

Treatment and Long-term Follow up of  
Twins with Skeletal Class III Malocclusions  
Dr. John Lin

Compromised Treatment  
for a Class III Asymmetry Case  
Drs. Johnny JL Liaw & W. Eugene Roberts

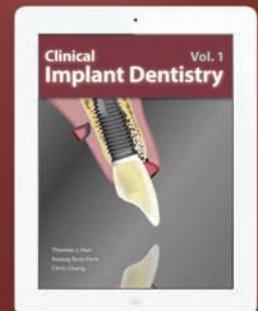
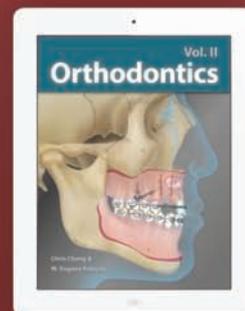
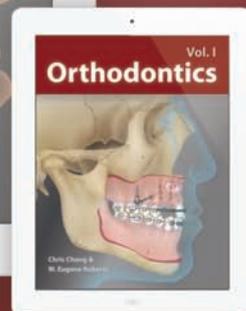
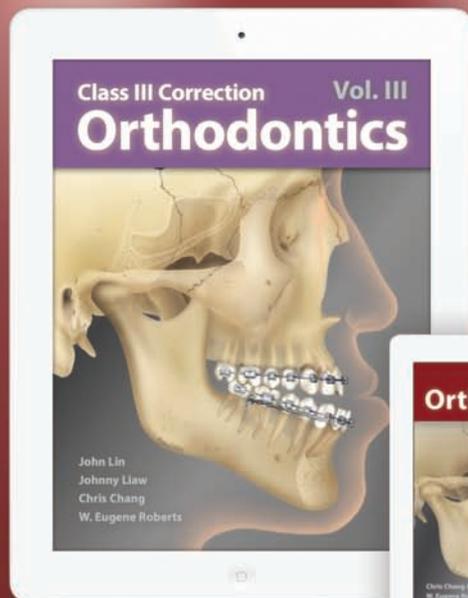
Conservative Management of a Severe Class III  
Open Bite Malocclusion  
Drs. Bill Su, Chris Chang, & W. Eugene Roberts

Stability of Mini-screws on Buccal Shelves:  
A Retrospective Study of 1680 Mini-screw Insertions  
by the Same Orthodontist  
Drs. Chris Chang & W. Eugene Roberts

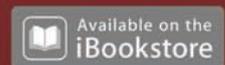
# IJOI

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**Beethoven Dental Encyclopedia e-Book**



About the Beethoven Dental Encyclopedia e-Book, please refer to pages 103-104.

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# 2013~2014

# 熱愛學矯正

## 張慧男 博士



新竹貝多芬齒顎矯正中心負責人  
 中華民國齒顎矯正專科醫師  
 美國齒顎矯正專科醫師學院院士 (ABO)  
 美國印地安那普渡大學齒顎矯正研究所博士

## 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。

【課程】9:00 - 12:00  
 【實習】另外安排

台北 (二)	台中 (四)	LECTURE	LAB
1 6/4/13'	6/13/13'	理想入門病例+Damon Q黏著	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

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】9:00 - 12:00  
 【高雄】14:00 - 17:00

新竹 (四)	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 <b>1/9/14'</b> <b>NEW</b>	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

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。

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

新竹(五) **2013** 10/11、18 (含午、晚餐)

## 課程資訊

### 上課地點

- 【台北】恒毅資訊中心 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 / 高雄市三民區九如一路797號 (107研討室)

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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

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。

【課程】9:00 - 12:00

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

### 3D e-Book: The future learning and teaching

It is always a great blessing to have mentors in your professional life. 27 years ago, I was lucky enough to have learned Class III treatment from Dr. John Lin, who I consider to be a real expert in this field. Five years later, I had the privilege to study for my PhD and Orthodontics Certificate at Indiana University. Dr. Gene Roberts became and has remained my mentor and godfather ever since then and has successfully redesigned my orthodontic gene.

For the past 10 years, the non-surgical approach to skeletal Class III treatment has evolved to a level that I never believed would have been possible. Buccal shelf miniscrews have played a crucial role in this extraordinary treatment modality. My best friend, Dr. Johnny Liaw certainly deserves the credit, as he proposed this extra-radicular insertion method in buccal shelves 10 years ago. Since then, Dr. Lin and I have adopted and modified this method, so that consequently, we have been able to enjoy treating challenging Class III malocclusions.

There is probably no better way to learn about orthodontics than studying well documented cases based on a solid theoretical foundation and scientific evidence. Following the suggestion of Dr. Roberts, Dr. Lin, Dr. Liaw and I decided to take this a step further, and using the most creative software, iBooks Author, we are now publishing our Class III treatment recipe. It is by far the most exciting way to understand other professionals' concepts of treatment. It is truly innovative and truly simple.

Be forewarned - if you pick up this 3D e-book, your perception of reading and learning will never be the same again!

*Chris Chang* DDS, PhD, Publisher

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## Treatment and Long-term Follow up of Twins with Skeletal Class III Malocclusions

Fraternal twins, one male and one female, presented for orthodontic treatment with a chief complaint of complete anterior crossbite extending into the right posterior segments and crowding.



The frontal views indicated the female's chin was deviated to the left side, while the male's chin was deviated to the right side.

The lateral facial views revealed that both patients exhibited a protrusive lower jaw. The female had a moderate lower jaw protrusion, but the male had a markedly prognathic mandible.



### ■ 9y4m

The male's chin was deviated to the right, and his midface was deficient, as evidenced by a concave infraorbital and malar regions.

The principle diagnosis was mandibular protrusion associated with maxillary retrusion, a severe Class III malocclusion. Both the panoramic films and intra-oral photographs indicated many caries lesions and residual roots of deciduous teeth, indicating a long history of poor oral hygiene. There was crowding in both arches and the maxillary canines had insufficient space for eruption.

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



The parents and patient were informed that the prognathic mandible and deficient maxilla required an additional phase of orthodontic treatment combined with orthognathic surgery. Space creation in the upper arch was indicated to assist eruption of the upper canines. The lower E space was required to facilitate eruption of lower premolars.



■ 9y5m - 9y10m - 10y3m - 10y5m

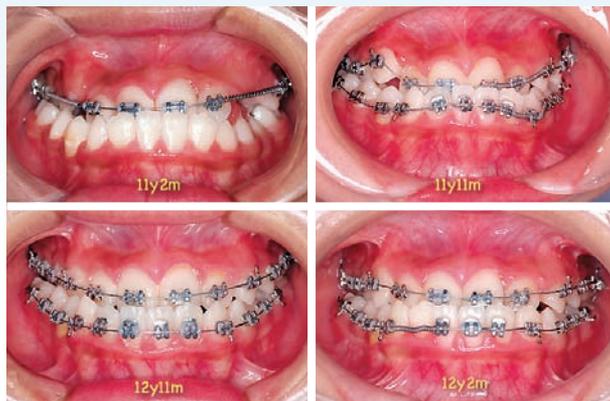
Early treatment was planned to gain spaces for upper canines, and maintain the lower E space by placing a lingual holding arch. The correction of anterior crossbite was postponed until the second stage of orthodontic treatment combined with orthognathic surgery. The upper dentition was well aligned, and spaces were opened for the upper canines to erupt.



■ 10y7m

The patient's mandible had become more protrusive. The parents fully understood the current early treatment objective was merely to align the dentition, not to correct the intermaxillary discrepancy.

All the permanent teeth in the buccal segments had erupted except for the maxillary canines.



■ 11y2m - 11y1m - 12y2m - 12y11m

After 1 year and 9 months of orthodontic treatment, both arches were well aligned.



■ 12y11m

Although both dental arches were well aligned, the severe Class III malocclusion persisted with a large reverse overjet. The extra-oral photographs demonstrated a severe concave appearance due to deficient infra orbital and malar regions, in addition to a very prognathic mandible.



■ 14y11m

The 2-year follow up examination indicated an increasing degree of mandibular prognathism and Class III malocclusion.



■ 18y6m

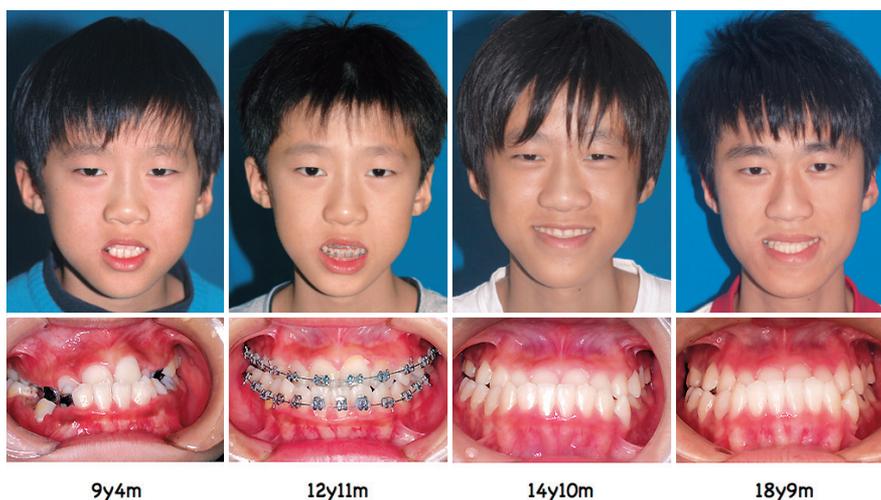
The patient still had severe Class III skeletal malocclusion with a retrognathic maxilla (*midface deficiency*) and a prognathic mandible. All four third molars were present, but the two upper second molars were extruded, because they had no antagonists due to a lack of eruption of the lower third molars.

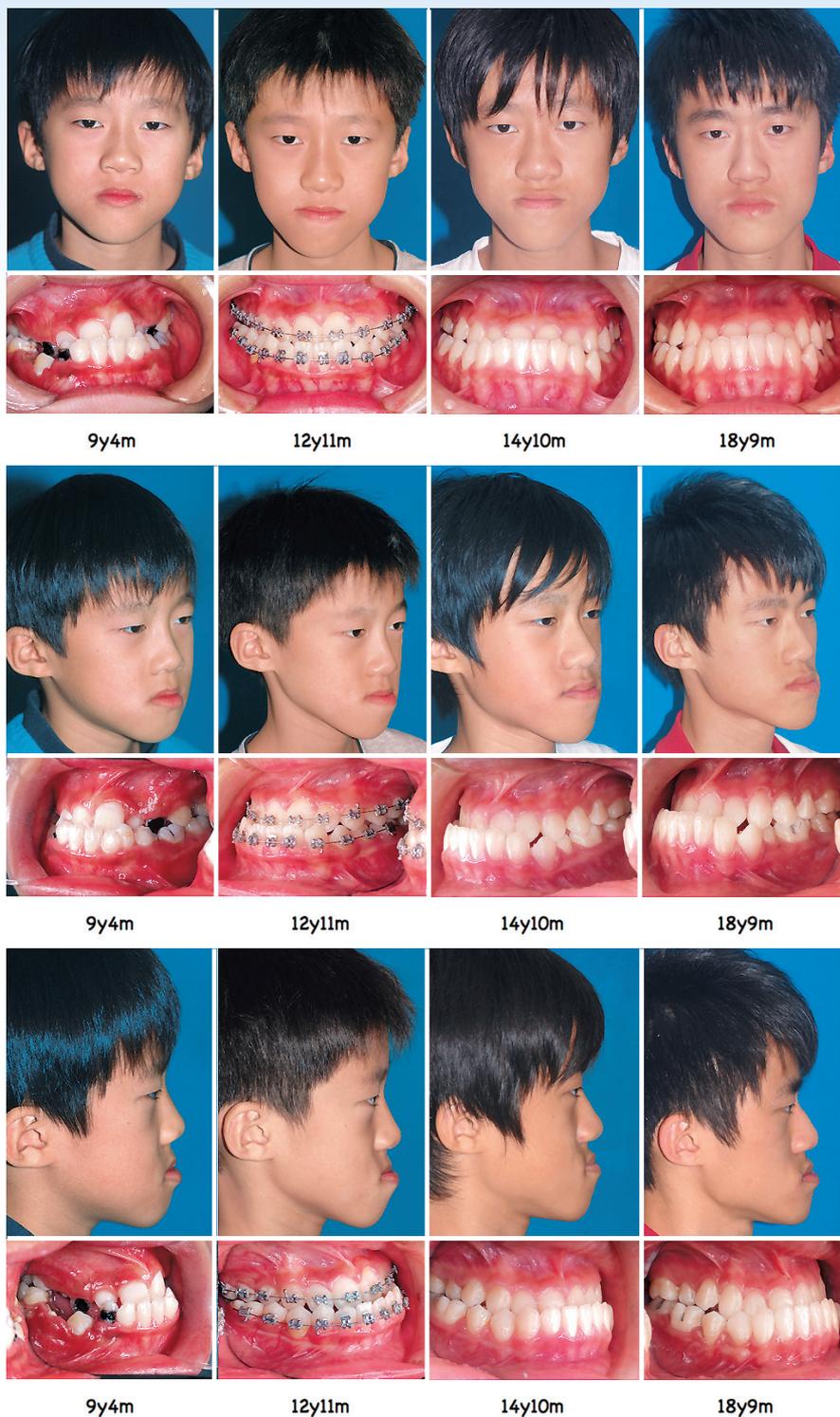


■ 18y9m

The two extruded upper second molars and two lower third molars were extracted.

The second stage of orthodontic treatment was delayed until full eruption of two upper third molars. Orthodontic alignment of both arches will be followed by orthognathic surgical correction of the severe Class III skeletal problem.





■ 9y4m - 12y11m - 14y10m - 18y9m

This longitudinal series of photographs was collected over 9 years and 5 months of recall follow up.

Early nonextraction orthodontic treatment was performed with the aim to align the dentition in each arch. The retrognathic maxilla and prognathic mandible were diagnosed in the initial examination, and the skeletal Class III pattern continued throughout the active growth period.

### What we can learn from this case:

- (1) These different sex siblings are obviously fraternal, not identical twins. However, they are an interesting comparison of opposite sex siblings that are the same age at any point in time. Throughout his development, the male twin was more severely affected by Class III malocclusion, both from a dental and skeletal perspective.
- (2) In terms of severe skeletal Class III malocclusions, these twins are a rare situation where a definitive diagnosis can be formed at a young age. Space management should be the primary treatment goal in early phase of treatment. Any early orthopedic intervention or dental compensations will be counterproductive. Second stage orthodontic treatment, after completion of growth, combined with orthognathic surgery was indicated in the initial treatment plan.
- (3) Severe caries is a common phenomenon in young patients in Taiwan. In this case, many cavities and residual roots of deciduous teeth were found in the initial examination. Early orthodontic management of the crowding was achieved and the arches were leveled. Despite the Damon system's MEAW effect on the dental correction of Class III malocclusion, the severe skeletal problem will persist. Furthermore, the dentition will relapse to an increasingly Class III relationship as growth continues.
- (4) Early treatment involving orthopedic appliances, such as chin cup or face mask, are in the author's experience counterproductive. There is no clinical evidence or reliable literature that supports successful early correction of severe, skeletal Class III malocclusions.
- (5) Due to the recent advancement of temporary anchorage devices (TADs),<sup>1</sup> many treatment methods have been proposed to provide early intervention in severe Class III cases. Many patients were treated early with mini-plates.<sup>2, 3</sup> Some studies reported very good treatment results, but only temporarily, because skeletal Class III malocclusions tend to relapse both dentally and skeletally, during the adolescent years. Although TADs may be a very effective clinical adjunct for severe Class III treatment, proper diagnosis remains the critical aspect of successful treatment. In general, treatment of severe Class III malocclusion is not predictable until facial growth is complete, or nearly so.
- (6) Early extraction treatment in severe Class III cases is contraindicated unless extreme crowding and/or arch irregularity are involved. Treatment options are more predictable after completion of active growth. In the present patient, the upper anterior teeth seemed very flared when the patient was about 10 years of age. However, after the patient turned 18, the proclined upper incisors no longer appeared as severe as before. In conclusion, do not conduct early extraction treatment to correct proclination of upper incisors.
- (7) In this case, the extruded upper second molars and lower impacted third molars were removed when the patient was over 18 years of age. The pre-surgical orthodontic treatment didn't begin until later, when mandibular growth was expected to be complete, or nearly so.



■ 9y4m

The female twin also presented with a Class III malocclusion, but it was less severe both dentally and skeletally compared with her twin brother. In addition, she had a more orthognathic profile, but there was Insufficient space for the upper canines to erupt. The parents were informed early treatment was necessary for space management, but the correction of the skeletal problem would be delayed until mandibular growth was complete.

The patient's chin was deviated to the left, coinciding with the deviated dental midline. The premature loss of deciduous right upper canine was noted, as were many badly decayed primary teeth along with multiple residual roots.



■ 9y5m - 9y10m - 10y1m - 10y5m

No early orthopedic treatment was attempted. A fixed appliance (*Damon II brackets, Ormco*) was placed on the upper arch to create enough spaces to facilitate eruption of the permanent canines.



■ 11y2m

The right upper canine had partially erupted, but the left one had not penetrated the mucosa. Both the lower dental midline and the skeletal chin point were deviated to the left side.



The skeletal chin point was further deviated to the left, coinciding with the deviated lower dental midline.



■ 12y4m

The first stage orthodontic treatment successfully aligned the dentition, but there was no attempt to correct the Class III malocclusion at this time.



■ 13y4m

After 1 year of orthodontic alignment, the patient still exhibited signs of severe Class III malocclusion. Consistent with the objective for only dental alignment, the lower dental midline, as well as the skeletal chin point, were deviated to the left. The lateral profile revealed a slightly prognathic mandible.



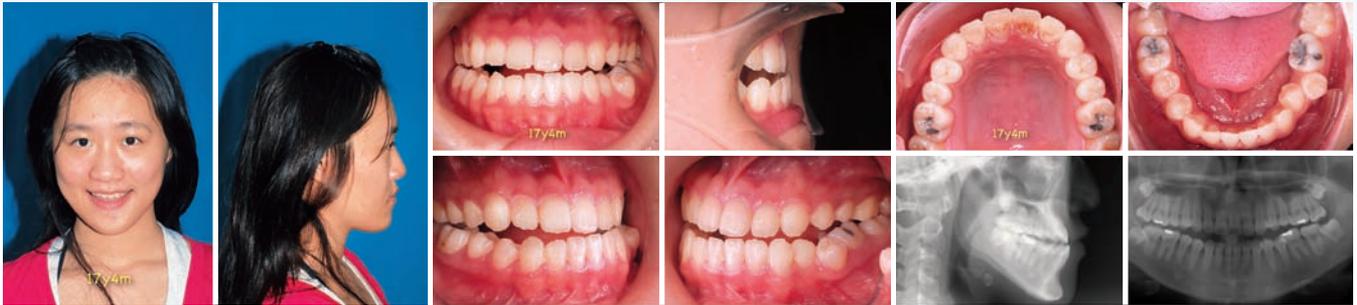
■ 14y11m

The Class III malocclusion continued to progress, but the patient's profile was almost straight.



■ 15y10m

The right side Class III relationship was more severe than on the left. Both the chin point and dental midline were deviated to the left. The patient maintained a straight profile, but the overbite had decreased.



■ 17y4m

The frontal views showed that both the chin point, and the lower dentition are more deviated to the left compared to the upper dental midline. The slight overbite had progressed to an open bite. Fortunately, the patient has still maintained an orthognathic facial profile.

Moderate crowding was found in the left lower second premolar region, with buccoverision of the second premolar, i. e. it was blocked out.

The patient planned to study abroad in 18 months. The initial treatment plan was to correct the Class III open bite by retracting the whole lower dentition with buccal shelf mini-screws, but considering the lower arch crowding, the treatment time was expected to to be longer than 18 months. In order to shorten the treatment time and correct the deviated dental midline, the right lower first premolar and left lower second premolar were extracted. Prior to lower arch extraction, one should confirm the presence of the lower third molars, because they will be the future antagonists for the upper second molarsupper second molars.

<b>Damon Q Torque Options</b>						
	Maxillary			Mandibular		
	1	2	3	1	2	3
<b>Super</b>	+22°	+13°	+11°	-	-	+13°
<b>STD</b>	+15°	+6°	+7°	-3°	-3°	+7°
<b>Low</b>	+2°	-5°	-9°	-11°	-11°	0°

Various torque options of the Damon Q brackets.



■ 17y6m

A full fixed appliance (*Damon Q brackets, Ormco*) was installed. The low torque lower incisor bracket ( $-11^\circ$ ) were placed upside down to express a high torque value of  $+11^\circ$ . Also, high torque brackets were bonded on the lower canines to prevent lingual tipping while the lower anteriors were retracted. Low torque brackets were used on the upper arch to avoid flaring of upper incisors while using the Class III elastics.



■ 18y9m

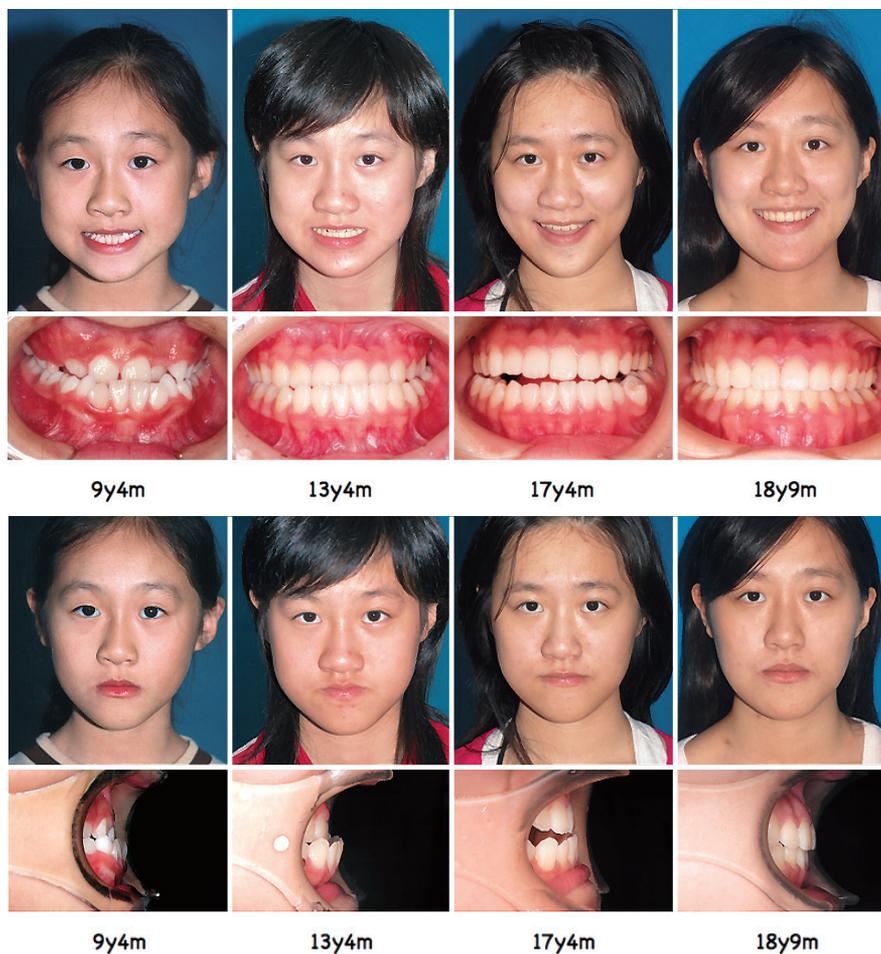
After 1 year and 5 months of active treatment, the Class I canine occlusion was achieved and the orthognathic profile was maintained. The various torque options of the Damon system were used to keep upper incisors and lower incisors upright throughout the treatment.

Since only two lower premolars were removed and nonextraction therapy was performed on the upper arch, the final occlusion remained in a Class III molar relationship. The open bite was resolved. For single arch extraction treatment in Class III cases, one should always confirm the presence of the lower third molars, because they will serve as antagonists for the upper second molars in the final occlusion.



■ 18y10m

To prevent excessive extrusion of the upper second molars before eruption of the lower third molars, while the patient was studying abroad, the extruded upper second molars were removed. The patient was finished with Class I canine, Class III molar relationships, an esthetic smile, and an orthognathic profile. Treatment was completed in time, so she could leave for her studies abroad.





### What we can learn from this case:

- (1) When considering single arch extraction treatment, one should always evaluate whether a future antagonist tooth is present or not. In this case, if the lower third molars are present, extraction of lower premolars is an appropriate treatment option. If not, then upper second premolars should be extracted also. The MEAW effect and various torque options of the Damon system have simplified Class III treatment.<sup>4</sup> The low torque brackets on upper incisors can effectively prevent the side effects of Class III elastics; furthermore, the upside down low torque brackets can be used as super high torque brackets on lower incisors to avoid lingual tipping when the premolar extraction spaces are closed.
- (2) The twins both exhibited characteristics of severe Class III malocclusion in the initial consultation, although the male appeared to have a more severe prognathic profile. The female appeared to have a better prognosis, despite her severe Class III malocclusion. Both the patients and parents were informed about the possibility of future orthognathic surgery. Fortunately the female maintained an orthognathic profile after turning 17. Therefore, no surgical correction was indicated for her.

- (3) Optimal correction of severe Class III malocclusions is very difficult with traditional orthodontic treatment. Passive self-ligating brackets, combined with the Damon Q system's MEAW effect, renders Class III early treatment possible, but late mandibular growth may be a relapse problem. Early treatment is only suggested for patients and parents who prefer that option, but fully understand the probability of relapse and retreatment. In this case, early treatment was only suitable for the less severe female, but it was contraindicated for the male.
- (4) If there was no time constraint for treatment of the female, the author would have recommended removing the lower third molars and retracting the whole lower dentition with buccal shelf bone screws. As such, the uncertainty of the third molar occlusion could be eliminated. Given the treatment performed, the eruption and position of the lower and upper third molars will be closely monitored. If there are eruption problems, further orthodontic treatment may be indicated.

## References

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4. Lin JJ. *Creative Orthodontics. Blending the Damon system & TADs to manage difficult malocclusions*. 2<sup>nd</sup> ed. Taipei: Yong Chieh; 2010. p. 30.





## 2013 Beethoven International Damon & OBS Workshop

### Damon & OBS 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.

### Popular Elective Courses:

#### VISTA for Impacted Cuspids in-office workshop

includes one half-day hands-on practice, features for VISTA with screw placement, VISTA with connective tissue graft and suture technique.

#### 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 us at [course@newtonsa.com.tw](mailto:course@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 advise you gave to us[...].



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



## 2013 Workshop Dates: 11/19-22



### 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*.

### Damon & OBS

#### 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 VISTA for Impacted Cuspids
- 10:00—10:10 Break
- 10:10—12:30 Damon + Screw *Dr. John Lin*
- 12:30—13:30 Lunch

#### Day 3 - VISTA

- 14:00—17:00 VISTA for Impacted Cuspids  
In-office Workshop (*Pig Jaw*)

#### Day 4 - Keynote

- 09:00—10:00 Introduction of Keynote:  
Organize your patient files for presentation
- 10:00—10:10 Break
- 10:10—11:30 Key Presentation Principles I
- 11:30—13:30 Lunch
- 14:00—15:30 Key Presentation Principles II
- 15:30—15:45 Break
- 15:45—17:00 Make it Visual



# VISTA for Impacted Cuspids

In-office Workshop (Pig Jaw)

2013/11/21 14:00~17:00

VISTA for Impacted Cuspids in-office workshop includes one half-day hands-on practice:

1. VISTA with Screw Placement
2. VISTA with Connective Tissue Graft
3. Suture Technique

Fees: USD **600**  
(Register 1 month in advance, \$100 discount)



VISTA: **V**ertical **I**ncision **S**ubperiosteal **T**unnel **A**ccess



## 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*, he has been actively involved in the design and application of orthodontic bone screws.

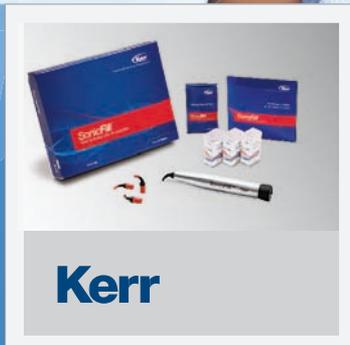
For more information, Contact us at [course@newtonsa.com.tw](mailto:course@newtonsa.com.tw) or call **+886-3-5735676**.



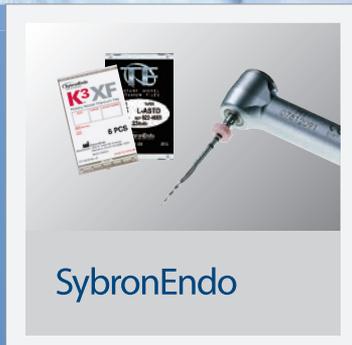
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## Compromised Treatment for a Class III Asymmetry Case

### History And Etiology

An 18 year-old female patient, accompanied by her mother, presented for orthodontic treatment with chief complaints of anterior crossbite and mandibular prognathism. Since the patient did not speak Chinese, all communication was interpreted by her Taiwanese mother for the patient and her Japanese father. The family lived in Japan, but the mother wanted her daughter to receive orthodontic treatment in Taiwan, because they were not satisfied with the opinions of Japanese orthodontists, who felt that orthognathic surgery was the only viable option.

The patient was referred by her elder sister, a practicing dentist in Taiwan, who was familiar with the author's method for treating skeletal Class III malocclusions, without extraction and/or orthognathic surgery. Clinical examination revealed midface deficiency (*concavity*), mandibular prognathism, chin deviation to the right, acute nasolabial angle, and perioral protrusion of both lips. The upper dental midline was coincident with the facial midline, but the lower dental midline was shifted 2.5mm to the right. The maxillary central incisors were in end-to-end occlusion, while the adjacent lateral incisors and the right canine were in crossbite. Arch length discrepancies were 9 and 10mm for the lower and upper arches, respectively.



■ Fig. 1: Pretreatment facial photographs



■ Fig. 2: Pretreatment intraoral photographs



■ Fig. 3: Pretreatment study models

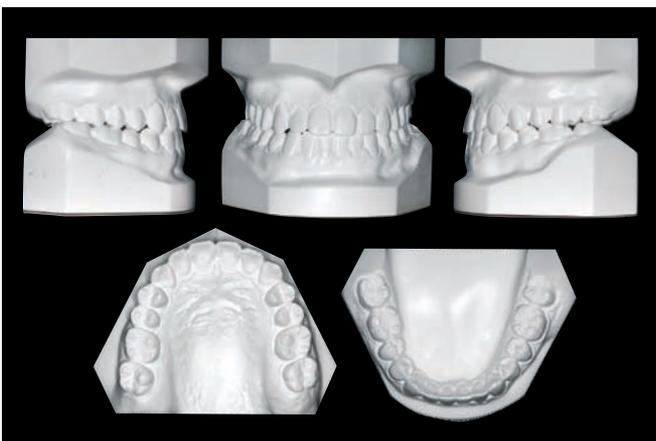
Johnny JL Liaw, Director, Beauty Forever Dental Clinic (left)  
W. Eugene Roberts, Consultant,  
*International Journal of Orthodontics & Implantology* (right)



■ Fig. 4: Posttreatment facial photographs



■ Fig. 5: Posttreatment intraoral photographs



■ Fig. 6: Posttreatment study models

Class III molar and canine relationships were noted bilaterally (Figs. 1-3).

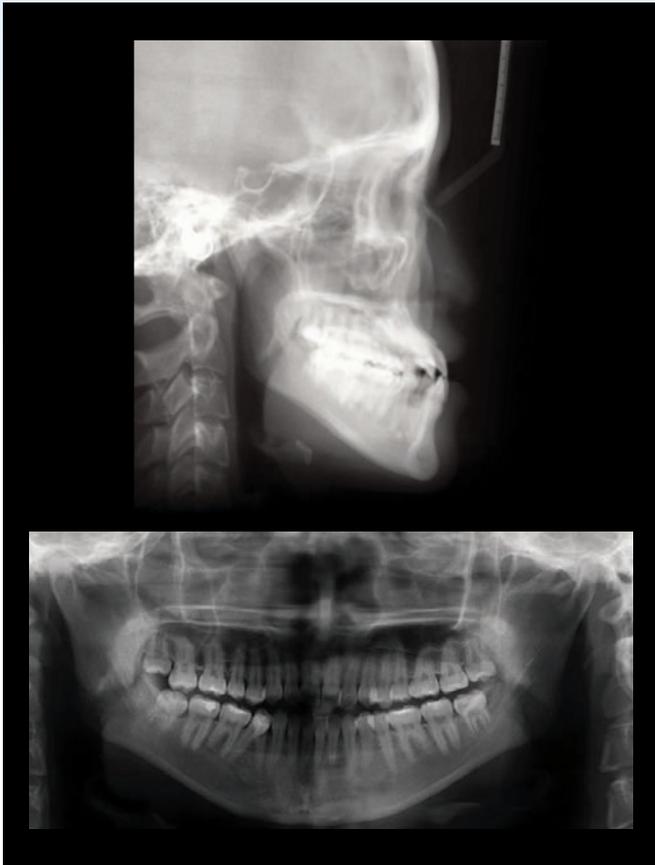
The molar discrepancy was more than a full cusp Class III bilaterally, which exceeded the author's previous experience with mandibular arch retraction. Although the treatment outcome was unpredictable, the patient was highly motivated. After a thorough discussion of treatment options, the patient preferred non-extraction treatment and total arch distalization via temporary anchorage devices (TADs).

The patient was treated to an acceptable 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, and the cephalometric measurements are provided in Table 1.

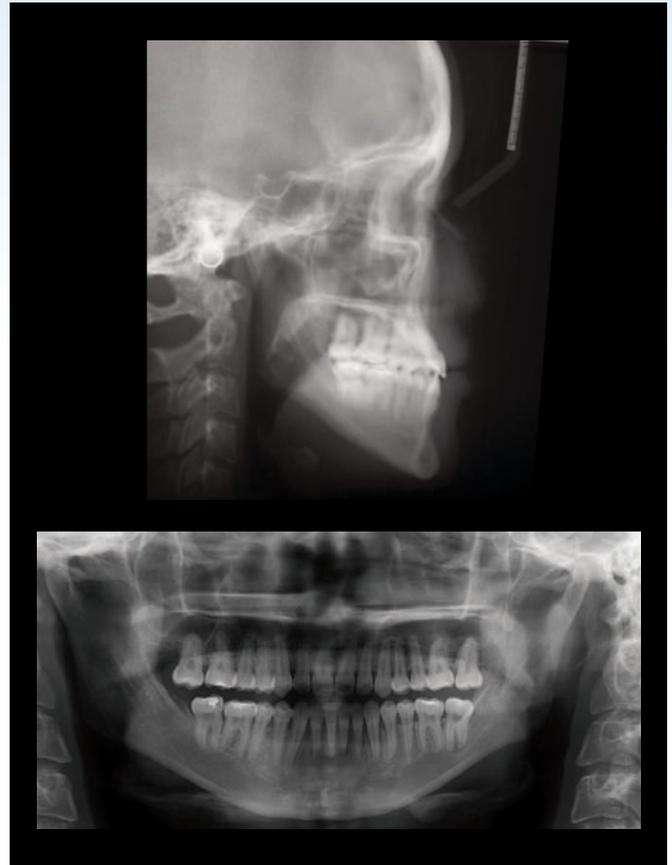
## Diagnosis

### Skeletal:

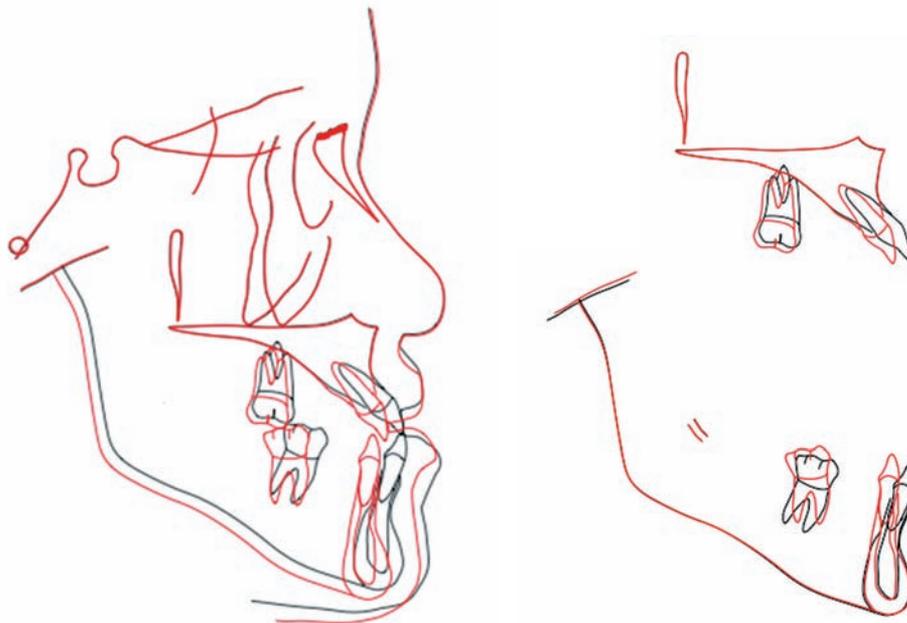
- Class III skeletal pattern ( $SNA\ 86^\circ$ ,  $SNB\ 89^\circ$ ,  $ANB\ -3^\circ$ )
- Mandibular plane angle ( $SN-MP\ 33^\circ$ ,  $FMA\ 24.5^\circ$ )



■ Fig. 7: Pretreatment pano and ceph radiographs



■ Fig. 8: Posttreatment pano and ceph radiographs



■ Fig. 9:

Superimposed tracings showed total arch distalization of both arches. More retraction was noted on the lower arch. The incisors became more upright after treatment. Total arch distalization with TADs on both arches resulted in backward rotation of mandible, which was beneficial for the post-treatment profile of Class III cases.

- Facial asymmetry: mandible was deviated to the right ~3mm

#### Dental:

- Bilateral Class III molar relationship (~10mm)
- Class III canine relationships (1mm right, 5mm left)
- Both upper lateral incisors and the right canine were in crossbite
- The OJ was 0mm for the central incisors and -2mm for the lateral incisors
- The OB was zero for the central incisors, and 2-3mm for the lateral incisors
- Space deficiency: 8mm in the upper arch and 9mm space in the lower arch
- Midlines: Upper dental midline was on the facial midline, lower dental midline was shifted 3mm to the right
- All third molars were erupted except for the maxillary right third molar
- Archforms: symmetrical ovoid in the maxilla; asymmetrical tapering ovoid in the mandible

#### Facial:

- Straight profile with prognathic mandible
- Midface deficiency
- Acute nasolabial angle
- Perioral, bimaxillary lip protrusion
- Prominent chin

The ABO Discrepancy Index (DI) was 36 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: Retract
- Vertical: Open slightly
- Transverse: Maintain

#### Maxillary Dentition:

- A – P: Retract incisors
- Vertical: Slight increase
- Transverse: Expansion

#### Mandibular Dentition:

- A – P: Total arch retraction
- Vertical: Slight increase
- Transverse: Constriction

#### Facial Esthetics:

- Mandibular lip retraction

## Treatment Plan

The first treatment option was orthognathic surgery, combined with orthodontic treatment,<sup>1</sup> following extraction of two upper first premolars and removal of all four wisdom teeth. The patient and her mother declined this option despite the advice that the orthognathic surgical approach would probably produce the most esthetic facial result.

The second treatment alternative was extraction of upper second premolars and lower first premolars as well as removal of four wisdom teeth. The objectives of this treatment plan would be to correct Class III molar relationships, alleviate crowding and reduce perioral protrusion. However, the disadvantages of this approach would be a midface deficiency, concave profile, a more prominent chin point, and severely retroclined lower incisors. In addition, the correction of the 10mm Class III molar relationship bilaterally would present a major anchorage challenge. TADs in the lower posterior areas would be necessary for maximal retraction of the lower dentition.

The third consideration was to extract two lower second premolars and two upper wisdom teeth, and then finish in a Class III molar relationship.<sup>2</sup> This alternative would avoid a dished-in midface profile, as a consequence of upper premolars extraction, and it would be easier to control mandibular posterior anchorage. The major difficulty of this treatment approach would be the torque control of lower incisors during space closure. The clinician considered this alternative to be the best nonsurgical option, but the patient and her mother were concerned about extracting permanent teeth.

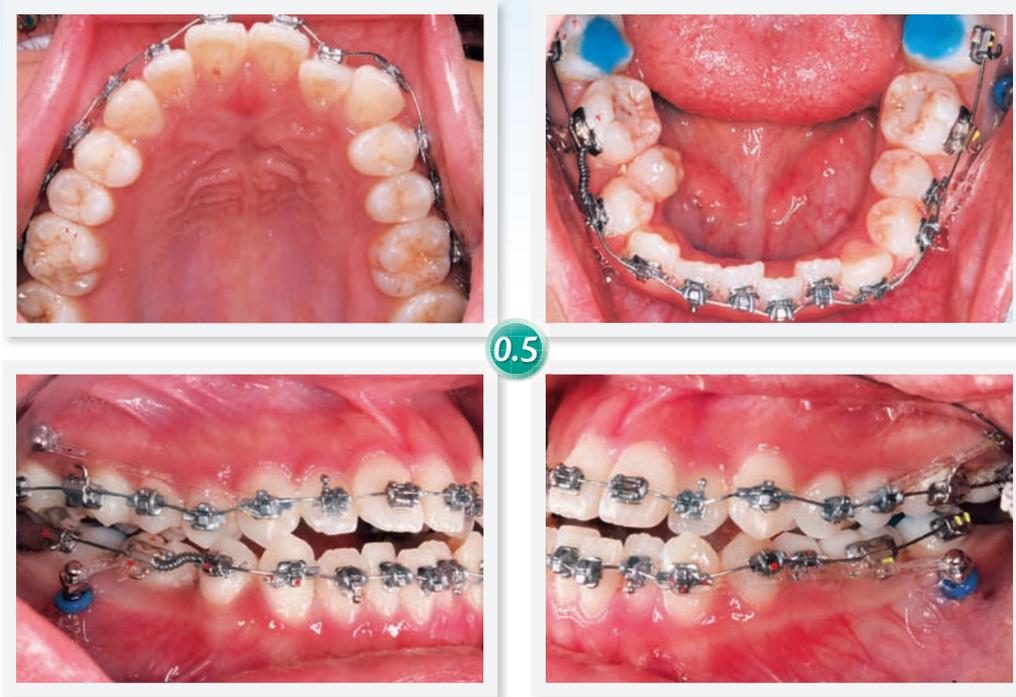
The fourth option was removal of all four third molars, followed by total arch retraction.<sup>3</sup> Four miniscrews in the posterior areas of both arches are used to correct the molar relationships and dental midline discrepancy, without producing bimaxillary protrusion. However, as was carefully explained during the consultation, the severity of the Class III molar relationships was beyond the author's previous experience with the method. After

a thorough discussion of the pros and cons of each approach, the fourth treatment alternative was selected. The plan was to re-evaluate nonextraction treatment with TAD anchorage after 8 to 10 months of treatment, to determine if extraction of lower second premolars was necessary, for optimal retraction of the upper and lower incisors.

### Appliances And Treatment Progress

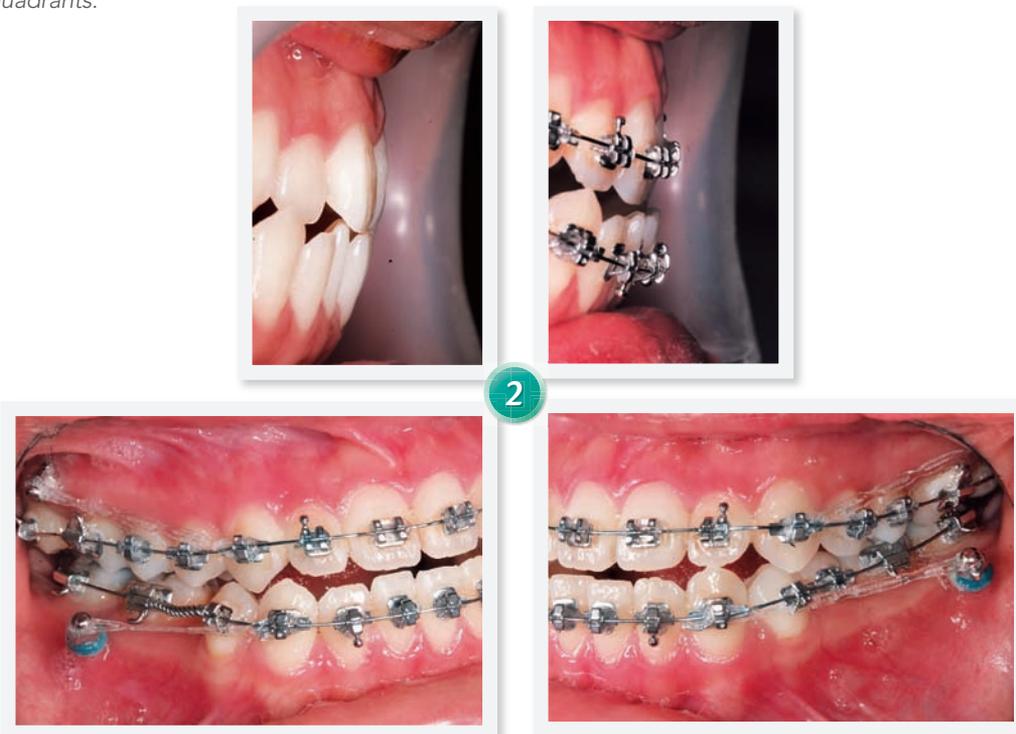
A modified Alexander fixed appliance prescription was used. The slot size from canine to canine was .018" and .022" slots were used for the posterior teeth. The initial archwire for the upper arch was .016" NiTi. Two miniscrews (*OrthoBoneScrew, Newton's A, Inc. 2x12mm*) were installed in the upper posterior area (*infrazygomatic crests bilaterally*) on the same day as the initial bracket bonding. Bilateral elastic chains were attached from the miniscrews to the maxillary canines for retraction to create spaces for the anterior segment alignment. About two weeks later, lower brackets were bonded, and two miniscrews were installed on the mandibular buccal shelves. An elastic chain was applied for lower left canine retraction (*Fig. 10*). A NiTi open coil spring was inserted, between the lower right first molar and first premolar, to create space for the blocked-out second premolar. A lower right elastic chain was applied to retract the first molar (*Fig. 10*). After initial space opening for the right second premolar, an elastic chain was then attached to the lower right canine (*Fig. 11*).

The anterior crossbite was corrected in 9.5 months (*Fig. 12*), but as expected, the profile was more protrusive (*Fig. 13*). Both arches were retracted, as the lower right second premolar space was opened (*Fig.*



■ Fig. 10:

Initial setups of the orthodontic appliances. A segment of NiTi open coil spring was compressed between lower right first premolar and first molar. Elastic chain from lower right miniscrew to lower right first molar was to apply distal and buccal force to the lower right first molar. Elastic chains were attached from the miniscrews to canines to alleviate anterior crowding in all the other three quadrants.



■ Fig. 11:

Anterior crossbite was noted after two months of treatment. The elastics on the lower right quadrant was shifted to attach on the lower right canine to avoid further development of negative overjet.



**Fig. 12:**  
The anterior crossbite was corrected at 9.5 months into treatment.



**Fig. 13:**  
The lateral profile became more protrusive after 9.5 months treatment.

14). After 11.5 months of treatment the right lower second premolar was bonded and engaged with the archwire (Fig. 15). The elastic chains, anchored with the TADs, continued to retract both arches (Fig. 16). Differential activation of the elastic chains was used for midline correction. Two months later, the midline was corrected and the protrusive profile had been reduced (Fig. 17). After 22 months (Fig. 18), the mandibular second molars were maximally retracted, relative to the soft tissue covering the ascending rami of the mandible. No more space was available for lower arch retraction. Cross elastics were used in the right premolar area to correct the excessive buccal overjet. One month later, the elastics were changed to box elastics for occlusal settling (Fig. 19). Following final detailing, the appliances were removed, after 31 months of active treatment (Fig. 20).

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	86°	86°	0°
SNB°	89°	87°	2°
ANB°	-3°	-1°	2°
SN-MP°	33.5°	35.5°	2°
FMA°	24.5°	26.5°	2°
DENTAL ANALYSIS			
U1 TO NA mm	10.5 mm	5 mm	5.5 mm
U1 TO SN°	122°	113°	9°
L1 TO NB mm	6 mm	1.5 mm	4.5 mm
L1 TO MP°	83°	68°	15°
FACIAL ANALYSIS			
E-LINE UL	-4.5 mm	-3mm	1.5 mm
E-LINE LL	1mm	0 mm	1mm

Table 1: Cephalometric summary



9.5

■ Fig. 14: Elastics from miniscrew to miniscrew were used to retract both dentitions for reducing the protrusion.



11.5

■ Fig. 15: The locked-in lower right second premolar was bonded after sufficient space was created after 11.5 months of treatment. A elastic chain from lower right miniscrew to lower right second premolar was used for further distalization of lower right buccal segment.

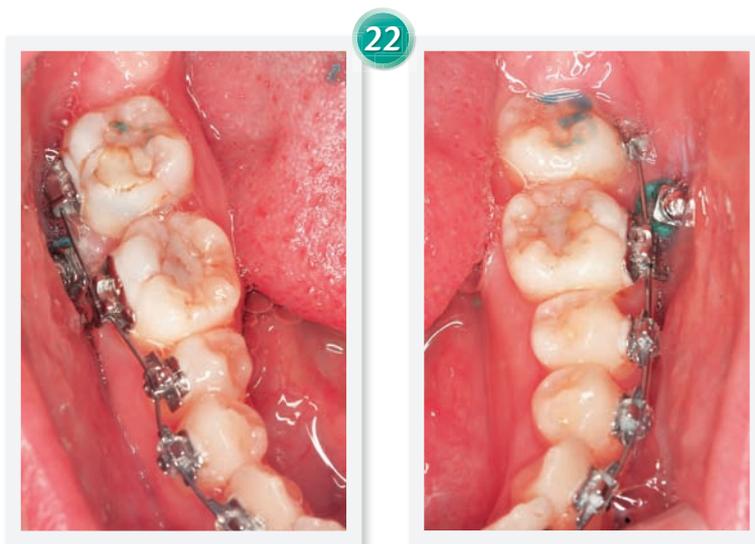


■ Fig. 16:

After complete alignment of both arches, the lower elastic chains from miniscrew to miniscrew were used to further retract the lower dentition for Class III correction. Another component of the force system was the asymmetrical applications of TADs on lower right and upper left for midline correction.



■ Fig. 17: The midline and the buccal interdigitation improved a lot .

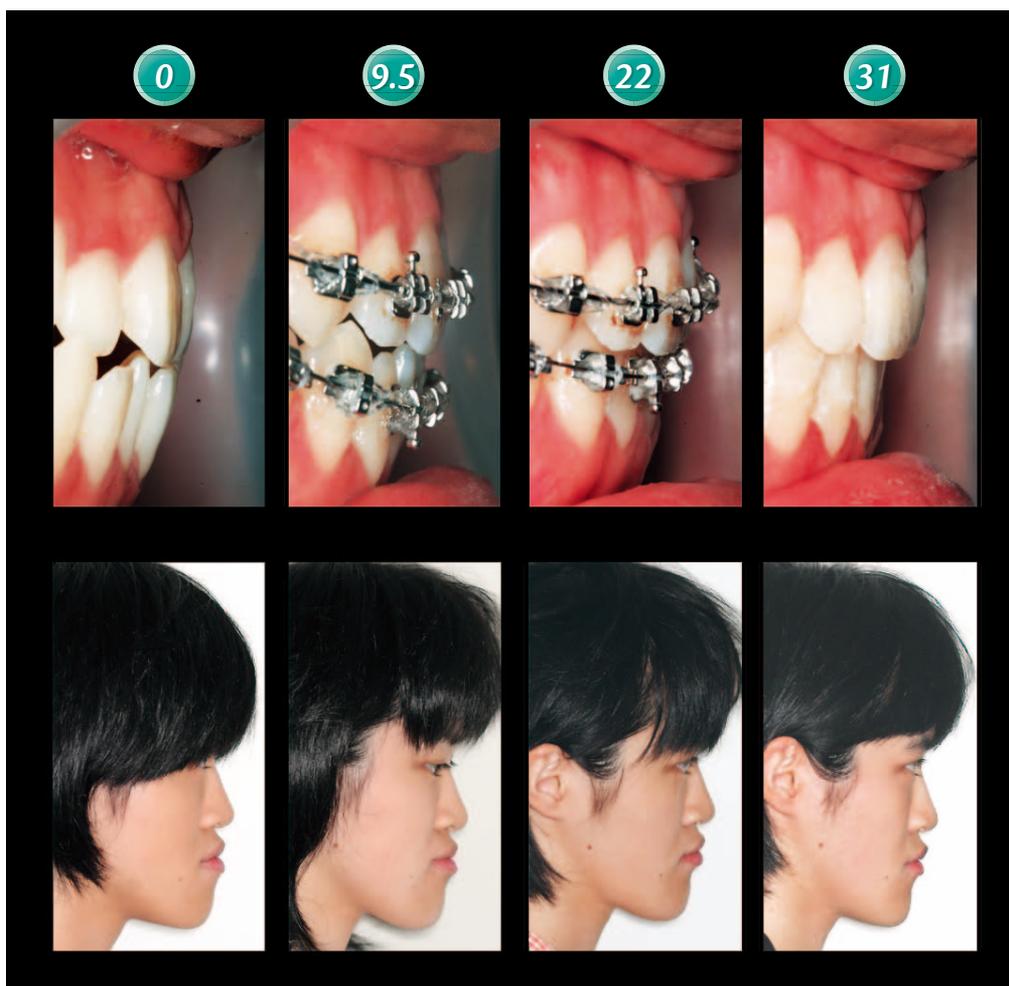


■ Fig. 18: The terminal second molars of the lower arch were approaching the posterior boundaries of the denture bearing areas.



■ Fig. 19:

Right criss-cross elastics were used to correct the increased buccal overjet over premolar area and right box elastics were used to settle the final occlusion.



■ Fig. 20:

Even with the anchorage reinforcement of TADs, the profile still became more protrusive during alignment. The protrusion was reduced back to the original profile after total arch distalization with TADs.

## Results Achieved

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

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

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

- A – P: Retraction as the mandible rotated posteriorly
- Vertical: Opened ~3mm as the mandible rotated posteriorly
- Transverse: Maintain

### Maxillary Dentition:

- A – P: Retract incisors
- Vertical: Slight extrusion of the molars
- Transverse: Expansion

### Mandibular Dentition:

- A – P: Retraction of the entire arch
- Vertical: 2-3mm extrusion of the entire arch
- Transverse: Constriction

### Facial Esthetics:

- Retraction of the mandibular lip

## Retention

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

## Final Evaluation of Treatment

The Cast-Radiograph Evaluation score was 39 points, with most of the points reflecting problems in incomplete correction of Class III relationships and marginal ridge alignment. The incomplete correction of Class III dental relationships was mainly because of the limit of the mandibular denture bearing area. The mandibular second molars were tipped distally because the archwire failed to deliver an adequate distal root moment. The problem could have been prevented by using an archwire with a root tip back bend between the first and second molars. Further retraction of the mandibular arch was not feasible because of the limit of the ascending ramus, bilaterally. The discrepancies in marginal ridges resulted from the distal forces on both arches to retract the buccal segments, which resulted in distal tipping of posterior teeth. Cephalometric superimpositions (*Fig. 9*) demonstrated total arch retraction of both arches. Retraction of the entire mandibular arch with TAD anchorage resulted in distal tipping of the entire arch, because the line of force for the elastic chains is occlusal to the center of resistance of the buccal segments. These mechanics result in a crown-distal moment on the entire mandibular arch. During full arch retraction the mandibular teeth extrude, due to the inclined plane effect of the tapered alveolus for each tooth. The mandibular arch extrusion was beneficial for opening the bite and posteriorly rotating the mandible to retract the chin and improve the concave profile. Overall, this challenging skeletal malocclusion was treated to a clinically acceptable facial and dental results. The treatment results are short of a board quality finish, so this treatment

approach was defined as a compromised outcome. None the less, this case report is a valuable addition to the literature, because it demonstrates the limit of mandibular arch retraction to correct skeletal Class III malocclusion. In retrospect, more care in applying root distal moments for the mandibular buccal segments during full arch retraction would have considerably improved the final occlusal outcome.

## Discussion

One of the most important keys to successful Class III treatment is differential diagnosis, based on: the skeletal discrepancy between the maxilla and mandible, the extent of dental Class III relationship, divergency, dental compensations, transverse dimension, asymmetry, family history and growth potential. In considering the positive factors for a Class III malocclusion,<sup>4</sup> less severe Class III skeletal and dental relationships generally offer the best prognosis.

The facial profile is usually the most important factor in deciding if orthognathic surgery is necessary for optimal correction of the malocclusion. The second most important factor for treatment planning is the extent of facial asymmetry, because orthodontics alone may be inefficient.<sup>5</sup> If the lateral profile is concave and/or there is extensive facial asymmetry, orthognathic surgery may be essential for an optimal outcome. Extraction treatment is often indicated for Class III malocclusions with lip protrusion and/or crowding.<sup>6</sup> One of the most common extraction patterns is upper second premolars and lower first premolars. For very protrusive Class III patients, extraction of all four first premolars remains the

treatment of choice, but it may be necessary to reinforce lower posterior anchorage with TADs.

Bilateral extraction of mandibular premolars is often the preferred option for patients with a markedly deficient midface and full cusp or more Class III molar relationships.<sup>2</sup> However, this approach is not ideal because the occlusion must be finished in Class III molar relationships. If lower first molars are restoratively compromised, they can be extracted instead of the premolars, which permits the occlusion to be corrected to a Class I relationship. However, the latter approach may complicate correction of the anterior crossbite and/or result in excessive overjet during space closure. Upper posterior TADs or Class II elastics may be needed. Care should be taken not to over-retract the lower incisors to avoid root dehiscences on the lingual surfaces.

A nonextraction approach with TAD anchorage to retract the entire dentition<sup>3</sup> is a viable alternative, which can prevent bimaxillary protrusion after teeth are aligned (*Fig. 20*), but the method does have anatomical limitations. For maxillary dental arch retraction, Sugawara<sup>7</sup> suggests that the average amount of upper molar distalization is 3.78mm at the crown level and 3.2mm at the root level. However, attempts to translate mandibular molars distally have been less successful: 3.5mm at crown level and 1.8mm at root apex level.<sup>8</sup> Thus, there is more of a tendency for mandibular molars to tip rather than to be translated distally.

The marked crowding in each arch precluded conventional non-extraction treatment because it

would have produce excessive expansion of the arch and/or proclination of incisors. Such compromises may predispose a patient to relapse. With extra-alveolar TAD anchorage, the corrected dentition can be aligned over the apical base of bone, but anatomical limitations, in the length of the alveolar process, may prevent complete Class III dental correction. In this event, a careful evaluation is indicated to determine if the expected results will be acceptable. Although the molar relationships could not be corrected to Class I, overjet, overbite and the canine relationships were corrected to near Class I, and the intercuspation of the buccal segments was acceptable. The facial profile remained the same, which was deemed acceptable by the patient and her parents, when they initially choose the compromise treatment option.

Because of the limitations in the amount of molar retraction, that can be achieved with TAD anchorage, clinicians should inform patients with severe Class III malocclusions that a re-evaluation will be conducted at 8 to 10 months, after the start of the treatment, to decide on the final treatment plan. If the initial nonextraction treatment is unsatisfactory, the treatment plan can be modified into an extraction approach. Furthermore, there may be complaints of discomfort as periodontal tissue builds-up distally to the terminal molars, and periodontal surgery may be necessary to reduce the amount of gingival tissue in the direction of tooth movement.

## Conclusion

Total arch retraction with extra-alveolar TAD anchorage provides a valuable nonextraction treatment option for Class III patients with severe

crowding and midface deficiency. However, the posterior boundaries of denture bearing area might not allow complete correction to ideal Class I molar relationships. Although the treatment resulted in a compromise, the author would like to share this clinical experience, as a viable option for Class III patients who decline extractions and/or orthognathic surgery.

## Acknowledgment

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

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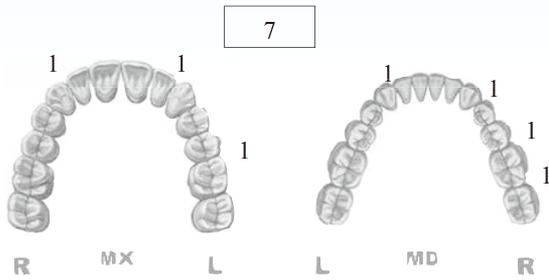


# Cast-Radiograph Evaluation

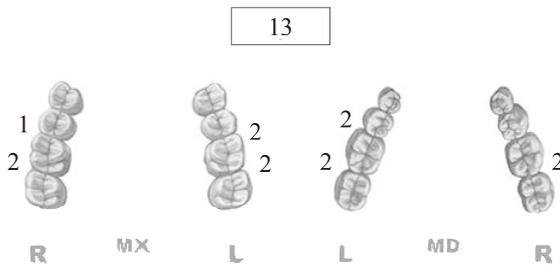
Case # 3 Patient

Total Score: **39**

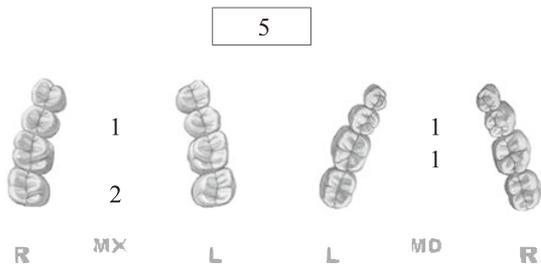
## Alignment/Rotations



## Marginal Ridges



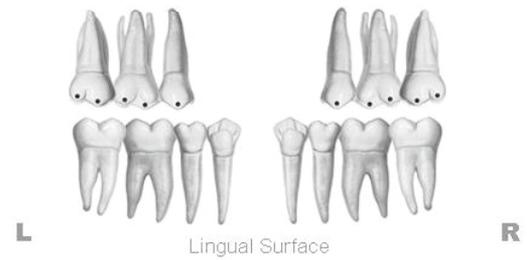
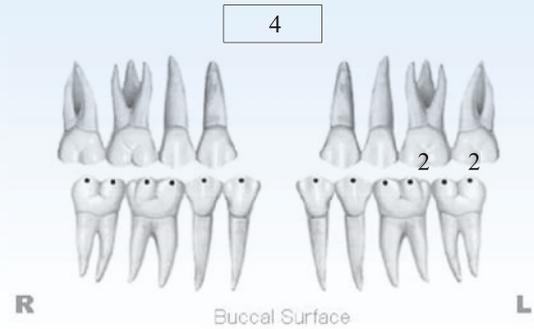
## Buccolingual Inclination



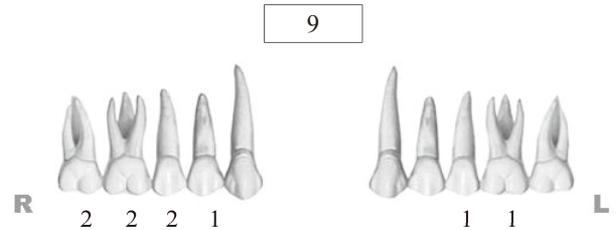
## Overjet



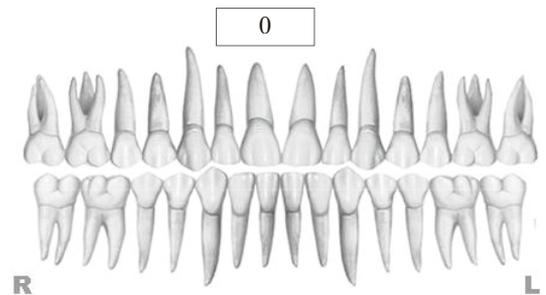
## Occlusal Contacts



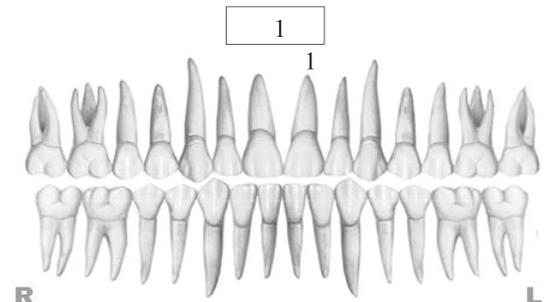
## Occlusal Relationships



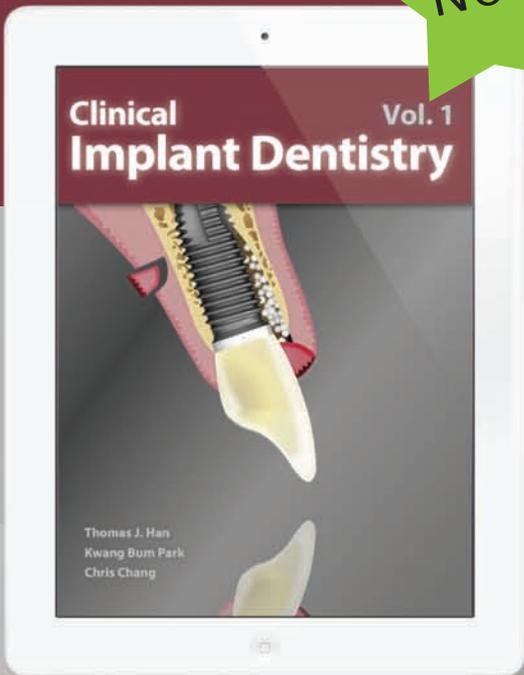
## Interproximal Contacts



## 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.



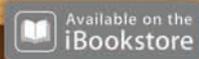
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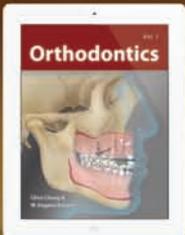
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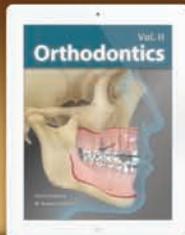
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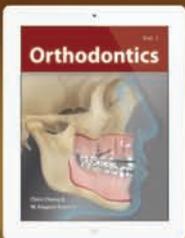


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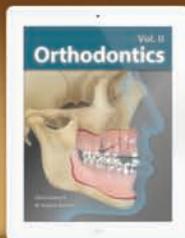
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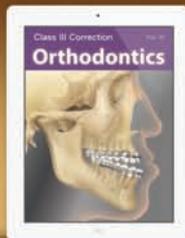
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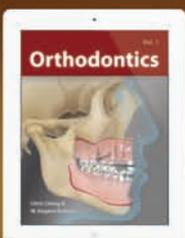


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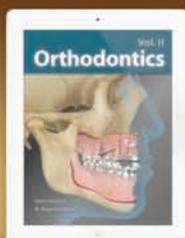
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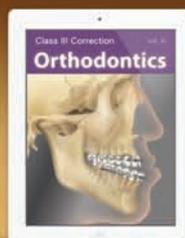
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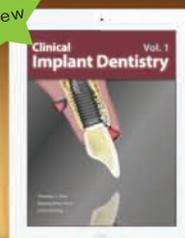
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# Endodontics

## Clinical Procedures

超強攻略

呂志明 醫師

- 台灣大學臨床牙醫學碩士
- 中華民國牙髓病學會專科醫師
- 台大醫院牙髓病科兼任主治醫師
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**Fee** 4/22 前 報名20000元

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- 5/1** 1. 診斷學 (Diagnosis)
  - a. Pulpal disease
  - b. Differential diagnosis
  - c. Treatment plan
- 5/15** 2. 形態學 (Morphology)
  - a. The canals numbers
  - b. The curvature of roots
  - c. Open chamber & Anesthesia
  - d. Rubber dam application
- 5/29** 3. 根管的清創與修形 (一)  
Cleaning & Shaping (1)
  - a. Apical size
  - b. The determination of Working Length
  - c. NiTi rotary instruments
- 6/5** 4. 根管的清創與修形 (二)  
Cleaning & Shaping (2)
  - a. Irrigants & Dressing material
  - b. Retreatment
- 6/19** 5. 根管充填 (Obturation)
  - a. Lateral condensation
  - b. Warm gutta percha technique
  - c. One or multiple visits
- 7/3** 6. 難症的處理 (Problems Saving)
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# 2013新式鎳鈦 根管治療密技

Dr. 呂志明 X Dr. 林郁恆

## SHAPING

鎳鈦合金器械在近幾年來發展迅速，要如何使用鎳鈦器械做出正確的診斷、完美的髓腔開擴及建立滑行路徑、達成根管治療成功的目的？

如何選擇一套適合臨床使用的旋轉鎳鈦根管銼針？演講中將會詳細介紹這些新器械的設計特點及使用方法。

透過呂志明醫師現場操作，將根管治療的「開擴、清創、修形」等關鍵因素逐一剖析，讓您輕鬆成就安全、高效率完美、又迅速的根管治療。

## OBTURATION

新式的熱塑馬來膠根管封填技術有很多的優點：穩定性強、精確度高；可達到根尖0.5mm左右且封閉性好，側根管也能緻密的封填。因此熱塑馬來膠根管封填技術已成為今後根管治療發展的方向。然而熱充填技術的步驟非常複雜繁瑣、十分耗時。

林郁恆醫師，將利用最新式的機器，以最精準的技術及最簡化的方式，帶領您達成根管封填最完美的結果。

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### 主辦單位

台灣楓城牙醫學會

### 協辦單位

湧傑企業股份有限公司

### 時間

2013年 5/19 (日) 台北班  
6/9 (日) 台中班  
6/23 (日) 高雄班

### 報名專線

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131林's

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### 上課地點

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台北市羅斯福路四段85號B1  
(捷運新店線 公館站2號出口)

台中-哈佛企業管理顧問公司 3203教室  
台中市中港路一段160號32樓

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### 課程時刻表

- 09:00 – 10:30 Lecture
- 10:30 – 10:50 Coffee Break
- 10:50 – 12:00 Hands-on
- 12:00 – 13:00 Lunch
- 13:00 – 14:30 Lecture
- 14:30 – 14:50 Coffee Break
- 14:50 – 16:00 Hands-on
- 16:00 – 16:30 Discussion



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# Conservative Management of a Severe Class III Open Bite Malocclusion

## History and Etiology

A 17-year-11-month-old girl was referred by her dentist for orthodontic consultation (Fig. 1). Her chief concerns were anterior cross bite, open bite and prognathic mandible (Figs. 2 and 3). She was told that surgery is the best solution for her severe malocclusion. However, the patient deemed that approach to be too aggressive, thus a nonsurgical camouflage plan was devised to meet her needs. There was no contributory medical or dental history. The patient was treated to an acceptable outcome as documented in Figs. 4-9. The details for diagnosis and treatment of this challenging malocclusion will be discussed in the following sections.

## Dianosis

### Skeletal:

- Skeletal Class III ( $SNA\ 80^\circ$ ,  $SNB\ 83^\circ$ ,  $ANB\ -3^\circ$ )
- Mandibular plane angle ( $SN-MP\ 40^\circ$ ,  $FMA\ 33^\circ$ )

### Dental:

- Bilateral Class III malocclusion
- Negative overjet was 5mm
- Anterior open bite was about 5mm
- Crowding was about 9mm in the upper arch, the lower arch was well aligned
- Bilateral posterior crossbite tendency



■ Fig. 1: Pretreatment facial photographs



■ Fig. 2: Pretreatment intraoral photographs



■ Fig. 3: Pretreatment study models

Dr. Bill Su, Director, Newtons Implant Center (right)  
 Dr. Chris Chang, Director, Beethoven Orthodontic Center (middle)  
 Dr. W. Eugene Roberts, Consultant,  
*International Journal of Orthodontics & Implantology* (left)



■ Fig. 4: Posttreatment facial photographs

- Mandibular midline was on the facial midline and the maxillary midline was shifted 2mm right

**Facial:**

- Competent lips
- Moderately convex profile with a protruded lower lip

The ABO Discrepancy Index (DI) was 77 as shown in the subsequent worksheet (Fig. 10).<sup>1</sup>



■ Fig. 5: Posttreatment intraoral photographs

**Specific Objectives of Treatment**

**Maxilla (all three planes):**

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

**Mandible (all three planes):**

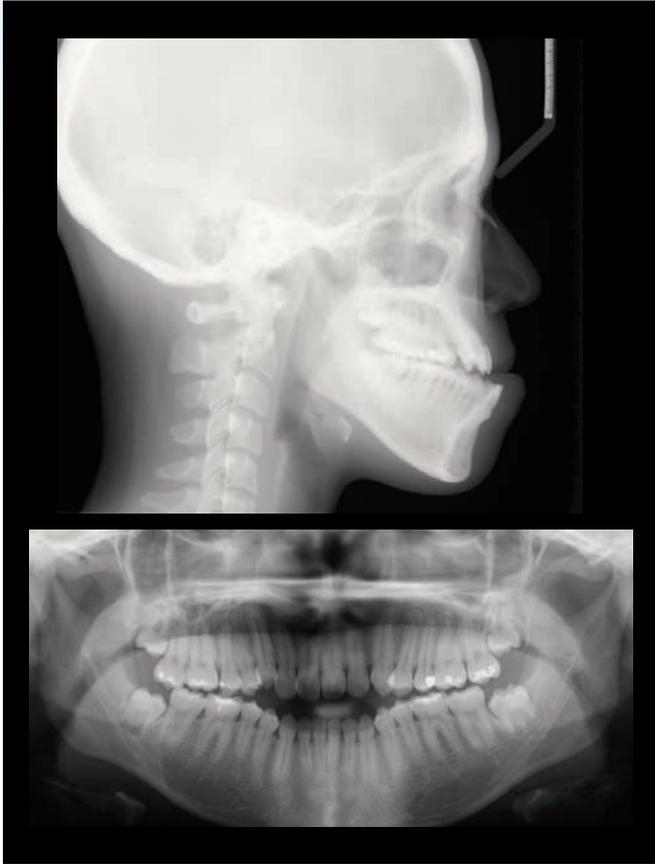
- A - P: Maintain
- Vertical: Posterior rotation of ~3-4mm
- Transverse: Maintain

**Maxillary Dentition:**

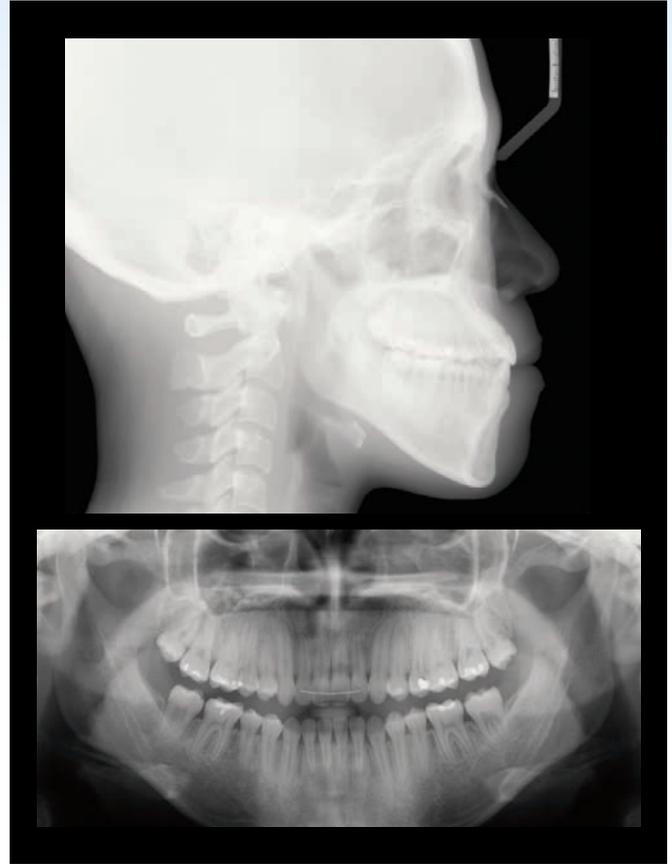
- A - P: Maintain
- Vertical: Extrude molars and incisors to correct the openbite and accommodate the posterior mandibular rotation



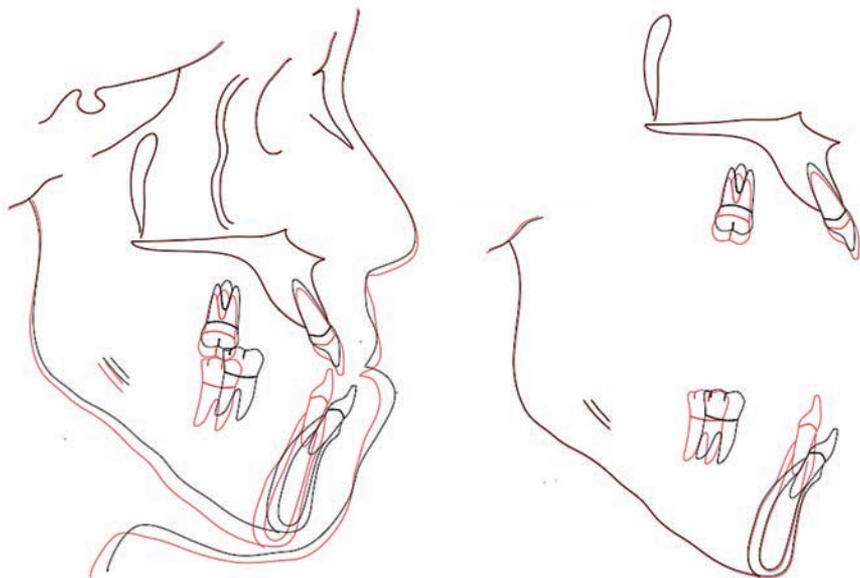
■ Fig. 6: Posttreatment study models



■ Fig. 7:  
Pretreatment pano and ceph radiographs show high mandibular angle and open bite.



■ Fig. 8:  
Posttreatment pano and ceph radiographs show a balancing lip profile.



■ Fig. 9:  
Superimposed tracings. The rotation of the occlusal plane helps correct this severe Class III malocclusion. But the extrusion of upper molars also produces the undesirable rotation of the mandible.

**DISCREPANCY INDEX WORKSHEET**

CASE #  PATIENT   
 TOTAL D.I. SCORE

**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 = **23**

**OVERBITE**

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

Total = **0**



6+5+5+7=23

2 pts. per mm. per tooth

Total =

**CROWDING** (only one arch)

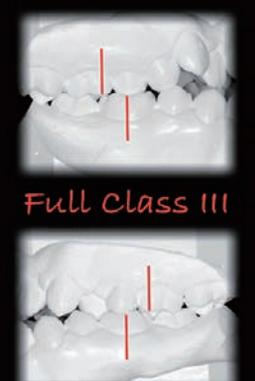
1 - 3 mm.	=	1 pt.
3.1 - 5 mm.	=	2 pts.
5.1 - 7 mm.	=	4 pts.
> 7 mm.	=	7 pts.

Total =

**OCCUSION**

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

Total = **8**



Full Class III

**ANTERIOR OPEN BITE**

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

Total = **15**

**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 =



6+3+1+1+2+2+0=15

EXAM YEAR 2009  
 ABO ID#

**LINGUAL POSTERIOR X-BITE**

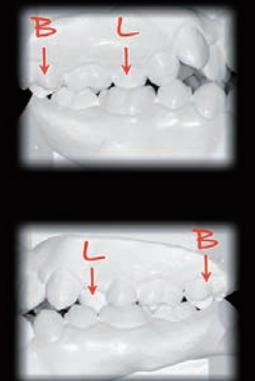
1 pt. per tooth Total = **2**

**BUCCAL POSTERIOR X-BITE**

2 pts. per tooth Total = **4**

**CEPHALOMETRICS** (See Instructions)

ANB ≥ 6° or ≤ -2°	=	4 pts.
SN-MP ≥ 38°	=	2 pts.
Each degree > 38°	x 2 pts.	=
≤ 26°	=	1 pt.



**ANTERIOR OPEN BITE**

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

Total =

**LATERAL OPEN BITE**

2 pts. per mm. per tooth

Total =

**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**



**CEPHALOMETRICS** (See Instructions)

ANB ≥ 6° or ≤ -2°	=	4 pts.
Each degree < -2°	x 1 pt.	=
Each degree > 6°	x 1 pt.	=
SN-MP ≥ 38°	=	2 pts.
Each degree > 38°	x 2 pts.	=
≤ 26°	=	1 pt.
Each degree < 26°	x 1 pt.	=
I to MP ≥ 99°	=	1 pt.
Each degree > 99°	x 1 pt.	=

Total **11**

**OTHER** (See Instructions)

Supernumerary teeth	x 1 pt.	=
Ankylosis of perm. teeth	x 2 pts.	=



■ Fig. 10: ABO-Discrepancy Index measurement

- Transverse: Inter-molar expansion to relieve crowding and correct the posterior crossbite

**Mandibular Dentition:**

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

**Facial Esthetics:**

Retract lower lip to improve facial balance.

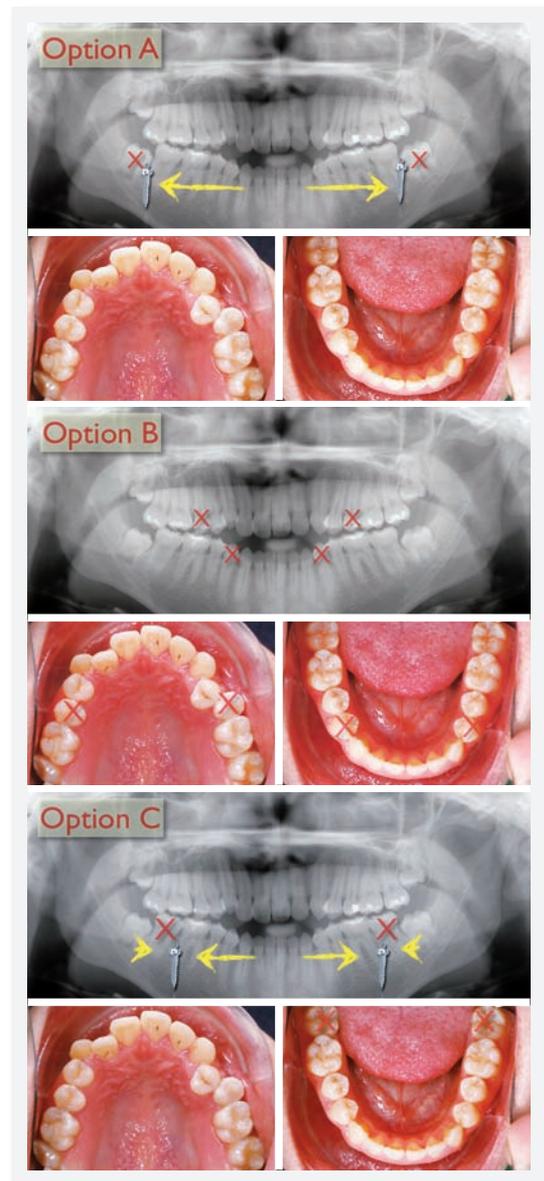
**Treatment Plan**

The Discrepancy Index (DI) worksheet revealed a very severe skeletal malocclusion, scoring 77 points. Consistent with the patient’s wishes, three treatment options were presented (Fig. 11):

1. Extract the unerupted mandibular 3<sup>rd</sup> molars, and retract the entire mandibular dentition, utilizing the anchorage provided by two bone screws placed in the buccal shelves.
2. Extract the maxillary second bicuspids and the mandibular first bicuspids. Protract the upper posterior segments and retract the lower segment.
3. Extract both mandibular second molars, protract the third molars, and retract the entire mandibular arch, with anchorage provided by two bone screws, placed on the buccal shelves of the mandible.

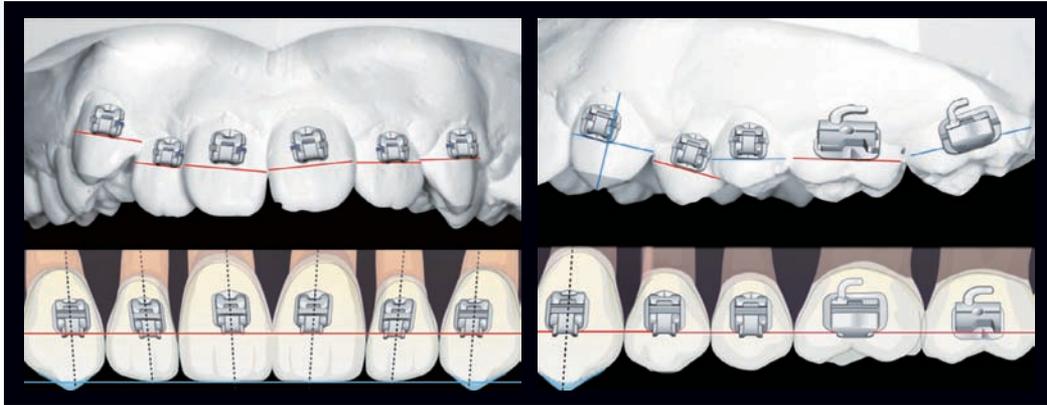
The pros and Cons on each treatment option were discussed. *Option A*, pros: remove the third molars and preserve the bicuspids. Cons: longer treatment

time, bone screws would be needed for full dentition retraction, and the axial inclination of the mandibular second molars would probably be tipped distally. *Option B*, pros: the Class III molar relation, open bite and protruded lower anteriors could be improved with the extraction of upper second and lower first bicuspids. Cons: the mesialdistal width of lower

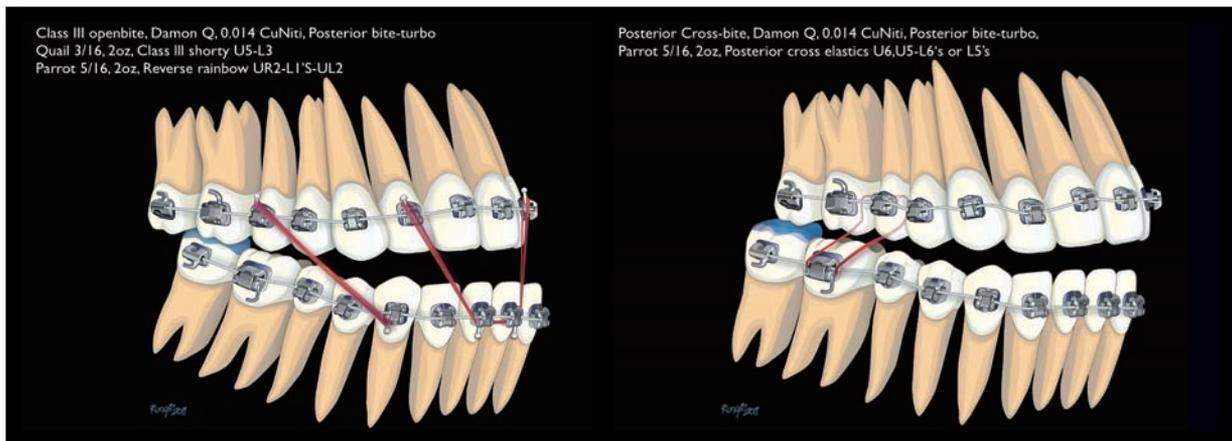


■ Fig. 11: Treatment options.

## Bonding



■ Fig. 12: Bonding positions



■ Fig. 13: Application of elastics

## Wire Sequence

<b>Initial Light Wire Phase</b>
.014 NiTi 4~6M
<b>High-Tech Edgewise Phase</b>
14x25 NiTi 3M
<b>Major Mechanics Phase</b>
17x25 TMA 2M ( Non-ext. 1Y )
U19x25 SS,L16x25 SS 1Y ( Ext. )
<b>Finishing Phase</b>

■ Fig. 14: Wire sequence.

bicuspid is inadequate space for correction of the large negative overjet. Especially for open bite malocclusions, it is necessary to retract the lower dentition more than 10 mm, so 4 quadrants of bicuspid extraction may be insufficient for optimal correction of the buccal interdigitation. Option C, pros: extracting second molars simplifies mandibular arch retraction, prevents distal tipping the terminal molars, and preserves both the bicuspid and the third molars. The mesial-distal width of the lower second molar extraction sites is ~10-12mm, which is adequate space for retraction of the arch to correct the negative overjet. Cons: retraction of the entire arch requires a longer treatment time and anchorage support is essential, so buccal shelf bone screws must be used bilaterally.

Following an extensive discussion of the relative risks and benefits of the three treatment options, the patient reemphasized her desire to avoid surgery and accepted camouflage orthodontic treatment, based on option C. Early class III elastics (Fig. 13), supplemented with posterior bite turbos, generated light force to help correct the Class III canine relationship and anterior open bite. Torque control of the incisors during Class III elastics therapy was maintained with low torque maxillary and high torque mandibular brackets (Fig. 15). Bilateral extra-radicular miniscrews (2x12mm OrthoBoneScrew, Newton's A Inc.) were inserted in the mandibular buccal shelves for traction anchorage (Fig. 17). Class III elastics were used to finish correction of the sagittal occlusal discrepancy, and detailing bends refined the final occlusion. Fixed anterior retainers were planned for both arches: Mx 2-2, Md 3-3.

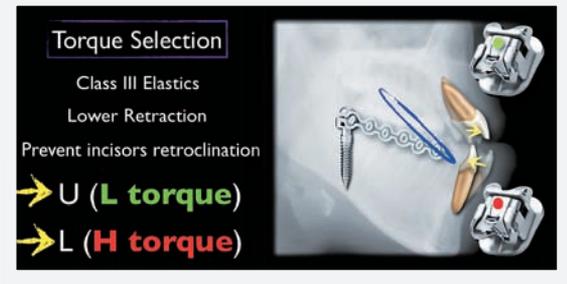


Fig. 15: Torque selection: Upper arch (lower torque), lower arch (high torque)



Fig. 16: The position of posterior Bite Turbos



Fig. 17: The bone screws were placed on the bilateral buccal shelves.

## Appliances and Treatment Progress

A .022" slot Damon D3MX bracket system (Ormco) was used (Fig. 12). The maxillary arch was bonded with low torque brackets on incisors (U1: 7°, U2: 3°), and low torque brackets were bonded upside down on the lower central and lateral incisors (L1, L2: -6° → 6°). High torque brackets were bonded on the lower canines (L3: 7°) (Figs. 18-19). Posterior bite turbos were placed on the lower first molars for intrusion and to assist in posterior crossbite correction (Fig. 16).



■ Fig. 18:

The torque of the Damon 3MX and Damon Q. For Damon 3MX, the upper anteriors can be up side down as super low torque brackets, and lower incisors can be up side down as high torque brackets. The same as Damon Q brackets.

From the start of treatment, full time light short Class III elastics (2oz) were applied from the lower canines to the upper second bicuspids to help resolve the sagittal discrepancy.

The wire sequence was as follows: .014" CuNiTi, .014x25" CuNiTi, .017x25" TMA, .019x25" SS (Fig. 14). During treatment, the Class III elastics were upgraded gradually from 2oz, 3.5oz, 4.5oz, to 6oz. Substantial slow palatal expansion was noted six months into treatment, at the same time that a panoramic film was taken to evaluate the position of bonds on the teeth (Fig. 21). The light wire on the upper arch corrected the posterior transverse discrepancy over the first 12 months of treatment, and resolved the posterior cross-bite without the

use of a rapid palatal expander or W-arch. In the 9<sup>th</sup> month, .016x25" SS arch-wires were placed on the lower arch, and bilateral bone screws (2x12mm OrthoBoneScrew, Newton's A inc.) were installed in the mandibular buccal shelves (Fig. 20). The bone screws were used to provide anchorage to retract the entire mandibular dentition while intruding the molars.

17 months after the initiation of active treatment, the negative overjet was corrected and anterior triangular elastics (U1-L2-U3-L4) were applied for open bite correction (Fig. 22). Once the bilateral Class I molar relationship was achieved, the lower bone screws were removed and closed coil springs were used to protract the third molars and complete closure of the residual spaces. In the 29<sup>th</sup> month

of the treatment, a cephalometric film showed a bimaxillary lip protrusion. Bilateral bone screws (2x12mm OrthoBoneScrew, Newton's A inc.) were inserted into the infrazygomatic crests (Fig. 23). Elastometric chains from upper canines to the infrazygomatic screws, and Class III elastics from lower canines to the IZC screws, were used to retract both arches simultaneously.

At the start of finishing phase, alignment was scored with the Cast-Radiograph Evaluation (CRE) worksheet to determine which brackets should be rebonded to correct first and second order problems (Fig. 26).<sup>2</sup> When using self-ligation brackets, this approach is more efficient than extensive wire bending for detailing the occlusion. Third order axial inclinations were corrected with torquing springs (Figs. 24-25). Overjet and overbite were refined with vertical elastics (Fig. 27). Evaluation of the prefinish casts revealed a posterior arch width discrepancy that required expanding the lower archwire. The substantial maxillary posterior expansion appeared to reflect a more natural tongue posture in the roof of the mouth once the negative overjet and open bite were resolved. To correct an intermaxillary tooth size discrepancy, interproximal reduction was performed in the maxillary anterior and mandibular posterior segments, to refine the canine and molar relationships.

Two weeks prior to the completion of active treatment, the upper archwire was sectioned distal to cuspids. Light up-and-down elastics (2oz) were used posteriorly for final settling of the buccal segments (Fig. 20). After 42 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.

## Results Achieved

### Maxilla (all three planes):

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

### Mandible (all three planes):

- A - P: Maintained
- Vertical: 4mm clockwise rotation of the mandible
- Transverse: Maintained

### Maxillary Dentition:

- A - P: Slightly more incisor protrusion
- Vertical: Extrusion of the entire dentition
- Inter-molar / Inter-canine Width: Crowding and cross bite was corrected with arch expansion

### Mandibular Dentition:

- A - P: Retract entire dentition and tip the incisors lingually
- Vertical: Maintained
- Inter-molar / Inter-canine Width: Expansion in the molar area to correspond to the maxillary arch

### Facial Esthetics:

Lower lip protrusion was improved and lip competence was maintained, but a long chin was evident in the profile view.



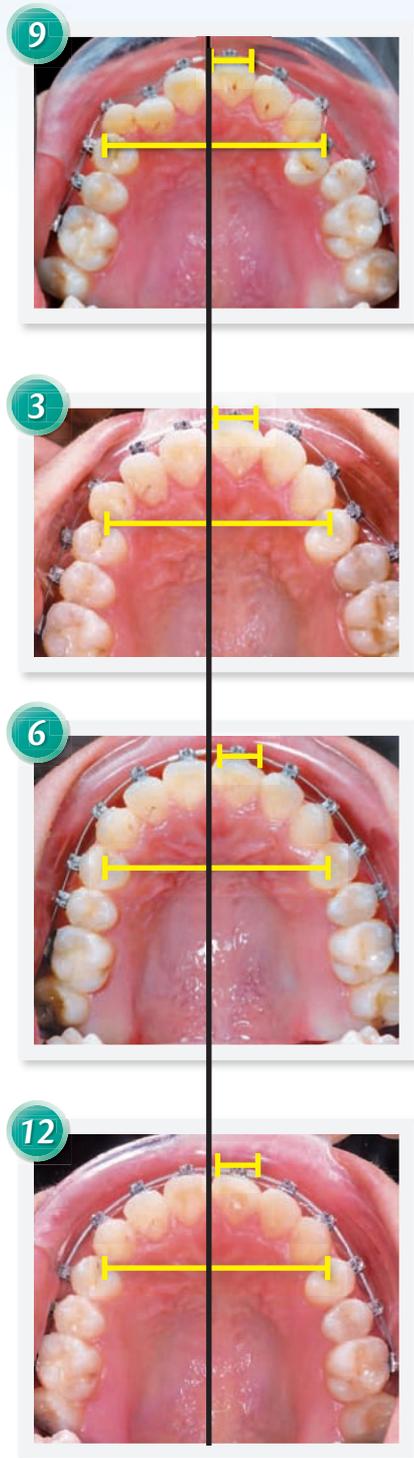
■ Fig. 19:

*In the first month of treatment, high torque brackets were bonded to lower canines and lower torque brackets were up side down as high torque on the lower anteriors. The poster bite turbos were placed on the lower first molars.*



■ Fig. 20:

*In the 9<sup>th</sup> month of treatment, two bone screws were inserted on the bilateral buccal shelves for full dentition distalization.*



■ Fig. 21

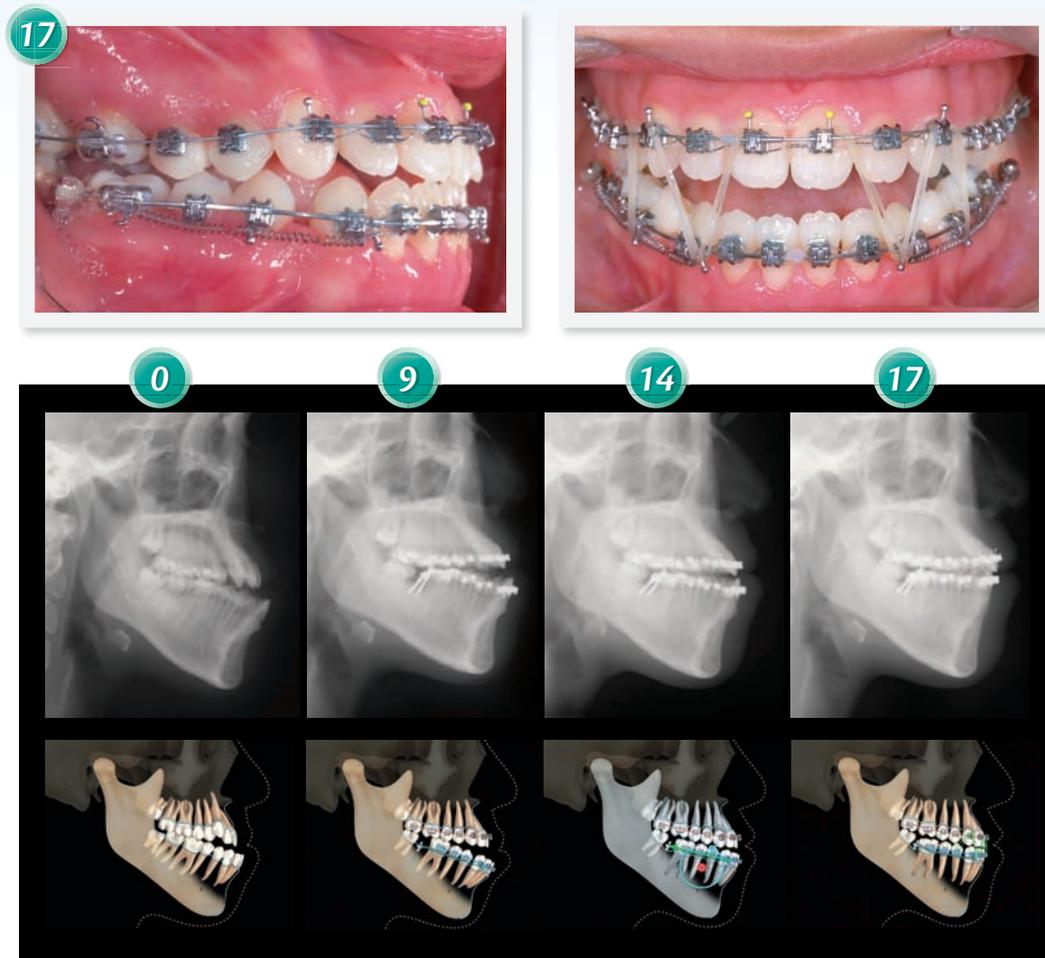
After having used the light wire and .022" slot self-ligating system, arch expansion effect was noticed.

## Retention

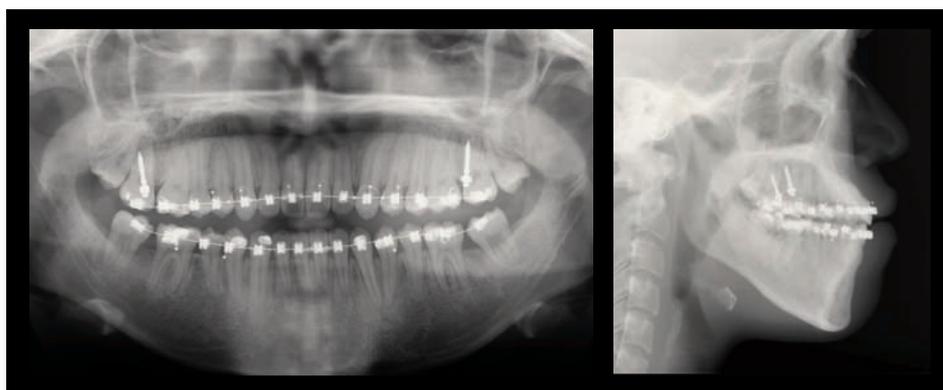
Fixed retainers were bonded on all maxillary incisors and from canine to canine in the mandibular arch. An upper clear overlay was delivered. Full time wear was prescribed for the first 6 months, and nights only thereafter. The patient was instructed in the home care and maintenance of the retainers.

## Final Evaluation of Treatment

The final CRE score was 23 points, indicated an excellent finished alignment for this challenging malocclusion.<sup>7</sup> The major discrepancies were in occlusal relationships, occlusal contacts, alignment/rotation, and marginal ridges.<sup>1,5</sup> The increased width between the upper second molars, as well as finishing them slightly out of occlusion, increased the CRE score; however, these discrepancies were actually favorable overcorrections and the second molars are expected to settle into a stable, near ideal occlusion. The large negative overjet and severe anterior open bite were corrected without surgery.<sup>3,4</sup> All teeth were well aligned over the apical base of bone, except for the mandibular incisors, which had a slightly decreased axial inclination. A favorable factor during treatment was the expansion of the maxillary arch, which indicated that the patient had spontaneously changed the posture of her tongue to a more ideal relationship. Class III openbite patients usually have a lower tongue posture that is manifest as a rounded out lower arch (Fig. 3). When the tongue assumes a more normal posture, in the roof of the mouth, the maxillary arch tends to expand and round out (Fig. 6). Extra-



■ Fig. 22:  
 In the 17<sup>th</sup> month, the negative overjet was corrected and anterior triangular elastics were applied for open bite correction.

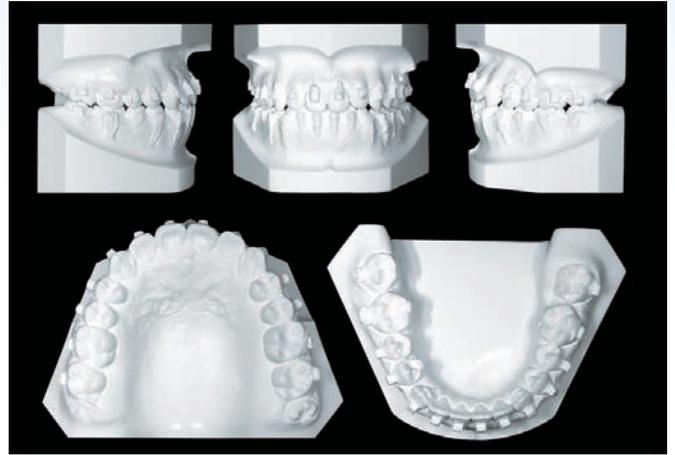


■ Fig. 23: 2 bone screw inserted into infra-zygomatic crests were applied for upper dentition distalization.

alveolar bone screws provide effective orthopedic anchorage for retracting both arches in skeletal Class III malocclusions.<sup>6</sup> The necessity for mandibular arch retrusion is intuitive, but it is important to realize that retraction of the entire mandibular arch usually results in a bimaxillary protrusion, when the negative overjet is corrected (Fig. 22). Thus, infrazygomatic screws are also necessary in the maxilla to augment the mandibular buccal shelf screws in order to achieve simultaneous retraction of both arches. Nonsurgical correction of the current severe skeletal Class III malocclusion required extensive retraction and extrusion of the mandibular incisors. This treatment should be reserved only for patients with a healthy periodontium, that is capable of generating new alveolar bone and attached gingiva. Since the lower incisors have a decreased axial inclination (*more retroclined*) than ideal, the patient's substantial orthodontic correction should be followed long-term. Night wear of the retainers is recommended indefinitely.

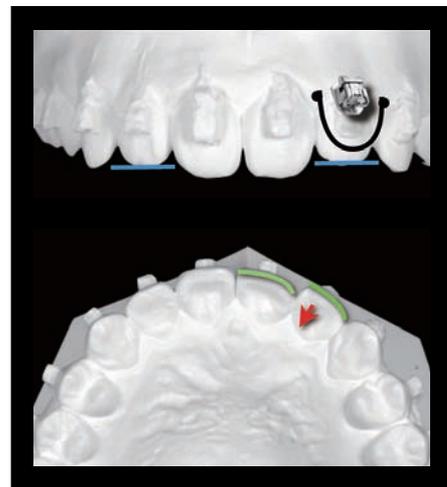
## Discussion

Conservative treatment, presently defined as without orthognathic surgery, of a Class III skeletal malocclusion is challenging, particularly in the presence of a large negative overjet and open bite. The most common, traditional camouflage treatment option is extraction of upper second premolars and lower first premolars, to provide space and anchorage for retraction of the lower anteriors to correct the buccal segments.<sup>3,4</sup> However, the present case was too severe to effectively manage with premolar extractions. Using bone



■ Fig. 24:

*In the finished stage, take impression for checking each bonding position.*



■ Fig. 25:

*#10 was higher than #7 and flaring. Rebond the bracket higher and apply reverse torque spring.*

screws in the mandibular buccal shelves provides maximum anchorage for retraction of the entire arch to correct the interdigitation of the buccal segments.<sup>6</sup> The DI of 77 documents the extreme severity of this malocclusion. It is unlikely that any other form of camouflage therapy could produce such an excellent outcome, as documented by CRE



■ Fig. 26:  
Check tooth axis from buccal, occlusal and palatal side to determine better bonding position.

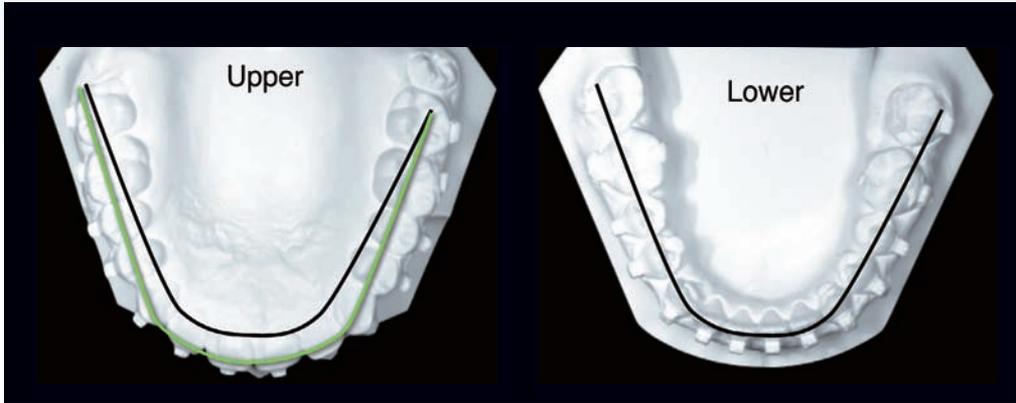
score of 23.

The chief concern (*complaint*) of the patient is always the first priority in treatment planning (Fig. 28). Especially for adult patients, a thorough periodontal evaluation is essential, as part of the diagnostic work-up. Extensive retraction and extrusion of the mandibular incisors in a periodontally compromised patient is contraindicated, because the treatment will probably result in severe bone loss. When teeth are moved long distances, they must generate new bone and attached gingiva. That can only be accomplished by a healthy periodontium. Another important consideration is the smile-line, which is drawn from a facial photograph documenting a natural smile. Once the ideal position of the maxillary

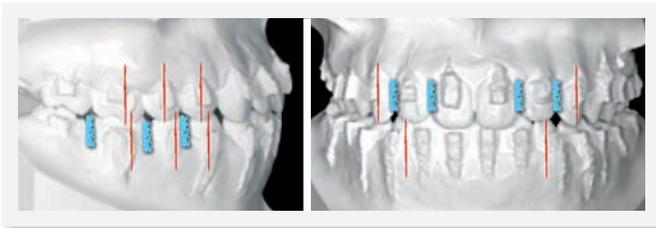


■ Fig. 27:  
Open contact on #10 and 11 was noticed, bond the lingual buttons and correct by cross-elastics.

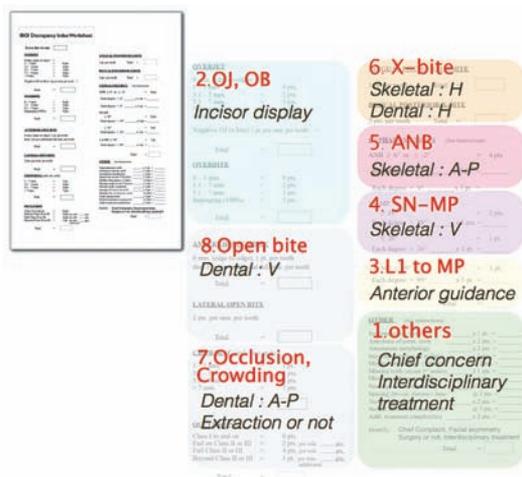
incisors is determined, the position and inclination of the lower incisors can be planned to achieve optimal incisal guidance. The SN-MP angle and lip competence are used to evaluate the facial height of the patient. It is usually necessary to increase the face height during Class III camouflage treatment, so it is important to make sure that the patient has adequate lip length to achieve lip competence at the end of treatment. For the present patient, lip length was adequate to tolerate the posterior mandibular rotation, but her lower face (*chin and lower lip*) area was lengthened. However, at the end of treatment the patient is an attractive young lady with a nice smile-line. The long chin is only noticed in the profile view.



■ Fig. 28: Upper and lower arch discrepancy were noticed.



■ Fig. 29: Correct posterior molar relation and anterior canine relation by interproximal reduction.



■ Fig. 30: Determining treatment sequence by checking ABO-DI worksheet

The ANB angle was reduced from -3 to 0 degrees, which is within normal limits. The patient’s facial esthetics would probably benefit from a surgical chin shortening and advancement procedure. Compared to orthognathic surgery, a skeletal chin revision is a relatively simple procedure, that often accomplished on an out-patient basis. Because of her aversion to surgery, and the attractive result in the frontal view, the patient is unlikely to pursue a chin revision in the near future, but it remains a viable alternative if she becomes concerned about her long chin in the future.

Analysis of the dental casts shows that the maxillary arch can be expanded with light forces. There was no need for rapid palatal expansion. However, as previously mentioned, this favorable result was probably substantially assisted by the patient assuming a more natural tongue posture, i. e. positioning her tongue in the roof of her mouth. Functional forces, and particularly tongue posture, are very important considerations when treating openbite patients. If patients do not assume normal

**Dental-facial analysis**

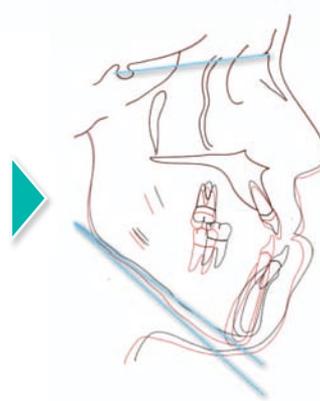
**Skeletal : V → A-P → H**



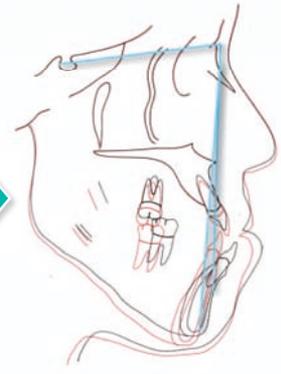
Incisor display



L1 position



Facial height  
(skeletal:V)



U & L bone  
relative position  
(skeletal:A-P)

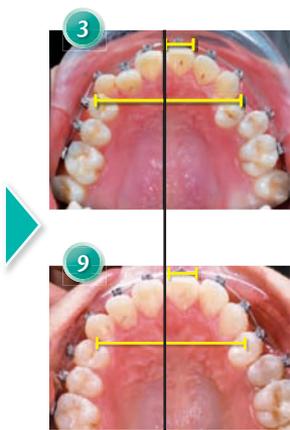
■ Fig. 31:

Orthodontic thing sequence as following:

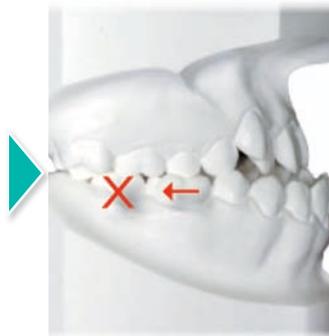
dental-facial analysis → skeletal (vertical - AP -horizontal) → dental (horizontal - AP - vertical) and star over.

**Dental : H → A-P → V**

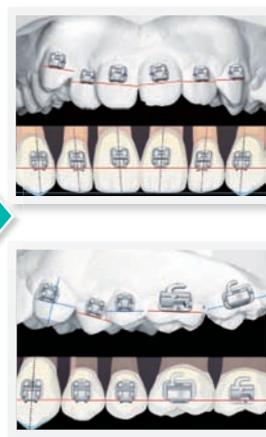
**Start over**



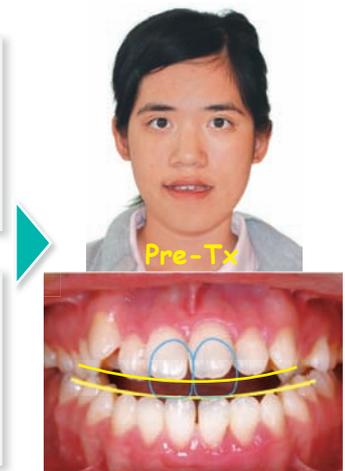
Arch expansion  
(skeletal:H,dental:H)



Molar relation  
(dental:A-P)



Tooth vertical position  
(dental:V)



Incisor display



■ Fig. 32: The comparison of facial profile before and after treatment.

lip and tongue posture at the end of treatment, relapse of the open bite is likely.

Another important aspect in the favorable results achieved is the ideal alignment of the terminal molars despite substantial retraction of the mandibular arch from first molar to first molar. If the third molars had been extracted and entire arch retracted, it would have been difficult to prevent the terminal teeth (*second molars*) from being tipped distally. Because of the inherent flexibility at the end of an archwire, it is challenging to deliver an adequate root-distal moment, to ideally align the terminal molars in the second order, when the entire arch is retracted. If all three molars are present, there is a substantial biomechanics advantage to extracting the first or second molars, rather than the third molars if the rest of the arch will be retracted with extra-radicular anchorage. Avoiding substantial retraction of the terminal molars is an important treatment planning option.

Before beginning the finishing stage of the

orthodontic treatment, it is advisable to obtain progress casts and a panoramic radiograph. The the CRE worksheet is very helpful for identifying problems that detract from an ideal result. These minor discrepancies are difficult to detect clinically. Preparing a check list to reposition brackets and attend to other details in finishing has been shown to result in a highly significant improvement in treatment outcomes.<sup>11</sup>

The present case report demonstrates that a skeletal Class III malocclusion, with a large negative overjet and severe anterior open bite, can be optimally corrected without orthognathic surgery (Fig. 32). The entire mandibular arch can be retracted with extra-alveolar anchorage. Interradicular miniscrews were be inappropriate, because they would interfere with the retraction of all the teeth in the arch. Extensive retraction of particularly the mandibular incisions should only be attempted in patients with a healthy periodontium.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	80°	80°	0°
SNB°	83°	80°	3°
ANB°	-3°	0°	3°
SN-MP°	40°	42°	2°
FMA°	33°	35°	2°
DENTAL ANALYSIS			
U1 TO NA mm	2mm	3mm	1mm
U1 TO SN°	109°	111°	2°
L1 TO NB mm	6mm	3mm	3mm
L1 TO MP°	89°	75°	14°
FACIAL ANALYSIS			
E-LINE UL	-2mm	0mm	2mm
E-LINE LL	4mm	1mm	3mm

■ Table. 1: Cephalometric summary

## Acknowledgment

Thanks to Mr. Paul Head for proofreading this article.

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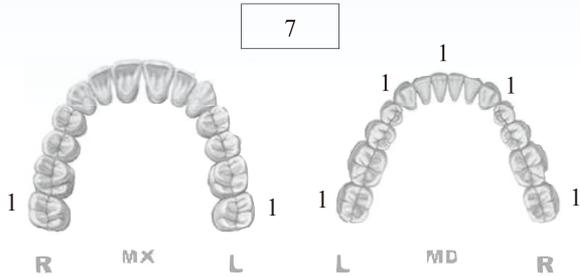


# Cast-Radiograph Evaluation

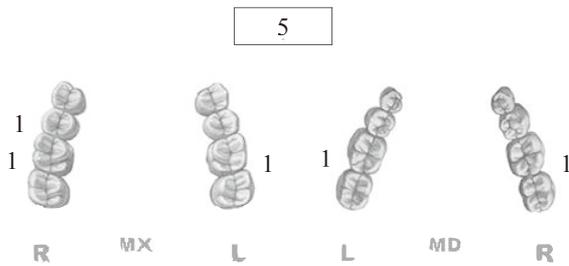
Case # 1 Patient

Total Score: **23**

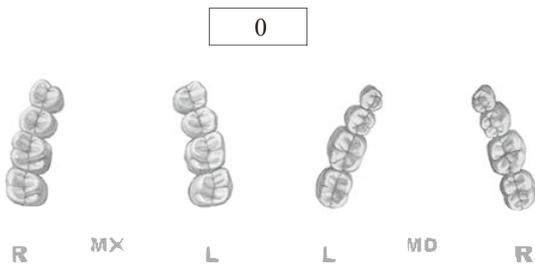
## Alignment/Rotations



## Marginal Ridges



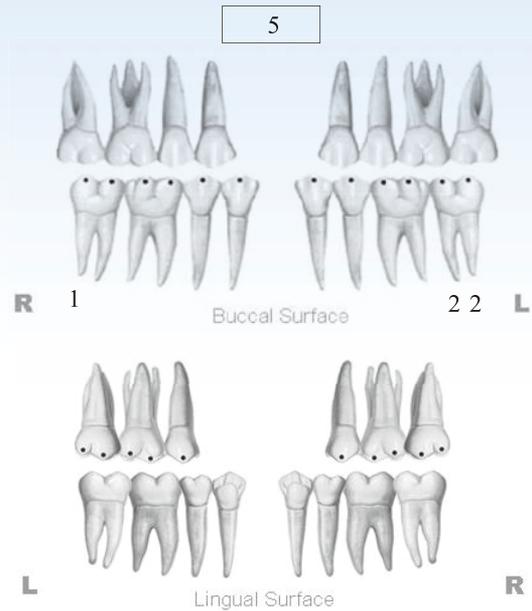
## Buccolingual Inclination



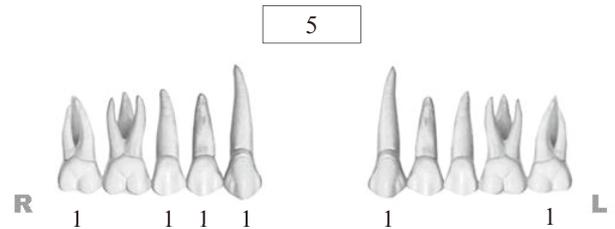
## Overjet



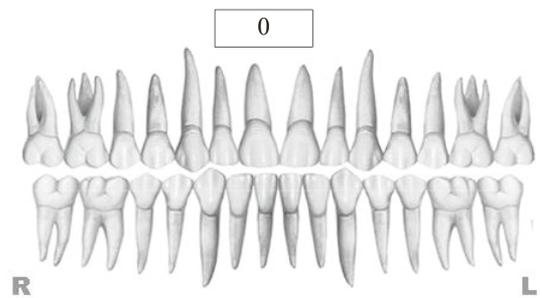
## Occlusal Contacts



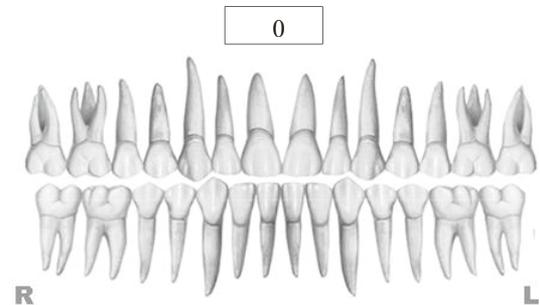
## Occlusal Relationships



## Interproximal Contacts



## Root Angulation



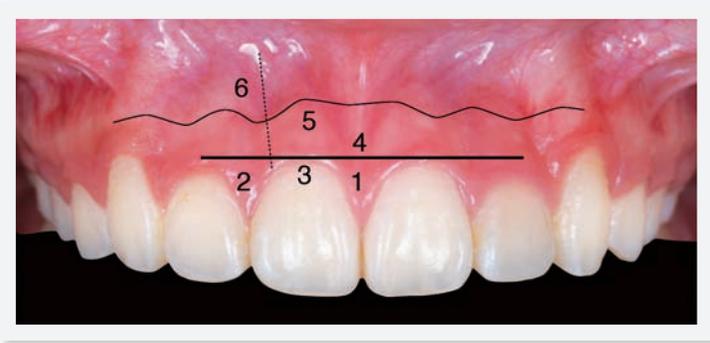
**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## IBOI Pink & White Esthetic Score

Total Score: = 7

### Pink Esthetic Score

Total = 5



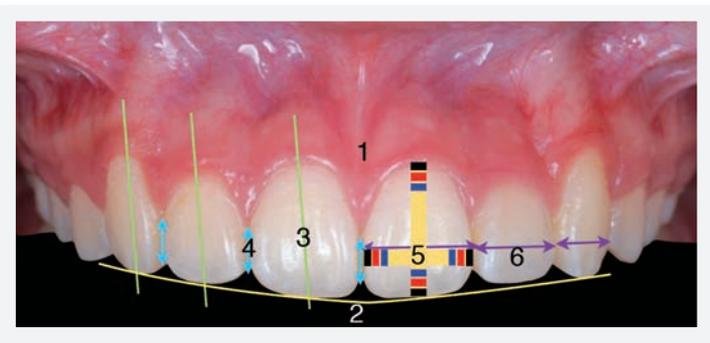
M & D Papillae	0	1	2
Keratinized Gingiva	0	1	2
Curvature of Gingival Margin	0	1	2
Level of Gingival Margin	0	1	2
Root Convexity ( Torque )	0	1	2
Scar Formation	0	1	2



M & D Papillae	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
Keratinized Gingiva	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
Curvature of Gingival Margin	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
Level of Gingival Margin	0	1	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">2</span>
Root Convexity ( Torque )	0	1	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">2</span>
Scar Formation	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2

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

Total = 2



Midline	0	1	2
Incisor Curve	0	1	2
Axial Inclination ( 5°, 8°,10° )	0	1	2
Contact Area ( 50%, 40%, 30% )	0	1	2
Tooth Proportion ( 1:0.8 )	0	1	2
Tooth to Tooth Proportion	0	1	2



Midline	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
Incisor Curve	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	2
Axial Inclination ( 5°, 8°,10° )	0	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	2
Contact Area ( 50%, 40%, 30% )	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
Tooth Proportion ( 1:0.8 )	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2
Tooth to Tooth Proportion	<span style="border: 1px solid red; border-radius: 50%; padding: 2px;">0</span>	1	2

# 矯正與植牙合併治療的思考流程

## Thinking Process for

# ORTHO-IMPLANT **COMBINED**

# TREATMENT

講師：張慧男 醫師及貝多芬團隊

2013 9/22 (日) 南區場：邱上珍 醫師 張銘津 醫師  
09:00-17:00 黃登楷 醫師 黃瓊嬋 醫師 蘇筌璋 醫師



主辦單位：台北醫學大學牙醫學系台南區校友會

協辦單位：湧傑企業股份有限公司

地點：國立成功大學醫學院第三講堂（台南市小東路1號）

費用：9/13前全國北醫校友會會員1000元，非會員1500元  
研究生及住院醫師600元

9/13後全國北醫校友會會員2000元，非會員3000元  
研究生及住院醫師1500元

報名專線：07-536-1701 王小姐  
02-2778-8315分機122 楊小姐

報名方式：請先電話報名，三日內劃撥費用

郵政劃撥帳號：17471807

戶名：湧傑企業股份有限公司

\*參加者發給繼續教育學分

2013 7/28 (日) 北區場  
09:00-12:00

張銘珍 醫師  
黃育新 醫師 蘇筌璋 醫師

主辦單位：社團法人桃園縣牙醫師公會  
地點：本會會館學術廳（中壢市環北路400號20樓之1）  
費用：預先報名300元，現場報名500元（外縣市加100元）  
報名專線：03-427-1712 或 03-422-9450 劉小姐、張小姐  
報名方式：請先電話報名，三日內劃撥費用  
郵政劃撥帳號：18308567  
戶名：社團法人桃園縣牙醫師公會  
\*全程參與4學分



# Early Treatment of Anterior Crossbite Complicated by Maxillary Posterior Crowding

## History And Etiology

An 8-year-1-month female presented with her parents for orthodontic consultation. The chief concerns were anterior crossbite and severe crowding in the maxillary posterior segments. Her facial profile was orthognathic and frontal symmetry was within normal limits (WNL). The mandibular permanent incisors and first molars were present. Maxillary primary lateral incisors, canines and left first molar were retained, but all four upper premolars were erupted in malposed positions (Figs. 1-3). The etiology of the malocclusion was presumed to be a more palatal ectopic path of eruption for maxillary incisors and canines. There was no other contributing medical or dental history.

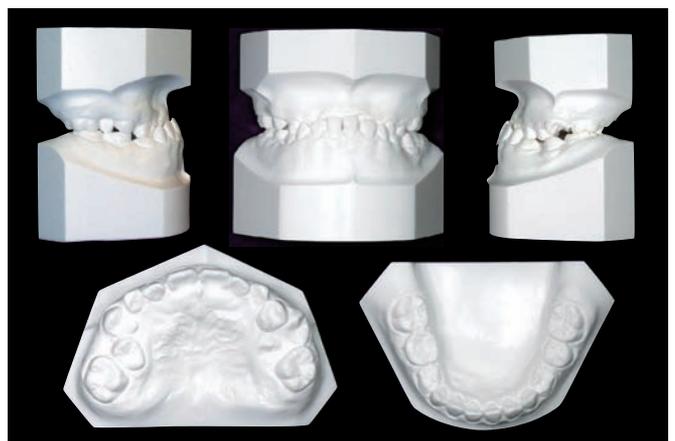
Active treatment started 8 months later when the permanent lateral incisors had erupted. Four years of non-extraction orthodontic treatment, in both the mixed and early permanent dentition, resulted in a near ideal alignment, as documented in Figs. 4. The original profile was maintained. Radiographic documentation of the pretreatment condition and the posttreatment result are provided in Figs. 7-8, respectively. Cephalometric data is presented in Table 1 and Fig. 9 shows the superimposed cephalometric tracings for the anterior cranial base, the maxilla and the mandible.



■ Fig. 1: Pretreatment facial photographs



■ Fig. 2: Pretreatment intraoral photographs



■ Fig. 3: Pretreatment study models

Dr. Shu Ping Tseng, Lecturer, Beethoven Orthodontic Course (left)  
 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

## Diagnosis

### Skeletal:

- Skeletal Class III ( $SNA\ 73^\circ$ ,  $SNB\ 76^\circ$ ,  $ANB\ -3^\circ$ )
- Mandibular plane angle ( $SN-MP\ 35^\circ$ ,  $FMA\ 28^\circ$ )
- Functional shift 3mm anteriorly and to the left

### Dental:

- Bilateral Class I molar relationship in centric occlusion (Co)
- Bilateral Class II molar relationship in centric relation (Cr)
- Full anterior crossbite with  $>100\%$  overbite OJ -3 mm; OB 8 mm
- Midline left shift 2 mm
- Deep curve of Spee on the lower arch Teeth #4, 12, 13 early and ectopic eruption ABO Discrepancy Index = 37

### Facial:

- Straight (*orthognathic*) profile
- Competent, slightly retrusive lower lip
- Prominent chin

## Specific Objectives Of Treatment

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

- A - P: Anterior crossbite correction allowing for normal expression of growth
- Vertical: Allow for normal expression of growth
- Transverse: Allow for normal expression of growth



Fig. 7: Pretreatment pano. and ceph. radiographs

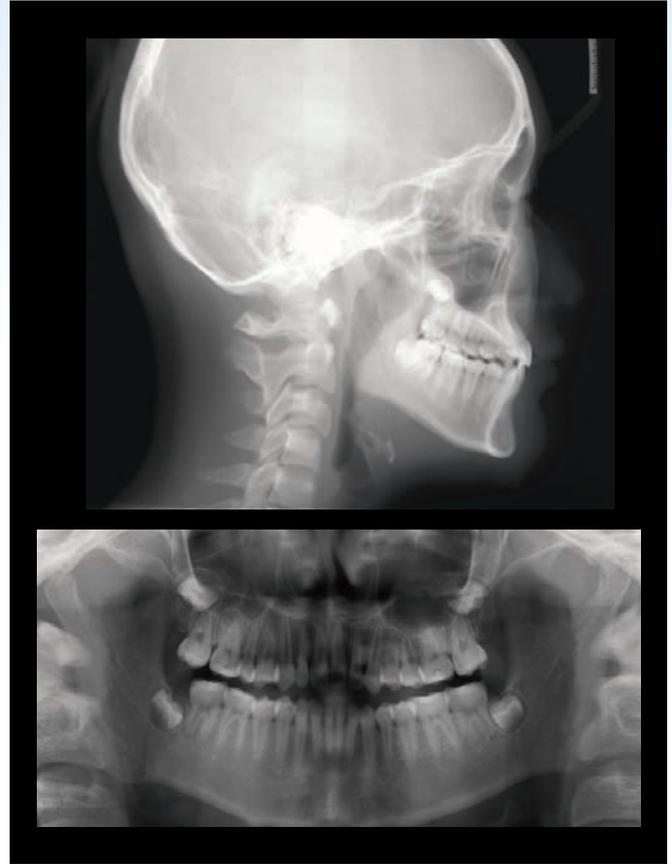


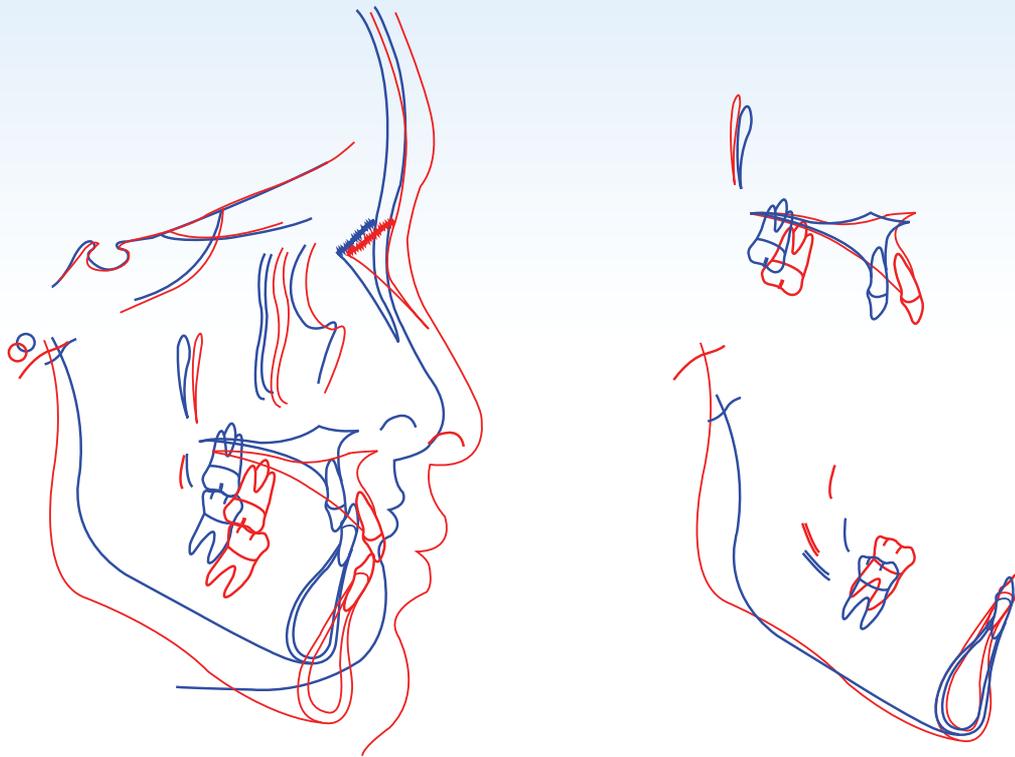
Fig. 8: Posttreatment pano. and ceph. radiographs

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	73°	74°	1°
SNB°	76°	76°	0°
ANB°	-3°	-2°	1°
SN-MP°	35°	35°	0°
FMA°	28°	30°	2°
DENTAL ANALYSIS			
U1 TO NA mm	2.4 mm	8 mm	5.6 mm
U1 TO SN°	84°	101°	17°
L1 TO NB mm	1 mm	3.5 mm	2.5 mm
L1 TO MP°	75°	88°	12°
FACIAL ANALYSIS			
E-LINE UL	-4.4 mm	-2 mm	2.4 mm
E-LINE LL	-3.8 mm	-2 mm	1.8 mm

Table 1: Cephalometric summary



Fig. 9: Presence of functional shift



■ Fig. 10: Superimposed tracings showed the patient's significant growth in these 4 years. Incisors were flared, and molars were extruded.

#### Mandible (all three planes):

- A - P: Allow for normal expression of growth
- Vertical: Allow for normal expression of growth
- Transverse: Allow for normal expression of growth

#### Maxillary Dentition:

- A - P: Correct anterior crossbite, increase axial inclination of incisors
- Vertical: Allow for growth-related extrusion
- Inter-molar width: Allow for growth-related expansion

#### Mandibular Dentition:

- A - P: Increase axial inclination of incisors
- Vertical: Allow for growth-related extrusion
- Inter-molar / Inter-canine Width: Allow for growth-related expression

#### Facial Esthetics:

- Maintain profile and lip protrusion pattern

#### Treatment Plan

To control the functional inhibition of growth, early intervention was indicated. A good prognosis could be expected because of the orthognathic profile in Cr, Class I molar relationship in Co and presence of a functional shift (Fig. 9). A non-extraction strategy



■ Fig. 11:

Incisors flared and molars were pushed back for anterior crossbite correction and posterior space creation with coil springs on a .014 CuNiTi wire.



■ Fig. 12: Low torque brackets combined with coil springs and a bite turbo on a .014 CuNiTi wire.

was chosen to maintain the profile. After eruption of the maxillary lateral incisors, the 2x4 mixed dentition method (brackets on maxillary permanent incisors and first molars) was combined with coil springs and bite turbos to correct the anterior crossbite and open space for alignment of the malposed premolars (Fig. 11).

The deep curve of Spee in the lower arch was corrected with natural eruption following the placement of bite turbos on the mandibular central

incisors (Fig. 12). Once the maxillary arch was aligned (Fig. 13), and the mandibular buccal segments erupted, all permanent teeth were bonded. Intermaxillary elastics (Class III and midline) were used as needed to solve the sagittal discrepancy and detailing bends produced the final occlusion. Following detailing, fixed appliances were removed and both arches were retained with removable retainers.

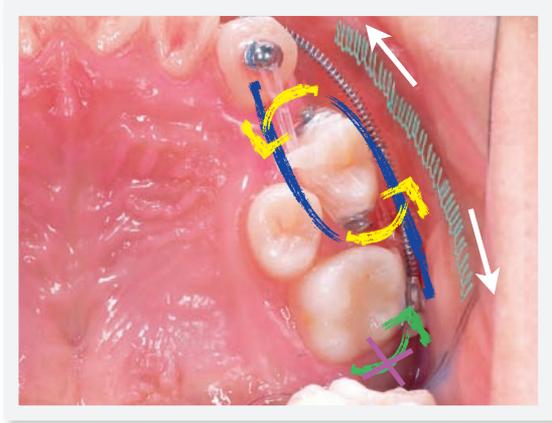
### Appliances And Treatment Progress

Damon Q low torque .022" brackets (Ormco) were bonded on the maxillary arch: both first molars, right first premolar, and all four incisors. Bite turbos were installed on the lower central incisors, and a .014 CuNiTi archwire was fitted, with three lengths of open coil spring, to correct the negative overjet and posterior crowding (Fig. 12). The anterior crossbite was corrected in one month. (Fig. 13)

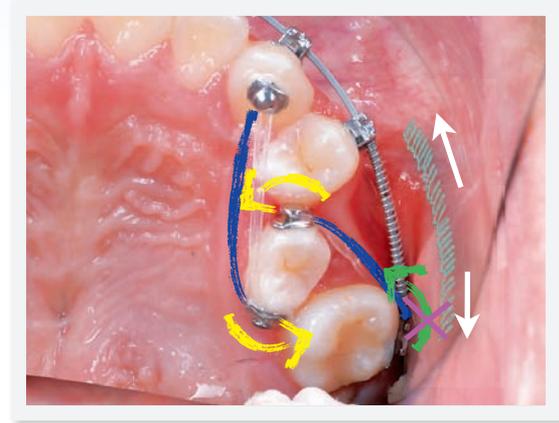
The subsequent archwire sequence was .014x.025 CuNiTi, followed by a .017x.025 TMA wire. Upper left and right canines erupted and were bonded in the 15<sup>th</sup> and 17<sup>th</sup> month of active treatment, respectively.



■ Fig. 13: Anterior crossbite was corrected in one month and the overbite was 2mm due to posterior teeth elongation.



■ Fig. 14: Tooth #12 rotation correction.



■ Fig. 15: Tooth #13 rotation correction.

In the 23<sup>rd</sup> month, all upper teeth were engaged on the archwire except for teeth #12 and Buttons were bonded on the lingual surface of tooth #11, as well as buccal and lingual surfaces of tooth #As shown in Fig. 14, two sections of power chain were used to rotate tooth #Over a period of 6 months, tooth #12 was brought into position, and then tooth #13 was rotated with a similar approach in about 4 months (Fig. 15). All of the maxillary teeth were engaged on the archwire by 34 months (Fig. 16).

In the 33<sup>rd</sup> month of active treatment, the lower arch was bonded for alignment and leveling. Class III elastics was applied to correct the sagittal discrepancy and detailing bends produced the final occlusion. Fixed appliances were removed after 48 months of active treatment and the corrected dentition was retained with removal retainers in both arches.



■ Fig. 16: Intra-oral photos showed the progress of upper arch.

## Results Achieved

### Maxilla (all three planes):

- A - P: Optimal growth expression
- Vertical: Optimal growth expression
- Transverse: Optimal growth expression

### Mandible (all three planes):

- A - P: Optimal growth expression
- Vertical: Optimal growth expression
- Transverse: Optimal growth expression

### Maxillary Dentition

- A - P: Increased axial inclination of the incisors
- Vertical: Posterior teeth extrusion
- Inter-molar width: Increased

### Mandibular Dentition

- A - P: Increased axial inclination of the incisors
- Vertical: Posterior teeth extrusion
- Inter-molar / Inter-canine Width: Increased

### Facial Esthetics:

- The orthognathic profile was maintained, consistent with optimal growth and incisor alignment.

## Retention

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

## Final Evaluation Of Treatment

The ABO Cast-Radiograph Evaluation was scored at 25, which was deemed to be a board quality result. The major discrepancies were buccolingual inclination (10 points), uneven marginal ridges (6 points) and problematic alignment and rotation (4 points). From the radiographs, the root alignment was nearly ideal, except for tooth #5. Fortunately, no bone loss was noted after the relatively long treatment time. Mild external apical root resorption (EARR) was noted on teeth #12 and #13, while the root of tooth #5 was dilacerated (Fig. 17).

The final occlusion was stable. The molar and canine relationships were both Class I (Fig. 18).

In terms of the pink esthetics score, the gingiva texture was pleasing, and the root prominence was satisfactory, while the axial inclination in white esthetic score was generally acceptable (Fig. 19).<sup>1,2</sup>

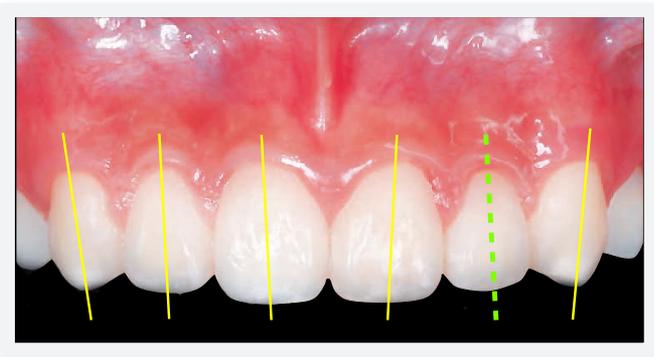


■ Fig. 17:

The posttreatment periapical films showed dilacerated root of tooth #5 and external root resorption of teeth #12,



■ Fig. 18:  
Posttreatment photos showed canine and molar Class I relationships.



■ Fig. 19:  
The intra-oral photo showed the inclination of tooth #10 was less than ideal.

Overall, the treatment results for this challenging early intervention case were pleasing to the patient and the clinician.

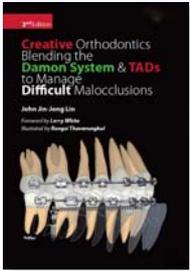
## Discussion

Early treatment continues to be controversial because a prolonged treatment time may increase treatment costs, but it also exhausts the patients' patience. Oral hygiene is often a problem, especially when extraoral devices and elastics are required.

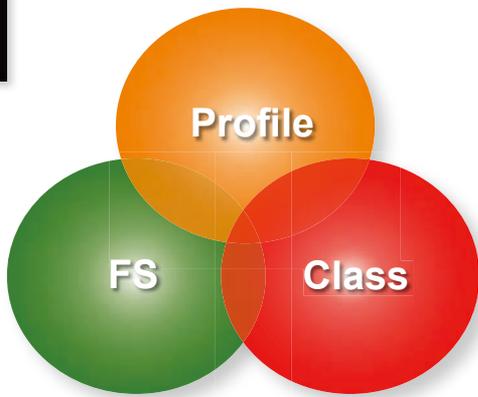
However, early treatment can provide long-term benefits that are difficult to achieve with delayed treatment. For instance, dental and/or periodontal trauma, as well as growth disturbances, can be more effectively controlled. Chang<sup>3</sup> proposed three practical indicators for early treatment: to address problems that can be corrected in less than 6 months, to intercept developmental problem that might get worse, and to eliminate growth disturbances. For the present case, an uncorrected anterior crossbite might restrict maxillary growth and result in incisor attrition. Additionally, mesial drift of the upper molars mesial would further complicate treatment.

Skeletal Class III treatment is usually postponed until the end of puberty, due to the unpredictable growth of the mandible. Lin<sup>4</sup> has defined a Three-Ring Diagnosis system, which predicts a good prognosis for 90% of anterior crossbite patients who have an orthognathic profile in Cr position, a functional shift and a canine/molar Class I relationship (Fig. 20). The present patient matched all three criteria, so a favorable result could be expected. However, the parents and patient were still informed that there was a chance of undesirable mandibular growth, and additional treatment might be needed in the future.

To minimize treatment time, the start was delayed until the maxillary lateral incisors had erupted. With



**Profile:** Orthognathic profile at CR position  
**Class:** Canine and molar Class I relationship  
**FS:** Functional shift (CO≠CR)



■ Fig. 20:

Lin's Three-Ring Diagnosis<sup>4</sup> indicated that good prognosis could be expected for 90% anterior crossbite patients who matched the 3 criteria listed above.

regard to the initial stage of treatment (Fig. 12), there are 3 clinical keys: low torque brackets help prevent incisors from excessive flaring; bonding the bite turbos on *two lower central incisors* together help reduce trauma from occlusion; placing resin balls on the extending ends of the archwire helps avoid mucosa trauma and prevents the wire from coming out of the tube (Fig. 21). Posttreatment periapical films of the incisors showed no pathologic changes, although the crossbite was corrected over a very short period of time (Fig. 22). It is important to monitor root resorption for teeth that have turbos attached.

For the upper left region, the challenge was to align the premolars without damaging the roots



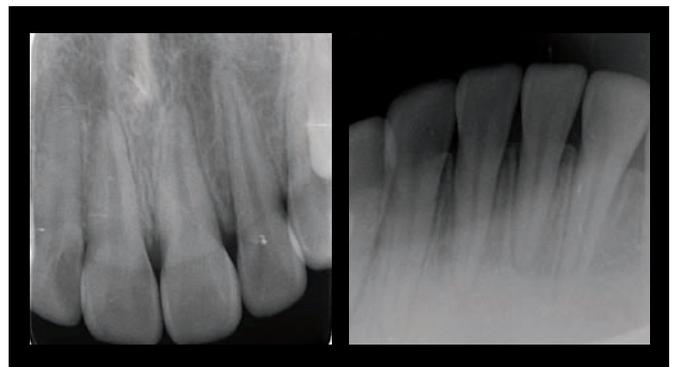
■ Fig. 21:

A resin ball bonded at the distal end of the wire to prevent wire from coming out of the tube and soft tissue trauma.



■ Fig. 23:

Molar mesial movement due to passive coil spring which couldn't resist the traction force from the power chain.

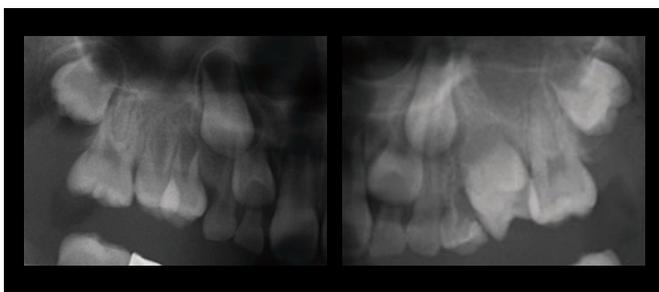


■ Fig. 22:

The posttreatment periapical films of incisors showed no pathologic change of the roots.

or altering the arch form. In the 19<sup>th</sup> month of treatment, the space was sufficient to allow for eruption and alignment of the upper permanent canines. As shown in Figs. 14-15, large rotations are best managed by applying a couple, via elastic chains attached to buttons bonded on the buccal and lingual surfaces. An activated open coil spring, as opposed to a passive one, was necessary to resist the traction force from the power chain to prevent mesial rotation of the molar. Fig. 23 shows the effect of a passive coil spring in a later stage of treatment. It is important to avoid applying force to the second premolar while the first premolar is being aligned.<sup>5,6</sup>

Maxillary premolars usually erupt between the ages of 10 to 12 years, when more than half of the root is formed. For the present patient, they erupted when less than a quarter of their roots formed, and the patient was only 8 years old (Fig. 24). It is important to carefully monitor this unusual development radiographically (Figs. 17 and 24). In treating ectopically erupted and transposed teeth, root pathology is always a concern. Some root

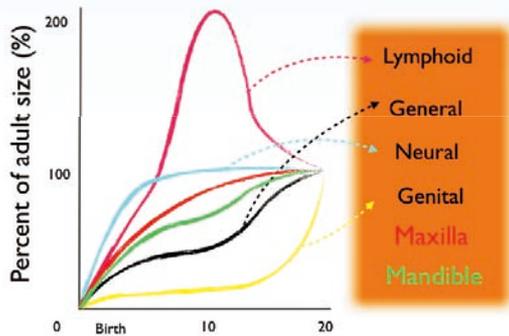


■ Fig. 24:  
Early erupted premolars with less than a quarter of root formation was observed when the patient was over

resorption and/or arrested root development was noted for the transposed premolars (Fig. 17), but fortunately the problem was modest. However, it is important to ensure that there is no occlusal trauma when the occlusion is detailed. Otherwise, external apical root resorption can be progressive following the treatment.<sup>7</sup>

Fig. 23 suggests that early intervention in retracting the molar was unnecessary, and the early bonding of the maxillary premolars may have been a factor in the dilaceration of tooth #In retrospect, a two-stage treatment plan may have been a better therapeutic approach. For instance, the first stage would be directed at achieving a positive overbite and preventing the molars tipping mesially. The second stage could be delayed until the permanent buccal segments had erupted. With this two stage treatment approach, it would have been possible to save active treatment time and better manage the oral hygiene.

The superimposed cephalometric tracings revealed significant lower facial growth, of both the maxilla and mandible. Generally speaking, the size of the maxilla is 80% complete at the age of 8 (Fig. 25).<sup>8</sup> However, for the present patient, a considerable amount of maxillary growth was observed after anterior crossbite correction. This observation supports the hypothesis that anterior crossbite restricts maxillary growth. Thus, correcting crossbites should be a high priority for intercepting malocclusion in the mixed dentition.



■ Fig. 25:

Growth of jaw is intermediate between the neural and general body curves, with the mandible (green) following the general body curve more closely than the maxilla (red).

## Conclusion

Early Intervention to correct anterior crossbite decreases the chance of incisors attrition, helps avoid gingival recession, improves facial appearance, and intercepts growth disturbances. Moreover, this important service can be achieved usually in a short amount of time, less than one month for the present case, and the mechanics are relatively simple, i. e. coil springs or advancement loop combined with bite turbos. Therefore, early intervention is strongly recommended for anterior crossbite if three criteria are met: functional shift, Class I canine and molar relationships, and an orthognathic profile in the Cr position.

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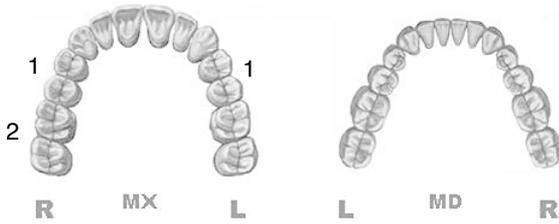


# Cast-Radiograph Evaluation

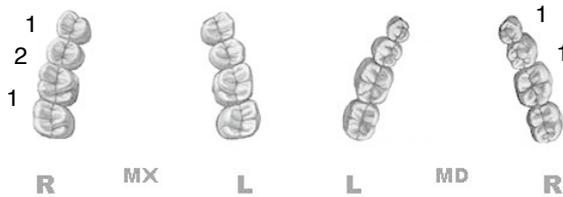
Case #  Patient

Total Score:

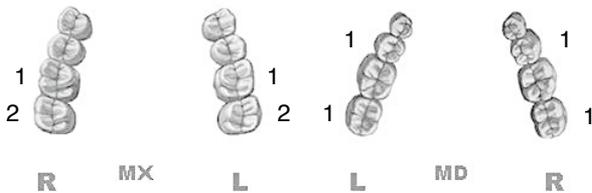
## Alignment/Rotations



## Marginal Ridges



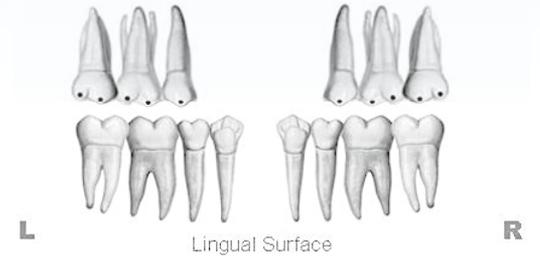
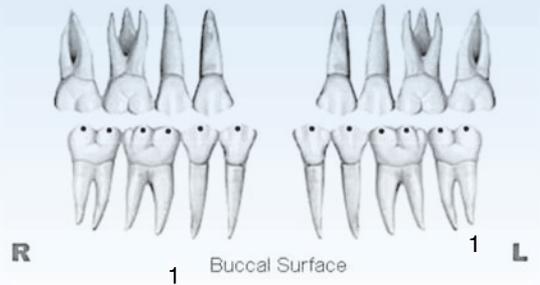
## Buccolingual Inclination



## Overjet



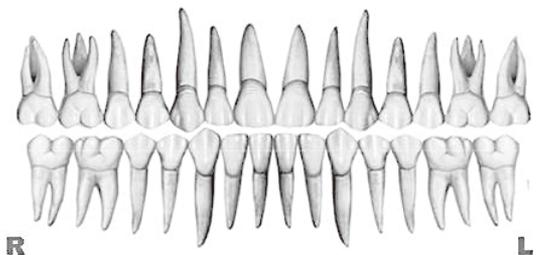
## Occlusal Contacts



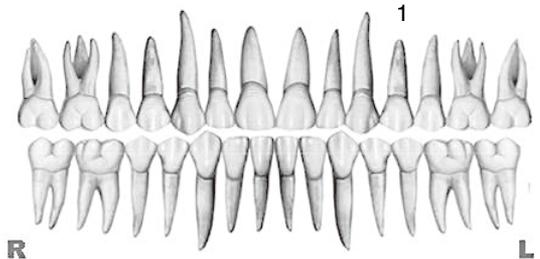
## Occlusal Relationships



## Interproximal Contacts



## Root Angulation

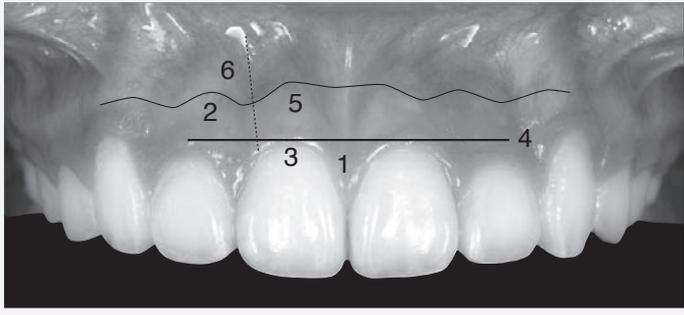


**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

## IBOI Pink & White Esthetic Score

Total Score: = 6

### Pink Esthetic Score

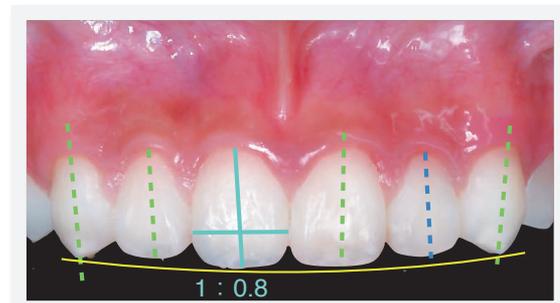
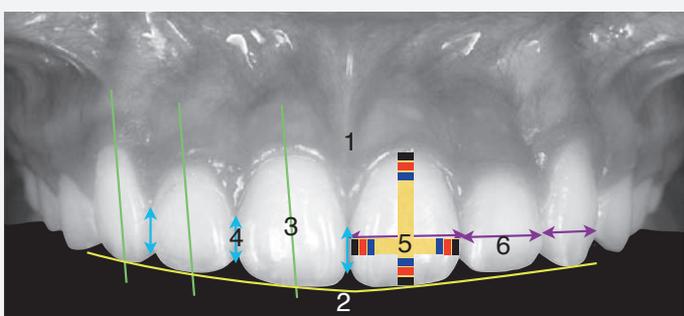


Total = 2

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

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

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



Total = 4

Midline	0 1 2
Incisor Curve	0 1 2
Axial Inclination ( 5°, 8°, 10° )	0 1 2
Contact Area ( 50%, 40%, 30% )	0 1 2
Tooth Proportion ( 1:0.8 )	0 1 2
Tooth to Tooth Proportion	0 1 2

Midline	0 1 2
Incisor Curve	0 1 2
Axial Inclination ( 5°, 8°, 10° )	0 1 2
Contact Area ( 50%, 40%, 30% )	0 1 2
Tooth Proportion ( 1:0.8 )	0 1 2
Tooth to Tooth Proportion	0 1 2

## Stability of Mini-screws on Buccal Shelves: A Retrospective Study of 1680 Mini-screw Insertions by the Same Orthodontist

**Background:** Previous studies on inter-radicular screw insertion have shown that there was a significantly higher failure rate for screws inserted through movable mucosa compared to attached gingiva. Furthermore, there are no reports about the stability of the extra-radicular screw insertion into the buccal shelf of the mandible.<sup>1-5</sup> This is an important area of research because extra-radicular mini-screws placed in the buccal shelf are effective anchorage, for retracting the entire lower dentition to correct Class III malocclusion.<sup>6</sup> It is important to understand the success rate and stability for buccal shelf miniscrews placed in different locations.

**Objective:** Compare the failure rates for buccal shelf screws inserted through movable mucosal (MM) as opposed to attached gingiva (AG).

**Design:** Retrospective review.

**Participants:** 840 patients (405 males; 435 females, with the age of  $16 \pm 5$  years) received buccal shelf screw placements that were performed by the same orthodontist between 2009 and 2012, using standardized procedures.<sup>7</sup>

**Methods:** A total of 1680 mini-screws (2x12 mm, stainless steel) were placed on buccal shelves; 1286 mini-screws were in movable mucosa and 394 mini-

screws penetrated attached gingiva. All mini-screws were placed as parallel as possible to the lower 1<sup>st</sup> and 2<sup>nd</sup> molars roots (*extra-radicular approach*). Screw heads, at the insertion point, were at least 5mm above the soft tissue. All mini-screws were immediately loaded with a force ranging from 8 oz. to 14 oz., according to the patients' age. The stability of the buccal shelf screws was tested up to 4 months after placement.

**Result:** 121 mini-screws out of 1680 failed during the course of study. Failure was defined as loose screws that were exfoliated or removed by the clinician. The overall failure rate was 7.2% for the entire sample ( $n=1680$ ). In the movable mucosa group, 94 out of 1286 (7.31%) failed; 27 out of 394 (6.85%) failed in the attached gingiva group. A  $\chi^2$  test showed there was no statistical significance of the failure rates between miniscrews inserted through MM compared to AG.

**Conclusions:** Buccal shelf mini-screws can be placed in either the movable mucosa or attached gingiva. In terms of stability, there was a high success rate for both groups (~93%). This is clinically valuable information because bone buccal to the roots of the teeth is more directly accessible by penetrating the movable mucosa apical to the mucogingival junction. Also many patients have a minimal width of attached gingiva buccal to the molars. Thus in

**Chris Chang, DDS, PhD.**

Founder, Beethoven Orthodontic Center  
 Publisher, International Journal of Orthodontics & Implantology (left)

**W. Eugene Roberts, Consultant,**

International Journal of Orthodontics & Implantology (Right)



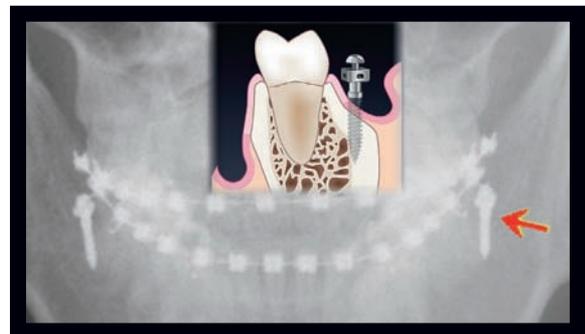
**Fig. 1:**  
 Between the 1<sup>st</sup> and 2<sup>nd</sup> molars, a larger buccal shelf bone volume is present.



**Fig. 4:**  
 Mucosal insertion refers to the position of the buccal shelf screw, when it is inserted in the movable mucosa.



**Fig. 2:**  
 There is a safe zone between the 1<sup>st</sup> and 2<sup>nd</sup> molar roots because the inferior alveolar neurovascular bundle is apical to the roots of the teeth.



**Fig. 5:**  
 The extra-radicular approach, utilizing the buccal shelves, is optimized by placing miniscrews parallel to the lower 1<sup>st</sup> and 2<sup>nd</sup> molar roots as shown in this radiograph.



**Fig. 3:**  
 The mucogingival junction (MGJ) separates the attached gingiva (AG) and the movable mucosa (MM).



**Fig. 6:**  
 In the extra-radicular approach to the buccal shelves, the insertion point of all screw heads is at least 5 mm above the soft tissue, in order to prevent the soft tissue overgrowth.

this retrospective study, the majority of the buccal shelf mini-screws (1286/1680) were placed through movable mucosa. Due to the elevated position of the screw head, mucosal insertion does not jeopardize the health of the soft tissue. For extra-radicular screw placement, insertion through the movable mucosa is often the preferred procedure for buccal shelf mini-screws, because it accesses more bone volume, facilitates the surgical procedure, and is usually more comfortable for the patient. It is important for the clinician to realize that these advantages can be realized without sacrificing screw stability.

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# Surgical and Orthodontic Management of Impacted Mandibular Premolars with a Severely Dilacerated Root



Chris Chang, DDS, Ph.D.  
 Director,  
 Beethoven Orthodontic Center

## Introduction

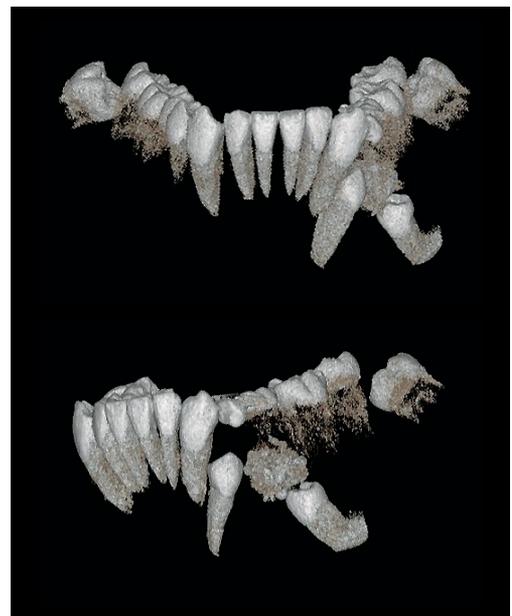
Impaction with a severely dilacerated root of the mandibular premolar is seldom reported, especially when it is combined with odontoma. This case showed impacted mandibular premolars due to a compound odontoma. Extraction of the primary teeth, excision of the odontoma, and an orthodontic forced eruption were performed to erupt the lower premolars. This article illustrates step by step treatment to achieve a predictable outcome.<sup>1-3</sup>

## Case Study

A 19-year and 2 month old male came for consultation. The panoramic film showed that there were two impacted lower premolars associated with one odontoma (Fig. 1). The frontal and lateral view of the CT scan indicated that the impacted premolars were just near and beneath the odontoma. It should be noted that the impacted second premolar had a severely



■ Fig. 1: Pre-treatment pano radiograph and intraoral photographs.

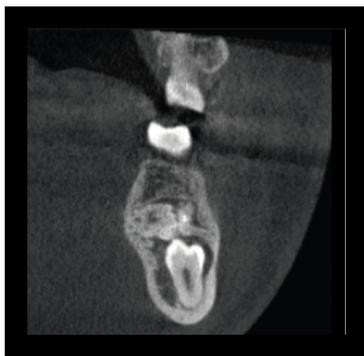


■ Fig. 2:  
 Pre-treatment CT image of frontal and lateral view shows the severely dilacerated root.



Dr. Grace Lee, Lecturer,  
Beethoven Orthodontic Course

curved root tip (Fig. 2). The slice view of the dental CT revealed that the odontoma was very close to the lingual plate and the second premolar was deeply impacted to the level of the mandible border (Fig. 3). All of this information was used for selecting appropriate surgical and orthodontic techniques.



■ Fig. 3: Pre-treatment CT image of slice view.

## Treatment Objectives

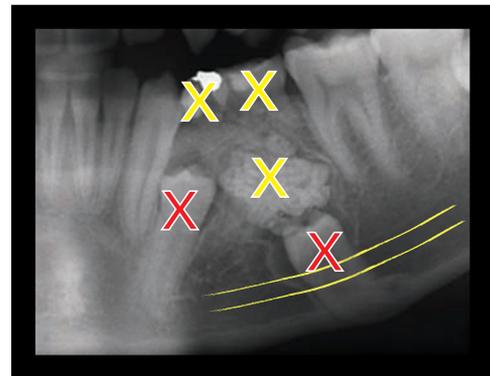
1. Redistribute the space of the mandibular left region.
2. Restore the normal appearance of the mandibular left region.
3. Establish an acceptable occlusion of the mandibular left region.

## Treatment Options

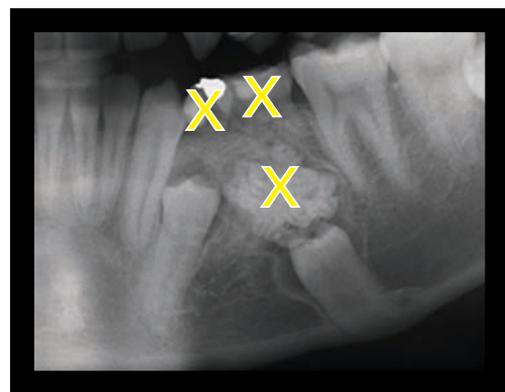
1. As the angle between the root and the crown of the impacted #35 was found to be dilacerated more than 90°, some dentists thought it might be a great obstacle to forcefully erupt #35. Oral surgeons

suggested to extract 7D, 7E, the Odontoma, impacted #34 & #35 and restore with a removable partial denture or dental implants (Fig. 4).

2. Extraction of 7D, 7E, and the Odontoma. Let #34 & #35 to erupt as spontaneously as possible. Followed by orthodontic space opening, surgical exposure and traction of #34 and dilacerated #35 into the proper position (Fig. 5).



■ Fig. 4: Treatment option 1:  
Extraction of 7D, 7E, the odontoma, and impacted #34 & #35.



■ Fig. 5:  
Treatment option 2: Extraction of 7D, 7E, and the odontoma.

## Treatment Process

After considering the possible treatment options, the parents chose to try to save the impacted premolars and bring them into the proper position.

The first stage was to extract 7D, 7E, and the Odontoma (Fig. 6). The biopsy report confirmed the diagnosis of a compound odontoma (Fig. 7).

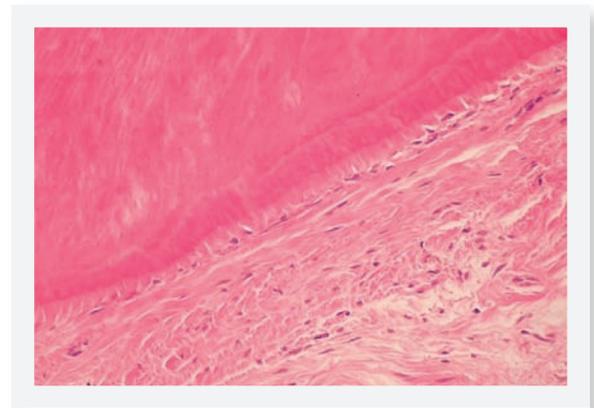
5 months after the first stage surgery had been completed, spontaneous eruption of #34 was visible in the oral cavity (Fig. 8). Then the initial leveling was performed with an open coil spring over the impacted #35 area (Fig. 9). The radiographic information revealed that #35 had erupted 5 mm (Fig. 10). During the 20 months after the first stage surgery, #35 kept erupting.

From the 13<sup>th</sup> to 20<sup>th</sup> month, #35 erupted more slowly and gradually stopped 7-7.5 mm below the alveolar ridge (Figs. 11-13). The reason for slowed down eruption might be attributed to the new bone formation covering #35. In total, #35 erupted 9mm in the 20 months after the first surgery had been performed (Fig. 14).

At the same time, an adequate space for the impacted #35 was achieved in the oral cavity (Fig. 15). The second stage was surgical exposure of the impacted #35. The following are step-by-step illustrations of this surgery:



■ Fig. 6:  
The day of the first stage surgery: the root tip of #35 was at the mandibular border.



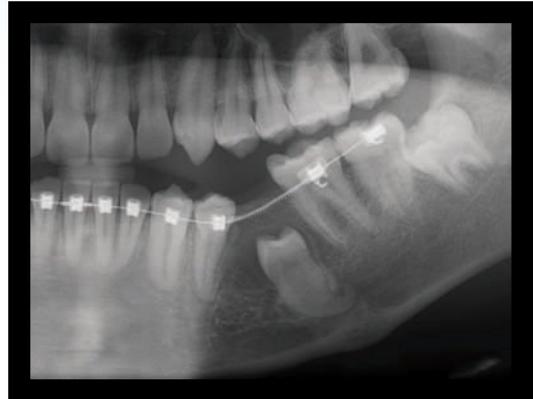
■ Fig. 7: Compound odontoma.



■ Fig. 8: Spontaneous eruption of #34.



■ Fig. 9:  
Initial leveling was performed with an open coil spring over the impacted #35 area.



■ Fig. 12:  
13 months after the first stage surgery: the root tip of #35 was 9 mm above the mandibular border.



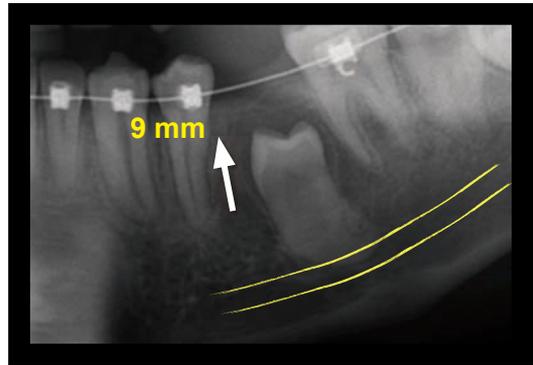
■ Fig. 10:  
5 months after the first stage surgery: the root tip of #35 was 5 mm above the mandibular border.



■ Fig. 13:  
20 months after the first stage surgery: the root tip of #35 was 9 mm above the mandibular border.



■ Fig. 11:  
8 months after the first stage surgery: the root tip of #35 was 6 mm above the mandibular border.



■ Fig. 14:  
#35 erupted 9 mm in the 20 months after the first stage surgery.

## 1. Incision

Central linear incision on the crest and intra-sulcular incisions of #34 & #36 were performed under local anesthesia (Figs. 16-17).

**Notice!** When designing the incision lines of a surgical exposure, preparing adequate keratinized gingiva for the impacted tooth is important. If the keratinized gingiva on the buccal site is less than 2mm, the incision line should be performed more lingually instead of in the central of the crest. Then the buccal full-partial thickness flap can be sutured apically to make sure the impacted tooth erupt in adequate keratinized gingiva.

## 2. Flap elevation

A full thickness flap was elevated to expose the surgical field (Fig. 18).

**Notice!** According to the radiographic information, the mental foramen was located below the crown of #35. Although the buccal flap may not be elevated to the level of mental foramen, the mental nerve branches could be damaged if we pressed or retracted the flap too much.

## 3. Osteotomy

A high-speed hand-piece with a carbide round bur



■ Fig. 16: Local anesthesia over the surgical field.



■ Fig. 17: Incision of the surgical field.



■ Fig. 18: Flap elevation of the surgical field.



■ Fig. 22: The 3D lever arm consists three helixes.

**Tips!** The orthodontic devices must be checked to ensure that they do not interfere with the occlusion. The .019x.025 stainless steel lever arm used consisted of 3 helical coils: one in the middle, and two on both ends. When this lever arm was inserted into the square hole of the extra-radicular miniscrew and activated, it provided more than 4 ounces of direct force to extrude #35 without lateral moment.



■ Fig. 23: The 3D lever arm in unactive position.

## 6. Suture

In order to irrigate and clean the surgical area, the flaps were primarily closed with simple 2 stitch interrupted sutures using 4-0 silk (Fig. 24)<sup>7</sup>

## Results

Radiographically, the impacted #35 was successfully extruded to the level above gingiva 5 months after the second stage surgical exposure, and the newly positioned #35 revealed an intact root with no apparent root resorption (Figs. 25-26).



■ Fig. 24: The 3D lever arm in active position.

## Discussion

Impacted mandibular premolar with a severely dilacerated root is seldom reported, especially when it is combined with odontoma.<sup>8-11</sup> It is probably because of the high clinical difficulty of bringing the dilacerated tooth into position, that some patients would probably instead choose to extract and replace with a prosthesis.

was used to remove the covering bone of #35 (Fig. 19).

**Tips!** According to the radiographic information, the covering bone height was 7-7.5 mm. When #35 was detected, it was important to make sure all the bone surrounding #35 occlusal table was removed in order to allow #35 to erupt easily. A dental explorer is a good tool to check the margin between the tooth and bone (Fig. 20). When an explorer touches a tooth, it feels like touching a smooth surface, whereas when it touches bone, it feels like touching a rough surface.

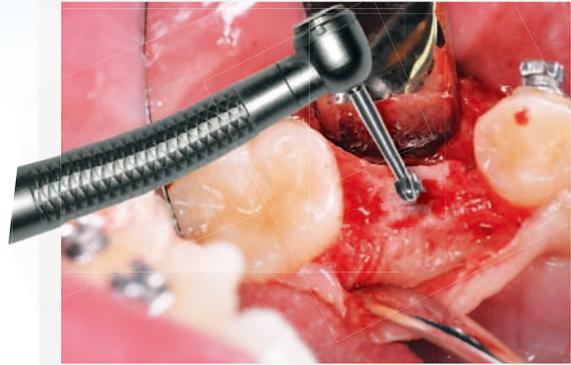
#### 4. Bonding

Bond a button on #35 occlusal surface (Fig. 21).

**Tips!** It is very important to control the bleeding in this step. Therefore, some lidocaine was added to the surgical area and pressure with gauzes for 5 minutes. To improve the bonding efficiency, it is advisable to use a button fixed with a ligature wire, which has already been prepared extraorally.

#### 5. 3D lever arm mechanics<sup>2,4-6</sup>

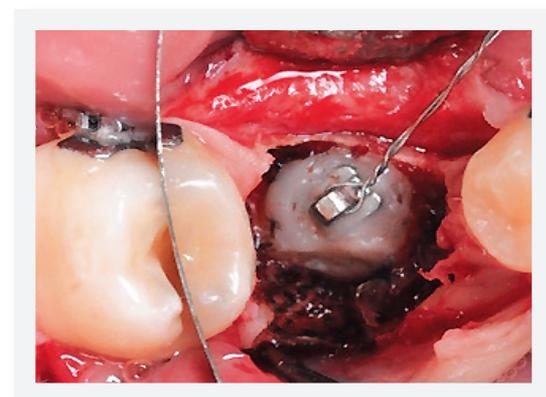
An extra-radicular miniscrew was inserted in the left buccal shelf area. A ligature wire was attached between a 3D lever arm and the button to extrude #35 (Figs. 21-24).



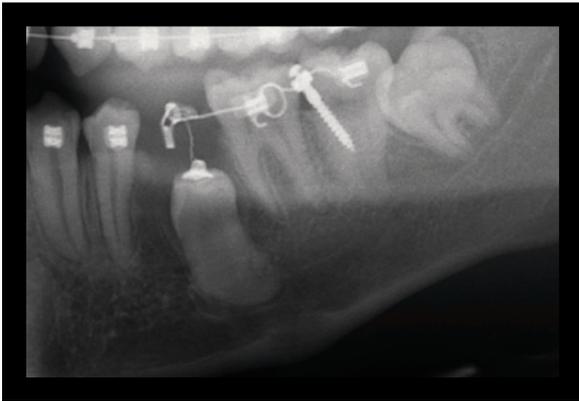
■ Fig. 19: Remove the covering bone of #35.



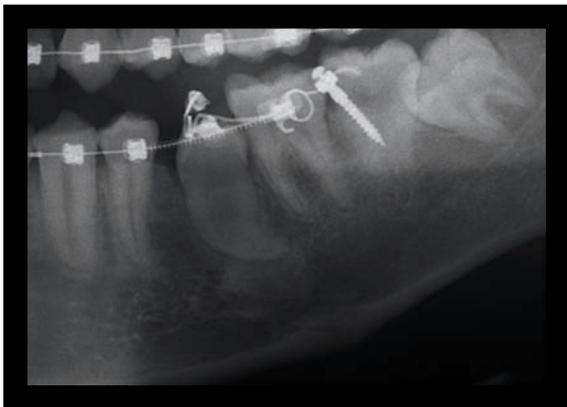
■ Fig. 20: Remove the covering bone of #35.



■ Fig. 21:  
Bond a button with a ligature wire on #35 occlusal surface.



■ Fig. 25:  
The day of the second stage surgery: the root tip of #35 was 9 mm above the mandibular border.



■ Fig. 26:  
5 months after the second stage surgery: the root tip of #35 was 17 mm above the mandibular border.

In study by Malcic et al,<sup>12</sup> the prevalence of dilaceration of mandibular first premolar was 2.1%, and that of mandibular second premolar was 1.5%. Trauma and developmental disturbance such as odontoma are the main causes of dilacerated root formation. Odontomas are the most common types of odontogenic tumors, and may disturb the normal eruption of teeth. In studies by Regezi<sup>13</sup> and

Kaugars,<sup>14</sup> the most common location of odontoma was the incisor and canine region of the maxilla followed by the incisor and canine region of the of the mandible. In this case, the physical presence of odontoma, causing the mechanical interference to the eruption of #35, might have influenced the direction of root development, leading to the dilaceration in the apical region.

Spontaneous eruption of the impacted tooth after removal of the odontoma has been reported by many authors.<sup>15-17</sup> Morning et al<sup>18</sup> examined 42 impacted teeth in relation to odontomas and reported that 45% (19/42) of the impacted teeth erupted, 77% (13/17) of the remaining teeth erupted after a second surgery, which indicated that three out of four impacted teeth would erupt after removal of the odontoma. Ohman<sup>19</sup> hypothesized that the forces within surrounding tissues act upon the surgically exposed crown in such a way as to direct it toward the area where the tissues were removed.

The success rate of treating the impacted dilacerated tooth depends on the degree of dilaceration, position of the tooth, and root formation of the tooth. A dilacerated root with an obtuse angle, normal erupting position, and incomplete root formation of the tooth would have a better prognosis for orthodontic traction. Studies have shown that the more bone removed during surgical exposure, the greater the bone loss after orthodontic treatment and the greater the chance of injury to the tooth during traction. This presented case

used two stages of surgery in order to reduce bone destruction. Besides, #35 was too deep to bond during the first stage surgery.<sup>9,20,21</sup>

With respect to the uncovering flap design, this case used the closed-eruption surgical technique, which returns the flap to its original location after placement and attachment on the impacted tooth. The technique induced a natural tooth eruption of the impacted tooth rather than the conventional design of the apically positioned flap. Vermette et al<sup>22</sup> compared these two surgical techniques and found that the apically positioned flap technique had more negative esthetic effects such as increased crown length and gingival scars than the closed-eruption technique.

## Conclusion

Treatment of the impacted dilacerated premolars with odontoma is a clinical challenge. Combining two stages of surgery with 3D lever arm orthodontic traction provides an effective approach for treating a severely dilacerated root. Pre-surgical case study is very important in each different cases. By understanding the location of the impacted teeth and the mental foramen, incisions and flaps can be designed well, and osteotomy can be performed effectively. If the procedures illustrated in this article are followed, successful treatment of impacted dilacerated premolars with odontoma can be achieved. However, long-term monitoring of the stability and periodontal health of the dilacerated premolar is also very important after orthodontic traction.

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## 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 interns a week to complete in other institutions. With the aid 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.

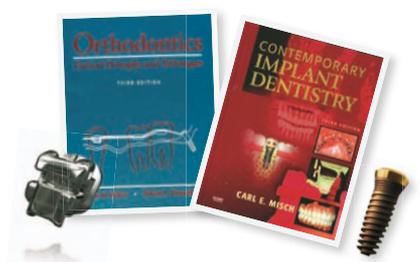
In October, 2011 Newton Implant Center is established to fulfill such needs that were not adequately met previous in the Beethoven. Dental Group. The new Center marks Beethoven's milestone in providing interdisciplinary treatment. Equipped with the latest 3D technology, Newton now has the capacity to 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

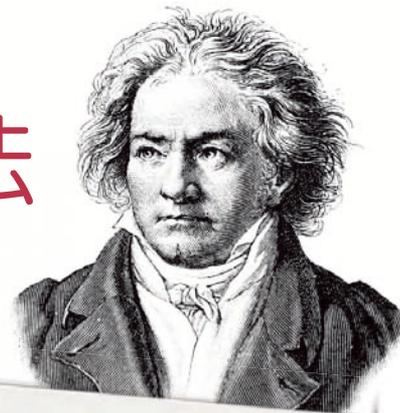


"None of these can be possible without my two great mentors", said Dr. Chris Chang. He contributed this recent shift of focus to the inspirations by Dr. Homayoun Zadeh from USC and Dr. Kwang Bum Park from UCLA. Dr. Homa is a strong advocate and dedicated educator on promoting evidence-based implant therapy. 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!



# 貝多芬矯正中心 見習獎學金辦法



## 目的：

為促進國內牙科學術教育與牙科實務工作間的學習交流，並鼓勵國內牙醫系所學生在學期間能認識牙科實務操作環境，貝多芬齒顎矯正中心、安徒生兒童牙科、金牛頓植牙中心與金牛頓藝術科技特聯合提供本獎學金以及三天觀摩見習的機會。

## 實習目標：

1. 提昇對牙醫實務操作環境與診所管理的認識與了解。
2. 學習如何應用資訊科技來提昇實務工作效率。
3. 觀摩矯正、兒童專科診所與植牙中心的經營模式。

聯絡人：黃思涵

聯絡地址：新竹市建中一路25號2樓

聯絡方式：03-573-5676

電子郵件：course@newtonsa.com.tw

- ★ 甄選對象：全台灣牙醫系四升五年級學生
- ★ 名額：每校3-5名
- ★ 獎助內容：三天二夜五星級飯店住宿以及見習期間餐飲費補助。
- ★ 遴選方式：學期成績在全班前30%或成績平均在75分以上，且對牙科實務展現積極學習的態度。
- ★ 見習時間：102年7月25日(四)-7月27日(六)
- ★ 申請截止日期：102年6月30日，以郵戳為憑。
- ★ 檢覆文件：該學年成績單影本(一份)，自傳(請簡述學習經歷及申請目的)。請將申請文件郵寄到：新竹市建中一路25號2樓黃小姐收。

這次的學習真是棒極了，捨不得這麼結束。除了專業知識外更學習到張醫師的態度過程中張醫師常分享的人的話，有些話小時候聽過就忘，但張醫師的提醒讓我突然覺得很多困難突然迎刃而解。求學的挫折、對目標遙遠的無力感等等...因為「**點滴改進、盡心盡力**」加上幽默的生活態度，讓我找到了方向。

這三天真的很充實，專業知識、診所經營、行醫的態度，對理想的熱情與堅持，讓**心靈充滿了電**。期待自己能記住張醫師的精神，堅持自己的目標！也很感謝一樣樂於分享的高老師，細心地關心每位同學是否學習到每個細節，這裡是充滿溫暖的學習環境，謝謝每一位樂於分享的工作人員，我好愛這裡！



中國醫藥大學 王靖玟

首先非常感謝張醫師及金牛頓團隊的各位，給我這次的見習機會，並且提供了這麼豐富的課程，使我在這短短兩天之內大開眼界。其中為期一個早上加一個下午的矯正中心觀摩，雖然不是非常長的時間，但我在那裡看到了**非常多的巧思及創新**，無論是在空間的配置上，診所運作的方式或是矯正的治療本身，都可以輕易看出許多和一般診所不一樣之觸。**雖然注重治療效率的提升，但是優質及完善的服務也是張醫師要求要做到的。**

張醫師關於其故事的演講也相當令人印象深刻。「成功並非幻想，而是公式。」很具體地描繪出了他個人是具備了什麼樣的特質及經過了什麼樣的努力，才能達到今日的成功。

「Passion」、「Practice」、「Persistant」3個P，也是張醫師非常強調的三大特質，也是大多數人相當不易做到的事，讓我對自己未來應以什麼樣的態度努力，又更清楚也更確定了一點。

張醫師非常鼓勵我們學員發問，也樂於給予我們詳盡的解說，甚至即時開啟以前case的資料讓我們更瞭解他們意思，雖然這並不事在學校上課，但聽張醫師生動的教學所得到的收穫，我認為絕對不亞於學校的課程。



高雄醫學大學 謝恩



# 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

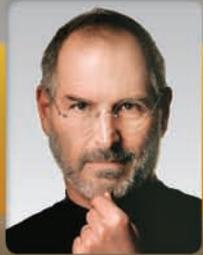


### K2 Dr.Kokich 令人屏息的十大演講秘訣

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

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

註1：課程當日之前結清款項，才能享有9折優惠。註2：舊生報名須繳交 500 元訂金/堂，課程當日退還。

## 課程 03

### 精修繪圖 簡報達人



講師  
Dr. Rungsi Thavarungkul

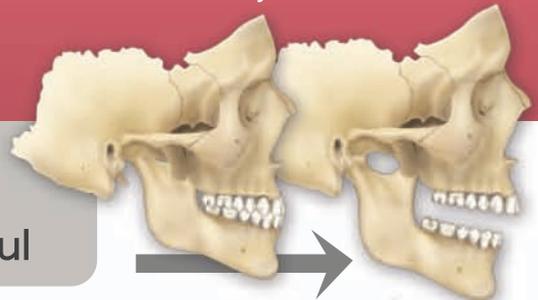
### K4 5 6

11/23-25

07.31 前報名K456

享 特惠價

- 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。



● 報名 2013 k456 課程即贈送 2012 及 2013 課程視訊。

註1：限額 25 名，以繳費順序為依據。

註2：舊生重溫報名，限額6名。

註3：若取消報名，10/23前退款將扣除10%行政手續費，10/24後扣除30%行政手續費。

報名專線：03-5735676

金牛頓藝術科技

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# 2013 貝多芬

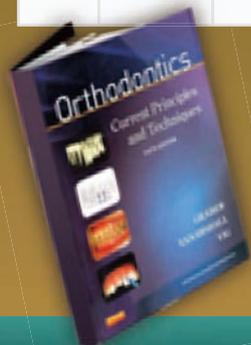
# 矯正精修班

## Part V

時間：每月中週二上午 9:00-12:00

地點：金牛頓教育中心（新竹市建中一路25號2樓）

No.	日期 (W2)	精選文獻分析 09:00 ~ 10:50	精緻完工案例 11:00 ~ 11:50
45	6/11	CH.17 Self-ligating brackets (part 1)	IAOI Finishing case 01
46	7/9	CH.17 Self-ligating brackets (part 2)	IAOI Finishing case 02
47	8/20	CH.20 Nonextraction (part 1)	IAOI Finishing case 03
48	9/10	CH.20 Nonextraction (part 2)	IAOI Finishing case 04
49	10/8	CH.23 Perio-orthodontic interrelationships (part 1)	IAOI Finishing case 05
50	11/5	CH.23 Perio-orthodontic interrelationships (part 2)	IAOI Finishing case 06
51	12/17	CH.24 Adult ITD (part 1)	IAOI Finishing case 07
52	1/7	CH.24 Adult ITD (part 2)	IAOI Finishing case 08
53	3/11	CH.12 Biomechanical considerations with TAD (part 1)	IAOI Finishing case 09
54	4/15	CH.12 Biomechanical considerations with TAD (part 2)	IAOI Finishing case 10
55	5/13	CH.14 Optimizing orthodontic and dentofacial orthopedic treatment timing	IAOI Finishing case 11



課程目標：

藉由精讀“Orthodontics Current Principles & Techniques”協助學員將文獻精髓應用於實際病例，並藉由DI及CRE達成精緻完工 (Excellent Finishing)之目標。

精修班報名專線：02-2778-8315 # 122，湧傑 邵美珍小姐

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# 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)
- 12/01, 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 •

USC 聯絡人：Julie

E-mail: julie.chen@usc.edu

Tel: +1-213-821-5281

Web: www.uscdentalce.org

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

# USC 植牙課程 強力推薦！



貝多芬齒顎矯正中心負責人  
張慧男 博士

我強烈推薦 Homa USC-Taiwan 的植牙課程 Course 有三大原因：

1. **學理與實作密切結合**，不會讓人有不切實際的感覺。
2. 課程呈現方式，簡明易懂，病例分析深入每一細節，且有實證醫學為根基。
3. 聯合**眾多國際級講師來台授課**，且同時了解各大師之長處，但又有明確可執行之準則，不致失焦。

同為講師和植牙入門者，我想不出更好的學習植牙的方式，Dr. Homa 所主持的課程正為植牙課程立下優良的教學典範。

植牙是當今顯學已無庸置疑，每天的廣告信多過過江之鯽。不只琳琅滿目，甚至眼花撩亂！實在無法去鑒別何者該去，何者又該捨棄？

一個好的課程應該是：可以讓學習者能學習到演講者所教，同時能馬上應用到臨床上。而非是只見講台上刀光劍影，火石電光，台下驚呼連連！出了場外，卻只能依稀記得；想用到臨床，又是捉襟見肘；是大師離我太遙遠？抑是自己智商不足？

當第一天上課報到時，接到厚厚一疊裝訂精美的講義，真有說不出的感動！國內好多的演講號稱名師，所以不能錄音錄影，錢收的超貴，連個講義卻也不給！好歹也印一些參考文獻，餵餵求知若渴的吾輩也不可得！

如今，上課時有所有幻燈片的資料，在課堂上只需要專心聽講，不用擔心沒有抄到重點。課後還有視訊檔，讓你回家聽個夠。還有同學間整理的精美筆記，隨時可以翻閱查詢。

講師群雖個個是雄霸一方的專家，卻又是如此平易近人，恰似如沐春風！學習就該如張慧男醫師所言：要高效的學習。USC in Taiwan 的植牙課程，或許就是進入植牙殿堂，最近的路。

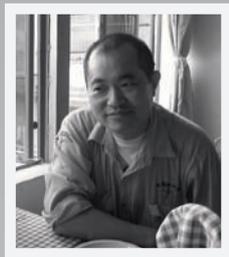


邱丕霞牙醫診所負責人  
邱丕霞 醫師

在回程機上看了鋼鐵擂台部電影，大讚精采。

想想過去七天的 USC 植牙學習之旅，為何也是那麼精采呢？除了課程中常「恍然大悟」的樂趣外，應該是老師們對於演講的呈現方式，都帶個 Hollywood 精神吧！

謝謝老師、謝謝金牛頓。



金龍牙醫診所負責人  
謝金龍 醫師

學而時習之不亦樂乎

人生是在不斷的學習中，發現自己的不足及缺點，再經由修正和補足的過程，找到自己的價值和快樂！

我在張慧男醫師的矯正課程中，找到一片樂土！Homa 老師兩年來的植牙課程令我如醍醐灌頂，不但充實我的生活，也令我的牙醫生涯更加快樂！



新世紀牙醫診所負責人  
王肖龍 醫師



連續參加二年 USC-Taiwan 植牙專科課程和二天美國洛杉磯 USC 牙周 / 植牙研討會見識到當今世界級植牙講師，收穫非淺。

尤其，領受到 Dr. Homa 的 VISTA 技巧，在牙周整形與植牙造骨功力和多位講師進階植牙補綴與技工教導；是想要達成全方位植牙的推薦課程。配搭二個月一次近身式，Model (Dr. Fernando 設計) Hands-on 更是初階到高階都受益的課程。



南台灣牙醫植體醫學會  
黃啟洲 理事長

本課程擁有來自跨國、跨領域的國際大師級講師師資，由淺入深，紮實統整，實為當前台灣不可多得，能時刻接軌國際的課程。還有一群喜愛追求成長的牙醫師同好們，相互砥礪，在技術上不斷精進，且精益求精，並又樂在其中。由張慧男醫師領導的貝多芬與金牛頓團隊，是最堅強的後備支援，在課程之後幫助大家在臨床上，身體力行，具體落實與應用。我誠摯的推薦牙醫師同好們一起來參與，共同成長，您一定會感到不虛此行。



三軍總醫院口腔復科主任  
廖文堅 醫師

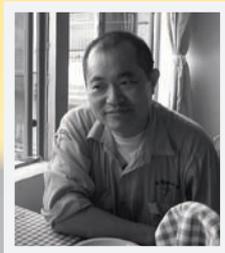


南台灣牙醫植體醫學會  
黃啟洲 理事長

執業到這把年紀的醫師，大概都開始想著何時退休？或者是該如何安全「下莊」？免得晚節不保，錢沒賺到還惹了醫療糾紛。

說實在的，當初參加植牙論壇，也只是想聽聽就好。沒想到張醫師又搞了個 USC 課程！一定有很多人會問：學矯正的還撈過界哩，這個課程會好嗎？的確，隔行如隔山，矯正跟植牙，怎麼個扯在一塊兒？我們不是要追求 IDT 嗎？第一次參加會不會變成白老鼠啊？

可是我還是堅定地參加了，理由無他，因為我看到了張醫師的決心！上過張醫師的矯正課，應當可體會到張醫師對學問的追求，與教學的效率！同時又有張醫師對講師教學的「監控」，不啻是為課程掛了品質保證。如今，很多學員也跟我一樣，真正做到了：IDT (I Do the Treatment all by myself) 各位看倌，還猶豫乎？



金龍牙醫診所負責人  
謝金龍 醫師

植牙三年多的經驗，參加了無數次的課程，雖然獲益良多。但總是盼望著有一天張醫師也能夠去學植牙，然後把植牙這種東西，用教矯正的方式呈現出來，那就真是一套既完整風趣又深入的一套課程，終於在兩年前他開始舉辦植牙的課程，然後在一年前我參加了他舉辦的 USC 植牙進階課程，課程大部分都是由張慧男醫師親自翻譯，他把課程翻譯得非常邏輯性，不用讓人太傷腦筋，就能把課程內容輕易理解，讓我很愉快的把 USC 植牙專家們的精髓，全部吸收。

2011 年是一個豐收滿滿的一年，尤其是除夕夜全家還能跟台灣這些熱愛學習的醫師前往 LA 的 USC，參加為期七天的結業訓練課程，俗話說，萬貫家財不如一技在身，感謝上天讓我成為牙醫師，有幸參加這麼紮實的海外訓練課程，而且是在執業二十年後的現在，我一定會活到老學到老。

## Feedback from 2012 Beethoven International Workshop

*Dear friends,*

I went to Taiwan last November for a week to attend this workshop and Keynote workshop; and I loved it and

*I am enjoying dentistry more than ever! :)*

I met Dr. Chris Chang at 2011 annual UCLA Perio/Implant meeting; he was one of the speaker and I told myself that I will like to learn from this mentor. I was looking into people (*mentors*) that will inspire me to do better and see things out side the box.

Dr. Chang received his Ortho/PhD from Indiana U and returned to Taiwan. You will be able to visit a few offices (*Orthodontic, Implant, Pedo, and GP*) during the seminar as well as an Apple Store he owns; they are very busy, clean, and so well run. We stayed at a very nice hotel and foods were so good in Taiwan, we were also treated like guests and Rita (*P.R. Associate*) helped us with our needs. I have never been to a seminar as detail oriented as this with a Education and P.R. Associate to care and make arrange for us. Another reason I went there was, I wanted to buy his mini implants (*Ortho Bone Screw, i.e. OBS*) after I saw his design at UCLA's meeting. The best on the market! Good design, easy to use and reasonably priced.

This year, I went to USC Perio/implant meeting in January and Damon Forum (*Orthodontic meeting*) February; and he was also invited by these two prestigious groups and again he was one of the best.

You may ask me why is an orthodontist speaking at the implant meeting. *First*, to me, Dr. Chang is not only an orthodontist specialist but he is a super specialist because he does more than an orthodontic: he can do some of the amazing surgery and implant as good or better. *Second*, he uses a lot of OBS in his orthodontist practice to treat surgery cases with braces and OBS; you may have to pick up your jaw from the floor after you see some of the case he treated. *Third*, he will teach you that the best implant is no implant.

I am now able to treat a lot of the case without implant, using what I learned from Dr. Chang. *It's a whole new world!*

I will try to return to Taiwan again this summer again to visit Dr. and Mrs Chang. Let me know if you have any questions. I hope that some of you will have a chance to hear him speak someday or somewhere.

We are only as good as what we know.

*John K.S. Tong*

DDS, MAGD Cupertino, California USA



## Feedback from Dr. Chris' lecture videos on Youtube

*Dear Dr. Chris,*

Foremost I would like to thank you for all the videos you have uploaded to youtube. I've never seen something *so educational and so interesting*. You are one of the few that makes this work *so human and so necessary* especially for students like me. I congratulate every video uploaded, because I know that it takes time and dedication and that does not make anyone but only those who are passionate as you.

I'm a big fan of the orthodontic cases published in the IJOI and I hope to publish my work someday in this journal.

I would like to congratulate everyone who works for the journal, IJOI, because the cases in it are very educational and interesting!

I wish you all the best. Receive my best regards from Venezuela.

*Andrés*

Universidad Autónoma de Tamaulipas (México)



# Orthodontics Hard Copy & e-Book

Beethoven Dental Group, based in Hsinchu, Taiwan, has been serving our community since 1996. In addition to providing comprehensive, patient-centered care, Beethoven continues to transcend itself by delivering dental training courses, engaging in clinical research and regularly publishing world-class journal, *International Journal of Orthodontics and Implantology* (IJOI).

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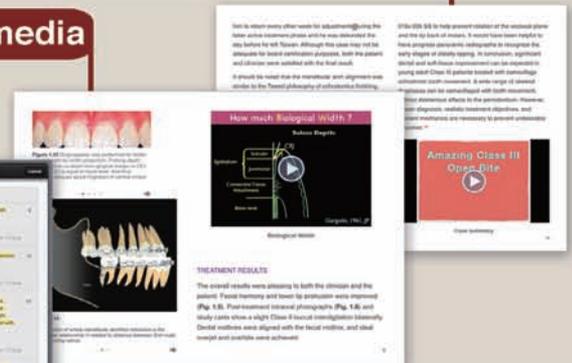
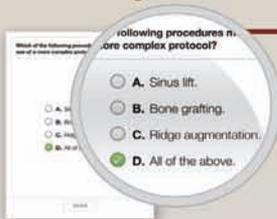


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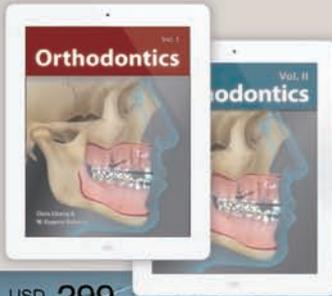
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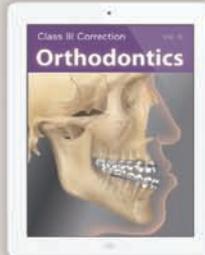


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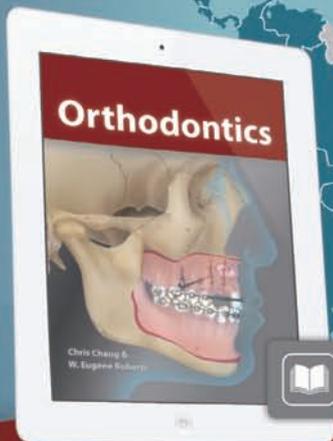
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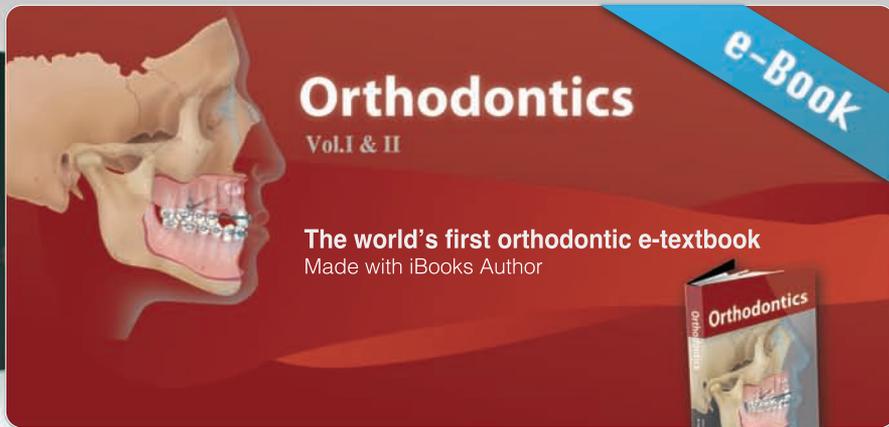
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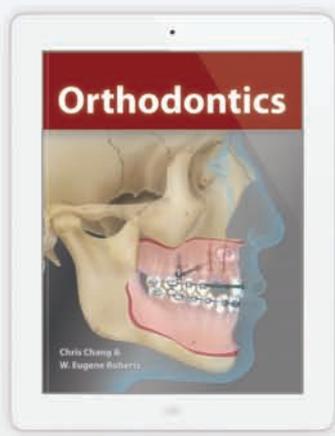
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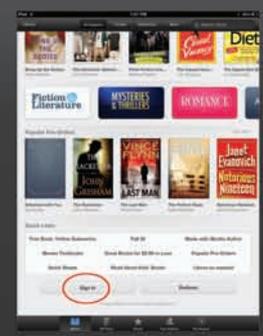
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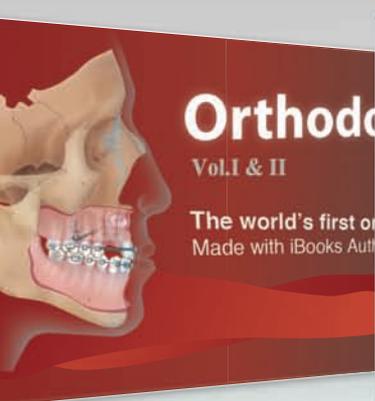


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This app is designed for iPad, iPhone and iPod touch



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### Manual – Step by Step



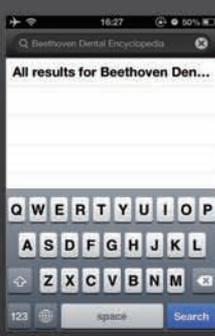
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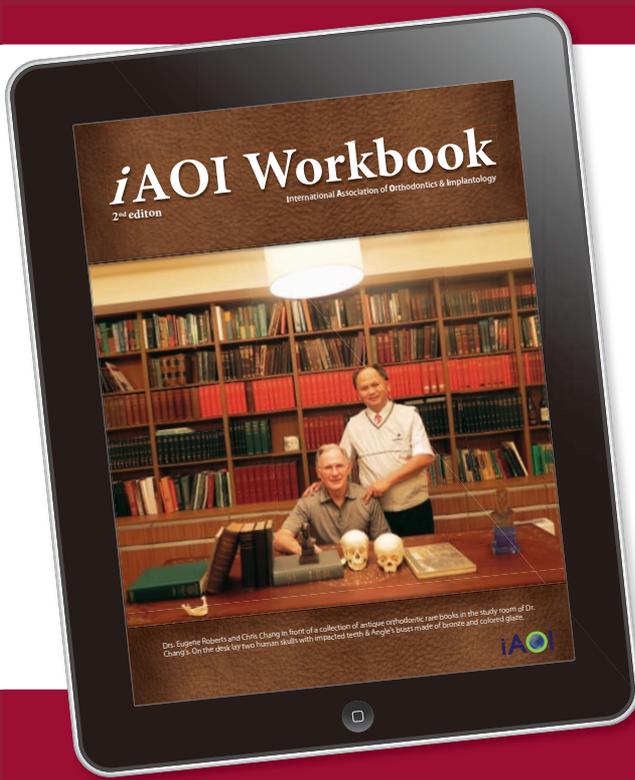


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### 1. Member

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.

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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.

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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

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## 6/23-24 日一

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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

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會員價	3,000 元	4,000 元	14,000 元	16,000 元
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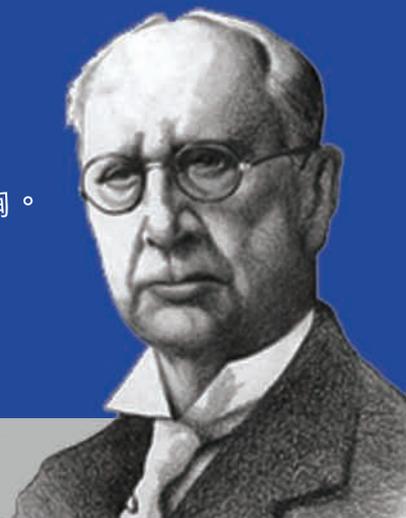
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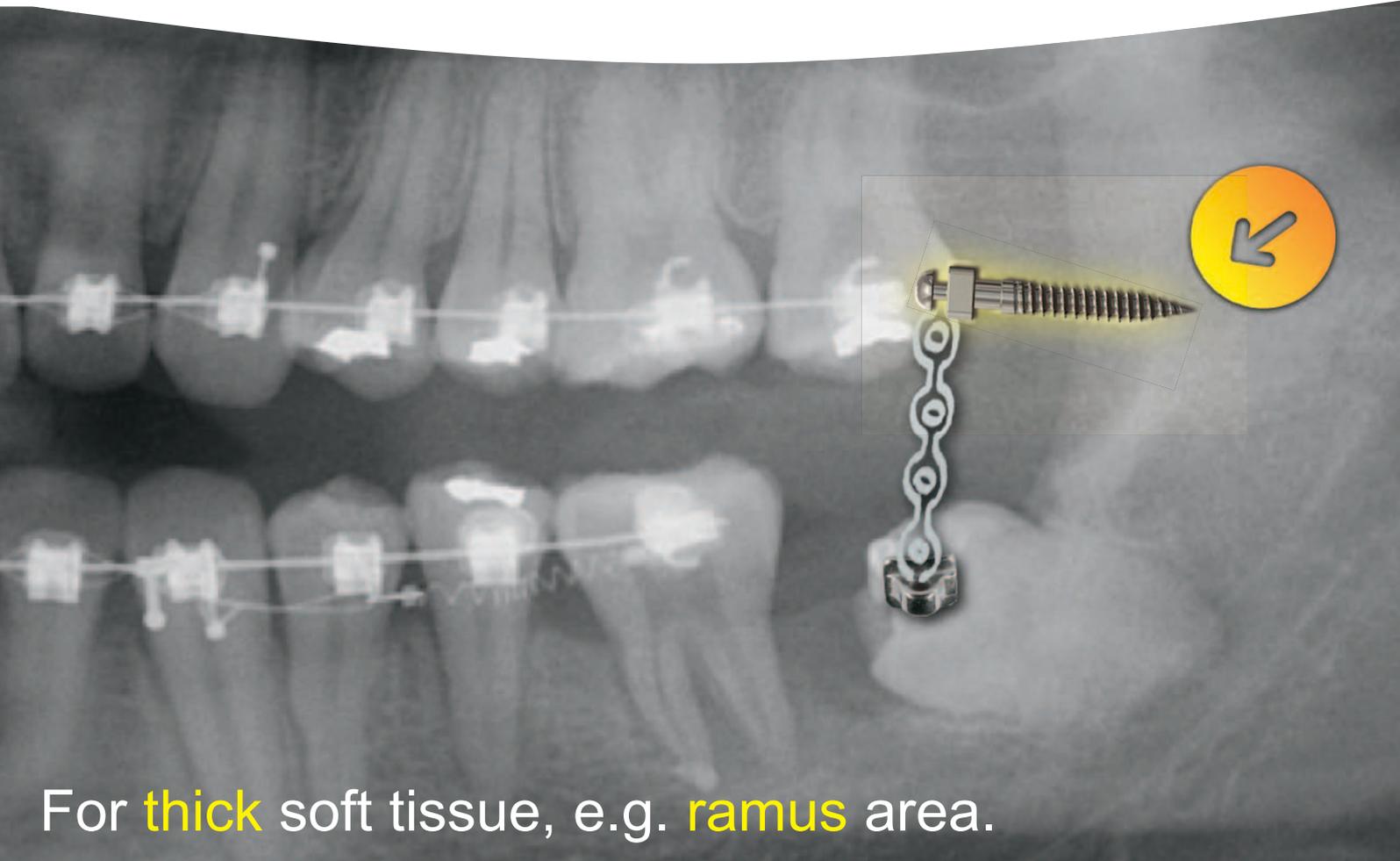
類型	課程名稱	內容	開課日期	上課對象
專業簡報	Keynote 簡報法 series 1 簡報聖經	1. 常見簡報謬誤 2. Keynote 入門	2013/8/22 (四) 09:00 ~ 17:00	科技人、醫師 教師、學生
專業簡報	Keynote 簡報法 series 2 Kokich 的 10 大演講秘訣	1. 多媒體影像處理 2. 簡報設計	2013/9/19 (四) 09:00 ~ 17:00	科技人、醫師 教師、學生
專業簡報	Keynote 簡報法 series 3 How to Wow'em like Steve Jobs?	1. 賈伯斯演講秘訣 2. 簡報設計進階應用	2013/10/24 (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
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This method of learning is quantum leap forward. My students at Oklahoma University will benefit greatly from Chris Chang's genius.

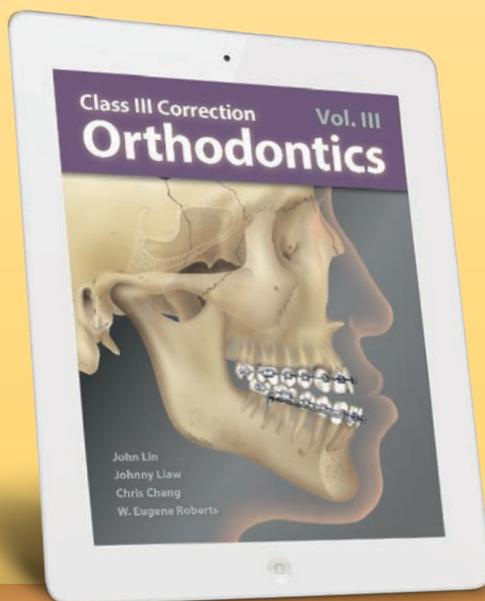
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The authors of the book *Orthodontics: Class III Correction* gave their lectures at the Bangkok Class III Forum in Bangkok on March 19, 2013.

From left to right: Drs. Johnny Liaw, Kullaya R'kul, John Lin, Chris Chang, Pintippa Bunyaratavej, and Rungsi Thavarungkul.

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