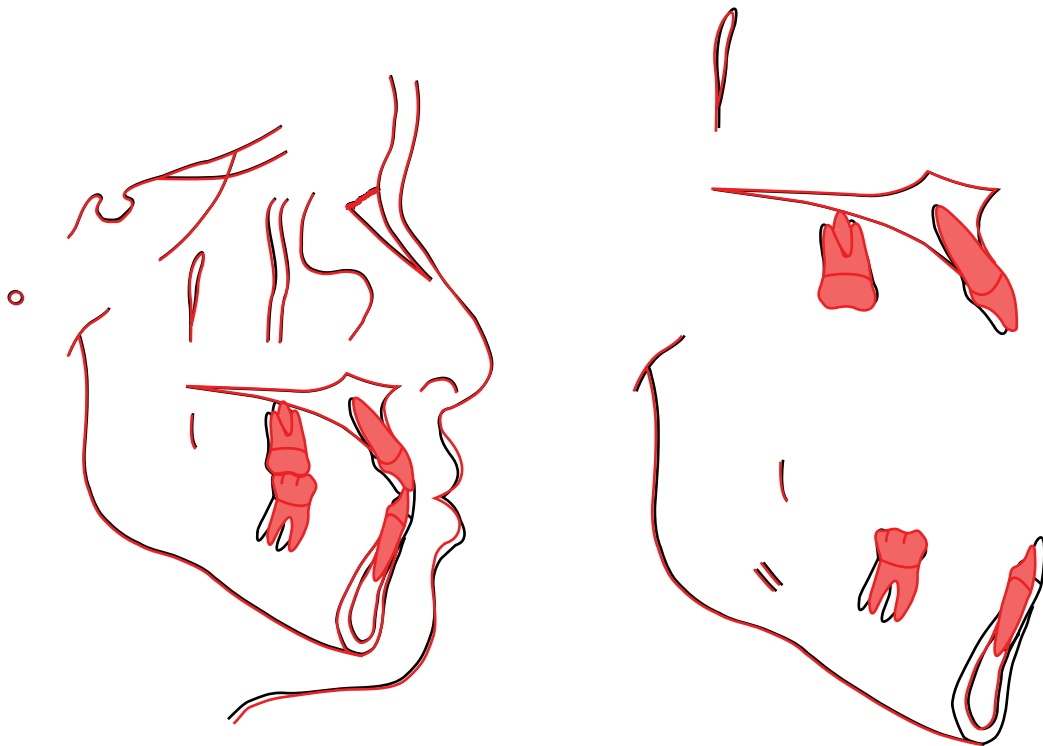
- A - P: Maintain



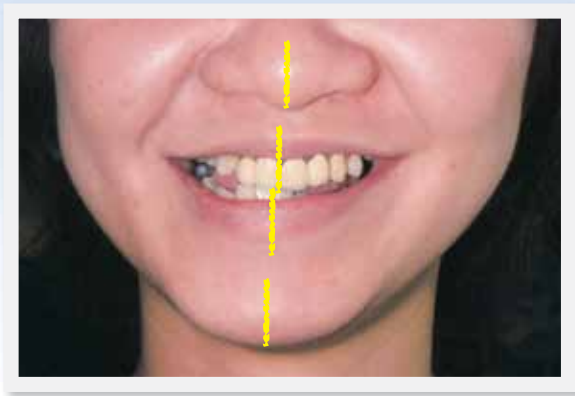
■ Fig. 7: Pretreatment pano and ceph radiographs



■ Fig. 8: Posttreatment pano and ceph radiographs



■ Fig. 9: Superimposed tracings revealed maxillary incisors tipping, mandibular incisors intrusion, and mandibular molar tipback .



■ Fig. 10:

Maxillary dental midline: a 3mm shift to the right of the facial midline. Mandibular dental midline: a 2mm shift to the right of the maxillary dental midline. Chin point deviated to the right of the facial midline.

- Vertical: Maintain
- Transverse: Maintain

#### Dentition :

- Correct Class III canine and molar relationship
- Correct anterior and posterior crossbite
- Create enough space for implantation of maxillary premolar
- Relieve mandibular crowding and close the remaining space
- Midline correction
- Remake prostheses for teeth #7, 8, 9, 10
- Implant-supported prosthesis to replace a maxillary premolar after orthodontic treatment

#### Facial Esthetics:

- Retract protrusive lower lip

The ABO Discrepancy Index (DI) was 39 as shown in the subsequent worksheet.<sup>1</sup>

### Treatment Plan

An orthognathic surgical approach was discussed for this asymmetric Class III malocclusion. However, the patient preferred a camouflage plan involving extraction of right lower 2<sup>nd</sup> premolar. Two options

were presented for restoring the maxillary left posterior segment: 1. an implant to replace #13, or 2. retraction of #12 for implant site development. Since the first option was more difficult and less predictable,

the orthodontics approach for implant site development was selected to produce a relatively flat bone area with sufficient height to receive an implant.

A full fixed orthodontic appliance was indicated to align and level the dentition. In the initial stage of treatment, an implant space was created between the left maxillary canine and first premolar. Mandibular anterior bite turbos assisted in overbite and overjet correction. Class III elastics were used to resolve the sagittal occlusal discrepancy, and detailing bends produced the final occlusion. The fixed appliances were removed and the corrected dentition was retained with fixed anterior retainers in both arches: Mx 2-2, Md 3-3.

### Appliances And Treatment Progress

After extracting the right mandibular 2<sup>nd</sup> premolar, both arches were bonded with .022"

Damon Q® brackets (Ormco). The low torque brackets to help prevent flaring were selected for the maxillary anterior provisional crowns (Fig. 11). Bite turbos were bonded on the mandibular central incisors to facilitate the correction of the anterior crossbite (Fig. 12,13). The patient was instructed to wear Class III elastics (Parrot 5/16, 2 oz.) full time.

In the 4<sup>th</sup> month of treatment, the NiTi open coil spring was placed between #11 and #12 (Fig. 14). The improvement in overjet from -2mm to 1mm





■ Fig. 11:

After fabricating 4 individual ortho. provisional crowns, bond ant. braces following the smile & gingival margin position.



■ Fig. 12:

Bond anterior bite turbos on the lower central incisors and apply light inter-arch elastics (2oz parrot, U6 to L3)

in 4 months was due to the combination of the anterior bite turbos, Class III elastics, and the patient's cooperation with treatment (Figs. 12-13). Both of the arch wires were changed to .014x.025 CuNiTi in the 7<sup>th</sup> month of treatment, and the position of the bite turbos was changed to the maxillary premolars.

In the 8<sup>th</sup> month, the mandibular arch wire was changed to .017x.025 TMA, and the bite turbos were removed. The crossbite elastics were applied, from the lingual buttons bonded on the maxillary 1<sup>st</sup> molars, to the tubes of mandibular molars. Power chains were placed on the mandibular arch to close the space.

After 10 months, the mandibular space was closed



■ Fig. 13,14:

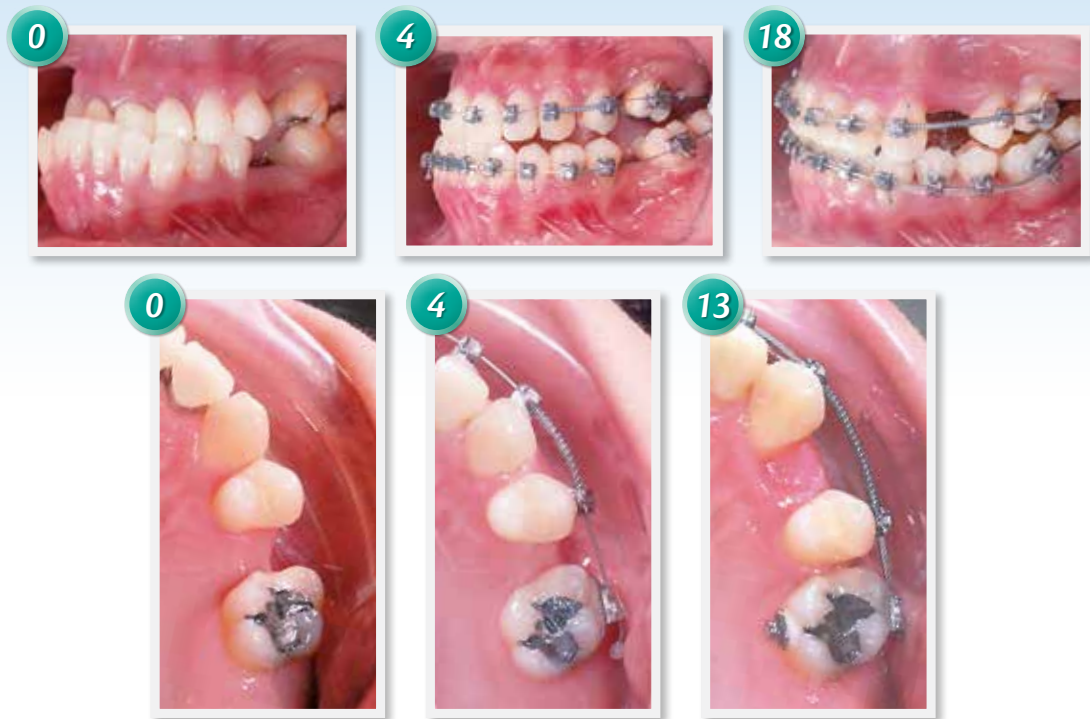
After 4 months of the orthodontic treatment, the negative overjet reached an edge to edge position.

and #12 was in contact with #14 (Fig. 15). In the 18<sup>th</sup> month, a panoramic radiograph was taken to evaluate the space for implants (Fig. 16). The implant placement procedure was designed at this time.

## Implant Placement

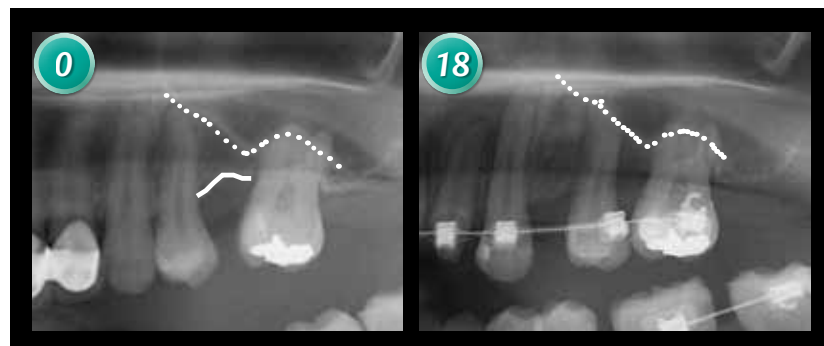
Before surgery, a three-dimensional cone beam computed tomography (CBCT) image was taken to evaluate bone density and volume: Height 13 mm and BL width 6mm was adequate for a 4x11.5 mm EZ Plus implant. The anatomic structure of the implant site is shown in Fig 17. A surgical stent was designed to guide the mesial-distal (M-D) and buccal-lingual (B-L) position. The implant fixture level was 3mm below the future crown margin), the angulation was less than 15° and the distance from adjacent teeth was at least 1.5mm (Figs. 18-19).<sup>2</sup>

A mid-crestal incision was executed with a number 15 scalpel blade, and sulcular incisions were performed with a number 12 scalpel blade on the buccal and palatal surfaces of the adjacent teeth. After exposing the bone with full thickness flaps,



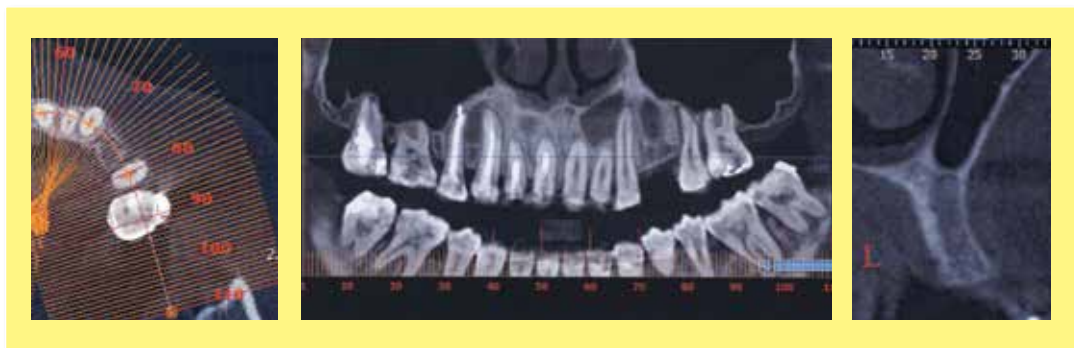
■ Fig. 15:

Retract #12 for implant site development with an open coil spring. The Atherton's patch was noticed over distal site of the #11 in the 13<sup>th</sup> month of the treatment.



■ Fig. 16:

Retract #12 for implant site development with open coil spring. The bone level of #12 space is more sufficient for implant fixture rather than #13 (sinus floor and tilted bone level).



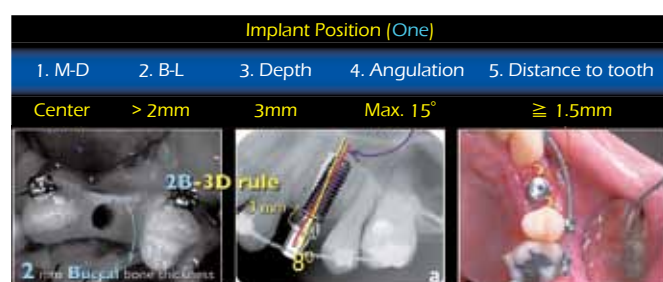
■ Fig. 17:

A three-dimensional cone beam computed tomography (CBCT) image was taken to evaluate bone density, volume (H: 13 mm BL: 6 mm, implant size: 4x11.5 mm EZ Plus), and the anatomic structure of the implant site.



■ Fig. 18:

A surgical stent was designed to guide the implant position.



■ Fig. 19:

A surgical stent was designed to guide mesial-distal (M-D) position, buccal-lingual (B-L) position, implant fixture level position (3 mm below the future crown margin), angulation (less than 15°) and distance from adjacent teeth (at least 1.5 mm).

the buccal flap was sutured on the cheek and the palatal flap was pulled palatally with a needle holder to obtain a clear surgical view of the implant site (Fig. 20).

A surgical stent was used to guide the implant fixture to position 3mm below the planned crown margin (Fig. 21). After leveling the edentulous area with a bone scraper (Fig. 22), the width of the ridge was 6.5mm. A fixture with dimensions of 4.0x11.5mm was inserted into the ridge following the implant manufacturer's recommended drilling and insertion protocol. Buccal bone thickness of 2mm was preserved after the osteotomy procedure (Figs. 23-25). The healing abutment was placed (Figs. 26-27).

A bony concavity was noticed after the fixture insertion, but there was no fenestration of the implant (Fig. 26). A free gingival graft was harvested



■ Fig. 20:

The buccal flap was sutured on the cheek and the palatal flap was pulled palatally with a needle holder.



■ Fig. 21:

Surgical stent was used as a guide for implant fixture level position (3mm below future crown margin).



■ Fig. 22: leveling the edentulous area with bone scraper.

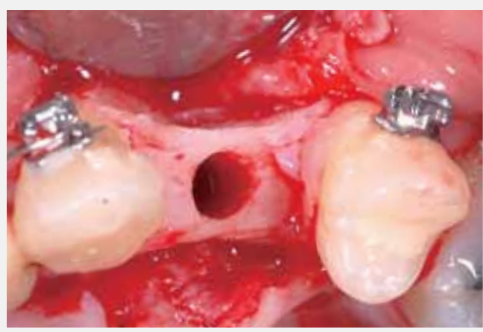


■ Fig. 23: Osteotomy procedure started from first lance drill.

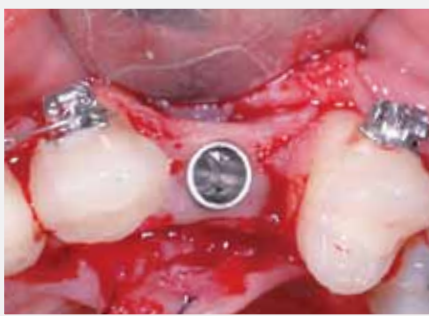




■ Fig. 24: Use guide pin to check the axis.



■ Fig. 25:  
Preserve 2mm thickness of the buccal bone after osteotomy procedure.



■ Fig. 26:  
EZ plus implant fixture 4x11.5 mm was inserted into prepared site.

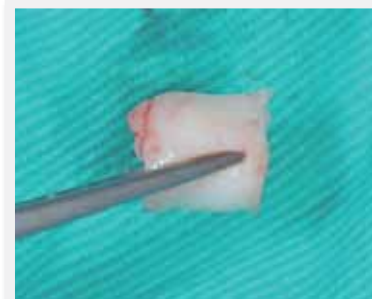


■ Fig. 27:  
Connect with healing abutment. Bony concavity was noted and there was no fenestration over apical area of the implant.

from the tuberosity area (Fig. 28a,b) and the epithelium layer was removed with a number 15c scalpel blade (Fig. 29). The resulting connective tissue graft was then positioned under the buccal flap, and retained with catgut sutures (Fig. 30). The flap was repositioned and sutured with interrupted 5-0 nylon sutures. Note the catgut suture securing the connective tissue graft (Fig. 31). After 1 week, the sutures were removed and a follow-up periapical film was taken (Fig. 32a,b,c). The prosthesis was planned for delivery following a 6 month healing interval.



■ Fig. 28a,b: Harvest free gingival graft from tuberosity.



■ Fig. 29: Remove epithelium layer with No.15c scalpel.



■ Fig. 30:

*Tuberosity graft was fixed beneath the buccal flap with catgut suture.*



■ Fig. 31:

*The flap was sutured with interrupted 5-0 nylon sutures, and the catgut suture was shown.*



■ Fig. 32a,b,c:

*After 1 week, suture were removed. Check periapical film.*

## Orthodontic Finishing Stage

A panoramic radiograph was taken to evaluate bracket positions relative to the axial inclinations of all teeth. Two weeks prior to the completion of active treatment, the upper archwire was sectioned distal to cuspids. Light up-and-down elastics (2 oz) were used posteriorly for final detailing of the buccal segments. The wire sequence was: .014 NiTi, .014x25 NiTi, .017x25 TMA, and .19x25 SS. After 31 months of active treatment, all appliances were removed. Upper clear overlay and fixed anterior (Mx 2-2, Md 3-3) retainers were delivered for both arches.

## Prosthesis Fabrication

In the 31<sup>th</sup> month of orthodontic treatment (including 13 months of implant healing), the brackets were debonded and referred for restorative management. The healing abutment was removed (Fig. 33) and replaced with an angled abutment (Fig. 34a,b). After abutment preparation (Fig. 33c,d), the gingival retraction cord was positioned in the gingival sulcus with packing-placement instruments (Fig. 34e,f). A direct impression, made with polyvinyl siloxane, was poured with type IV dental stone, and the casts were subsequently articulated using the appropriate



■ Fig. 33:

*In the 31<sup>th</sup> months of orthodontic treatment (including 13 months of implant healing period), Orthodontic treatment was finished and implant prosthesis procedure had been arranged. Healing abutment was removed and intact sulcus was noticed.*

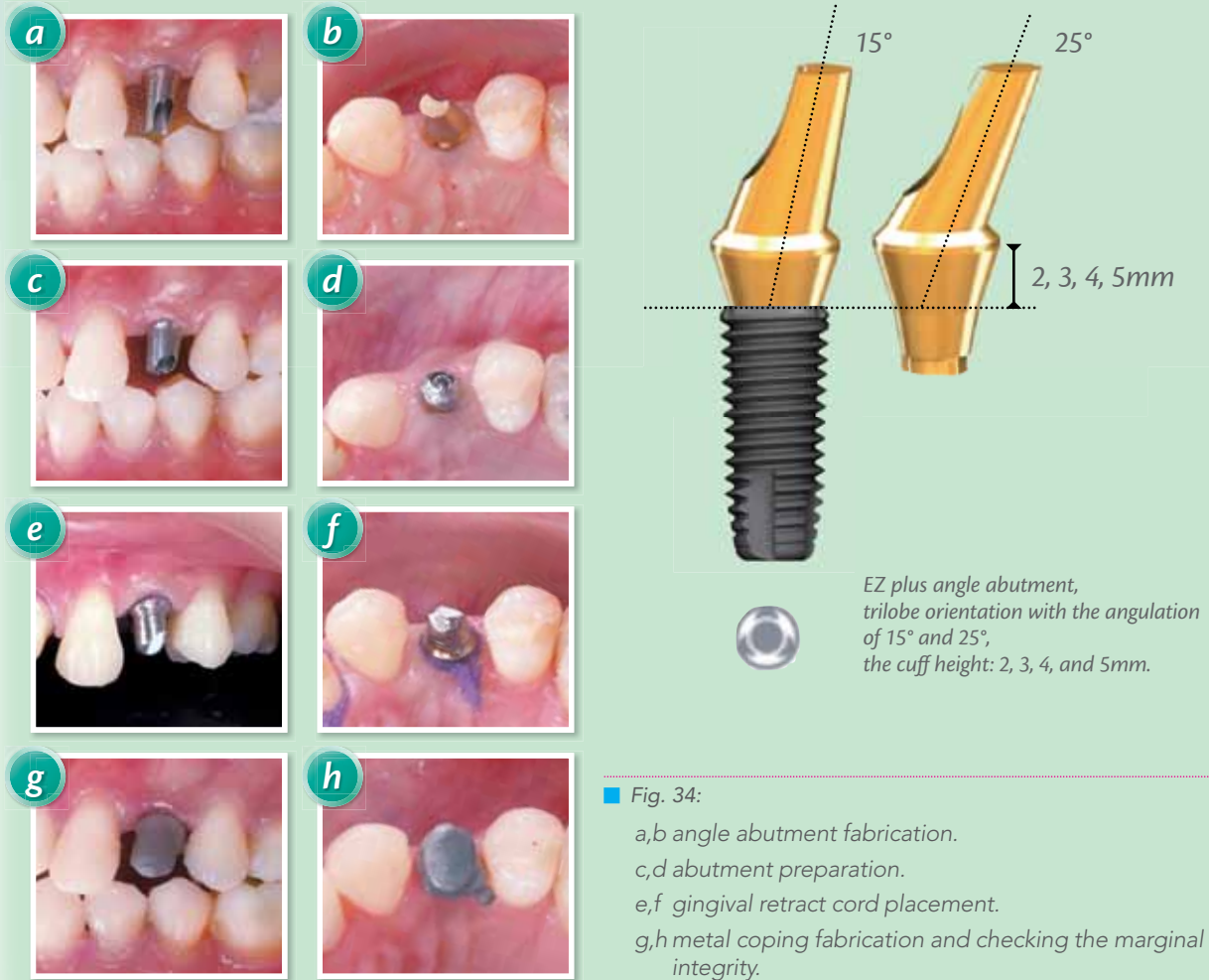


Fig. 35: Appropriate tightness of the contact area was confirmed with dental floss. The occlusal area was made of porcelain for esthetic concern.



check-bite records. A metal coping was fabricated by the laboratory, and the marginal integrity was verified with a dental explorer (*Fig. 34g,h*). After completion of the final prosthesis, appropriate tightness of the contact area was confirmed with dental floss. The occlusal area was made of porcelain because of the patient's esthetic concerns. After clinical adjustment and verification of the fit and occlusion, the definitive crown was completed and luted into place with temporary cement (*Figs. 35-36*).



■ *Fig. 36:*

Take peri-apical film was taken for checking margin integrity.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	86°	87°	1°
SNB°	87°	86.5°	0.5°
ANB°	-1°	0.5°	1.5°
SN-MP°	38°	38°	0°
FMA°	31°	31°	0°
DENTAL ANALYSIS			
U1 TO NA mm	5 mm	8 mm	3 mm
U1 TO SN°	115°	118°	3°
L1 TO NB mm	8 mm	7 mm	1 mm
L1 TO MP°	82°	81°	1°
FACIAL ANALYSIS			
E-LINE UL	-2 mm	-1 mm	1 mm
E-LINE LL	2 mm	0.5 mm	1.5 mm

■ Table. 1: Cephalometric summary

The crown remover on the lingual side was trimmed off a week later.

## Results Achieved

### 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: Slightly flared incisors ~ 3degrees
- Vertical: Maintained
- Inter-molar / Inter-canine Width: Maintained

### Mandibular Dentition

- A - P: Incisors retracted
- Vertical: Molar uprighed
- Inter-molar / Inter-canine Width: Maintained

Facial Esthetics: Lower lip retruded

## Retention

The fixed retainer was bonded on all maxillary incisors and from canine to canine in the mandibular arch. An upper clear overlay was delivered with instructions to wear it full time for the first 6 months and nights only thereafter. The patient was also instructed in the home care and maintenance of the retainers.

## Final Evaluation Of Treatment

The ABO Cast-Radiograph Evaluation score was 19 points. The major discrepancies were alignment/rotation, marginal ridges, and root angulation (*Fig. 37*).<sup>1</sup> The anterior crossbite, contributing to the



■ Fig. 37: The major discrepancies were alignment/rotation, marginal ridges, and root angulation.

Class III relationship was corrected. The orthodontic movement of #12 before the implantation simplified the surgical procedure. Overall, this complex case was treated to an acceptable dental result by combined orthodontic and implant-prosthetic treatment.

## Discussion

The classical belief holds that a force acting on a tooth generates bone resorption on the pressure side of the periodontal ligament (PDL) and apposition on the tension side, but that a tooth can only be moved within existing bone. But clinical experience has shown that it's possible to move teeth through many anatomic limitations such as the sinus floor, sutures, or cortical bone barriers.<sup>3</sup> The concept that teeth can be moved "*with the bone*" is really movement of a tooth "*through the bone*" because new bone forms ahead of it. "Force level" and especially the "moment to force ratio" determines the distribution of orthodontic forces within the periodontal structures. When a therapeutic force is initially applied, hyalinization occurs in the PDL, necessitating (*undermining*) resorption before substantial movement occurs. On the other hand, the tooth will rapidly form new bone

in areas of PDL tension, by an extensive proliferative response to make new osteoblasts.<sup>4</sup> Radiographic evaluation of orthodontic tooth movement revealed that 6 months of active treatment resulted in bodily movement through the floor of the maxillary sinus. The tooth retained its alveolar bone support by inducing new bone in the path of tooth movement. There was no loss of connective tissue or gingival attachment. The space opened in the maxillary premolar area allowed for the insertion of an implant to support a prosthetic crown. The result of the present clinical case suggest that a tooth with a healthy periodontium can be orthodontically moved through the maxillary sinus while maintaining pulp vitality, bone support and exhibiting a normal width of the periodontal ligament both on the pressure and tension sides.<sup>5</sup> An adequate implant site was generated orthodontically, so a sinus lift surgical augmentation procedure was not necessary.<sup>6</sup>

When a tooth is moved, changes may be observed in the surrounding gingiva. Movement of a tooth may result in an opening (*eversion*) of the gingival sulcus on the trailing tooth surface, producing a red patch, and also epithelial creases in the path of tooth movement.<sup>7</sup>

Evaluating the success of an implantation procedure requires an assessment of gingival esthetic changes after surgical healing and prosthesis delivery (*the IBOI Pink & White Esthetic Score*).<sup>8</sup> Implant position and abutment selection are also major concerns for the esthetic result. Two items have been added to the IBOI esthetic score. Assessing the IBOI Implant-Abutment Transition & Position Analysis requires assessment of: 1. Implant position, and 2. implant-abutment transitional contour (Fig. 38).<sup>9</sup>



Fig. 38:

IBOI esthetic score system for implant/ restorations evaluation, including: pink esthetic, white esthetic, implant position and transitional contour.

## 1. Pink esthetic score

The gingival response is assessed by the Pink Esthetic Score (PES),<sup>10</sup> from clinical photographs. Six variables are scored from 0→2: mesial & distal papillae, keratinized gingiva, curvature of the gingival margin, level of the gingival margin, root convexity (*torque*), and scar formation.

Mesial and distal papillae are assessed for a complete papilla (*score 0*), incomplete papilla, (*score 1*), or absence of a papilla (*score 2*). The keratinized gingiva is scored as thick biotype (*score 0*), thin biotype (*score 1*) or absence of keratinized gingiva (*score 2*). The curvature of the gingival margin, also defined as the line of emergence of the gingival margin, is evaluated as being identical to comparative teeth (*score 0*), slightly different (*score 1*), or markedly different (*score 2*). The level of the gingival margin is scored by comparison to the contralateral tooth in terms of an identical vertical level (*score 0*), a slight ( $\leq 1\text{mm}$ ) discrepancy (*score 1*), or a major ( $\geq 1\text{mm}$ ) discrepancy (*score 2*). The root convexity (*labial eminence*) combines three additional specific soft tissue parameters as one variable: presence (*score 2*), partial presence (*score 1*), or absence (*score 0*) of a convex profile in the facial aspect. The scar formation is scored by the absence of scar (*score 0*), moderate scar formation (*score 1*), and severe scar formation (*score 2*).

## 2. White esthetic score

The white esthetic score (WES) for the anterior segment is assessed from clinical photographs. Six variables are scored from 0→2: midline, incisor curve, axial inclination, contact area, tooth proportion, and tooth to tooth proportion. For a single crown, there are also 6 variables: tooth form, mesial & distal outline, crown margin, translucency, hue & value, and tooth proportion.

### For micro-esthetic score:

The midline is evaluated as follows: upper midline equal to lower midline (*score 0*), midline off <3mm (*score 1*), or midline  $\geq 3\text{mm}$  (*score 2*). The incisor curve is scored as a smooth curve (*score 0*), uneven



curve (*score 1*) or missing curve with or without crowding (*score 2*). The axial inclination, aligned with standard angulation 5°, 8°, 10°: (*score 0*), slightly different: (*score 1*), or crowding/spacing: (*score 2*). The contact area is assessed as the ratio of the contact area to crown length from central incisor to canine: ideal proportion 50% : 40% : 30% (*score 0*), asymmetrical contact areas on mesial and distal (*score 1*), or elongation of the contact area (*score 2*). Tooth proportion is scored as follows: 1: 0.8 (*score 0*), slightly too long (*score 1*), excessively long (*score 2*). Tooth to tooth proportion should follow the golden proportion ( 1.6:1:0.6 ): (*score 0*), a slight discrepancy (*score 1*), missing/ crowding teeth (*score 2*).

#### White esthetic score for a single restoration:

A score of 2, 1, or 0 is assigned for all six parameters. Thus, in the case of an optimum implant/tooth restoration, a score of 0 is recorded. All six parameters are assessed by direct comparison with a natural contralateral reference tooth, by estimating the degree of match or eventual mismatch. In the case of an optimum duplication of the esthetically relevant features, relative to the control tooth, a score of 0 is assigned.

For the Pink Esthetic Score, the insufficient soft tissue contour and loss of the papillae are scored. The supra-gingival porcelain margin and narrow outline of the crown are evaluated on the WES. This score is optimized by an ideal implant position and abutment selection.

### 3. Implant position

There are 5 keys<sup>11</sup> for placing the implant during the surgical procedure: mesial-distal (M-D) position, buccolingual (B-L) position, depth, angulation,

and distance to adjacent anatomical structures. A detailed description of each key follows:

- A. M-D position: The hole to receive the implant should align with the center of the restored crown (*score 0*), shift to one side (*score 1*), and close to or touching an adjacent tooth (*score 2*). A surgical stent may be used as the guide.
- B. B-L position: It is important to preserve 2mm of buccal bone thickness after implant placement (*score 0*). If the buccal bone plate is less than 2mm, the options are: (a) place the implant more lingually, (b) choose a smaller diameter implant fixture, and/or (c) augment buccal bone with a guided bone regeneration (GBR) procedure to improve buccal bone thickness. If the buccal bone plate is less than 2mm (*score 1*), and if there is no buccal bone plate (*score 2*).

For the present patient, the 2mm buccal bone plate was preserved. Viewing the CBCT slices, the concavity of the middle portion of the bone ridge was noted. After implant insertion, a CT graft was harvested from the tuberosity area, and sutured beneath the buccal flap, to augment the soft tissue thickness. In retrospect, a larger CT graft and/or combination with particulate bone graft would have provided a more harmonious soft tissue profile (Fig. 39).

- C. Depth: The implant fixture should be placed 3mm below the future crown margin (*score 0*). If less than 3mm (*score 1*), and if deeper than 3mm (*score 2*).<sup>12</sup>
- D. Angulation, the implant axis should be parallel with the adjacent teeth (*score 0*). It's important to place the guide pin and take a peri-apical X-ray

film to check the axis before implant insertion. Especially when orthodontics is used to open a space, the patient should be referred for an X-ray to check the root position of the adjacent teeth. If an adjacent root is too close, it's difficult for the surgeon to insert the implant without damaging it. If the tilted angulation is less than 15 degrees (*score 1*), or more than 15 degrees (*score 2*). In the present case, the axis of the implant fixture was aligned with the canine during the surgical stage. But the panoramic film showed that the axis was distally tilted ~8 degrees. That was the reason the angled abutment was used for axis correction. When opening a space with orthodontics, special care must be taken to apply an adequate moment to control the root position. An x-ray of the guided pin should be taken before implant fixture insertion (Fig. 40).

- E. Distance to adjacent anatomical structures: For a single implant, the fixture should be at least 1.5mm away from adjacent teeth to preserve the proximal bone level (*score 0*). If less than 1.5mm *score 1*, or if touching an adjacent tooth or other important anatomical structure *score 2*.

#### 4. Implant-abutment transitional contour

There are nine factors which affect final esthetic result: fixture cervical design, platform switching, implant-abutment (I-A) connection type, abutment selection, screw hole position, marginal bone loss, sulcus height, modified gingival contour, and crown margin fit. The last four items are assigned a score.

Fixture cervical design: For esthetic reasons, a bone level implant should be selected, which does not

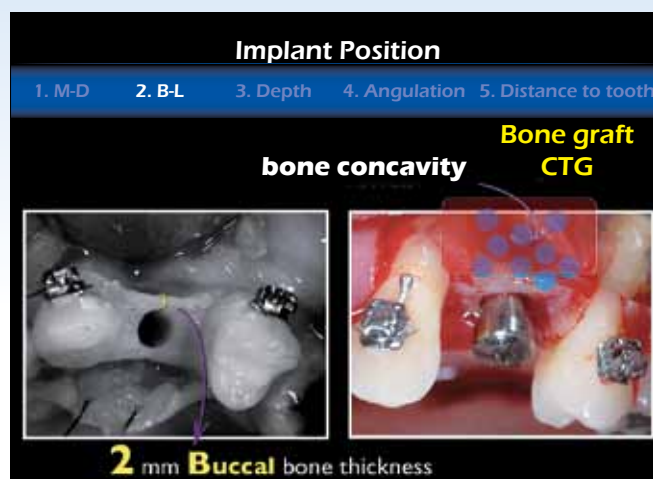


Fig. 39:

In this case, we preserved the 2mm buccal bone plate. From the slice view of the CBCT, the concavity of middle portion of the bone ridge was noticed. After implant insertion, we harvested CT graft from the tuberosity area and sutured beneath the buccal flap for augmentation of the soft tissue thickness. If we treat this kind of case again, larger CT graft and/or combination with particle bone graft on this area may provide more harmonious soft tissue profile.

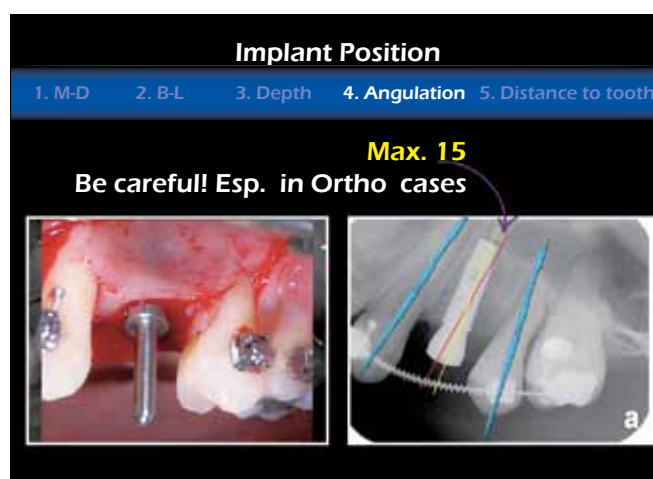


Fig. 40:

In our case, the axis of the implant fixture was aligned with the canine during surgical stage. But the panorex film showed the axis was too distally tilted by 8 degrees. That was the reason we used the angle abutment for axis correction. For this kind of case, after opening a space special care must be taken with orthodontic torque control for root axis. An x-ray of guided pin should be taken before implant fixture insertion.

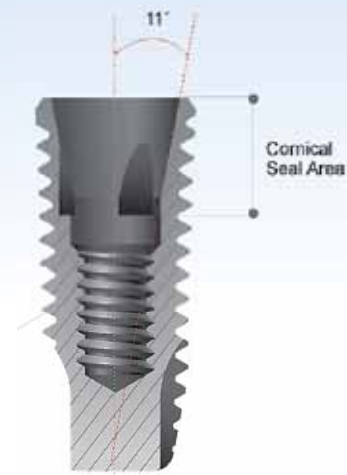
have a smooth collar on the cervical portion of the fixture.

Platform switching and I-A connection type (*E: external connection, I: internal connection*): For example: EZ Plus implant has platform switching design, which maintains crestal bone. In addition, an 11° morse taper produces a conical seal which forms a cold weld between the abutment and the implant (Fig. 41). The platform switching and morse taper design prevent microgap movement, and promotes a beautifully keratinized soft tissue response.

Abutment selection (*S: screw-retained, C: cement-retained*): For a cement-retained abutment, there are many choices for different situations: one-piece, two-piece, custom milling, or a UCLA customized abutment. For the present patient, an angled abutment (15° with cuff height of 4mm) was selected to compensate for the long axis of the implant (Fig. 42). After abutment fabrication, the preparation procedure was carried out intra-orally.

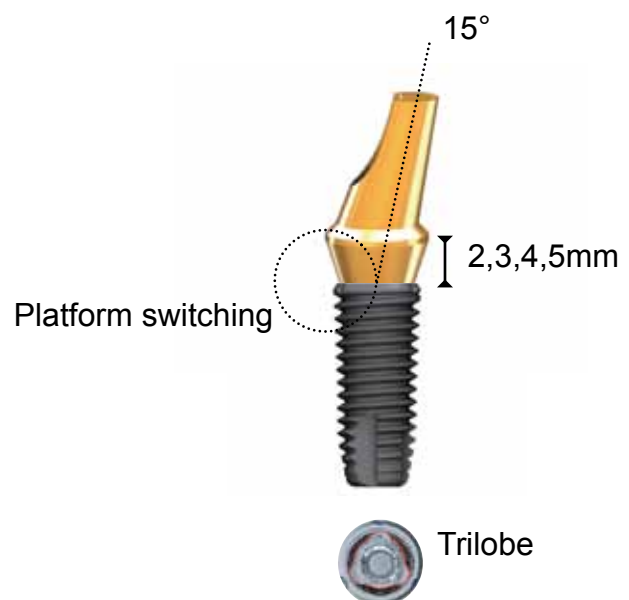
Screw hole position (*B: buccal, L: lingual*): In this case, the screw hole to retain the crown was visible on the labial surface of abutment. The screw-retained prosthesis will be esthetically compromised when the patient smiles due to an obvious screw hole.

Marginal bone loss: If there is no bone loss at the time of crown delivery, the score is 0. According to ICOI Consensus conference meeting in 2007 (Fig. 43), the criteria for a successful implant is defined as: a. no pain or tenderness upon function, b. no mobility, c. <2mm radiographic bone loss from the initial surgery, and d. no history of exudation. If < 2mm bone loss at the time of crown delivery score 1, and



■ Fig. 41:

EZ Plus implant has platform switching design, which maintains crestal bone, and in addition, it incorporates an 11° morse taper, producing a conical seal which forms a cold weld between the abutment and the implant.



■ Fig. 42:

Angle abutment (15° with cuff height 2,3,4, or 5 mm) for axis compensation. The platform switching and morse taper design prevent microgap movement and allow for a beautifully keratinized tissue response.



Implant Quality Scale Group	Clinical Concitions
I. Success ( <i>optimum health</i> )	<ul style="list-style-type: none"> <li>a) No pain or tenderness upon function</li> <li>b) 0 mobility</li> <li>c) &lt; 2mm radiographic bone loss from initial surgery</li> <li>d) No exudates history</li> </ul>
II. Satisfactory survival	<ul style="list-style-type: none"> <li>a) No pain on function</li> <li>b) 0 mobility</li> <li>c) 2-4mm radiographic bone loss</li> <li>d) No exudates history</li> </ul>
III. Compromised survival	<ul style="list-style-type: none"> <li>a) May have sensitivity on function</li> <li>b) No mobility</li> <li>c) Radiographic bone loss &gt; 4mm (less than 1/2 of implant body)</li> <li>d) Probing depth &gt; 7mm</li> <li>e) May have exudates history</li> </ul>
IV. Failure ( <i>clinical or absolute failure</i> )	Any of following: <ul style="list-style-type: none"> <li>a) Pain on function</li> <li>b) Mobility</li> <li>c) Radiographic bone loss &gt; 1/2 length of implant</li> <li>d) Uncontrolled exudate</li> <li>e) No longer in mouth</li> </ul>

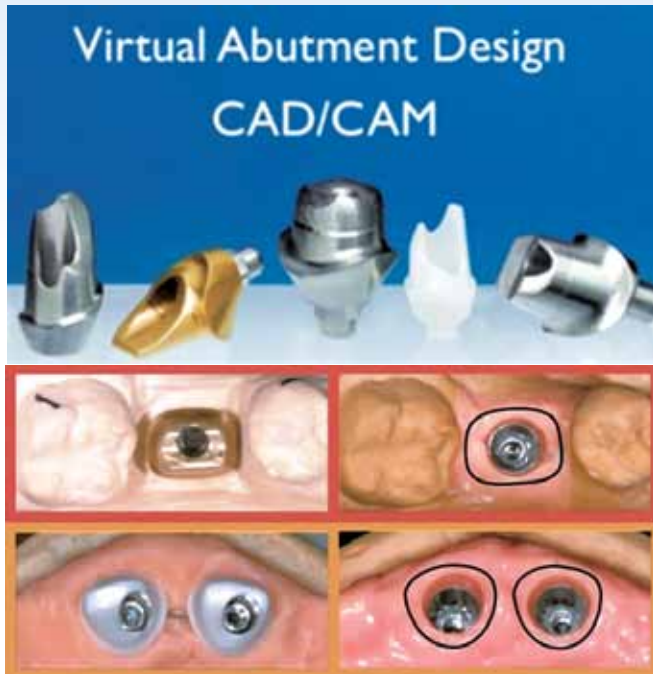
■ Fig. 43. ICOI, Consensus conference meeting, 2007: Criteria for implant success

if more than 2mm bone loss score 2. For the present patient, the marginal bone loss was about 1.8mm after abutment connection. The follow-up protocol is necessary for evaluation of the implant success rate long-term.

**Sulcus height:** The ideal sulcus depth around an implant is about 3mm for the biologic width (*score 0*). If less than 3mm score 1, and if more than 3mm score 2. For the present patient, the sulcus depth around the implant was about 3mm, and the crown margin was equal to the gingival margin. A dark shallow was noted in the gingival margin area. In retrospect, locating the crown margin 1mm subgingivally, or using the Zirconium (Zr) customized abutment may have solved the problem.

**Modified gingival contour:** If papillae are insufficient and cause a dark triangle, the CAD/CAM customized abutment can be useful to the move the crown emergence closer to the natural teeth to achieve the best interproximal contact. This design will help regain the interdental papilla. If the implant crown interproximal contact, measured to the crestal bone of adjacent teeth, is less than 5mm the papilla will be restored 95% of the time. To assess papillae height, measure the modified gingival contour: 100% papillae fill (*score 0*), papillae less than 100% fill (*score 1*), and no papillae (*score 2*) (Fig. 44).

**Crown margin fit:** on the periapical film, check the integrity of crown margin to the abutment. If it is 100% fit (*score 0*), small gap (*score 1*), or the crown doesn't fit in the abutment (*score 2*).



■ Fig. 44:

*The CAD/CAM customized abutment can be useful to move the crown emergence closer to the natural teeth to achieve the best interproximal contact. This design will ensure us to regain the interdental papilla. The papilla will be restored 95% of the time if the implant crown interproximal contact measured to the crestal bone of adjacent teeth is less than 5mm.*

## Conclusion

When treating a Class III malocclusion, combined with a multiple missing teeth, a treatment plan considering the orthodontic, surgical and prosthodontic aspects is necessary. When the bone height is poor, implant site preparation is needed. Orthodontic tooth movement can facilitate the bone quantity without additional surgical augmentation.

When evaluating the implantation, the Pink and White esthetic Scores are important. Adjustments of implant position and abutment connection can improve the result.

## Acknowledgment

Thanks to Ms. Tzu Han Huang for proofreading this article.

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# Discrepancy Index Worksheet

**TOTAL D.I. SCORE** 39

## OVERJET

0 mm. (edge-to-edge)	=	1 pt.
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 = 18

## OVERBITE

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

Total = 3

## ANTERIOR OPEN BITE

0 mm. (edge-to-edge), 1 pt. per tooth  
then 1 pt. per additional full mm. per tooth

Total	=	0
-------	---	---

## LATERAL OPEN BITE

2 pts. per mm. per tooth

Total	=	0
-------	---	---

**CROWDING** (only one arch)

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

Total = 1

## OCCLUSION

Class I to end on	=	0 pts.
End on Class II or III	=	2 pts. per side _____pts.
Full Class II or III	=	4 pts. per side _____pts.
Beyond Class II or III	=	1 pt. per mm. _____pts. additional

Total = 4

### LINGUAL POSTERIOR X-BITE

1 pt. per tooth	Total	=	2
-----------------	-------	---	---

## BUCCAL POSTERIOR X-BITE

2 pts. per tooth      Total = 0

**CEPHALOMETRICS** (See Instructions)

$$\text{ANB} \geq 6^\circ \text{ or } \leq -2^\circ = 4 \text{ pts.}$$

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

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

SN-MP

$$\geq 38^\circ \qquad 38^\circ \qquad = \quad 2 \text{ pts.}$$

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

$$\leq 26^\circ = 1 \text{ pt.}$$

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

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

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

Total = 2

**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. =	<b>2</b>
Missing teeth (except 3 <sup>rd</sup> molars)	<b>4</b>	x 1 pts. =	<b>4</b>
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. =	<b>3</b>
Addl. treatment complexities		x 2 pts. =	

Identify:

Total = 9



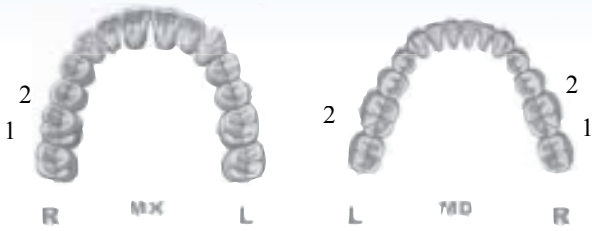
## Cast-Radiograph Evaluation

Case #	1	Patient
--------	---	---------

**Total Score:** 19

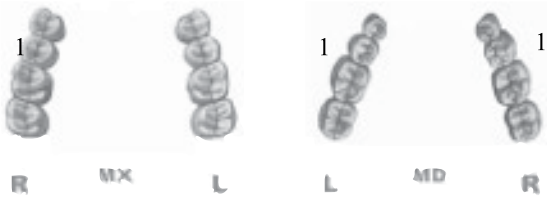
## Alignment/Rotations

8



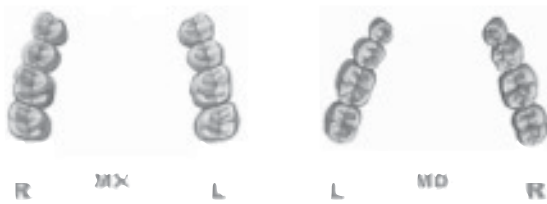
## Marginal Ridges

3



### Buccolingual Inclination

0



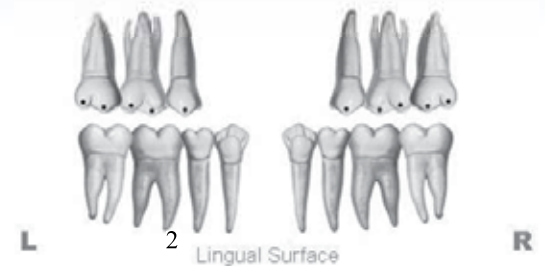
## Overjet

1



## Occlusal Contacts

2



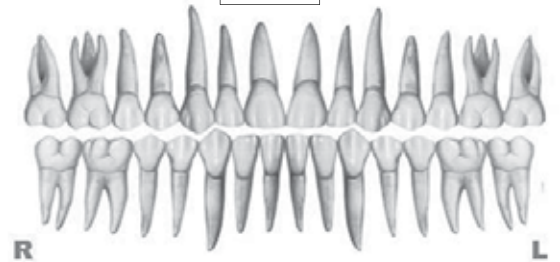
## Occlusal Relationships

0



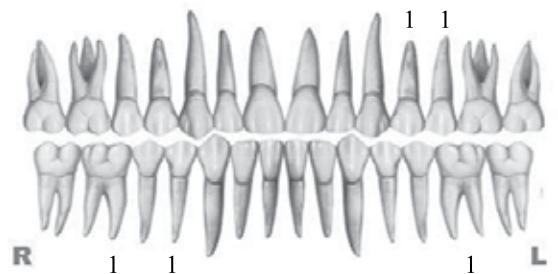
## Interproximal Contacts

0



## Root Angulation

5

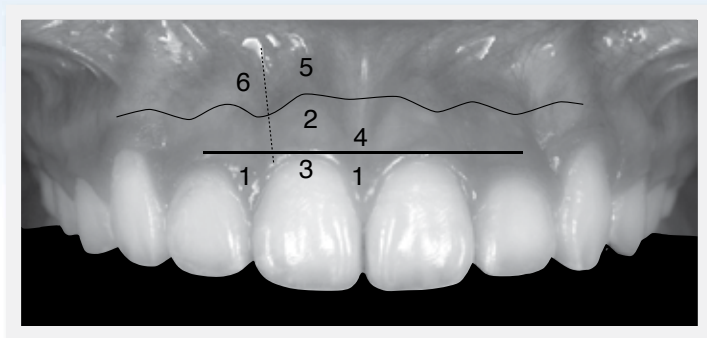


**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## IBOI Pink & White Esthetic Score

Total Score: = **12**

### 1. Pink Esthetic Score

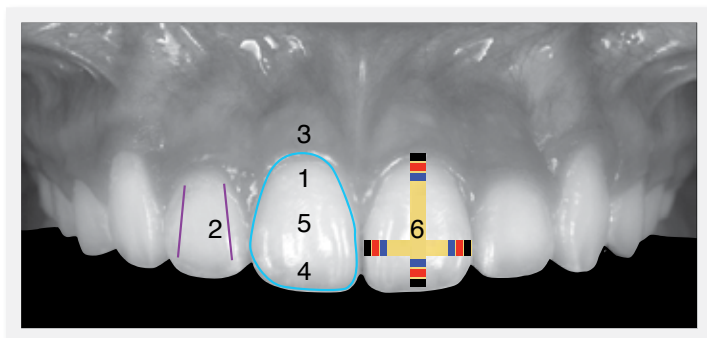


Total = **3**

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

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



Total = **3**

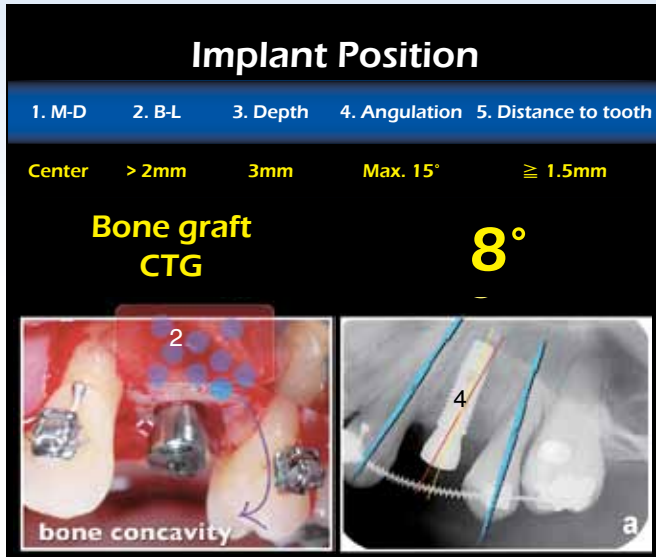
1. Tooth Form	0	1	2
2. Mesial & Distal Outline	0	1	2
3. Crown Margin	0	1	2
4. Translucency ( Incisal third )	0	1	2
5. Hue & Value ( Middle third )	0	1	2
6. Tooth Proportion	0	1	2

1. Tooth Form	0	1	2
2. Mesial & Distal Outline	0	1	2
3. Crown Margin	0	1	2
4. Translucency ( Incisal third )	0	1	2
5. Hue & Value ( Middle third )	0	1	2
6. Tooth Proportion	0	1	2

## IBOI Implant-Abutment Transition & Position Analysis

### 3. Implant Position

Total = 2

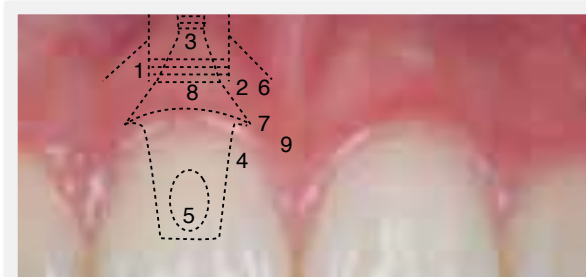


1. M & D ( Center )	0	1	2
2. B & L ( Buccal 2 mm )	0	1	2
3. Depth ( 3 mm )	0	1	2
4. Angulation ( Max. 15° )	0	1	2
5. Distance to Adjacent Anatomy	0	1	2

1. M & D ( Center )	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
2. B & L ( Buccal 2 mm )	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	2
3. Depth ( 3 mm )	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
4. Angulation ( Max. 15° )	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	2
5. Distance to Adjacent Anatomy	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2

Total = 4

### 4. Abutment transition Contour



E: external connection,  
I: internal connection,  
S: screw type,  
C: cement type,  
P: palatal/central,  
B: buccal



1. Fixture Cervical Design	N	Y		
2. Platform Switch	N	Y		
3. I-A Connection Type	E	I		
4. Abutment Selection	S	C		
5. Screw Hole Position	P	B		
6. Marginal Bone Loss	N	Y	0	1 2
7. Soft Tissue Height	N	Y	0	1 2
8. Modified Gingival Contour	N	Y	0	1 2
9. Crown Margin fitness	N	Y	0	1 2

1. Fixture Cervical Design	N	Y		
2. Platform Switch	N	Y		
3. I-A Connection Type	E	I		
4. Abutment Selection	S	C		
5. Screw Hole Position	P	B		
6. Marginal Bone Loss	N	Y	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span> 2
7. Soft Tissue Height	N	Y	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span> 2
8. Modified Gingival Contour	N	Y	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span> <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">2</span>
9. Crown Margin fitness	N	Y	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1 2



# 早期矯正治療的陷阱 及植牙介入的時機

2013.4.14

## 演講資訊

兒童牙科的早期治療主要在針對萌發中的恆齒問題處理，以促進骨骼的正常發展，並減輕日後矯正的複雜度。因此，早期治療的重點主要在解決眼前的局部問題，而臨床上常見的問題是缺乏針對患者整體的情況做出完整的診斷，擬定全面的治療計畫，並且依據此計畫來決定適當的介入時機。

本演講希望透過四個完整的案例報告來說明決定早期治療的重要關鍵，從詳盡的資料蒐集，給予正確的診斷和擬定完整的治療計畫後，決定最理想的矯正流程，包括先天性缺牙與植牙介入的時機探討。唯有透過詳實的個案報告，臨床工作者才能具體地了解及分析如何做出早期治療裡的每個關鍵判斷。

最後，講者將依據多年的臨床經驗，整理出明確的臨床診斷依據，幫助我們決定什麼樣的情況下該進行早期介入，而哪些往往是造成消耗病患治療熱情，以及造成醫師延長治療時間的早期治療陷阱。希望透過本演講可以協助醫師輕鬆的判斷「如何執行」或「不執行」早期治療。

pre. tx



post. tx



## 演講時刻表

08:30-09:00	報到
09:00-10:20	陳建綱,張慧男
10:20-10:50	Break
10:50-12:10	陳信利,張慧男
12:10-13:30	Lunch
13:30-14:50	徐玉玲,張慧男
14:50-15:20	Break
15:20-16:40	蘇筌瑋,張慧男
16:40-17:00	Discussion

0

個月

20

個月

29

個月

37

個月



# 演講資訊

主辦單位

社團法人新北市牙醫師公會  
高雄醫學大學北區校友會

協辦單位

湧傑企業股份有限公司

時間

2013年 4/14 (日) 9:00am - 5:00pm

地點

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地址：臺北市常德街1號

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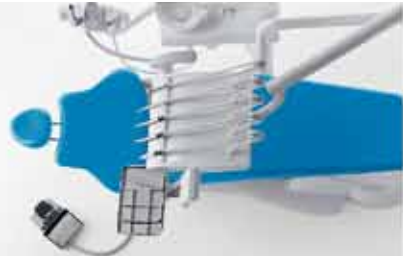
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- 附光源：治療無死角。（2003L）
- 直接接在治療台上，不佔空間。
- 多種Tip可選擇，一機多用途。
- 3段式強度設計：依照不同需求選擇。
- 特殊表面處理：輕鬆好握。



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# Nonsurgical Treatment of a Class III Patient with Bilateral Open Bite Malocclusion

## History And Etiology

A 25-year-9-month-old young lady, with an unremarkable medical history, presented for orthodontic consultation (Figs. 1-3). Her chief concerns were *"my underbite and my side teeth don't touch."* Clinical examination indicated Class III dental malocclusion, an end-to-end incisal relationship, bilateral posterior open bite, dental crowding in both arches, poor lip balance, and a slightly concave facial profile. There was a slight chin deviation to the right, but facial asymmetry was within normal limits.

Orthognathic surgery is indicated in adult patients with severe open bite combined Class III malocclusion and unesthetic facial proportions. However, the patient was adamantly opposed to surgery, and so a camouflage treatment plan was prescribed. A near ideal result was achieved as documented in Figs. 4-6. Pre- and post-treatment radiographs are presented in Figs. 7-8, respectively. Cephalometric documentation is shown in Fig. 8.

## Diagnosis

Study models, cephalometric and panoramic radiographs (Fig. 7) document the complexity of the malocclusion.



Fig. 1: Pretreatment facial photographs



Fig. 2: Pretreatment intraoral photographs

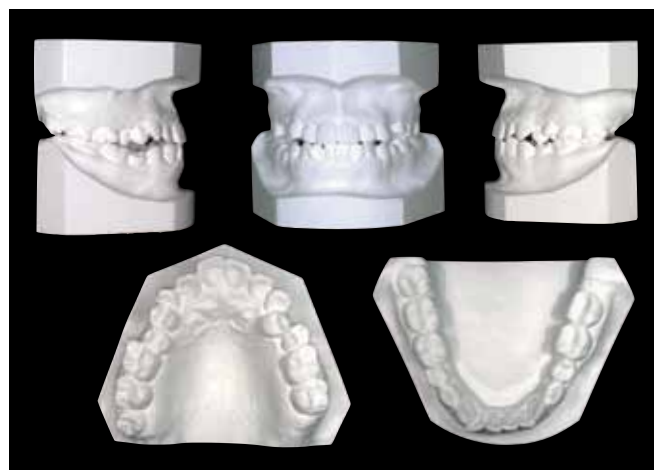


Fig. 3: Pretreatment study models

Dr. Chin Lung Hsieh, Lecturer, Beethoven Orthodontic Course (right)  
 Dr. Chris HN Chang, Director, Beethoven Orthodontic Center (middle)  
 Dr. Eugene W. Roberts, Consultant,  
 International Journal of Orthodontics & Implantology (left)



Fig. 4: Posttreatment facial photographs



Fig. 5: Posttreatment intraoral photographs



Fig. 6: Posttreatment study models

#### Skeletal:

- Skeletal Class III ( $SNA\ 74^\circ$ ,  $SNB\ 78^\circ$ ,  $ANB\ -4^\circ$ )
- Mandibular plane angle ( $SN-MP\ 37^\circ$ ,  $FMA\ 30^\circ$ )

#### Dental:

- Bilateral Class III malocclusion End-to-end incisal relationship
- Lingual cross bite UR4, UR5, and UL4 Severe crowding of about 10mm in upper arch, moderate crowding of about 4mm in the lower arch
- Bilateral posterior open bite was up to 4mm on the right side and up to 3mm on the left side
- Both lower 2<sup>nd</sup> bicusps were rotated mesially  $90^\circ$  and blocked out of occlusion, due to insufficient space There was an insignificant midline discrepancy of  $\sim 1\text{mm}$ .

#### Facial:

Slightly concave profile due to midface insufficiency. Slight deviation of the chin to the right side.

The Discrepancy Index (DI) was 49 as shown in the subsequent worksheet.

### Specific Objectives Of Treatment

#### Maxilla (all three planes):

- A - P: Maintain
- Vertical: Maintain
- Transverse: Maintain

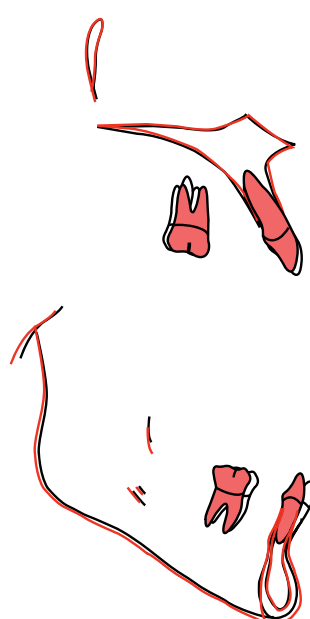




■ Fig. 7. Pretreatment pano and ceph radiographs



■ Fig. 8. Posttreatment pano and ceph radiographs



■ Fig. 9:  
Superimposed tracings, the downward and mesial eruption of maxillary molar as well as the backward and distal movement of lower molar and ant. teeth (slight upward) facilitate Class III correction after Class III elastic traction.

Indicator	Ext.	Non-Ext.
1. Profile	Protrusion	Straight
2. Md. angle	High	Low
3. Bite	Open	Deep
4. Anterior inclination	Flaring	Flat
5. Crowding	>7mm	None
6. Decay/missing	Present	????
7. P't perception	OK	No

■ Table 1. Chang's "Extraction Decision-making table<sup>1</sup>". The first column lists indicators corresponding to the choice of extraction or non-extraction therapy in the second and third column. Since the patient had high mandibular angle, bilateral open bite, and crowding on both arches, four bicuspid extraction was recommended.

#### Mandible (all three planes):

- A - P: Retraction
- Vertical: Increase 1-2 mm
- Transverse: Maintain

#### Maxillary Dentition

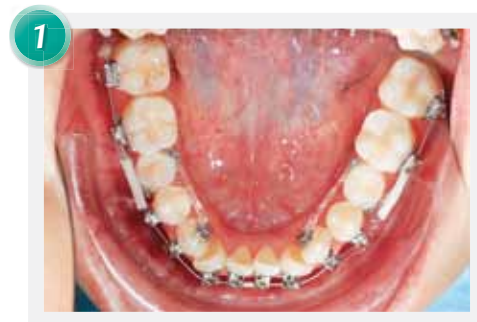
- A - P: Slight retraction of the incisors
- Vertical: Maintain
- Inter-molar / Inter-canine Width: Maintain

#### Mandibular Dentition

- A - P: Retract molars and incisors
- Vertical: Extrude incisors
- Inter-molar / Inter-canine Width: Maintain

Facial Esthetics: Reduce the prominence of lower jaw

The treatment objectives were to (i) improve the facial profile, (ii) obtain normal canine and incisal guidance, (iii) correct the lateral open bite and cross bite, (iv) correct the Class III dental relationship, and (v) coincident facial and dental midlines.



■ Fig. 10:

Lingual buttons were bonded on the canines and 2<sup>nd</sup> premolars to rotate the direction of 2<sup>nd</sup> premolars. Open coil springs were also placed between 1<sup>st</sup> premolar and 1<sup>st</sup> molars to create spaces.



■ Fig. 11:

Used high torque brackets (placed the low torque brackets upside down) to prevent lingual tipping during retraction.

## Treatment Plan

Chang's "Extraction Decision-Making Table" (Table 1) was used to assess space requirements.<sup>1</sup> Since the patient had high mandibular angle, bilateral open bite, and crowding on both arches, four bicuspids extraction was recommended to relieve crowding and upright the maxillary incisors over basal bone. Fixed orthodontic appliances were indicated to align and level the dentition. To enhance the osseous development of the alveolar ridge and to facilitate extraction of the lower second bicuspids, spaces will be opened so that the teeth can be extruded and rotated into normal position (Fig. 10).

Early light and short Class III elastics will be used to correct the Class III relationship and improve the E-line (Fig. 12). Considering the effects of Class III elastics, high torque brackets will be used on the lower anterior teeth to prevent lingual tipping when the lower anterior teeth are retracted. (Fig. 11)

## Appliances And Treatment Progress

A .022" slot Damon D3MX bracket system (Ormco) was used. The mandibular arch was bonded with high torque brackets on mandibular incisors and canines, and two open coil springs were placed both sides between the first premolar and first molar to open a pathway for the extraction of the blocked out 2<sup>nd</sup> premolars. Concurrently, lingual buttons were bonded on both sides of the canines and 2<sup>nd</sup> premolars to rotate the teeth distally and create space for the subsequent extraction of 2<sup>nd</sup> premolars. Since high torque brackets for lower incisors were not available in the local market, low torque brackets



■ Fig. 12:

Class III elastics were applied on both sides, from upper 1<sup>st</sup> molar to lower 1<sup>st</sup> premolar.



■ Fig. 13:

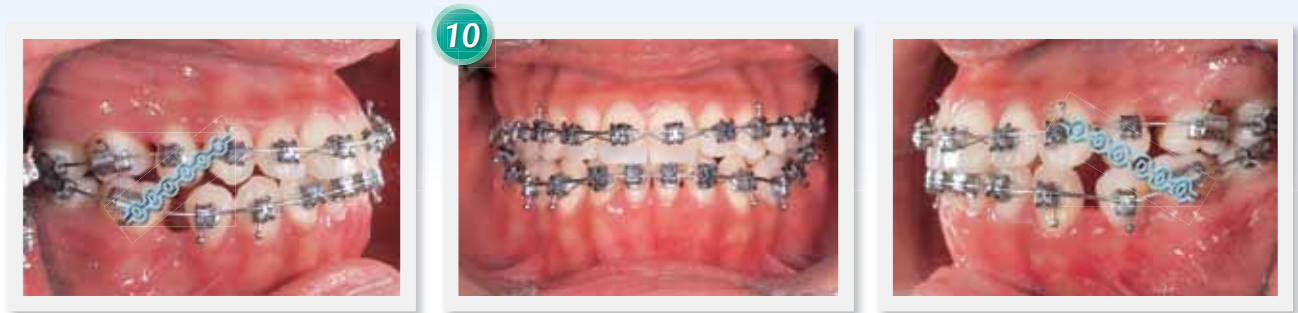
Arch wires, drop in hooks and elastics were changed in the 5th month of treatment.

(-6°) were placed upside down to express high torque (+6°) for lingual root movement (Fig. 11).

One month after extracting all four second bicuspids, the upper arch was bonded, and Class III elastics (2 oz Quail, Ormco) were applied from upper 1<sup>st</sup> molar to lower 1<sup>st</sup> premolar bilaterally (Fig. 12). In the 5<sup>th</sup> month of treatment, arch wires were changed to .014x.025 NiTi and brackets with gingival hooks were used on the lower canines. Class III elastics were changed to 3.5 oz (Fox, Ormco) (Fig. 13).

To control lingual tipping of lower anterior teeth, a .016x.025 pre-torque CuNiTi wire was inserted in the 7<sup>th</sup> month and then switched to .019x.025 in the 9<sup>th</sup> month. After 9 months of treatment, the Class





■ Fig. 14: Drop-in hooks were inserted in #1323 and changed the direction of elastics (Class II elastics).



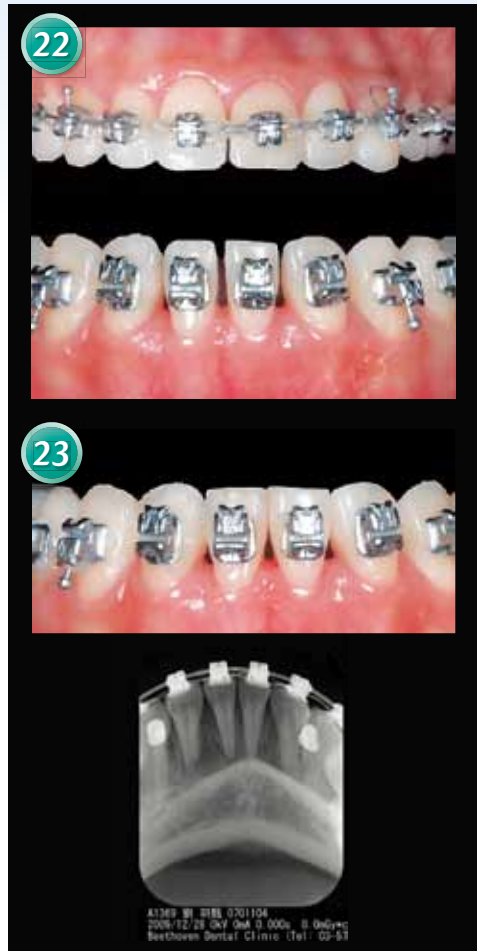
■ Fig. 15: The pre-torque .019x.025 wire was applied on the upper arch to de-torque the crown root torque of anterior teeth in the 13th month.

III relationship was corrected and positive anterior overjet was produced. To protract the mandibular molars and close the posterior open bite, Class II elastics extended from the upper canines to lower 1<sup>st</sup> molars for four months, and they were then extended to 2<sup>nd</sup> molars (Fig. 14). A .019x.025 pre-torqued wire was inserted in the 13<sup>th</sup> month to correct the lingual tipping of the mandibular incisors, due to space closing mechanics (Fig. 15). After relieving the severe crowding of anterior teeth, black triangles were noted in both arches. Interproximal enamel reduction was performed on all incisors, and the space created was closed with power chains or elastic tubes in the 22<sup>nd</sup> and 23<sup>rd</sup> month of treatment (Fig. 16). A torquing spring was used on the UL3 to tip the root lingually (Fig. 16 left). Vertical, triangular

elastics (Kangaroo,Ormco) were used to improve the occlusion and close the residual posterior open bite. After 26 months of active treatment, all appliances were removed. Upper clear overlay and fixed anterior (Mx 3-3, Md 4-4) retainers were delivered for both arches.

### Results Achieved

The post-treatment facial photographs (Fig. 4) illustrate the change in the patient's profile. Her midlines are coincident in the center of her face. The posttreatment dental casts (Fig. 6) and intraoral photos (Fig. 5) show a Class I canine and molar occlusion with normal overjet, overbite. Examination of the range of motion demonstrated optimal canine and incisal guidance.



■ Fig.16:

*Correcting the black triangles of upper and lower anterior teeth by slicing the proximal area and closing the spaces with power chains.*

**Maxilla (all three planes):**

- A - P: A point moved anteriorly 1 degree as the incisors were retracted slightly
- Vertical: Maintained
- Transverse: Maintained

**Mandible (all three planes):**

- A - P: Moved posteriorly slightly with posterior mandibular rotation

- Vertical: Increased
- Transverse: Maintained

**Maxillary Dentition**

- A - P: retracted incisors ~ 1mm
- Vertical: Maintained
- Inter-molar / Inter-canine Width: Maintained

**Mandibular Dentition**

- A - P: Retracted incisors ~3mm, first molar crowns moved distally as they were uprighted
- Vertical: Maintained
- Inter-molar / Inter-canine Width: Increased

**Facial Esthetics:** upper and lower lip balance was improved

**Retention**

Fixed retention (Mx 3-3, Md 4-4) was used and an upper clear overlay retainer was delivered. The patient was instructed to wear the overlay full time for the first 6 months and nights only thereafter. The patient was instructed in the home care and maintenance of the retainers.

**Final Evaluation Of Treatment**

The ABO Cast-Radiograph Evaluation score was 24 points. The major discrepancies were in the occlusal contact (-7), marginal ridges (-5), occlusal relationships (-4), overjet (-3), bucco-lingual inclination (-2), alignment/rotation (-2), and root angulation (-1). The use of Class III elastics and space closure contributed to the lingual tipping of the lower anterior teeth despite the application of high torque brackets and pre-torqued arch wires.

## Discussion

Angle described a Class III malocclusion as a condition in which the maxillary first molar is positioned distally to the mandibular first molar.<sup>2</sup> This relationship could indicate a skeletally recessive maxillary and a normal mandible, a prognathic mandible and a normal maxilla, or a combination of both. The primary treatment option is to correct the faulty skeletal component and the dental malrelationship. A pseudo-Class III occlusion might be the result of a forward shift of the mandible to avoid incisal interferences.<sup>3</sup> In the United States, true (*skeletal*) Class III malocclusions are found in less than 1% of the general population.<sup>4,5</sup> However, according to Lin's study, the prevalence of pseudo Class III in Taiwan is roughly 2.31% for all age groups, and true (*skeletal*) Class III malocclusions comprise ~1.65% of the population.<sup>6</sup>

Open bite is believed to result from a complex etiology.<sup>7,8</sup> Etiologic factors include vertical maxillary excess, skeletal patterns, abnormalities in dental eruption, and tongue-thrust problems. In some patients, lateral open bite is due to a disturbance of the passive eruption mechanism, including an abnormal growth pattern, finger sucking, airway obstruction, or abnormal tongue posture and function, which prevents non-ankylosed teeth from erupting into occlusion.<sup>9</sup> Most lateral open bite cases reported in the literature involve ankylosed teeth or primary failure of eruption. Routine tongue and cheek posture problems are rarely addressed.

An open bite with any malocclusion classification is often considered a difficult and complex anomaly. Open bite is particularly troublesome with a Class III

malocclusion, because it is often associated with an increased vertical dimension of occlusion.

The etiology of open bite in this case is probably the result of severe crowding, early loss of primary molars and a mesial shift of 1<sup>st</sup> permanent molars. The succedaneous permanent teeth in the buccal segments had inadequate space for eruption. The second bicuspid, the last teeth to erupt, were blocked out and failed to fully erupt to occlusal table. To seal the open bite areas during swallowing, the patient developed an aberrant tongue posture, which prevented occlusal contact in the buccal segments. Extraction of all four 2<sup>nd</sup> bicuspid was recommended for crowding relief as well as to promote open bite correction.



■ Fig.17 Ivory separator



■ Fig.18: An pleasing looking and satisfactory result.



CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	74°	75°	1°
SNB°	78°	78°	0°
ANB°	-4°	-3°	1°
SN-MP°	37°	39°	2°
FMA°	30°	32°	2°
DENTAL ANALYSIS			
U1 TO NA mm	8 mm	7 mm	1 mm
U1 TO SN°	112°	107°	5°
L1 TO NB mm	4 mm	1 mm	3 mm
L1 TO MP°	88°	80°	8°
FACIAL ANALYSIS			
E-LINE UL	-4 mm	-4.5 mm	0.5 mm
E-LINE LL	-1 mm	-3 mm	2 mm

■ Table. 2: Cephalometric summary

When treating adult Class III patients without orthognathic surgery, various methods have been proposed, including multi-brackets with Class III elastics, extraction treatment, and multi-loop edgewise therapy.<sup>10,11</sup> These techniques facilitate acceptable interincisal relationships and stable occlusions, but usually require intraoral or extraoral anchorage to retract the mandibular incisors.<sup>12</sup> The quality of treatment result often depends on the patient's cooperation.

In this present case, the patient was diligent in wearing her elastics, so a satisfactory camouflage result was achieved following extraction of all 4 second bicuspids. It was not necessary to use

more complex procedures such as a face mask or miniscrew anchorage.<sup>13</sup> For adult patients with an orthognathic or acceptable mild prognathic profile, the light force of the Damon system, combined with buccal shelf mini-screws, can provide satisfactory camouflage treatment results without orthognathic surgery.<sup>13</sup> The profile of the present patient may have benefited from a nonextraction approach using four quadrants of extra-alveolar anchorage, but that approach would have required a more complex and expensive treatment plan.

The mesial and vertical eruption of the maxillary molars, as well as distal movement of mandibular molars, facilitated the Class III correction. Class III elastics allowed the maxillary molars to erupt and move mesially while holding the mandibular molars in place, vertically and anteroposteriorly. In addition, the Class III elastics facilitated facial tipping of the maxillary and retraction the mandibular incisors. This pattern of tooth movement improved the molar relationships, from Class III to Class I, by flattening the occlusal plane (Fig. 9).

To prevent excessive lingual tipping of mandibular incisors during space closure and retraction, the use of high torque brackets is emphasized. Furthermore, application of pre-torqued arch wires (.016x.025 and .019x.025 *pre-torque* CuNiTi) also helped maintain torque control. The risk of dehiscence and lack of bone support should be considered when the angle of retraction of anterior teeth is beyond 80°.<sup>14</sup> In this present case, the final result of lower anterior teeth was precisely 80° and the tissue texture and mobility

appeared to be ideal. The light force of the Damon D3mx system appears to be effective in preventing these common side effects. Cone beam computed tomography (CBCT) is planned for follow up visits to rule out alveolar dehiscence.

Open gingival embrasures, also known as black triangles, are commonly noted in anterior teeth after relief of crowding.<sup>14</sup> Possible causes include the followings: 1) the dimensional change in the dental papilla during alignment of incisors as it is stretched and blunted, 2) decreased height of the alveolar crest relative to the interproximal contact, 3) location and the size of the interproximal contact, 4) divergent root angulation, and/or 5) triangular-shaped crown form. The prevalence of post-treatment open gingival embrasures in an average adult orthodontic population is about 38%.<sup>15</sup> The deficient papilla, in some situations, can be improved with orthodontic treatment. By closing open contacts, the interproximal gingiva can be squeezed and moved incisally. However, the interproximal alveolar bone level should be carefully monitored. If crestal bone loss has occurred, an incisor can be extruded after the incial edge is adjusted gingivally.

Black triangles often present an esthetic challenge to clinicians. Patients should be informed of this possible complication and the potential treatment options. Radiographic films should be exposed prior to slicing (*reducing*) the interproximal area of anterior teeth to verify the location of the long axis of the anterior teeth (Fig. 17). An Ivory Separator is recommended for separating the teeth prior to

reducing the contact area with a diamond fissure bur (N221-010). Caution should be exercised not to expose the dentin. The linear crown to root ratio must be maintained from 0.7-1.0. The sliced (*reduced*) surfaces should be thoroughly finished and polished, with a fine diamond bur. A surface fluoride treatment is helpful for preventing subsequent caries.

The ABO CRE score of 24 was deemed to be an excellent occlusal result. Most of the points deducted were reflecting problems in occlusal contacts of the molars. Occlusal contacts could have been improved if sectioning of the arch wire distal to right 2<sup>nd</sup> premolar, was performed earlier to provide a longer period for vertical box elastics wear to settle the buccal occlusal contacts.

## Conclusion

It is always a challenge to treat Class III malocclusion, complicated by severe crowding and bilateral posterior open bite, with conservative, non-surgical treatment. An accurate diagnosis and treatment plan are critical to the success of therapy. Efficient mechanics consisting of early light short elastic and a bracket system with light forces can prevent undesirable side effects. In addition to optimal intra-oral esthetics and function, the improved facial result was due to good lip balance and occlusal alignment (Fig. 18).

## Acknowledgment

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# Discrepancy Index Worksheet

**TOTAL D.I. SCORE**
**49**

## 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 = **0**

## ANTERIOR OPEN BITE

0 mm. (edge-to-edge), 1 pt. per tooth  
then 1 pt. per additional full mm. per tooth

Total = **4**

## LATERAL OPEN BITE

2 pts. per mm. per tooth

Total = **18**

## 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 = **7**

## OCCLUSION

Class I to end on = 0 pts.  
End on Class II or III = 2 pts. per side **8** pts.  
Full Class II or III = 4 pts. per side **8** pts.  
Beyond Class II or III = 1 pt. per mm. **8** pts.  
additional

Total = **8**

## LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = **3**

## BUCCAL POSTERIOR X-BITE

2 pts. per tooth Total = **0**

## CEPHALOMETRICS (See Instructions)

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

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

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

## SN-MP

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

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

$\leq 26^\circ$  = 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 = **5**

## OTHER (See Instructions)

Supernumerary teeth \_\_\_\_\_ x 1 pt. = \_\_\_\_\_  
Ankylosis of perm. teeth \_\_\_\_\_ x 2 pts. = \_\_\_\_\_  
Anomalous morphology \_\_\_\_\_ x 2 pts. = \_\_\_\_\_  
Impaction (except 3<sup>rd</sup> molars) \_\_\_\_\_ x 2 pts. = \_\_\_\_\_  
Midline discrepancy ( $\geq 3$ mm) @ 2 pts. = \_\_\_\_\_  
Missing teeth (except 3<sup>rd</sup> molars) \_\_\_\_\_ x 1 pts. = \_\_\_\_\_  
Missing teeth, congenital \_\_\_\_\_ x 2 pts. = \_\_\_\_\_  
Spacing (4 or more, per arch) \_\_\_\_\_ x 2 pts. = \_\_\_\_\_  
Spacing (Mx cent. diastema  $\geq 2$ mm) @ 2 pts. = \_\_\_\_\_  
Tooth transposition \_\_\_\_\_ x 2 pts. = \_\_\_\_\_  
Skeletal asymmetry (nonsurgical tx) @ 3 pts. = \_\_\_\_\_  
Addl. treatment complexities \_\_\_\_\_ x 2 pts. = \_\_\_\_\_

Identify:

Total = **0**

## IMPLANT SITE

Lip line : Low (0 pt), Medium (1 pt), High (2 pts) = \_\_\_\_\_  
Gingival biotype : Low-scalloped, thick (0 pt), Medium-scalloped, medium-thick (1 pt), High-scalloped, thin (2 pts) = \_\_\_\_\_  
Shape of tooth crowns : Rectangular (0 pt), Triangular (2 pts) = \_\_\_\_\_  
Bone level at adjacent teeth :  $\leq 5$  mm to contact point (0 pt), 5.5 to 6.5 mm to contact point (1 pt),  $\geq 7$  mm to contact point (2 pts) = \_\_\_\_\_  
Bone anatomy of alveolar crest : H&V sufficient (0 pt), Deficient H, allow simultaneous augment (1 pt), Deficient H, require prior grafting (2 pts), Deficient V or Both H&V (3 pts) = \_\_\_\_\_  
Soft tissue anatomy : Intact (0 pt), Defective (2 pts) = \_\_\_\_\_  
Infection at implant site : None (0 pt), Chronic (1 pt), Acute (2 pts) = \_\_\_\_\_

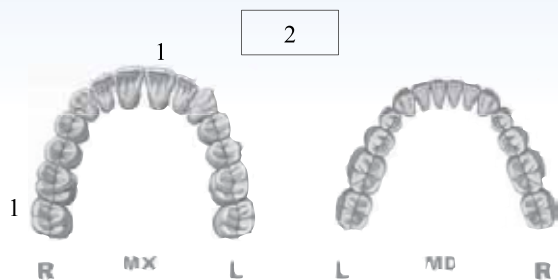
Total = **0**

## Cast-Radiograph Evaluation

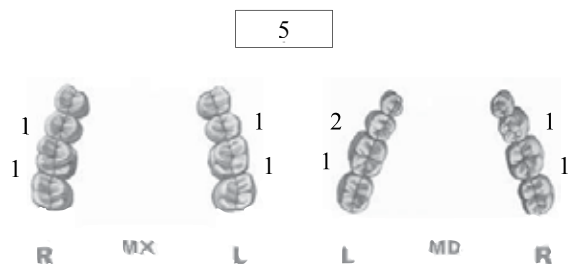
Case #	1	Patient
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**Total Score:** 24

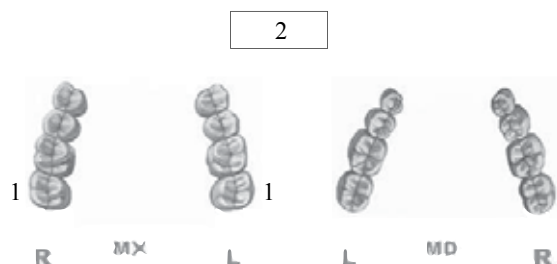
### Alignment/Rotations



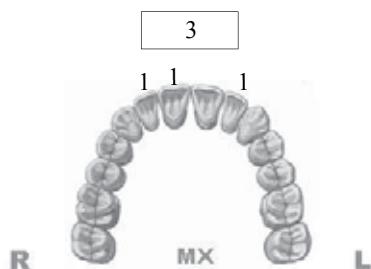
## Marginal Ridges



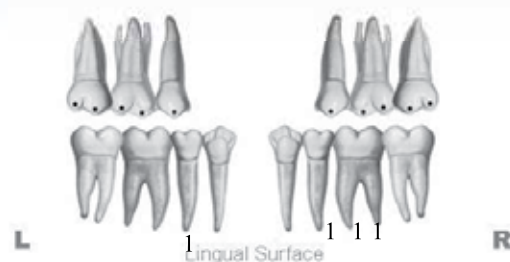
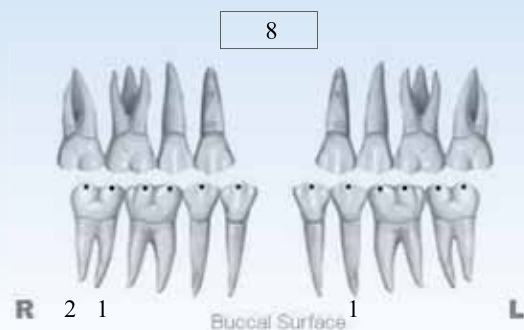
### Buccolingual Inclination



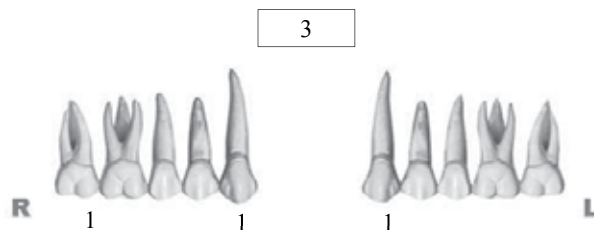
## Overjet



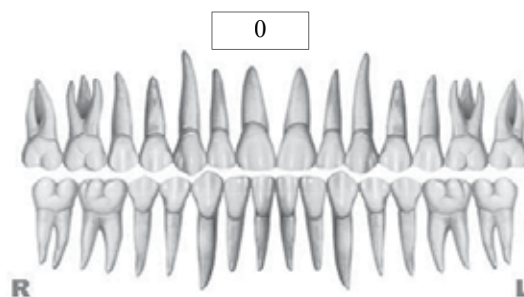
## Occlusal Contacts



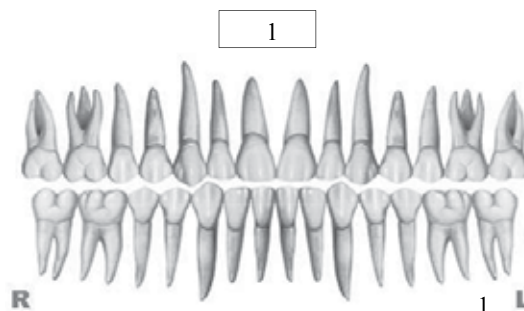
## Occlusal Relationships



## Interproximal Contacts



## Root Angulation



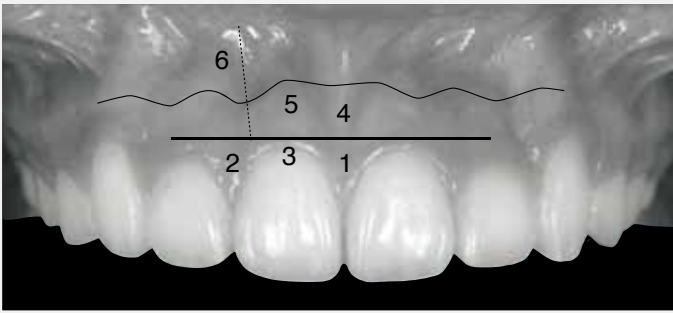
**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## IBOI Pink & White Esthetic Score

Total Score: =

**7**

### 1. Pink Esthetic Score



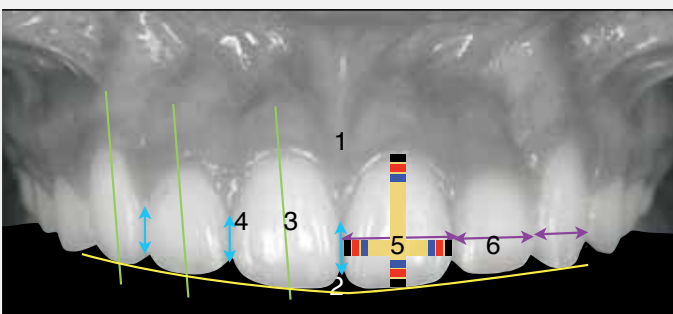
Total =

**1**

1. Mesial Papilla	0	1	2
2. Distal Papilla	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 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 =

**6**

1. Tooth Form	0	1	2
2. Mesial & Distal Outline	0	1	2
3. Crown Margin	0	1	2
4. Translucency ( Incisal third )	0	1	2
5. Hue & Value ( Middle third )	0	1	2
6. 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(1:0.8)	0	1	2
6. Tooth to Tooth Proportion	0	1	2



# A treatment of a bimaxillary protrusion case with canine substitution and impacted third molar uprighting

## History And Etiology

This female adult, aged 34 years 5 months, came for orthodontic evaluation. Her chief concern was dissatisfaction with her smile (Fig. 1). There was no contributory medical or dental history. Clinical exam revealed an upper left lateral incisor missing and anomalous morphology of the upper right lateral incisor. Her lower first molar had deep caries with defective crown (Figs. 2-3). After 44 months of orthodontic treatment, the patient was treated to an acceptable result as documented in Figs. 4-9. The details for diagnosis and treatment will be discussed below.

## Diagnosis

### Skeletal:

1. Skeletal Class II (SNA 82°, SNB 78°, ANB 4°)
2. Mandibular plane angle (SN-MP 42°, FMA 36°)

### Dental:

1. Class II molar malocclusion (*left*)
2. The overbite and overjet were both 5mm. (*from upper right central incisor to lower right central incisor*)
3. Severe crowding in both arches
4. Anomalous morphology of maxillary right lateral incisor.
5. Maxillary left lateral incisor missing.
6. Deep caries over mandibular left first molar.

### Facial:

Convex profile with protrusive lip position.



Fig. 1: Pretreatment facial photographs



Fig. 2: Pretreatment intraoral photographs



Fig. 3: Pretreatment study models

Dr. HsinYinYeh, Lecturer, *Beethoven Orthodontic Course* (left)  
 Dr. Chris Chang, Director, *Beethoven Orthodontic Center* (middle)  
 Dr. Eugene W. Roberts, Consultant,  
*International Journal of Orthodontics & Implantology* (right)



■ Fig. 4: Posttreatment facial photographs



■ Fig. 5: Posttreatment intraoral photographs



■ Fig. 6: Posttreatment study models

The ABO Discrepancy Index (DI) was 35, as shown in the subsequent worksheet.

## Specific Objectives Of Treatment

Maxilla (*all three planes*):

- A - P: Maintain
- Vertical: Maintain
- Transverse: Maintain

Mandible (*all three planes*):

- A - P: Maintain
- Vertical: Maintain
- Transverse: Maintain

Maxillary Dentition

- A - P: Retract the maxillary incisors
- Vertical: Maintain
- Inter-molar Width: Maintain

Mandibular Dentition

- A - P: Retract the mandibular incisors
- Vertical: Maintain
- Inter-molar / Inter-canine Width: Maintain

Facial Esthetics: Retract protrusive lips

## Treatment Plan

Full fixed orthodontic appliance was indicated to align and level the dentition. Extract maxillary and mandibular right first premolar for crowding release. The maxillary left canine was substituted for the missing maxillary left lateral incisor and the left first premolar replaced the canine. Because the long-term prognosis of the left mandibular first molar



■ Fig. 7:

Pretreatment pano and ceph radiographs. The pano film showed a deep caries over the mandibular left first molar and the mandibular left third molar was impacted.



■ Fig. 8:

Posttreatment pano and ceph radiographs. The pano film showed that the impacted mandibular left third molar was upright and well aligned.



■ Fig. 9: Superimposed tracings indicate that both upper and lower central incisors were retracted and the protrusive profile was corrected.





■ Fig. 10:

*A temporary crown was fabricated for the palatally impacted maxillary right lateral incisor.*

was questionable, extract the first molar rather than the first premolar. To close the extraction space of mandibular left first molar, protract the second molar and upright the impacted third molar.

An open coil spring was used to create the space for maxillary right lateral incisor and post-treatment restoration with a porcelain crown would be applied on this anomalous morphology tooth. To correct the convex profile, four extra-alveolar miniscrews (2x12mm, OrthoBoneScrew, Newton's A, Inc.) were inserted in both sides of infrazygomatic crests and buccal shelves of mandibular first molar as anchorage for retracting the dentitions. Detailing bends produced the final occlusion. The fixed appliances were removed and the corrected dentition was retained with fixed anterior retainers in lower anterior teeth and clear overlay retainer on upper arch.

### Appliances And Treatment Progress

At the start of the treatment, the patient was referred to a general dentist to extract the maxillary and mandibular right first premolar. After that, the crown of the maxillary right lateral incisor was removed

and restored with a temporary crown made with normal size of maxillary lateral incisor (Fig. 10). Before applying fixed appliances, re-contour the prominent labial ridge and cusp tip of maxillary left canine to imitate lateral incisor (Fig. 11).

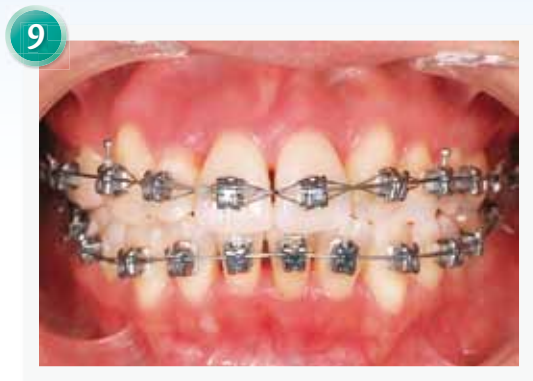


■ Fig. 11:

*Reshape the cusp tip and labial ridge of the maxillary left canine before bonding.*

.022" Damon D3MX brackets (Ormco corporation) were bonded on both arch (low torque on anterior teeth but high torque on the maxillary left canine). The wire sequence was: .014 NiTi, .018 NiTi, .014x.025 NiTi, .017x.025 TMA, .016x.025 SS. Open coil springs were used for space opening. One was placed between maxillary right central incisor and canine to open the space for palatally displaced lateral incisor and another was placed between mandibular left central incisor and right lateral incisor for lingually displaced right central incisor. Two months later, these displaced teeth were bonded with brackets.

After alignment, interproximal enamel reduction was performed in upper and lower incisors to lessen the black triangle area (Fig. 12).



■ Fig. 12:

After alignment, black triangle areas between incisors were found. Interproximal enamel reduction can reduce the spaces for esthetics.

22 months after the active treatment, the impacted mandibular left third molar erupted. A buccal tube was bonded on this third molar and the second molar was rebonded with a cover-lifting buccal tube (Fig. 13). This cover-lifting buccal tube made an open coil spring to be easily inserted between the second and third molar (Fig. 14). Eight months later, the third molar was uprighted. Two buttons were separately bonded on the mandibular second premolar and third molar, and a power chain was hung on these buttons to close the extraction space (Fig. 15). After all the spaces were closed, extra-alveolar miniscrews were inserted in both sides of infrazygomatic crests and buccal shelf of mandibular first molars to retract upper and lower dentition. A torquing spring was applied to correct the labial crown torque of right lateral incisor (Fig. 16).

After 44 months of active treatment, all appliances were removed. A upper clear overlay and lower fixed anterior retainer were delivered for lower arch.



■ Fig. 13:

A cover-lifting buccal tube was bonded on mandibular left second molar and a buccal tube was bonded on third molar. A .018 NiTi archwire was used.



■ Fig. 14:

An open coil spring was inserted between the second and third molar to upright the impacted third molar and push the second molar forward at the same time.



■ Fig. 15:

Buttons were bonded on the third molar and second premolar with a power chain connecting them. This lingual force could facilitate space closing and prevent the third molar from lingual rotation and mesial tilting.



■ Fig. 16:  
Four extra-alveolar miniscrews were used as anchorage to retract dentitions. A torquing spring which produces a lingual crown torque corrected the labial crown torque of maxillary right lateral incisor.



■ Fig. 17:  
The occlusal relationship of the left side was not optimum because of asymmetric extraction.

Retention

The fixed retainer was bonded from second premolar to second premolar in the mandibular arch. An upper clear overlay was delivered. The patient was instructed to wear it full time for the first 6 months and nights only thereafter. The patient was instructed in the home care and maintenance of the retainers.



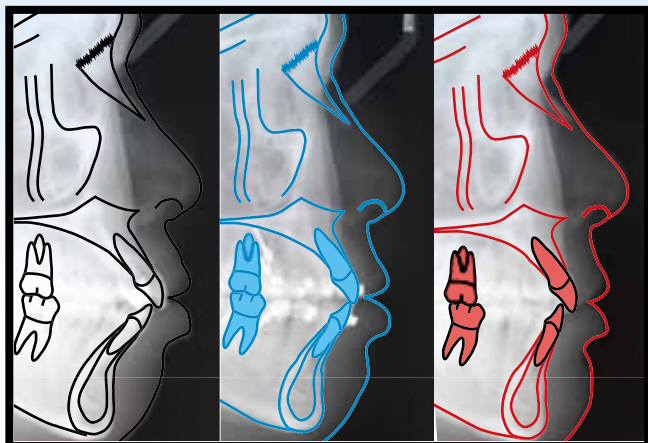
■ Fig. 18:  
The midline of lower arch was 2mm to the left. The maxillary right lateral incisor was restored with porcelain crown and the maxillary left lateral incisor was replaced by canine.

Final Evaluation Of Treatment

The ABO Cast-Radiograph Evaluation score was 26 points. The major discrepancies were in occlusal relationships and marginal ridges. Because of asymmetric extraction, the occlusal relationship of left side was not in ideal position and the midline of lower arch was 2mm to left (Figs. 17-18). The extraction space of left mandibular first molar area was closed and the impacted third molar was well aligned. The palatally displaced maxillary lateral incisor was restored with porcelain crown. The maxillary left canine substitution looked natural but the level of gingival margin was higher than the central incisor (Fig. 18).

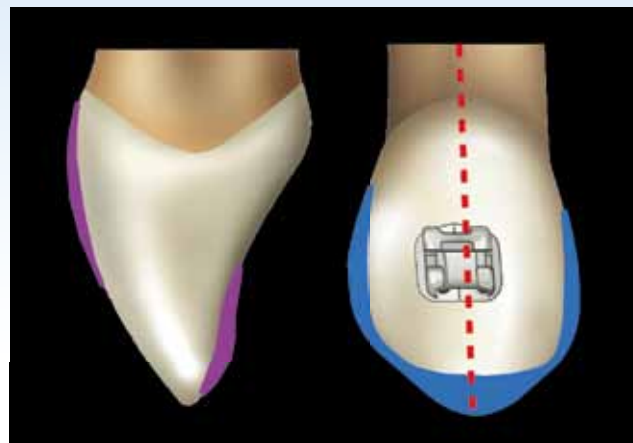
CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	82°	81°	1°
SNB°	78°	78°	0°
ANB°	4°	3°	1°
SN-MP°	42°	40°	2°
FMA°	36°	35°	1°
DENTAL ANALYSIS			
U1 TO NA mm	7 mm	2 mm	5 mm
U1 TO SN°	111°	109°	2°
L1 TO NB mm	10 mm	3 mm	7 mm
L1 TO MP°	102°	85°	17°
FACIAL ANALYSIS			
E-LINE UL	2 mm	-1 mm	3 mm
E-LINE LL	5 mm	1 mm	4 mm

■ Table. Cephalometric summary



■ Fig. 19:

Tracings of pre-treatment, the appointment of extra-alveolar miniscrews inserted, post-treatment. The protrusive profile was corrected.



■ Fig. 20:

Recontour the labial ridge, palatal surface, and cusp tip of canines before bonding a bracket. Bond the bracket distally to imitate lateral incisor crown torque. Reduce the inter proximal area if the M-D dimension of canine is much wider than lateral incisor.

The protrusive upper and lower incisors were resolved and the convex profile was subsequently corrected (Fig. 19). Overall, the patient was satisfied with this treatment.

## Discussion

Patients with missing teeth will make the orthodontic treatment more complicated. Maxillary lateral incisors are often anomalous or congenitally missing. Because mandibular first molars erupt at the age of 6, they are prone to have dental caries. It is common to see the mandibular first molars extracted or endodontic treatment in adults. There are many treatment options for replacement of missing teeth, including space closing with substitution of adjacent tooth, single tooth implants, and tooth-supported restorations. In this case, we had the treatment plan with the least restoration after finishing orthodontic treatment.

Conventional space closure with canine substitution for missing maxillary lateral incisor is a safe

procedure that provides satisfactory esthetic and functional long-term results. Single tooth implant-supported restorations, the thickness of alveolar ridge over the lateral incisor area must be adequate.<sup>1</sup> According to studies,<sup>2-3</sup> if a permanent canine is orthodontically moved distally, an increased dimension of buccolingual alveolar width is stable. To this patient, based on her convex profile, and severe crowding of lower arch, we made the treatment plan with extraction of upper and lower right first premolar and first molar and the upper left first premolar was used to canine substitution. Then this patient did not need any implants on her maxillary anterior side.

The technique of canine substitution, according to some studies,<sup>1,4-7</sup> includes:

1. Mesial relocate canines to imitate the lateral incisor crown torque (*bond distally*) (Fig. 20).
2. Recontouring of prominent labial ridge and cusp tip of canines before bonding a bracket (Fig. 20).





■ Fig. 21:

*The lingual force can facilitate the process of extraction space closure and prevent mandibular second and third molar tilting and rotation.*

3. Individualized extrusion and intrusion of the canine and first premolar for optimal level of marginal gingival contours.
4. Reshaping and composite resin buildup of canine and first premolar to resemble lateral incisor and canine. To yellowish or dark canines, bleaching or porcelain veneer could be considered.
5. Reshape or restore central incisors to make more optimal display of smile arc.

Brough et al's study<sup>6</sup> ranked the smile attractiveness by judging the photographs of canine substitution with digitally altering the canine morphology and gingival height. If the canines were 10 times brighter, 1.5mm narrower, with less pointed tips than original canines, the smiles were perceived as more attractive. Canine gingival height was the most attractive 0.5mm below the gingival margin of the maxillary central incisor, but was perceived as relatively unattractive 0.5mm above. In this case, extrusion of the canine was not performed

because extensive enamel reduction might lead to tooth sensitivity. The post-treatment intra-oral photo shows that the marginal gingival contour of maxillary left canine was higher than central incisor, but it was acceptable when the patient smiled (Fig. 4). Zachrisson<sup>7</sup> suggested that extrusion of the canine can resolve the higher gingival contour and excessive occlusal contact of extruded canines should be corrected by increasing lingual root torque and grinding their lingual surfaces.

Different extraction sites will increase the complexity of orthodontic treatment.<sup>8</sup> However, patients might get the benefit from extraction of questionable prognosis molars rather than extraction of healthy premolars. The treatment plan to this patient was extraction of the left mandibular first molar instead of the first premolar. According to Williams and Hosila,<sup>9</sup> the chance of successful third molar eruption is much higher when the first molars were extracted. In this case, 22 months after extraction of the first molar, the impacted third molar auto-erupted. A cover-lifting tube was used to replace the buccal tube of second molar and a normal size buccal tube was bonded on the third molar. An open coil spring was activated between the tubes of two molars. There was no auxiliaries required to upright impacted third molars.<sup>10</sup> If the crown of the impacted third molar is insufficiently exposed and the patient wants to finish the treatment earlier, surgical exposure will be considered.<sup>10</sup>

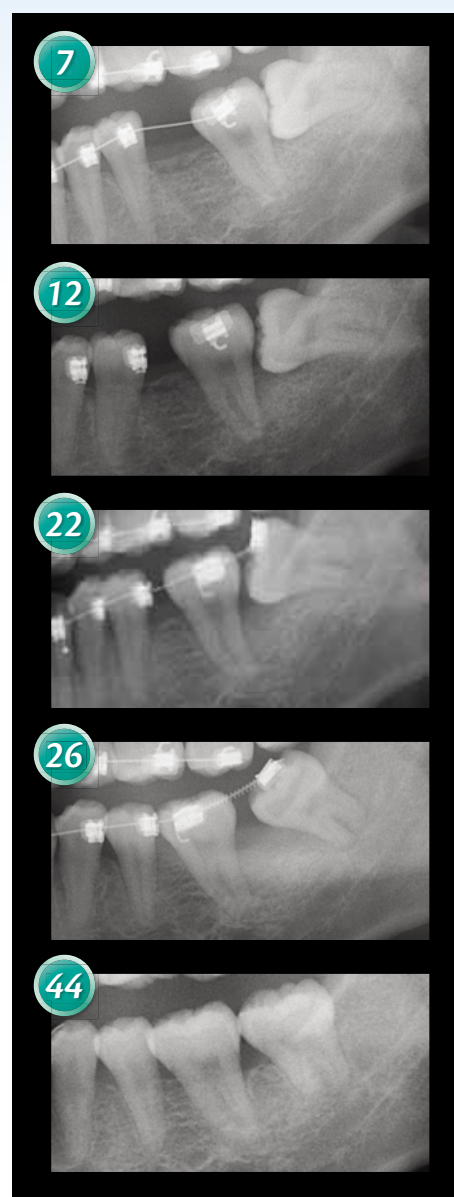
About ten months later, the impacted third molar was aligned into the lower arch. Another challenge of first molar extraction case is space closure. During the period of protracting the second and third molar for space closing, the second and third molar have a tendency to tilt mesially and roll lingually. Sandler et al<sup>13</sup> advise that active space closure should not be

attempted before the lower teeth are well aligned and in full-sized working arch wire. A .016x.025 stainless steel archwire was placed in lower arch. Balancing lingual force was applied by a power chain and two buttons bonded on lingual surface of third molar and second molar. This lingual force can facilitate the process of extraction space closure and prevent mandibular second molar tilting (Fig. 21). In many first molar extraction cases, the total treatment time is determined by the time taken to upright the impacted third molar and bring both the lower second and third molar into a good occlusal position (Fig. 22).

First molar extraction treatment is likely to have less effect on the profile than premolar extraction.<sup>9</sup> After all spaces closed, extra-alveolar miniscrews were used as anchorage to retract the whole dentition. The superimposed tracing indicated significant improvement of protrusive lips (Fig. 19).

## Conclusion

Adults presenting with missing maxillary lateral incisors or anterior crowding but not getting proper orthodontic treatment who only accept restorations, will have compromised esthetic and periodontal results. Orthodontic treatment with canine substitution or space development for restorative replacement is an ideal option for patients. Canine substitution can provide functional long-term results and acceptable esthetic. Another common missing tooth in adults is mandibular first molar. There are many other clinical situations in mandibular first molars such as extensively caries, heavily filled, and endodontic treated with apical lesion. Extraction of these poor long-term prognosis first molars rather



■ Fig. 22:

*Panoramic films indicate the third molar was uprighted and well aligned.*

than healthy first premolars should be considered in orthodontic treatment. Moreover, if the patient has available mandibular third molars, they can be protracted to replace second molars. Detailed case assessment must be made before treatment to ensure that the patient can get the most benefits from this treatment.

## Acknowledgment

Thanks to Ms. Tzu Han Huang and Dr. Sean Peng, a prosthodontist, for proofreading this article.

Workshop (1)(2), Podcast Encyclopedia in Orthodontics 2011, Newton's A Ltd, Taiwan.

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11. Lin JJ. The Wisdom of Managing Wisdom Teeth: Part 1. Lower 3<sup>rd</sup> Molar Extraction in Class III Treatment. *News & Trends in Orthodontics* 2011; vol 22: 4-13
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## OVERJET

## OVERBITE

## ANTERIOR OPEN BITE

## LATERAL OPEN BITE

**CROWDING** (only one arch)

## OCCLUSION

### LINGUAL POSTERIOR X-BITE

### BUCCAL POSTERIOR X-BITE

**CEPHALOMETRICS** (See Instructions)

SN-MP

Total = 14

**OTHER** (See Instructions)

Identify:

IMPLANT SITE

Total = 0

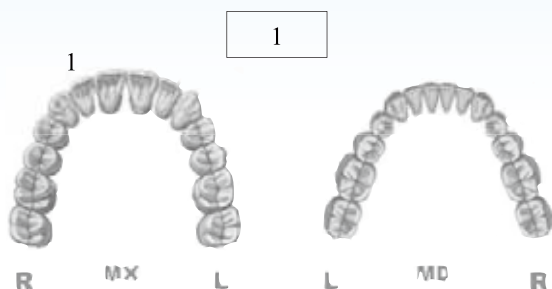


## Cast-Radiograph Evaluation

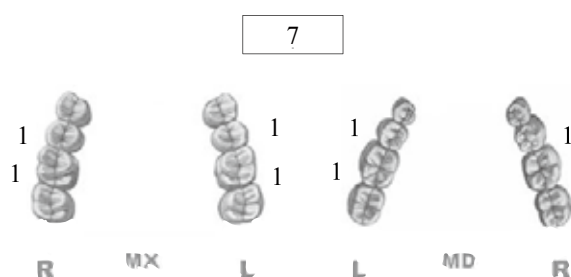
Case # 1 Patient

Total Score: **24**

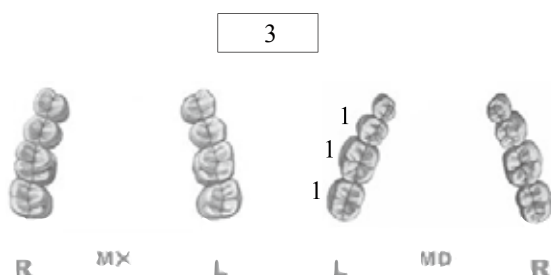
### Alignment/Rotations



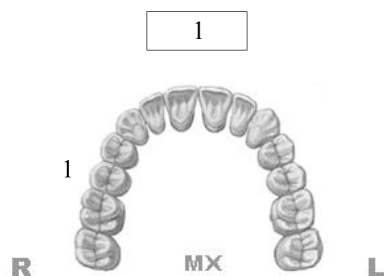
### Marginal Ridges



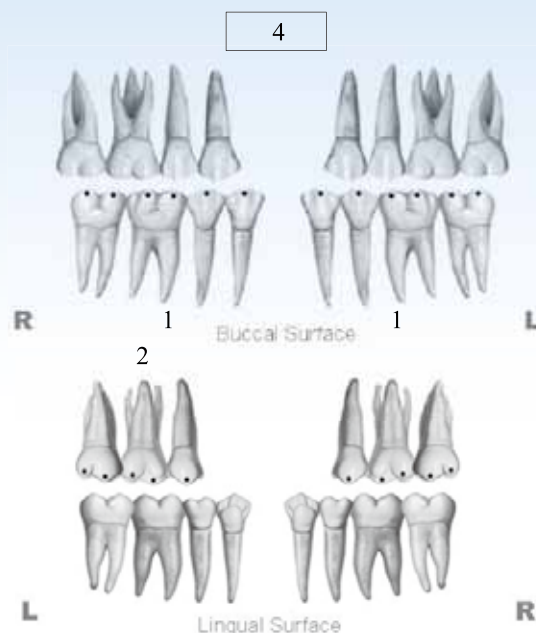
### Buccolingual Inclination



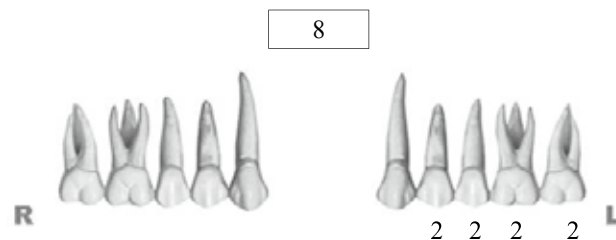
### Overjet



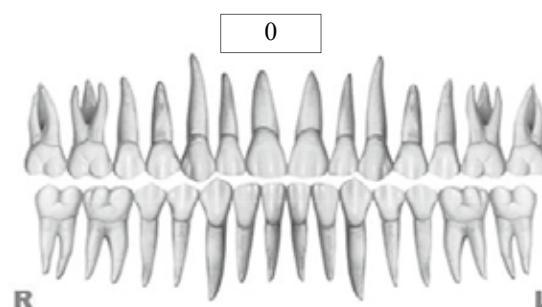
### Occlusal Contacts



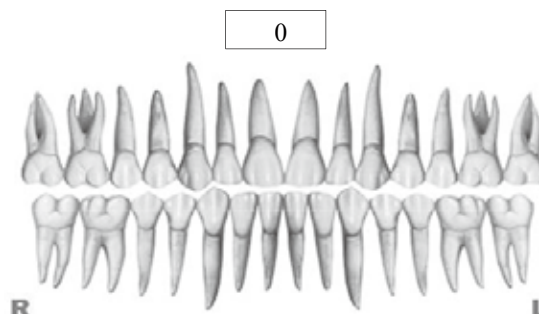
### Occlusal Relationships



### Interproximal Contacts



### Root Angulation



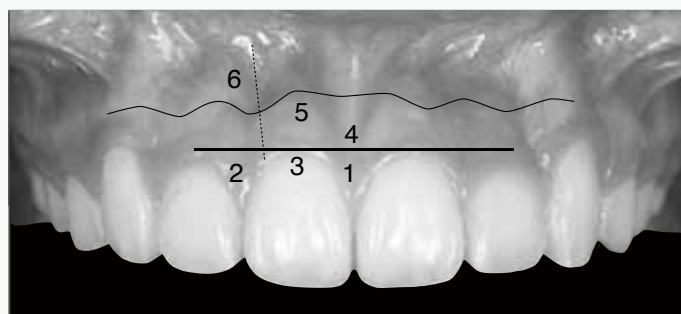
**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## IBOI Pink & White Esthetic Score

Total Score: =

6

### 1. Pink Esthetic Score



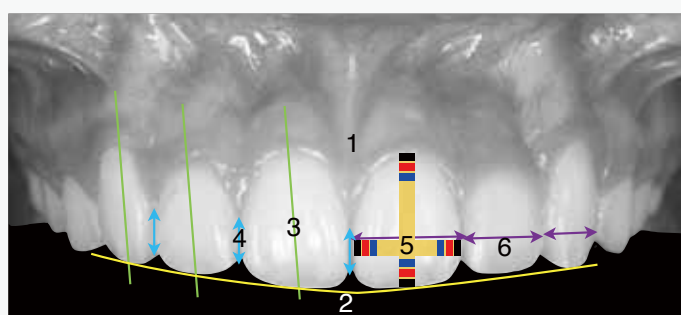
Total =

3

1. Mesial Papilla	0	1	2
2. Distal Papilla	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 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 =

3

1. Tooth Form	0	1	2
2. Mesial & Distal Outline	0	1	2
3. Crown Margin	0	1	2
4. Translucency ( Incisal third )	0	1	2
5. Hue & Value ( Middle third )	0	1	2
6. Tooth Proportion	0	1	2

1. Midline	0	1	2
2. Incisor Curve	0	1	2
3. Axial Inclination (50, 80, 100)	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

# USC Comprehensive Surgical and Restorative Implant Training Program in Taiwan

## 南加大植牙專科進修課程 2013

時間：9:00am - 6:00pm

07/14 - 07/15, 2013 ..... (日、一 | 演講與實作 workshop)  
08/18, 2013 ..... (日 | 視訊教學)  
09/15 - 09/16, 2013 ..... (日、一 | 演講與實作 workshop)  
10/13, 2013 ..... (日 | 視訊教學)  
11/10 - 11/11, 2013 ..... (日、一 | 演講與實作 workshop)  
12/08, 2013 ..... (日 | 視訊教學)  
01/20-01/21, 2014 ..... (一、二 | 美國演講)  
01/22, 2014 ..... (三 | 美國可選修的 cadaver workshop)  
01/23, 2014 ..... (四 | 美國可選修的 cadaver workshop)  
01/24-01/25, 2014 ..... (五、六 | 美國演講，畢業典禮)  
01/26, 2014 ..... (日 | 美國可選修的 cadaver workshop)

地點：集思交通部國際會議中心。台北市中正區杭州南路一段二十四號。(2013年7月到12月)  
Millennium Biltmore Hotel Los Angeles, 506 South Grand Avenue, Los Angeles, CA 90071 (2014年1月)

### 報名費：

**台北和美國課程** (包含 USC 牙醫學院發出的培訓證書)

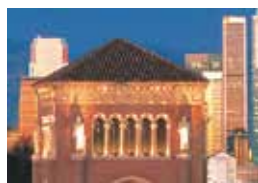
- 6/1/13 前報名：美金 \$8,500
- 6/1/13 後報名：美金 \$9,000

**台北課程** (不含 USC 牙醫學院發出的培訓證書)

- 6/1/13 前報名：美金 \$5,950
- 6/1/13 後報名：美金 \$6,450

**可選修的 Cadaver Workshops on Bone and Soft Tissue Grafting 課程** (不含 USC 牙醫學院發出的培訓證書)

- 9/1/13 前報名：美金 \$1,115
- 11/1/13 前報名：每一堂課美金 \$1,395
- 11/1/13 後報名：每一堂課美金 \$1,595



### 南加大講員陣容

Homa Zadeh \* Avishai Sadan \* Baldwin Marchack \* Casey Chen \* Domenico Cascione  
Ilan Rotstein \* Yang Chai \* Songtao Shi \* Parish Sedghizadeh \* Ramin Mahallati

演講嘉賓：Mauricio Araujo \* Fernando Rojas-Vizcaya \* Clark Stanford \* Stephen Wallace \* Lyndon Cooper

• 欲知詳情，請與以下單位聯絡 •

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Fax: (07) 615-0913

**金牛頓藝術科技** 聯絡人：葉芳如

Email: rita@newtonsa.com.tw

Tel: (03) 573-5676





**Chris H.N. Chang, DDS, Ph.D. Founder, Beethoven Orthodontic Center**

- Taiwan Orthodontic specialist
- Author, 3D iBooks Ortho
- Publisher, International Journal of Orthodontics & Implantology
- ABO-Certified Orthodontist
- Ph.D, Dept. Orthodontics, Indiana University-Purdue

# The Beethoven Dental Group

## A Learning Organization

Tzu Han Huang

Beethoven, a worldly renowned musician, is also the name of a famous dental clinic in Taiwan. If you google it, it ranks the 5th in the research results, with more than 6,000 findings. From this you get an impression of its popularity by the general public on the internet.

### The Beethoven Dental Group

The Beethoven is a dynamic team, led by Dr. Chris Chang, with its origin in orthodontics but quickly extending to general practice, pedodontic center, as well as specialized care in periodontics and prosthodontics. The team is consisted of excellent specialists as well as dental assistants. In addition to dental clinics, the Beethoven group established a subsidiary, Newton's A, Inc, whose primary focuses include dental information technology, development of dental equipment and providing dental education. In order to provide more comprehensive dental care, we will open an implant clinic next year.

### Beethoven Orthodontic Center-Environment

When you first enter the clinic, you will be immediately greeted by

the beautiful and warm smile of our assistants. We have a very spacious waiting area and consultation space surrounded by lines of bookshelves with a wide selection of books and magazines to entertain you. What's even more precious is the open atmosphere created by French window and ample natural lighting.

Such a stress-free environment is appreciated by not only patients but also doctors who spend all day in the clinic. The greens from the outside is a soothing reminder of another beautiful day at work. The open design of the waiting area aims to create ample space for patients and facilitate communication between parents and doctors. This type of space design also allows a smooth and efficient workflow when patients arrive during peak hours.

The supply station is located at the rear side of the chairs, mainly for equipment and patient records. In addition, the technology structure is built on a Mac-based system, using Apple desktops, iMac, to store patient data, run the customized patient appointment system and its native presentation software, Keynote, to guide clinical consultation. All patients'



Orthodontic Center

records and photos are entered and saved before the end of a clinic session. The saved data is also shared between computers located in the internal network.

### Beethoven Orthodontic Center-Operating system

One of the most unique features of the Beethoven clinic is its operating system. The daily average number of patients that enter the clinic is very significant and the combination of residents and specialists change in different days of the week. However, patients can still expect to go through a standard treatment process, fully executed by the doctors and assistants. A key secret weapon is a simple, concise, image-based patient record. You can clearly identify a patient's background, extra-oral, intra-shots, chief complaints, source of referral, treatment plans, all in a piece of A4 size paper. All doctors can easily pick up a patient record and immediately follow the instructions left from the previous visit. Most of all, an ideal treatment outcome can still be obtained despite the changes in doctors. An effective and efficient system should be able to be replicated by different operators, in different location. The aim of the system in Beethoven is to create such a model so doctors can make treatment more easy and predictable.



Dr. Park and the Korean delegates, together with the Beethoven Orthodontic Group's staff.



# BEETHOVEN

## Continuing Education



Indonesian doctors practicing screw placement on a model.

One may wonder how doctors can continue to update their knowledge and skills in today's busy world. The answer for Beethoven's doctors is the standardized training process. All residents in Beethoven have to complete Beethoven's Comprehensive Damon Q course, the Advanced Damon Course and continue their pursuit of excellence in the Finishing course. Dr. Chang's teaching style is very interactive and engaging, filled with fresh cases. Students constantly find cases they just saw last week or yesterday at the clinic, demonstrated and analyzed in the class next day.

### International Course

Beethoven's courses are not only designed for the local doctors; many doctors from overseas also attend the customized international workshop. The response from the participants were so overwhelmingly positive that several of them repeated the class. Besides providing international courses, Dr. Chang is frequently invited to give lectures around the world and bringing the most up-to-date news and internationally renowned speakers back to Taiwan's audience.

### International Journal of Orthodontics & Implantology

After over a decade of service to the people in Hsinchu, Dr. Chang has won the trust and support of his patients. In addition to providing orthodontic treatment, Dr. Chang dedicates most of his energy to providing continuing education and devoting himself to academic exchange locally and internationally. In order to provide a platform for dentists to share their clinical experiences, Dr. Chang also publishes a quarterly journal, News & Trends

in Orthodontics, now renamed as International Journal of Orthodontics & Implantology. Famous doctors in Taiwan and abroad frequently share their clinical secrets or summaries of recent lectures in the journal. We hope through this channel we can spread the messages of knowledge sharing and pursuit of excellence to our readers.

### The Beethoven Team

The Beethoven team is not only consisted of Dr. Chang himself. We have a team of doctors specializing in pedodontics, prosthetics, periodontics as well as implant therapy. So we can take care of patients from 1 year old to 99 years old. In addition to specialized care, we also have a general practice taking care of patients common dental issues. Through this comprehensive approach, we can provide total care to our patients.

Needless to say, dental assistants play an indispensable role in Beethoven's operating system. When every new patient enters the clinic, he or she will immediately be greeted by a professional assistant whose main function is to provide orthodontic consultation. The assistant will walk you through the consultation process, explain the data she will collect in this visit, including photos and X-rays, and the fees and stages of the treatment process. In terms of controlling the flow of patients during a clinic session, a senior assistant acts as the conductor in the clinic, assigning assistants to each chair and notifying doctors the order of patient sequence. Assistants are the crucial link between doctors and patients. If you think your assistants haven't met your expectations, you can consider signing up for Beethoven's assistant training for them.



The Beethoven team

# Andersen Pedodontic Center

*Guarding children's dental health*

## Andersen Pedodontic Center-Introduction

After serving the local community for over a decade, the local community leader approached Dr. Chang to express the community's needs for a doctor who understands children's dental health. At the time when children had toothache, parents have to travel to the crowded city center for treatment. In response to such wishes from his own community, and the repeated requests from parents of his orthodontic patients, he and Dr. Hsu together established "Andersen Pedodontic Center". "Our mission is to create an environment where parents can feel safe, children can experience joy and doctors can provide the best possible care to children", Dr. Hsu said.



Flower-decorated ceiling is what children see during treatment.

## Newton's A

*Dental education center*

The constant dilemma for successful dentists is the conflict between time and need for continuing education. It's almost a luxury to devote one's full attention to a full-day lecture or a new book. Newton's A understands doctors' needs for a more flexible and effective method of learning and has turned Beethoven's excellent teaching materials to videos. Combined with a mobile device, such as iPad or iPod touch, one can learn orthodontics anytime and anywhere. This latest utilization of technology has revolutionized the orthodontic world.

### Newton's A-Mobile Learning: Orthodontic Podcast Encyclopedia + iPad

Dr. Chang is the first dentist to combine the three seemingly distinctive but closely related courses, Damon

orthodontics, orthodontic bone screws and assistant training into easy viewing educational presentation videos. Using Mac's native presentation software, Keynote, he can instantly record live narration with his slides and turn his lecture into an engaging movie. Students can use these videos as electronic notes, carry them in their iPod or iPad



wherever they are and review the content whenever they want. Whether you are past, current or prospective students of Beethoven, you can use these videos for course preview or review to enhance the learning experience. Since the content is digitalized and frequently updated, students won't have to worry about being outdated once they purchase the course videos.

### Newton's A-Effective teaching tools: Mac + Keynote

In addition to produce professional dental educational podcast, Newton's A is also in charge of the design, execution and maintenance of Beethoven's technical environment. For example, recently the chairman of the premier teaching hospitals in Taiwan came to visit Beethoven with his son-in-law from the US. During the visit Dr. Chang performed an out-patient surgery. Some trained assistants provided clinical assistance to Dr. Chang while others took photos and videorecorded the procedures in small segments. Immediately after the surgery, assistants uploaded the patients' photos and videos and organized them in Beethoven's standardized patient record template, utilizing Mac's presentation software, Keynote. So Dr. Chang then used data from the previous visits as well as the procedures that just took place a moment ago to demonstrate to the patient the treatment progress and surgery process instantly. Followed by the presentation to the patient, Dr. Chang used the same file to continue a further in-depth discussion with the chairman.

# BEETHOVEN

## Andersen Pedodontic Center-Environment

The clinic is named after the famous children's book author, Hans Andersen. The image design of the clinic is inspired by Andersen's most famous fairy tales, the emperor's new clothes, the little match girl and thumbelina. Dr. Hsu hopes visiting the clinic can bring children not just the thought of stinky smell or feary drills but also beautiful stories. Besides the pleasant visual stimulants, the brushing station is designed at three levels to fit the varying heights of children of different development stages.

## Andersen-Long-term dental growth data preservation

Andersen sees itself as the long-term guardian of children's dental health. In order to closely monitor patients' growth, we

routinely take intra-oral, extra-oral photos and X-rays to make sure we won't miss the first sign of an emerging problem at a later stage. To achieve this goal, we use high quality digital cameras and wireless memory cards to ensure fast and secure data transmission. Mac's dual operating system allows us to take advantage of both windows and Mac's functions.

## Andersen-Children's health education

Prevention is better than cure. This is particularly true for parents battling with young children's cavity. In view of this common challenge for parents, Andersen regularly collaborates with local kindergartens to administer supplemental fluoride. Parents can also play a strong advocate for children's dental health by helping children develop proper concepts and practices of dental hygiene.



A case report as described may take several days to a week to complete in other institutions. With the use of proper technology, one can finish such tasks in less than 30 minutes.

This wonderful combination of Mac and Keynote makes preparing case reports, producing educational materials or presenting treatment progress to doctors, assistants, patients or parents so easy and effective. The built-in recording function allows presenters to record voiceover as the slides advance so the audience can better appreciate the content.

## Newton's A- OrthoBoneScrew

Originated from Beethoven's clinical experiences, Dr. Chang is leading a team of experts from academia and engineering to develop an orthodontic mini anchorage device, OrthoBoneScrew. The research and development team include experts from University of Indiana-Purdue's professor of Emeritus, Dr. Eugene Roberts, Dr. John Lin and Dr. Lin Shan Jie from National Central University in Taiwan. Our products have improved over the last two years and received positive feedback from orthodontists in Taiwan and abroad. The combined use of bone screw and Damon can significantly reduce extraction rates in borderline surgical cases. Cases that traditionally require surgery can achieve satisfactory results with the use of orthodontic bone screws.

## Implant Center

### *Ortho-Implant combined treatment*

In recent years Beethoven have seen a growing number of adult patients seeking treatment for missing teeth. This indicates a stronger need for esthetic appearance for adult patients. However, this brings a new set of challenges for orthodontists because the problems are far more complex than creating ideal alignment. Patients often have periodontal problems, multiple missing teeth and the reconstruction of prosthetics or implant placement. Hence, Beethoven believes providing adult patients a comprehensive treatment is our new goal.

Traditionally adult dental treatment can be summarized in two words, periodontics and prosthetics. However, in the era of inter-disciplinary treatment, orthodontics and implantology have become the new two pillars in this treatment structure. Orthodontics can lay a solid foundation to support future implant placement. Therefore, the establishment of the new implant center is to provide a more comprehensive care to our patients in our dental network.

In October, 2011 Newton Implant Center is established to fulfill such needs that were not adequately met previous in the Beethoven. Dental Group. The new Center marks Beethoven's milestone in providing interdisciplinary treatment. Equipped with the latest 3D technology, Newton now has the capacity to provide diagnostic information on impaction for orthodontic treatment, and bone quality assessment for implant therapy. In addition, Newton also applies the latest cloud technology to manage clinical data as well as provide patient consultation and staff continuing education.

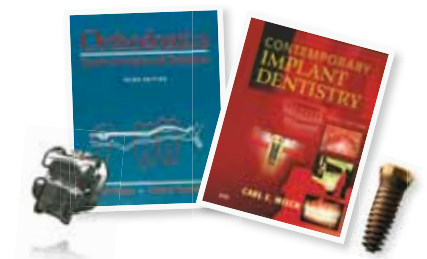


# BEETHOVEN



"None of these can be possible without my two great mentors", said Dr. Chris Chang. He contributed this recent shift of focus to the inspirations by Dr. Homayoun Zadeh from USC and Dr. Kwang Bum Park from UCLA. Dr. Homa is a strong advocate and dedicated educator on promoting evidence-based implant therapy. Since 2010 Beethoven and USC has collaborated to annually provide a six-month international certificate course to doctors in Taiwan. Armed with solid knowledge foundation, Dr. Park, faculty of UCLA, CEO of Megagene, one of the fastest growing implant cooperation and MIA, one of the largest dental hospitals in Korea, inspired Dr. Chang with his business management wisdom. After two years of immersing himself in the learning of implantology from an orthodontic perspective, Dr. Chang and many of the experts in these two fields, all agree that implant-ortho combined treatment is the future of dentistry. In order to promote the study and practice of implant-ortho combined treatment, Dr. Chang, together with world leaders in orthodontics and implantology, such as Drs. Eugene Roberts, John Lin (林錦榮醫師), Fernando Vizcaya, established International Association of Orthodontists & Implantologists (iAOI) in October, 2011. Beethoven's previous orthodontic journal, News and Trends in Orthodontics (NTO), is now changed to International Journal of Orthodontics & Implantology (IJOI). As member of iAOI, one can view the latest lectures of iAOI's consultants or read all issues of its publications from the comfort of their home or when they are on the go. Learning can never be easier.

"All we doctors do is aimed to provide the best possible care to our patients", Dr. Chang stresses. Based on this philosophy, the core value of the Beethoven Dental Group is education. As medical technology and innovation evolve, doctors need to constantly renew their knowledge and skills through continuing education. We hope doctors sharing the same commitment to quality patient care and passion for learning can join iAOI, the future of dentistry!





New

# Clinical Implant Dentistry

e-Book

## Clinical Implant Dentistry Vol. 1



Thomas J. Han  
Kwang Bum Park  
Chia Chang

A comprehensive collection of dental implantology courses featuring popular topics from soft and hard tissue management to the innovative Ortho-Implant combined treatment. The interactive features of the e-book format (supported by Apple's iBooks) make learning more fun and engaging than ever. It is a must read for any clinicians aspire to provide a high quality of modern practice.

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Orthodontics Vol.II



Orthodontics Vol.I and Vol.II are now

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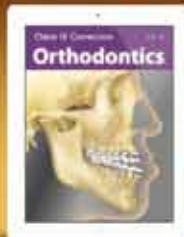
Orthodontics Vol.I



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Orthodontics Vol.III



Ortho Combo

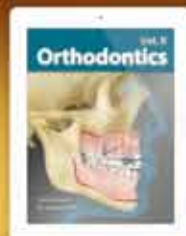
eBook 01

eBook 02

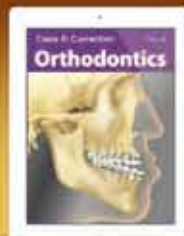
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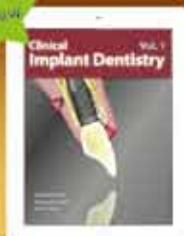


Orthodontics Vol.III



Dental Implantology

New



eBook Combo

eBook 01

eBook 02

eBook 03

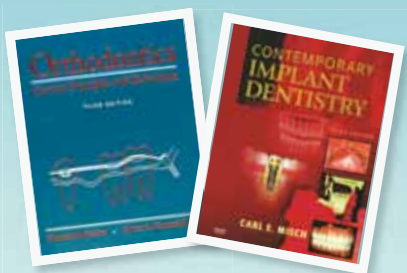
Amazing





# 當矯正遇上植牙

## 課程 04



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## 2013 *Newton's A* Implant 金牛頓植牙論壇

### Implant Technique + DDx + Fundamentals

現在的牙科治療已經是各科統合彙整的時代，協同矯正、植體、牙周、補綴讓治療成果臻於完美是我們追求的目標。

邀請您一起迎接「協同性整合」的新牙科時代，讓我們從植體與矯正的對話出發。透過整合各科精華，締造集美觀、功能於一身的全方位治療。張醫師相信，儘管課程內容可能相似，但是貝多芬對於資料的呈現方式不一樣！唯有自己消化吸收後的整理，才是真正屬於自己的難能可貴的經驗，這就是貝多芬精神！

關於植牙論壇的定位與期許：

1. 將目前眾多植牙演講精華，重新整理過在自己的場合報告
2. 提供訓練平台供學員報告自己的case，從中相互學習。
3. 提升助教的演講技巧，培養新講師群。
4. 作為未來IAOI矯正植專科醫師考試的考前訓練班。

# 2013年02月22起

每月底週五，上午9:00-12:00



書 視 課 品





# 2013 *Newton's* Implant

	日期	IAOI case report	Article review
1	2/22	特別演講 張慧男醫師	ITP Vol.1 CH.11 Position teeth (Ward M. Smalley)
2	3/22	IAOI ortho/implant combined case report	ITP Vol.1 CH.10 Occlusal scheme (Neil L Starr)
3	4/26	IAOI ortho/implant combined case report	ITP Vol.1 CH.5 Soft tissue framework (Llory M Tucker)
4	5/24	IAOI ortho/implant combined case report	ITP Vol.1 CH.4 Endo or not (John D West)
5	6/28	特別演講 邱上珍醫師	ITP Vol.1 CH.7 Save or ext (Andrew M Alpert)
6	7/26	特別演講 李裕隆 / 蘇筌瑋 醫師	ITP Vol.1 CH.9 Treatment planning (Henry I Nichols)
7	8/30	特別演講 賴依玲 / 張慧男 醫師	ITP Vol.1 CH.12 All ceramics (Ariel J Raigrodski)
8	9/27	特別嘉賓 黃國精醫師	
9	10/25	IAOI ortho/implant combined case report	ITP Vol.1 CH.15 Veneers (Galip Gurel)
10	11/29	特別嘉賓 張燕清醫師	
11	12/27	IAOI ortho/implant combined case report	ITP Vol.1 CH.17 Implant or not (Neil L Starr)



邱丕霞醫師

南下高雄開業，迄今已逾十五年時間，邱醫師最感受用的，是她在三十五歲開業之初學會矯正，在四十六歲還沒得老花眼時學會了植牙。邱醫師坦言，在職進修必然造成壓力，它可能來自於時間、金錢與家庭，畢竟一天只有二十四小時，但終身學習所創造的成就感與報酬，卻讓她覺得當牙醫「真是好玩」，而且將持續下去，謹此與讀者分享。

～本文摘錄自2010最新一期《台大牙友》



## Feedback on the Book "Orthodontics"



*Dear Chris,*

Exquisite! Inspirational! Innovative! Elegant! Thought provoking! Just received and cannot find adequate words to describe! Only needs your autograph to be complete.

Looking forward to the digital version, especially with regard to a cutting edge teaching platform.

More congratulations and Warmest hugs!



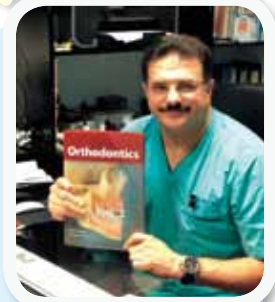
*Ron* Dr. Ronald Bellohusen, DMD

*Dear Chris,*

Today I received your book. I order it in Amazon on Monday and got it today in México city. Congrats! It looks excellent! I am anxious to start reading it. The only thing is missing....Your autograph!

*Best regards amigo, Nasib*

*Nasib Balut*  
Mexico



*Hello Professor,*

Hope all is well!!! Just purchased the book (1 of 3 left). It is a great day and I will also purchase a lottery ticket since I lucked out getting my hands on a copy of your book! Please tell Shufen hello for me.

*Your friend and student, Karla Thompson*

*Karla Thompson*  
DDS, Ortho Smile 360 in Encino, CA



*Hi Chris,*

Finally we received your amazing book! Elena and I are practicing a lot as you can see in the pictures, we have found that bigger screws are better....

Thank you very much for this fabulous book and for sharing your knowledges with everyone. Very lucky to have you and Shufen with us in the Progressive.

*Big hug*

*Elena and José*  
Spain





## Feedback from the Keynote Workshop

My life has leveled up after I met "Keynote." To be honest, I had been an die-hard fan of Powerpoint. However, my life has leveled up after I met "Keynote". **The amazing functions of Keynote has helped my life dramatically.** As a student of a business school, any single presentation could be our stage of opportunities. Therefore, how can we make these single chances brilliant is considerable. The most treasurable thing of Keynote is that it can create magics with a very easy way. For instance, "Inspector" function can almost build up every effects and transi ons of slides. Unlike the old Powerpoint software, it takes you a lot of time to make good slides. Keynote, the masterpiece of the Apple, tells you what is the ultimate "quality." I really appreciate that I had learned Keynote from Dr. Chang. After many presentations in my business school, I realized that **my slides are different from others.** And also, **I have gained a lot of confidence from creating slides by Keynote.** I feel like I am a creator when i am using those incredible functions. This is how an encouraging thing in the life, isn't it?

Thank you for enlightening me, Dr. Chang.

*Vicky Yu*

Hult International  
Business School, San Francisco, USA



Initially, I was a common undergraduate. Due to Keynote, my view of life has been broadened. Now, I am somewhat unique.

Last summer, I was advised to attend a Keynote Workshop. Originally, the first image of Keynote was "what's that?" Why did I have to spend time learning a kind of Powerpoint I had already known? Without doubt, these thought vanished into thin air as sudden as lightning. If my memory serves me right, the first time I used Keynote taught by Newton's A, I was deeply fascinated by it. **Not only Keynote is delicate, but the way to use it is a lot simpler than Powerpoint.** For instance, I can search any picture I want on the Internet and drag it directly into Keynote without downloading it. Additionally, removing pictures' backgrounds called keyer effects is much easier with Keynote than traditional Photoshop. In Keynote, we just need to use the "alpha" functions so that backgrounds of pictures can be removed. Nonetheless, the most impressive function is that we can drag video files directly into Keynote. It makes my presentation with higher quality with such cool and convenient functions.

It didn't until one time I had a presentation with Keynote that I more certainly sures **my skill of presentation has improved exponentially.** No sooner had I stood on the stage appealing techniques learned by Newton's A and especially Dr. Chang than all I felt was my classmates' curious and admiring look. After the presentation, a great number of them came to me asking how to do that. Instantly, all that comes into my brain was a full of confidence and appreciation as well. I know that every applause, every "wow" sound, classmates admiring me and more confident I becoming have to be credited to Newton's A and Dr. Chang' s solid and useful training. As a result, I can have an indispensable ability just when I am a college student.

*David Yu*

National Taiwan University, Taiwan



## Feedback from the International Damon & OBS Workshop

*Dear Chris,*

It was wonderful to be at this international workshop to learn simple and powerful things that, when I think of them, will **revolutionize my orthodontic practice**. This is true progress in the way it is turning the difficult into easy. **This is the best I've ever attend to since 2001 when I took my first Ortho course**. I love those little tips that you share and that will make the big difference. This sharing also point out how humble and transparent you are.

It could be already enough but there was more than Ortho to learn. I was inspired by your system organization both in clinic and at Newton's A. And this Keynote course is more than I could expect.

Overall for me it was a **mind-opening experience**. As I already told you I want to be part of your journey. You awaken some dreams in my mind. Now I have to think and work!

Thank you, thank to "mummy Sabrina" and thank to all your dedicated staff!!

*Your African friend Sabi*

*Sabi Sika Boni Guessou*

Benin



*Dear Dr. Chris Chang,*

I registered to attend your International Damon and OBS Workshop 2012 after hearing the presentation you gave in UCLA Conference in Maui, HI.

I can only say that the Workshop exceeded my expectation and it was truly **amazing**. Lectures by the world class orthodontists (Dr. Chris Chang and Dr. John Lin), and wealth of knowledge from your many years of dedication, wisdom, and clinical experiences were evident through the cases you presented. I am also very much appreciative of the opportunity to observe you actively and effortlessly practicing what you teach through the chair-side observation session held in your very busy practice.

First, as an innovative educator, you encouraged us to be innovative. Second, you taught us your system and showed us tools in Damon and OBS for us to succeed and duplicate it in each of our own practices.

Third, you motivated us to continue to continually improve the system. Personally, I am very grateful and thankful for these three pieces of advise you gave to us.

You have inspired me to learn more. Your eBooks, IJOI, and Podcast Encyclopedia have helped me to continue to study and digest what I learned from you.

*Respectfully,*

P.S. I am looking forward to your presentations in USC Periodontal and Implant Symposium and Damon Forum 2013.



*John K.S. Tong*

DDS, MAGD Cupertino,  
California USA



### 親愛的張醫師、高老師

這次有機會赴貝多芬診所及金牛頓教學中心學習真是獲益不少。來美國近20年這還是第一次以中文來學習牙醫，感覺特別親切，但也要適應學習些中文的專業名詞。雖然我自學習矯正已近十年，但從張醫師的電子書及視訊教學中，看到自己過去臨床的一些盲點及困難處得著解答。執業多年，反而漸漸忽視張醫師所說的基本功，而那些基本功的小細節，要自己經歷了不少挫敗後才逐漸發現。站在巨人的肩膀上學習，真是少了不少臨床的困扰。張醫師的教學活潑生動且幽默，讓學員享受學習並期待後面的講解，同時也激發學員們的求知慾。張醫師對牙醫的熱情及不斷精進，真是每一位困於繁重且枯燥牙醫治療醫師們的福音。

未來打算每一兩年會赴新竹與張醫師學習。本月24-27日我參加USC在洛杉磯 Perio Symposium時會住在 USC 建議的 Millennium and resort hotel，期待幾周後的再相會。這次忘了與張醫師及高老師合照，這次在美國相會可不要忘記。

蔣德成

Jack Chiang, DDS MAGD, Pullman Family Dentistry PLLC  
Pullman, WA USA



*Dear Chris,*

Happy new year! I believe you will be healthy and prosperous in 2013.

I have a request to you. One of my faculty, Dr. Young Chae Cho, wants to be a leader in Orthodontics in our group.

So I told him to learn your concept of orthodontic treatment. If you teach him everything in detail, he can guide Korean dentists to be a member of iAOI.

As a matter of fact, Korean dentists in our group including me, do quite well in implant treatment, but have not enough knowledge in Orthodontics.

I hope your concept of Orthodontic treatment can be penetrated throughout our treatment planning.

He said he can go any week of March, and can stay one whole week.

Can you guide me which week is best for you? If you have a course for foreign dentists, it will be perfect for him.

*Best regards, KB*

*Kwang Bum Park*

Director, MIR Dental Network, Korea







# Keynote 高效簡報學習法 系列課程

## 課程 02

### 輕鬆製作 吸睛簡報

連續報名K1~3，

學費 **9** 折！

#### K1 簡報聖經

8/22



看過太多充滿複雜文字和圖表的幻燈片，聽過就忘了的演講嗎？Keynote 系列一的演講要教你如何利用 Keynote，製作出令人目眩神迷、印象深刻的電腦簡報。透過小班教學，貼身指導，務必讓你在八小時裡輕鬆掌握 Keynote 的簡報技巧。

學習重點：1. Keynote 操作入門 2. 演講常見十大謬誤 3. 資料視覺化技巧

#### K2 Dr.Kokich 令人屏息的十大演講秘訣

9/19



Keynote 系列二位各位介紹世界牙醫界的天王講師 Dr.Kokich 的十大演講秘訣，讓您在進階的課程中更加掌握演講設計的關鍵原則，不但讓你知其然，更知其所以然！

學習重點：1. Dr.Kokich 十大演講秘訣 2. 準備演講的九個步驟 3. 多媒體影片剪輯

#### K3 賈伯斯令人目眩神迷的五項演講技巧

3/14, 10/24



總結我們 Keynote 系列的系列三，我們為大家逐步解析跨界演講大師 Steve Jobs 是如何說出打動人心、價值數十億美金的關鍵故事。透過逐步的分析拆解，要讓您也可以成為獨具魅力的演講人。

學習重點：1. Steve Jobs 的五項演講技巧 2. 幻燈片的設計概念 3. 幻燈片修改應用

## 課程 03

### 精修繪圖 簡報達人

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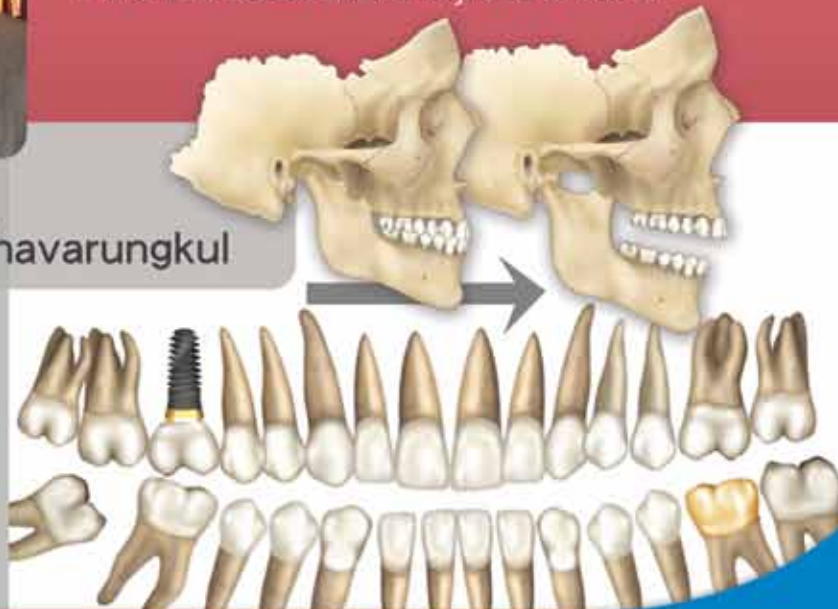
#### K4 5 6

11/23-25



講師  
Dr. Rungsi Thavarungkul

- 學會使用繪圖版。
- 在 Keynote 內繪製插圖，並運用動畫效果完美呈現。
- 用 Adobe Illustrator 和 Photoshop 創造複雜的構件。
- 完美整合 Adobe 繪圖及 Keynote 實用技巧。



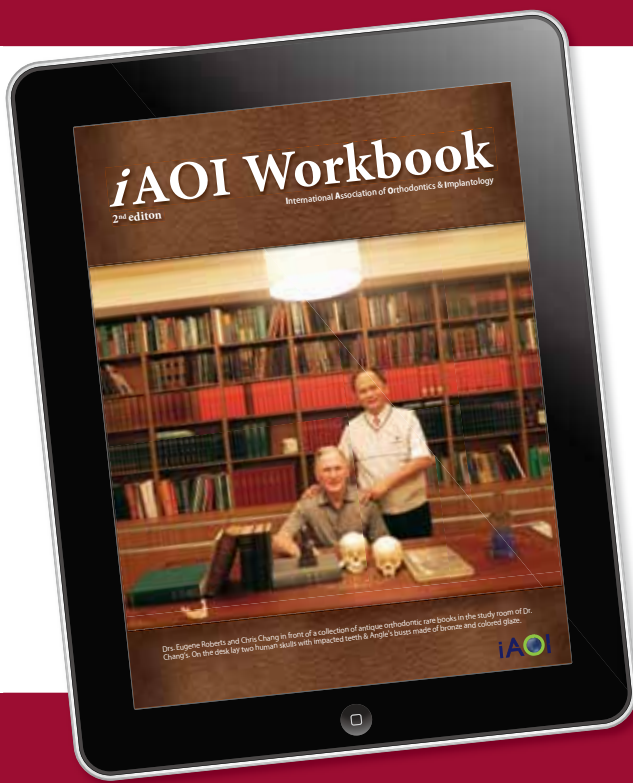
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### 1. Member

Doctors can go to <http://iaoi.pro> to apply for membership to join iAOI. Registered members will have the right to purchase a workbook in preparation for the entry exam.

### 2. Board eligible

All registered members can take the entry exam. Members will have an exclusive right to purchase a copy of iAOI workbook containing preparation materials for the certification exam. The examinees are expected to answer 100 randomly selected questions out of the 400 ones from the iAOI workbook. Those who score 70 points or above can become board eligible.

The exam is one hour and the next session will be held on June 23, 2013, Taiwan Academy of Banking and Finance Building, Taipei, Taiwan.

### 3. Diplomat

Board eligible members are required to present three written case reports, one of which has to be deliberated verbally. Members successfully passing both written and verbal examination will then be certified as Diplomat of iAOI.

### Ambassador

Diplomates will have the opportunity to be invited to present six ortho-implant combined cases in the iAOI annual meeting. Afterwards, they become Ambassador of iAOI and will be awarded with a special golden plaque as the highest level of recognition in appreciation for their special contribution.



2013 國際矯正植牙學會

# EXCELLENT FINISHING

## 6/23-24 日一

活動地點：台北金融研訓院

台北市中正區羅斯福路三段62號

報名專線：03-5711377

線上報名：iaoi.pro

### 6/23 日

## 大會演講 Angle 學會考試病例

Angle 學會考試案例有別於以往的案例報告方式，  
矯正前、中、後都需經嚴謹的評估與測量，  
張慧男醫師將探討六個 Angle 學會考試的病例，  
以深入簡出的方式和與會醫師分享考試心得，  
六位參與撰寫 Angle 案例的院士也將獲邀於大會演講。

地點：台北金融研訓院 2F 菁業堂

iAOI



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# 6/23-24

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### 6/24

#### Hands-on Workshop

地點：台北金融研訓院 5F 501教室

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深入分析治療前 DI、治療中及後之 CRE，  
實際體驗 Angle 考試的箇中精華，  
參加課程者將獲得實作模型 3 個、ABO 量尺及案例分析電子書，  
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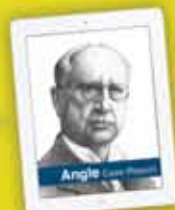
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模型 x 3



ABO 量尺



Angle 案例分析電子書

## 費用/匯款資訊

	06/23 (日) 大會		06/24 (一) Workshop	
	05/31 前報名	05/31 後報名	05/31 前報名	05/31 後報名
會員價	3,000 元	4,000 元	14,000 元	16,000 元
非會員價	4,500 元	5,500 元	16,000 元	18,000 元
大會 + Workshop 合報優惠 (限額 50 名)	會員價 <b>15,500</b> 元 非會原價 <b>18,500</b> 元			

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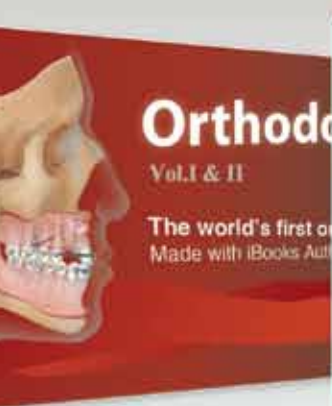
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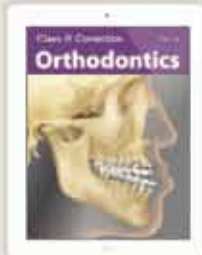
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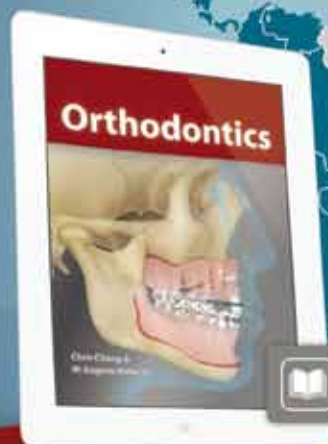
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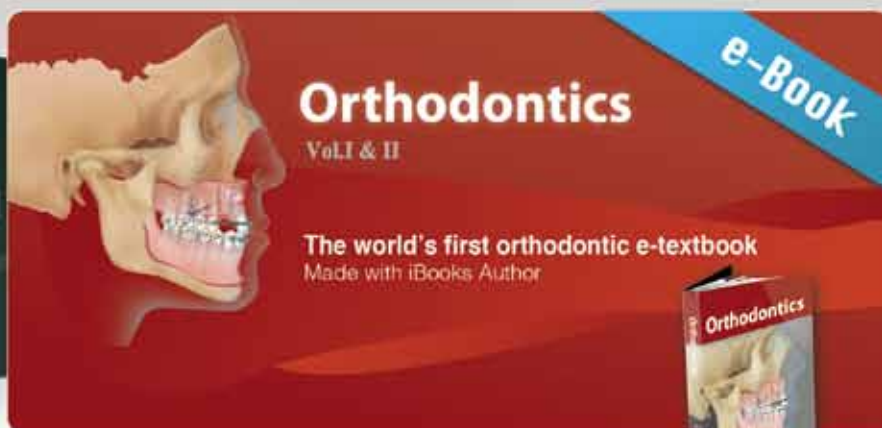
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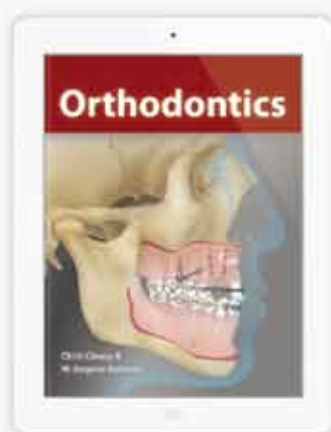
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專業簡報	Keynote 簡報法 series 1 簡報聖經	1. 常見簡報謬誤 2. Keynote 入門	2013/8/22 (四) 09:00 ~ 17:00	科技人、醫師 教師、學生
專業簡報	Keynote 簡報法 series 2 Kokich 的 10 大演講秘訣	1. 多媒體影像處理 2. 簡報設計	2013/9/19 (四) 09:00 ~ 17:00	科技人、醫師 教師、學生
專業簡報	Keynote 簡報法 series 3 How to Wow'em like Steve Jobs?	1. 賈伯斯演講秘訣 2. 簡報設計進階應用	2013/3/14、10/24 (四) 09:00 ~ 17:00	科技人、醫師 教師、學生
專業簡報	Keynote 簡報法 4-6 繪圖精修課程	1. How to use a digital drawing board. 2. Design illustration in your Keynote. 3. Showcase your own drawing with stunning animation in Keynote. 4. Create complicated diagrams using Adobe Illustrator and Photoshop. 5. Animation Competition	2013/11/23-25 (六、日、一) 09:00 ~ 17:00	科技人、醫師 教師、學生
International	Damon and OBS workshop	1. Damon System 2. OrthoBoneScrew	2013/6/18-20 2013/11/19-21	International Orthodontist



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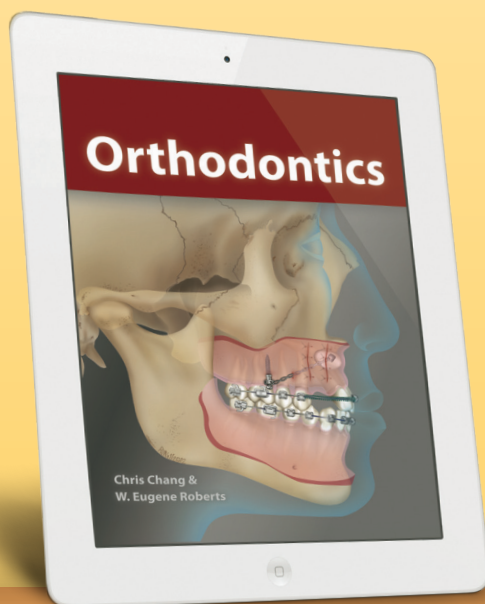
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Dr. Chris gave a lecture on "Ortho-implant Combined Treatment" in 38<sup>th</sup> Annual USC International Periodontal and Implant Symposium, 2013. He did a round table interactive session with experts, Drs. Joseph Kan, Niklaus Lang, Brahm Miller, & Sonia Leziy (from left to right).

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