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Drs. Irene Yi-Hung Shih, John Jin-Jong Lin & W. Eugene Roberts

Implant-Supported Crowns to Replace Congenitally Missing Lateral Incisors:

2B-3D Rule for Ideal Implant Position

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Full-Cusp Class II Malocclusion with Bilateral Buccal Crossbite (Scissors-Bite) in an Adult

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2014 Beethoven international workshop in December. Participants took photo with Dr. John Lin (center) and Dr. Chris Chang (center right) in Dr. Chang's Orthodontic library.

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《僅供牙科專業人士參閱》

2014~2015

熱愛學矯正



張慧男 博士



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學會開始做矯正需多久?

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



Damon矯正課程

【課程】9:00 - 12:00
【實習】另外安排

使用最新一代矯正器 Damon Q 進行課程,
歡迎舊生報名參加。

2015 全新開課

矯正植體課程

【課程】9:00 - 12:00
【實習】13:30 - 20:00

矯正植體的操作時機、
植法與實習、個案討論、
臨床跟診及實作示範。



台中 (二) 高雄 (四) 台北 (二)

LECTURE

LAB

1	4/28	5/7	10/13	理想入門病例+Damon Q黏著	Bonding (Damon Q) + BT
2	5/12	5/14	10/20	快速矯正療程四部曲	Ceph + Photo
3	5/26	5/21	11/3	簡捷有效的錨定系統	Damon + OrthoBoneScrew I
4	6/23	6/25	11/17	不拔牙與拔牙分析	Damon + OrthoBoneScrew II
5	6/30	7/16	11/24	Damon 診斷流程及微調	Finish Bending
6	7/14	7/30	12/15	完工檢測及報告示範	Fixed Retainer (FR)
7	7/21	8/13	12/22	維持及復發: 病例示範	Presentation Demo
8	8/4	8/27	12/29	矯正力學及診斷分析 (1)	DDX + Case Reports I
9	8/18	9/17	1/5/16	軟硬組織及診斷分析 (2)	DDX + Case Reports II
10	8/25	9/24	1/12	兒童矯正及診斷分析 (3)	DDX + Case Reports III
11	9/1	10/8	1/19	成人矯正及診斷分析 (4)	DDX + Case Reports IV

新竹(五) 2015 11/6 (含午、晚餐)

International workshop

Keynote & management
OrthoBoneScrew & Damon

馬來西亞B班 2015 4/9 - 11
越南班 4/28 - 30
英文A班 6/16 - 19
亞洲A班 7/2 - 4
亞洲B班 10/29 - 30
英文B班 12/1 - 3



矯正進階課程

【新竹】9:00 - 12:00

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

新竹 (四) 2015 新竹 (二)

Paper Reviews

Topics & Case Demo

1	10/2	9/15	Bracket Placement	Crowding: Ext. vs. Non-ext.
2	10/9	9/22	Impacted Canines	Upper Impacted Teeth
3	10/23	10/27	Canine Substitution	Lower Impacted Teeth
4	10/30	12/1	Missing 2nd Premolar	Missing: Ant. vs. Post.
5	11/13	3/1/16	DI Workshop	Crossbite: Ant. vs. Post.
6	11/27	3/8	CRE Workshop	Open Bite High Angle
7	12/18	3/22	Excellence in Finishing (occlusion)	Deep Bite Low Angle
8	1/8/15	3/29	Excellence in Finishing (esthetics & perio)	Gummy Smile & Canting
9	2/12	4/5	Ortho-Perio-Restore Connection	Esthetic Finishing (Transposition)
10	3/5	4/19	Adjunct to Perio	Implant-Ortho
11	3/12	4/26	Unhappy Patient	IDT - Adult Complex

助理訓練課程

【課程】10:00 - 14:30
【實習】15:00 - 20:00

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



新竹(五) 2015 10/2、16 (含午、晚餐)

課程資訊

上課地點

【台北】

華亞會議中心
/ 台北市復興北路99號15樓
(捷運文湖線 南京復興站旁)

【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
/ 台中市西屯區臺灣大道三段
658號3樓 (Rich 19 大樓)

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* 每次上課請依最新一期
IJOI 公告為主

矯正精修課程

【課程】9:00 - 12:00

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

新竹(二) 精修VI

2014/6/10 7/22 8/19 9/16 11/11 12/16
2015/1/13 2/10 3/10 4/14 5/19

"Real Artists Ship" - IJOI steams into its 10th year

This famous slogan from Steve Jobs is one that I have always admired and have tried to put it into practice in my own work. I feel that it also holds true to the publication of IJOI.

IJOI started off as a simple idea and a simple 8 page publication to share our passion of new adventures in the orthodontic field.

Since then, and now as IJOI enters its 10th year of publication, there have obviously been many changes and improvements. From this simple idea, it has become what we think of as our ideal product. This ideal product is not always perfect, but it is in the hands of the readers every three months, following the philosophy of Steve Jobs' slogan – ship. What I feel is ideal however, is how the cases are presented in a step by step format with detailed descriptions and photos which allow the reader to consider what would be the best way to achieve a similar result and fix similar cases in their own practices, an ideal educational product.

And from this idea, another ideal, the ideal method of how to organize the most effective way of publishing a case report, has evolved. Here the inspiration has come from Henry Ford, who stated, "*Nothing is particularly hard if you divide it into small jobs.*" By dividing the publication of the journal into small jobs, we manage to ship on time a professional educational journal to our readers.

Nothing is ever ideal, but we will continue to improve and to ship every quarter as an ideal as possible product to allow our readers the chance to improve their professional skills. And as we continue shipping, IJOI looks forward to welcoming new doctors, readers and authors to join us as our ship continues to steam its course along the path to glory.

Wishing you all a healthy and prosperous 2015.

Chris Chang DDS, PhD, Publisher of IJOI.

3 Editorial

LIVE FROM THE MASTER

- 4 Interdisciplinary management of deep bite malocclusion with excessive curve of Spee and severely abraded lower incisors

IAOI CASE REPORT

- 22 Implant-Supported Crowns to Replace Congenitally Missing Lateral Incisors: 2B-3D Rule for Ideal Implant Position
- 60 Full-Cusp Class II Malocclusion with Bilateral Buccal Crossbite (Scissors-Bite) in an Adult

NEWTON'S A ARTICLE

- 86 A Dentist on the Cutting Edge, Who Promotes Education with Digital Technology

FEEDBACK FROM THE WORLD

- 102 Feedback from Doctors in Malaysia
- 103 Feedback from Damon, OBS & VISTA Workshop in December
- 105 大陸正畸菁英班心得回饋



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iAOI
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Interdisciplinary Management of Deep Bite Malocclusion with Excessive Curve of Spee and Severely Abraded Lower Incisors

Abstract

It is difficult to restore severely abraded lower incisors in adult patients with a deep bite, that is associated with an excessive curve of Spee in the lower arch and a reverse curve in the upper arch. Orthodontics is the first step in an effective interdisciplinary treatment plan. Intrusion of the incisors in both arches is required to level the plane of occlusion and correct the deep bite without increasing the vertical dimension of occlusion (VDO). Once the occlusion is aligned, the restorative dentist can restore the severely abraded lower incisors. Incisor extraction or extensive enamel stripping in the lower arch were treatment options for resolving the anterior tooth size discrepancy, which was expected to become more severe as the curve of Spee was leveled. Extraction of the lower right central incisor was the best option because it had a root fracture. The extraction space was closed and the anterior segment was aligned over the apical base of bone by intruding the incisors and leveling the curve of Spee. Anterior bite turbos (raisers) were placed on the maxillary central incisors to open the bite and intrude the lower incisors. Class II elastics were required for anterior-posterior correction of the buccal interdigitation. Pre-restorative orthodontic treatment optimally aligned the dentition for a more predictable esthetics and function for this 54 year old male patient. Correcting extruded lower incisors in older adults is particularly important because the lower anterior dentition is increasingly visible with age. This challenging malocclusion, with Discrepancy Index (DI) of 13, was treated to an excellent result, Cast-Radiograph Evaluation (CRE) of 10. (Int J Ortho Implantol 2015;37:4-16) .

Key words:

Deep bite, abraded incisors, lower incisor extraction, bite turbos, passive self-ligating brackets

History and Etiology

A 53-year-7-month-old male with a slight Class II relationship was concerned about poor esthetics and excessive abrasion of his lower incisors (Figs. 1-3). Interdisciplinary treatment was provided (Fig. 4-6), as documented by the pretreatment (Fig. 7), post-treatment (Fig. 8), and cephalometric radiographs (Fig. 9). The chief complaint was well managed by correcting the overbite and overjet (Fig. 10). The medical history was non-contributory. The treatment plan was based on the etiology as defined by a careful review of the history and presenting conditions. Interdisciplinary treatment was the patient's expectation because he had previously been informed that the abraded incisors could not be restored without orthodontics preparation. Root canal treatment had been performed on all of lower incisors, but the root of the lower right central incisor was fractured (Fig. 11), and the patient was scheduled for endodontic evaluation.

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MS, Marquette University Chief Consultant of IJOI President of TAO (2000~2002)

Author of Creative Orthodontics (middle)

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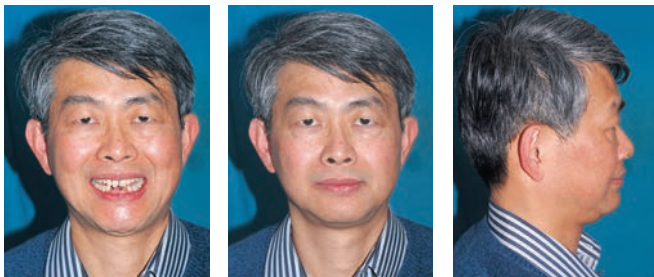


Fig. 1:

Pre-treatment facial photographs show an ideal profile with no facial asymmetry, but the lower anterior area is unesthetic when smiling.



Fig. 4:

Post-treatment facial photographs demonstrate the facial form was maintained, and the lower incisor area is more esthetic when smiling.



Fig. 2:

Pre-treatment intraoral photographs show severely compromised lower incisors.



Fig. 5:

Post-treatment intraoral photographs document optimal alignment and esthetics of the entire dentition. The only significant deficit is the lack of ideal gingival papillae between the lower incisors.

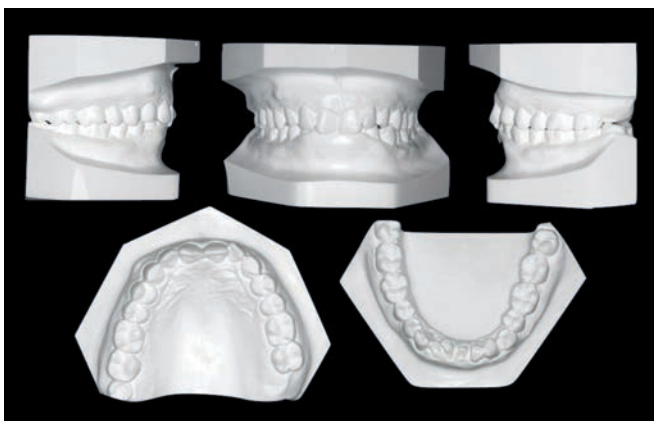
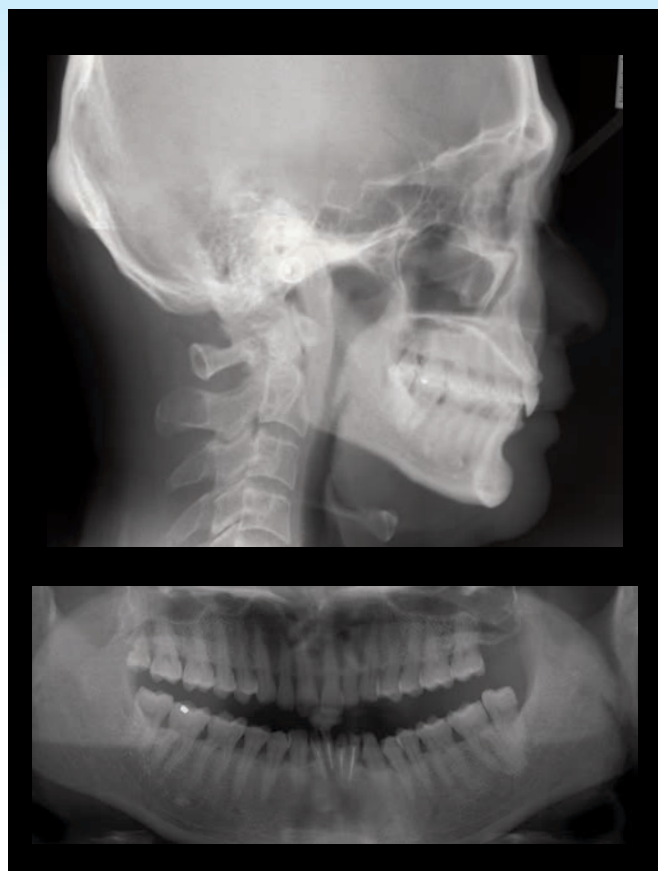


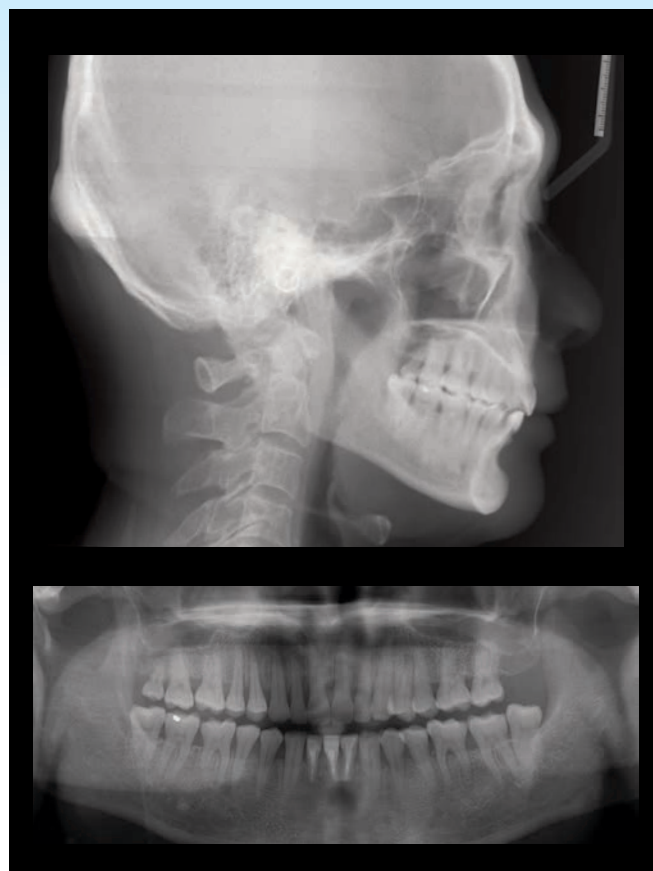
Fig. 3: Pre-treatment study models (casts)



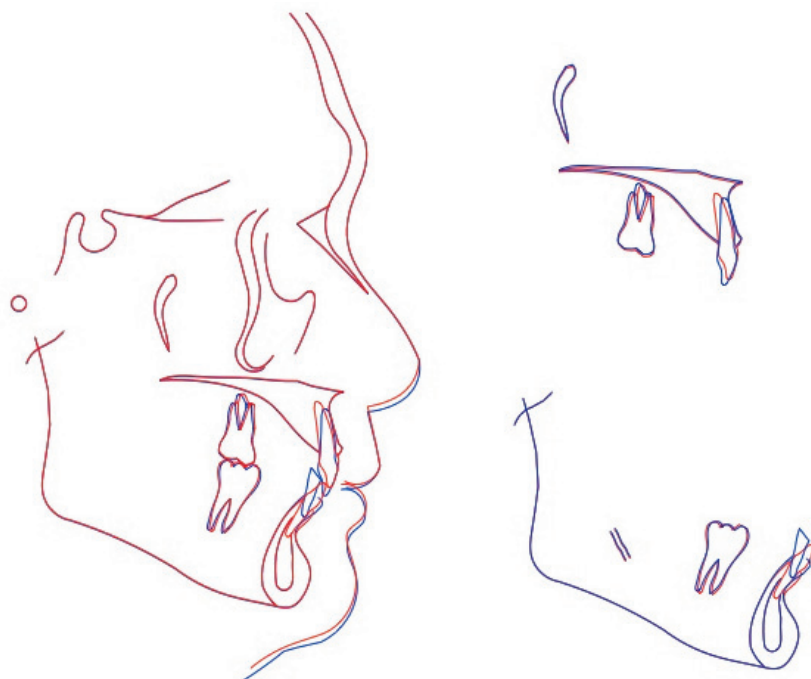
Fig. 6: Post-treatment study models (Casts)



■ **Fig. 7:**
Pre-treatment cephalometric and panoramic photographs



■ **Fig. 8:**
Post-treatment cephalometric and panoramic photographs



■ **Fig. 9:**
Tracings of the pre-treatment (blue) and post-treatment cephalometric films are superimposed on the stable skeletal structures of the anterior cranial base (left), maxilla (upper right) and mandible (lower right). Note that the dentition alignment was corrected without affecting the skeletal structures.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	84.1°	84.5°	0.4°
SNB°	77.1°	77.3°	0.2°
ANB°	7.0°	7.2°	0.2°
SN-MP°	30.1°	30.6°	0.5°
FMA°	21.7°	22.1°	0.4°
DENTAL ANALYSIS			
U1 TO NA mm	-2.8 mm	-0.7mm	2.1 mm
U1 TO SN°	81.8°	95.9°	14.1°
L1 TO NB mm	1.4mm	7.3 mm	5.9 mm
L1 TO MP°	69.9°	102°	32.1°
U1 TO PP mm	31.3 mm	29.5 mm	-1.8 mm
U6 TO PP mm	24.3 mm	24.4 mm	0.1 mm
L1 TO MP mm	45.2 mm	40.8 mm	-4.4 mm
L6 TO MP mm	33.9 mm	34.1 mm	0.2 mm
FACIAL ANALYSIS			
E-LINE UL	-2.5 mm	-2.2 mm	0.3 mm
E-LINE LL	-3.7 mm	-2.9 mm	0.8 mm

■ Table 1: Cephalometric summary



■ Fig. 10:
Pre-treatment (left) compared to post-treatment (right)
overbite and overjet correction

Diagnosis

Skeletal:

- Skeletal Class II (SNA 84.1°, SNB 77.1°, ANB 7°)
- Average mandibular plane angle (SN-MP 30.1°, FMA 21.7°)

Dental:

- Slight Class II molar and cuspid relationship
- Overjet was 3.5-4 mm
- Overbite exceeded 100%
- 1.5 mm space deficiency in the upper arch
- 3 mm space deficiency in the lower arch
- Severely abraded lower incisors
- Upper right, lower right and lower left wisdom teeth were present.
- Upper and lower dental midlines were coincident with the facial midline
- Arch forms: *symmetrical tapering ovoid for both arches.*

Facial:

- Form and convexity was within normal limits (WNL)

The ABO Discrepancy Index (DI) was 14 as shown in the subsequent worksheet.

Treatment Objectives

After a thorough examination and discussion with this patient, 5 treatment objectives were established to satisfy his concerns:

1. Level and align both upper and lower arches.
2. Improve the esthetics of the lower incisors.
3. Reduce the anterior overbite and establish normal overjet and overbite.
4. Maintain the stable posterior occlusion.
5. Close the lower right central incisor space and restore the other three lower incisors.

Maxilla (*all three planes*):

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

Mandible (*all three planes*):

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

Maxillary Dentition:

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

Mandibular Dentition:

- A – P: *Increase incisal axial inclinations*
- Vertical: *Maintain*
- Transverse: *Maintain*

Facial Esthetics:

- Maintain the patient's good profile.

Treatment Plan

Extraction of the fractured lower right central incisor and correction of the endodontic treatment for the other three incisors. Flatten the lower curve of Spee by intruding the incisors. Provide adequate space for lower incisor restoration with the upper midline coincident with the center of the lower left central incisor. The slight Class II occlusion was acceptable.

Appliances and Treatment Progress

After the lower right central incisor was extracted, endodontic treatment was completed on the other incisors.

A .022" slot Damon Q® bracket system (*Ormco, Glendora, CA*) was bonded on the upper arch using standard torque brackets on the incisors, which were replaced with high torque brackets 10 months later. Upper incisor intrusion and anterior tipping was accomplished with an elastic occlusal to the brackets from canine to canine, and power chains were used to correct rotations (*Fig. 12*). Two months later, the overjet had been increased and enough space was provided for lower incisor restorations (*Figs. 13 and 14*).

In the 8th month of treatment, low torque brackets were bonded up-side down on the lower incisors and high torque brackets were bonded on the lower canines, to provide labial crown torque in the anterior segment. Glass ionomer cement (*GIC*) bite raisers (*turbos*) were bonded on the occlusal surfaces of both upper first premolars. Class II elastics were used to move the lower dentition forward and open the bite (*Figs. 15 and 16*). The initial archwires were .013" CuNiTi on both arches.

In the 14th month of treatment, coordination of the arches was accomplished with elastics applied from: 1. the upper right cuspid and first premolar to a lingual button on the lower right first premolar, and 2. the upper left cuspid and first premolar to a lingual button on the lower left first bicuspid. The anterior component of elastics traction moved the lower first premolars anteriorly. An open coil spring was inserted between the lower premolars bilaterally (Fig. 17).

In the 21st month of treatment, two bite turbos were bonded on the lingual surfaces of the maxillary central incisors to open the bite and provide intrusive force on the three lower incisors as well as the upper central incisors (Fig. 18).

In the 25th month of treatment, repositioning of brackets was performed to detail alignment, tooth angulation and occlusal contacts (Fig. 19). After five months of detailing, fixed appliances were removed 30 months of treatment.



■ Fig. 11:

Periapical X-ray films of the lower incisors document the treatment sequence. Left is pre-treatment showing the compromised lower incisors. Center is after extraction of the central incisor, and composite build-up of the other incisors. Right is at the end of treatment.



■ Fig. 12:

Two months (2M) into treatment (54yr 1m), an intercuspid elastic coursing under the brackets had a significant intrusive component on the central incisors. Simultaneously, individual elastic chains were applied from the first molars bilaterally, to rotate the central incisors mesial-out.



■ Fig. 13:

After four months (4M) of treatment (54yr 3m), the overjet was increased, overbite was shallower, and a diastema opened between the central incisors.



■ Fig. 14:

In the sixth month (6M) of treatment (54y5m), adequate space was achieved for lower incisor composite resin build-up.



■ Fig. 15:

In the eighth month (8M) of treatment (54y7m), the lower arch was bonded, bite turbos were placed on the maxillary first premolars, and light, short Class II elastics were applied.



■ Fig. 16:

In the eighth month (8M) of treatment (54y7m), low torque brackets were bonded up-side down on lower incisors and high torque brackets were bonded on lower canines.

Results Achieved

The patient was treated to an acceptable result as documented in Figs. 4-6. Cephalometric and panoramic radiographs document the pre-treatment conditions and post-treatment results (Figs. 7 and 8). Superimposition of cephalometric tracings document the pretreatment condition (53y7m, T1) relative to after treatment (56y6m, T2) are shown in Fig. 9. A summary of cephalometric measurements is provided in Table 1. The ABO Cast-Radiograph evaluation (CRE) score was 10 as shown in the subsequent worksheet.



■ Fig. 17:

At seventeen months (17M) of treatment (55y4m), a .019x.025" SS archwire was used on the upper arch to enhance anchorage. Open coil springs were inserted between the premolars bilaterally, and Class II elastics were used to protract the lower dentition.



■ Fig. 18:

At twenty-one months (21M) of treatment (55y8m), glass ionomer bite turbos were bonded on the lingual surfaces of maxillary central incisors, providing intrusive force on the lower incisors as well upper central incisors.



■ Fig. 19:

In the twenty-fifth month (25M) of treatment (56y), finishing and detailing is accomplished with bracket repositioning.

Maxilla (all three planes):

- A – P: *Maintained*
- Vertical: *Maintained*
- Transverse: *Maintained*

Mandible (all three planes):

- A – P: *Maintained*
- Vertical: *Maintained*
- Transverse: *Maintained*

Maxillary Dentition:

- A – P: *Upper incisors proclined (increased axial inclination)*
- Vertical: *Upper incisors intruded 1.8 mm*
- Transverse: *Maintained*

Mandibular Dentition:

- A – P: *Lower incisors proclined ~32°*
- Vertical: *Lower anteriors intruded 4.4 mm*
- Transverse: *Maintained*

Facial Esthetics: Maintained

Bolton's tooth-size discrepancy analysis: The anterior Bolton's ratio at the end of treatment was 71.8% (30.5 mm/ 42.5 mm)

Retention

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

Final Evaluation of Treatment

In general, both upper and lower arches were well-

aligned, but the original slight Class II canine molar relationships were maintained (Figs. 5 and 6). In spite of there being over 100% deep overbite initially, both the overjet (4 to 2 mm) and the openbite (100 to 45%) decreased significantly by the end of treatment. The Cast-Radiograph Evaluation (CRE) score was excellent (10 points), with most of the points associated with problems in alignment / rotations, marginal ridge discrepancies, and lack of occlusal contacts. The CRE and IBOI pink & white scores are listed at the end of this report.

In the beginning of the treatment, an intra-arch elastic from canine to canine provided an intrusive component on the upper incisors to improve overjet, bite opening and axial inclination. This combination alignment improvements resulted in adequate space for lower incisor restoration and bracket bonding.

A relatively rigid archwire was used in the upper arch (.019x.025" SS) to improve the axial inclination (*torque*) of the upper incisors. It also stabilized the maxillary arch as an anchorage unit for protracting the lower dentition with Class II elastics.

A technically difficult aspect of the treatment was deepbite correction and mandibular anterior space closure. It was easily achieved by using high torque brackets on the lower anterior teeth, and applying Class II elastics to protract the lower dentition. In addition, the incisor bite turbos produced incisor intrusion and bite opening.

Discussion

Restoration of the lower incisors was essential for improving the patient's dental esthetics,¹ but restoring the crown form of severely abraded

incisors is challenging.² Excessive occlusal shear, due to the deepbite and/or parafunction, produced the progressive attrition. Continual eruption of the incisors was also a factor because the lower incisors had no centric stop in occlusion. If the tooth wear was generalized bruxism, it may have affected the vertical dimension of the occlusion, thereby requiring an opening of the bite before providing definitive restorations. However, if the tooth wear is limited to the mandibular anterior teeth, orthodontic intrusion provides enough space for appropriate restoration without altering the patient's vertical dimension of occlusion.^{3,4,5}

Bite turbos (*raisers*) are very useful early in treatment for opening a deep overbite, to leveling the curve of Spee and prevent interference with lower brackets.^{6,7} Advantages for bite turbos are: 1. no patient cooperation is required, 2. full-time alteration of occlusion, and 3. they are easy to bond and remove. Bite turbos bonded on the lingual surface of upper incisors are particularly useful for deepbite correction in Class I and II malocclusions with a moderate overjet. They can be constructed with glass ionomer cement, composite resins or self-curing acrylic resins. For adults, bite turbos provide an intrusive force resulting in upper and lower incisor intrusion, usually without significant extrusion of the posterior teeth, because the mandibular plane angle is unchanged.

Lower incisor extraction is a valuable option for some patients.^{8,9,10,11} The space gained can help correct a tooth size discrepancy, relieve lower anterior crowding, as well as assist in retraction of lower incisors and correction of anterior crossbite.^{12,13,14} The lower right central incisor was extracted for the present patient because its root was fractured. The space was utilized for lower anterior intrusion and deepbite correction. However, extracting one

incisor resulted in a tooth size requiring a restorative increase in the width of the other three incisors. The Bolton's ratio was 71.8% when the treatment was finished, compared with the normal mean value of 77.2%. Consequently, there was excessive upper incisor tooth width which resulted in a deeper overbite than normal at the end of treatment.

Restoration of lower incisors was essential prior to bonding brackets on their labial surfaces. Mandibular incisors are difficult to partially restore with conventional anterior crown forms, so composite build up was utilized to adequately restore the worn incisors without resorting to full-crown restorations.^{15,16,17} The severely abraded incisors had previously received root canal therapy, so fiber posts were inserted in the upper root to reinforce the restored crown structure.

Porcelain crowns were contraindicated because: 1. too much reduction of tooth structure is required, 2. when incisors are reduced in diameter they are susceptible to fracture, and 3. porcelain is abrasive to opposing teeth. Thus composite build-up was a much better option than porcelain, even though the restorations were a little darker than ideal. The latter was not a problem because the patient did not show much of the lower incisors when smiling. After almost 2 years of follow up, the composite restorations have held up very well, and no attrition has been noted.

Conclusion

As patients age, the upper lip lengthens and it is more difficult to display the maxillary incisors when smiling. So the mandibular anterior teeth are increasingly more visible during speaking, smiling and sometimes even at rest. For the present

patient, restoration of the lower incisors was crucial to improving dental esthetics. Adjunctive orthodontic treatment assisted the restorative dentist in restoring the severely-worn, over-erupted lower incisors by intruding the lower and upper anterior teeth without changing the patient's vertical dimension. The lower right central incisor was extracted due to root fracture and its space was utilized to compensate for the decrease in arch length when the curve of Spee was corrected. With proper planning and careful clinical management, lower incisor extraction significantly contributes to the resolution of deepbite, crowded malocclusions with a deep curve of Spee. The pursuit of excellence in orthodontic treatment results requires optimal esthetics, function and stability.

Acknowledgements

Thanks to Dr. Jeng-Feng Hwang for his excellent composite restoration of the lower broken incisors without further reduction of the compromised tooth structure.

Thanks to Dr. Tien Chun Kuo for her excellent endodontic retreatment of the compromised lower incisor.

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Discrepancy Index Worksheet

TOTAL D.I. SCORE **13**

OVERJET

0 mm. (edge-to-edge)	=	
1 – 3 mm.	=	0 pts.
3.1 – 5 mm.	=	2 pts.
5.1 – 7 mm.	=	3 pts.
7.1 – 9 mm.	=	4 pts.
> 9 mm.	=	5 pts.

Negative OJ (x-bite) 1 pt. per mm. per tooth =

Total = **0**

OVERBITE

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

Total = **5**

ANTERIOR OPEN BITE

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

Total = **0**

LATERAL OPEN BITE

2 pts. per mm. per tooth

Total = **0**

CROWDING (only one arch)

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

Total = **1**

OCCLUSION

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

Total = **0**

LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = **0**

BUCCAL POSTERIOR X-BITE

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

CEPHALOMETRICS (See Instructions)

ANB $\geq 6^\circ$ or $\leq -2^\circ$ **0** = 4 pts.

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

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

SN-MP

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

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

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

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

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

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

Total = **1**

OTHER (See Instructions)

Supernumerary teeth	<u> </u>	x 1 pt. = <u> </u>
Ankylosis of perm. teeth	<u> </u>	x 2 pts. = <u> </u>
Anomalous morphology	<u> </u>	x 2 pts. = <u> </u>
Impaction (except 3 rd molars)	<u> </u>	x 2 pts. = <u> </u>
Midline discrepancy (≥ 3 mm)	<u> </u>	@ 2 pts. = <u> </u>
Missing teeth (except 3 rd molars)	<u> </u>	x 1 pts. = <u> </u>
Missing teeth, congenital	<u> </u>	x 2 pts. = <u> </u>
Spacing (4 or more, per arch)	<u> </u>	x 2 pts. = <u> </u>
Spacing (Mx cent. diastema ≥ 2 mm)	<u> </u>	@ 2 pts. = <u> </u>
Tooth transposition	<u> </u>	x 2 pts. = <u> </u>
Skeletal asymmetry (nonsurgical tx)	<u> </u>	@ 3 pts. = <u> </u>
Addl. treatment complexities	3	x 2 pts. = 6

Identify: **Lower one incisor extraction was planned in such an adult deepbite case.**

Total = **6**

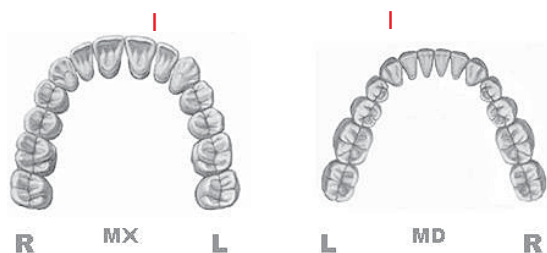
Cast-Radiograph Evaluation

Total CRE Score

10

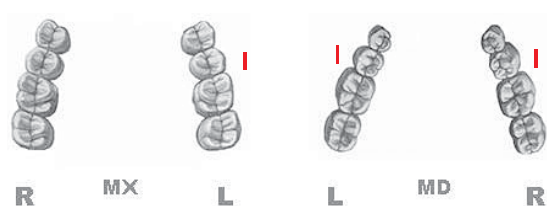
Alignment/Rotations

2



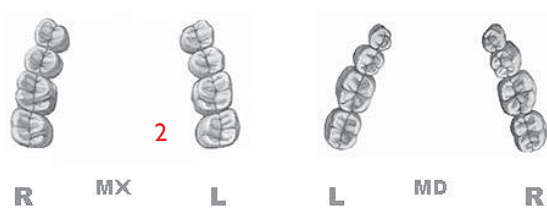
Marginal Ridges

3



Buccolingual Inclination

2



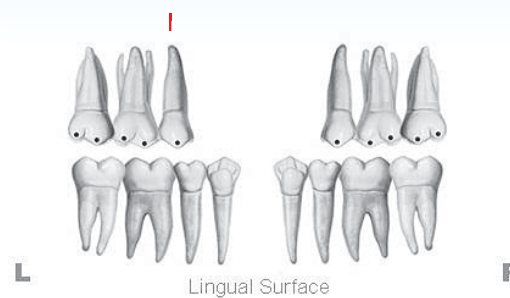
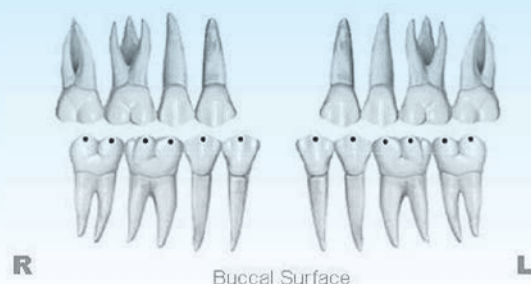
Overjet

0



Occlusal Contacts

1



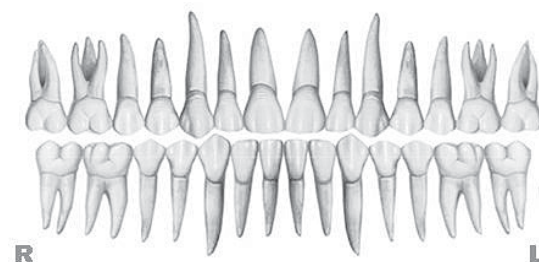
Occlusal Relationships

1



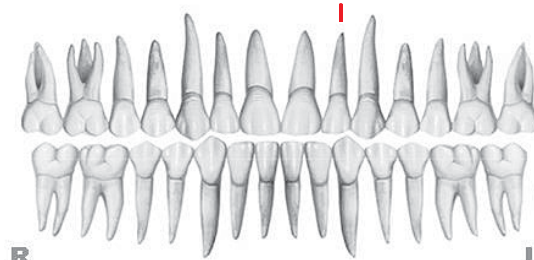
Interproximal Contacts

0



Root Angulation

1



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

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beginning
and last mile
of the
Orthodontic
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2015



4/12^(日) 大會演講
4/13^(一) Hands-on

時間 / 09:00-16:30

地點 / 大會演講 新竹世博館國賓影城
新竹市東區公道五路三段8號1樓

Hands-on 金牛頓教育中心
新竹市東區建中一路25號2樓

議程時間表

	時間	講題	講者
04/12 (日) 年中大會 世博國賓影城	09:00~10:30	兒牙早期治療技巧 Part 1 Tips for Early Treatment - Part 1	徐玉玲 醫師
	10:30~10:45	休息 Break	
	10:45~12:10	兒牙早期治療技巧 Part 2 Tips for Early Treatment - Part 2	曾淑萍/彭緯倫 醫師
	12:10~13:30	午餐 Lunch	
	12:10~13:00	iAOI 第一階段資格考 Board Eligibility Exam	
	13:30~14:45	矯正的精緻完工秘訣 Part 1 Top Secret of Excellent Finishing - Part 1	張慧男 醫師
	14:45~15:00	休息 Break	
	15:00~16:00	矯正的精緻完工秘訣 Part 2 Top Secret of Excellent Finishing - Part 2	張慧男 醫師
04/13 (一) Hands-on 金牛頓藝術科技	16:00~16:30	交流討論 Discussion	張慧男 醫師
	09:00~12:00	矯正的精緻完工 工作坊 Excellent Finishing Workshop 1. Wire bending 2. Finishing elastics	張慧男 醫師
	12:00~13:30	午餐 Lunch	
	13:30~16:00	兒牙早期治療 工作坊 Early Treatment Workshop 1. 2x4 set up 2. ant. & post. bite turbos	徐玉玲 曾淑萍 彭緯倫 醫師
	16:00~16:30	交流討論 Discussion	張慧男 醫師

DAY 1 大會演講

由貝多芬集團張慧男博士領軍，
帶領旗下徐玉玲、曾淑萍院長，
分享兒童早期治療的關鍵時機與處置要點，
再到成人矯正精緻完工的最後一哩路。

完整公開兒童到成人矯正的每個細節，
期望醫師能從中獲得實務經驗。

課程要點：1. Tips for early treatment
2. Top secret of excellent finishing

★ 報名專線 / 03-5711377 官網報名 / iaoi.pro



2015

International Association of
Orthodontics and Implantologists
國際矯正植牙學會年中大會



DAY 2 AM

Hands-on：矯正的精緻完工

透過矯正經驗豐富的老師解說，
加上助理帶領實際操作，
把深奧的精髓簡化，
讓你不再懼怕重要的精緻完工階段！

操作內容：1. wire bending
2. finishing elastics



DAY 2 PM

Hands-on：兒牙的早期治療

什麼情況該先開始第一階段矯正？
如何訂定明確的治療計畫，
使用簡單的mechanism掌握黃金時機！
經由模型操作，了解所有細節，
讓治療事半功倍！

操作內容：1. 2X4 set up
2. ant. & post. bite turbos



報名費用

	03/10 前報名		03/11 後報名	
	大會 (原價 7,000)	Hands-on (原價 16,000)	大會 (原價 7,000)	Hands-on (原價 16,000)
會員價	3,600元	+ 12,000元	5,000元	+ 14,000元
非會員價	5,000元	+ 14,000元	7,000元	+ 16,000元
費用 Fees	入會費 One time enrollment fees	年費 Annual fees	第一階段資格考 Board Eligibility Exam	
	NT\$1,000	NT\$3,000	NT\$9,000 - NT\$13,000 (含入會費、年費、考試及證書費)	

帳戶資訊

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銀行代號：815 日盛銀行 光復分行
帳號：105-273-762-10000

* 匯款後，請務必來電03-5711377核帳。
* 若退費，金額將扣除10%行政手續費用。

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第6期

2015 Newton's Implant

金牛頓植牙論壇

■ 時間：2015年03月20日起，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）

現在的牙科治療已經是各科統合彙整的時代，**協同矯正、植體、牙周、補綴**讓治療成果臻於完美是我們追求的目標。2015年的課程規劃再突破，精選四年來在台舉辦 **USC 南加大植牙進修課程精華**，由在臨床及演講領域裡經驗豐富的張慧男、蘇筌瑋和邱上珍醫師共同主講，並導讀**經典期刊**、深入分析 **iAOI 精緻完工案例**，化繁為簡。植牙入門者可以輕鬆、有效率地學習，專科醫師也可獲得全新的植牙概念及技術，持續精進！



關於植牙論壇的定位與期許：

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

報名專線：03-5735676 黃登鍵先生

	日期	USC 學程精選 (主講：張慧男、蘇筌瑋、邱上珍醫師)	經典期刊導讀	iAOI 經典案例
1	3/20	Dr. Homa: Biomechanical considerations, ridge preservation	Introduction of implant system, ridge preservation	Case 01
2	4/24	Dr. Homa: Decision tree for reduced bone volume	Short implant vs immediate implant	Case 02
3	5/22	Dr. Homa: Vertical Incision Subperiosteal Tunnel Access(VISTA)	VISTA: cross link etween ortho & implant	Case 03
4	6/26	Dr. Fernando: Prosthetic consideration in implant therapy	2B3D rule - single implant	Case 04
5	7/31	Dr. Fernando: Implant site planning	2B3D rule - multiple implants	Case 05
6	8/21	Dr. Fernando: Material selection, loading protocol	Smile design	Case 06
7	9/18	Dr. Chiu: Case presentation - Full mouth rehabilitation	GBR	Case 07
8	10/23	Dr. Wallace: Sinus lifting	Sinus lifting	Case 08
9	11/20	Dr. Baldwin: Abutment selection	Abutment selection	Case 09
10	12/18	Dr. Baldwin: Implant occlusion	Implant occlusion	Case 10



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協辦單位

湧傑企業股份有限公司

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名額有限，欲報從速。

請先電話報名並於3日內
劃撥費用至

戶名：湧傑企業股份有限公司

帳號：17471807

報名費用

NT\$ 2000元，參加即贈送

TF Adaptive Small Procedure Pack 一盒

*人數到達10人才開班

*報名未出席者，恕不退回收款項費用

報名專線

台北：02-2778-8315

分機124王's / 131林's

台中：04-2305-8915 張's

高雄：07-226-0030 王's

上課時間 & 地點

台北 - 2015年 01/24 (六) 晚上19:00-22:00

犇亞國際會議中心-台北市松山區復興北路99號15樓
捷運文湖線-南京復興站

台中 - 2015年 07/26 (日) 早上9:00-12:00

中國文化大學推廣教育部-台中教育中心(307教室)
台中市西屯區臺灣大道三段658號3F(Rich19大樓)

高雄 - 2015年 10/18 (日) 早上9:00-12:00

國立科學工藝博物館南館 107 教室
高雄市三民區九如一路797號

課程介紹

近二十年對醫師作根管治療影響最大的就是鎳鈦旋轉器械的出現，它讓牙醫師們既期待又怕受傷害；期待的是藉由它的高彈性及高效率應付彎曲根管的修形，但又不曾無預警地在根管中斷裂。而影響器械臨床表現的主要因素，例如器械的斷面與溝槽設計、冶金製造技術、原始材料特性、運轉模式、錐度與尖端大小的搭配方式、與根管壁接觸面積等，常取決於它們的顯微結構以及相關機械熱處理的製程。

而改變製程的最大目標就是要提升器械的抗疲勞斷裂強度，例如最近發展由 R-Phase Wire所製造之鎳鈦旋轉器械、以往覆式運動取代360度的運轉模式等，這意味鎳鈦金屬合金已經進展到下一個世代。對臨床醫師來說，在操作這些器械之前一定要更清楚新式器械的特性。所以本次演講的目的，就是希望藉由 李偉明 醫師專業又幽默風趣的表達，協助醫師在挑選及運用鎳鈦旋轉器械的時候，能具備更有立論基礎的必要知識，讓根管治療能進行得更順暢，達到更高品質的醫療服務。

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Implant-Supported Crowns to Replace Congenitally Missing Lateral Incisors: 2B-3D Rule for Ideal Implant Position

Abstract

A 29-year-old male patient presented for orthodontic consultation concerned with multiple spaces in the maxillary and mandibular dental arches. Clinical evaluation revealed modest Class II buccal segments, generalized anterior spacing, congenital absence of both maxillary lateral incisors, but there were no other manifestations of malocclusion. The malocclusion Discrepancy Index (DI) was 12, but implant site deficiencies added an additional 8 points, resulting in an overall Interdisciplinary DI of 20. A diagnostic wax set-up showed that implant replacement was esthetically superior to canine substitution bilaterally. A full fixed orthodontic appliance with passive self ligating brackets was used to correct the malocclusion and prepare the implant sites. Open coil springs in the edentulous areas closed the midline diastema and consolidated the space at the desired location of the implants. Because of the Class II buccal segments, pre-implant alignment of the maxillary anterior region produced overjet. Extra-alveolar (E-A) bone screws were inserted bilaterally in the infrazygomatic crests to provide osseous anchorage to retract the entire maxillary arch to Class I. Implants were placed with bone augmentation to increase the width of the alveolar process to cover the endosseous portions of the fixtures. The posttreatment Cast-Radiograph Evaluation (CRE) was a near ideal 7, and the Pink & White dental esthetic score was 5. (Int J Ortho Implantol 2015;37:22-57) .

Key words:

Congenitally missing maxillary lateral incisors, OrthoBoneScrew, extra-alveolar bone screws, maxillary midline diastema, passive self-ligating brackets, early light short elastics (ELSE), Atherton's patch, apical fenestration, bone augmentation, GBR (guiding bone regeneration), 2B-3D rule.

History and Etiology

Congenitally missing maxillary lateral incisors are the second most common dental agenesis, exceeded only by third molars. The congenital absence of one or more maxillary lateral incisors usually compromises esthetics and may also be associated with dental midline and functional occlusion problems. Treatment planning to achieve an ideal result is often challenging and may involve interdisciplinary procedures. To achieve an optimal result it is important for the orthodontist to be involved in the entire process.

The most common orthodontic options are related to space management. Space can be opened for prostheses, usually implant-supported crowns, or closed for canine substitution.

Many factors must be considered in formulating a treatment plan to achieve an optimal result, including the: 1. patient preference, 2. overall cost, 3. shape and size of the adjacent central incisor and canine,

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Consultant, International Journal of Orthodontics & Implantology (right)



■ Fig. 1: Pre-treatment facial photographs



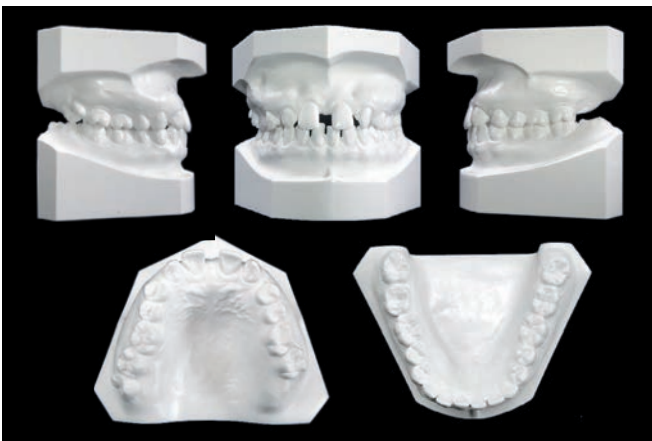
■ Fig. 4: Post-treatment facial photographs



■ Fig. 2: Pre-treatment intraoral photographs



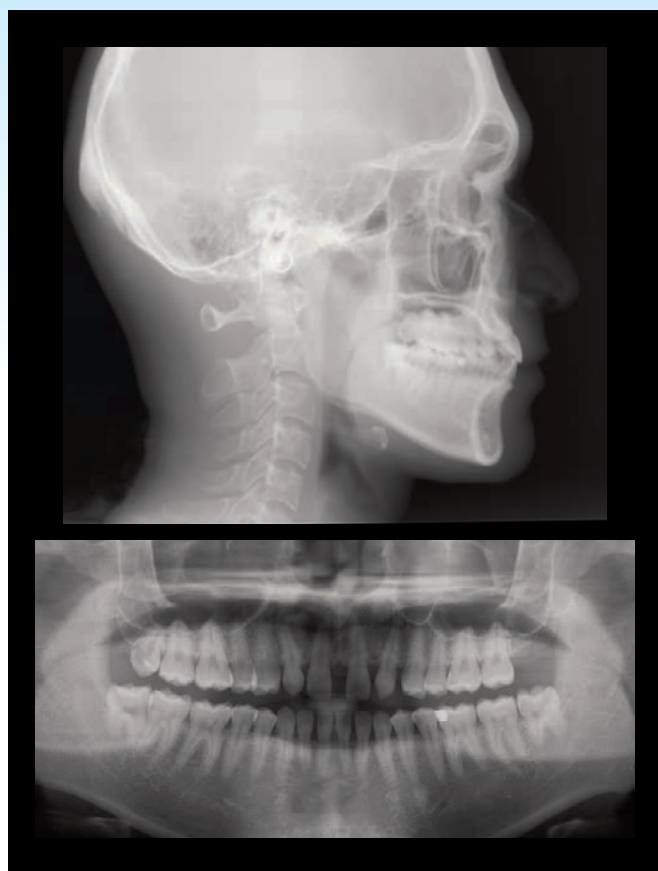
■ Fig. 5: Post-treatment intraoral photographs



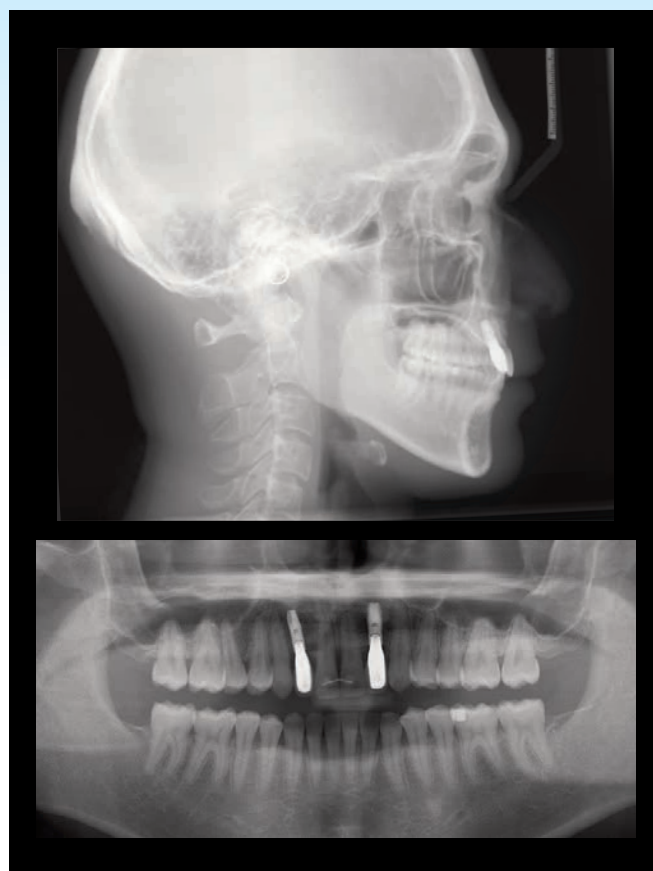
■ Fig. 3: Pre-treatment study models (casts)



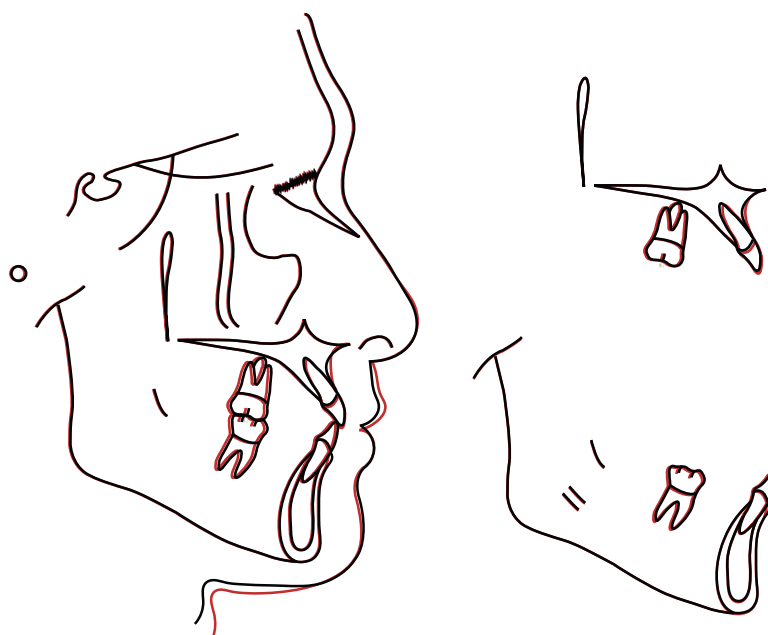
■ Fig. 6: Post-treatment study models (casts)



■ **Fig. 7:**
Pre-treatment panoramic and lateral cephalometric radiographs



■ **Fig. 8:**
Post-treatment panoramic and lateral cephalometric radiographs



■ **Fig. 9:**
Superimposed tracings of pre-treatment (black) and post-treatment (red) lateral cephalometric radiographs document the skeletal and dental treatment. The upper lip was protruded to improve the facial profile.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	87°	89°	2°
SNB°	85°	85°	0°
ANB°	2°	4°	2°
SN-MP°	29°	29°	0°
FMA°	22°	22°	0°
DENTAL ANALYSIS			
U1 TO NA mm	4 mm	3 mm	1 mm
U1 TO SN°	115°	113°	2°
L1 TO NB mm	5 mm	5 mm	0 mm
L1 TO MP°	97°	97°	0°
FACIAL ANALYSIS			
E-LINE UL	-5 mm	-3 mm	2 mm
E-LINE LL	-3 mm	-2 mm	1 mm

■ Table 1: Cephalometric summary

and 4. presenting occlusion, particularly with regard to the sagittal plane (*Class I, II or III*). Canine substitution may be the best long-term biologic solution, but mesial translation of the canine is difficult to achieve without compromising the occlusion of adjacent teeth. Furthermore, it is often necessary to extensively reshape the entire anterior segment to achieve acceptable esthetics. Preprosthetic alignment may be problematic in the presence of a substantial malocclusion. Implant-supported prostheses have immediate appeal for many patients, but preprosthetic alignment to achieve an optimal result may be challenging for the orthodontist, particularly if the buccal segments are Class II.

A 29-year-old male patient presented for orthodontic consultation, concerned about

unesthetic anterior dental spaces (*Figs. 1-3*). The initial clinical examination revealed the congenital absence of both maxillary lateral incisors that was associated with a maxillary midline diastema (*Fig. 10*). The lateral cephalometric radiograph showed a normal skeletal pattern (*ANB 2°, SN-MP 29°*), his pre-treatment facial profile revealed a straight profile with an acceptable soft tissue E-line projection (*Fig. 7*). There was no other contributory medical or dental history. The patient was treated to an acceptable result as documented photographically in *Figs. 4-6*. The cephalometric and panoramic radiographs document the pre-treatment condition (*Fig. 7*) and the post-treatment results (*Fig. 8*). The superimposed cephalometric tracings from before and after treatment are shown in *Fig. 9*. The details for the diagnosis and subsequent treatment will be discussed.

The etiology of the malocclusion was related to excess space in the developing arch due to congenitally missing maxillary lateral incisors. The major problems were: 1. central incisors had drifted distally, 2. canines had erupted into the lateral incisor space, and 3. mesial drift of the canines was associated with Class II buccal segments. The patient preferred an interdisciplinary treatment plan to align and restore his teeth with implants, prosthetics. An additional advantage was a shorter treatment time compared to canine substitution.

Diagnosis

Skeletal:

1. Skeletal Class I (*SNA 87°, SNB 85°, ANB 2°*)
2. Normal mandibular plane angle (*SN-MP 29°, FMA 22°*)

Dental:

1. Right: *end on Angle Class II molar relationship*,
Left: *Angle Class I molar relationship*
2. The overbite was 2.5 mm and overjet was 1.5 mm
3. Tooth Size Arch Length Discrepancy: *spacing of 10 mm in the maxilla and 2 mm in the mandible*
4. Bilateral congenitally missing maxillary lateral incisors
5. Maxillary midline diastema

Facial:

- Straight profile with an acceptable soft tissue E-line projection

The ABO Discrepancy Index (DI) was 12 and 8 points were added for implant site evaluation for an overall Interdisciplinary DI of 20. Scoring details as shown in the subsequent worksheet.¹

Specific Objectives of Treatment

Maxilla (all three planes):

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

Mandible (all three planes):

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

Maxillary Dentition

- A - P: *Maintain*
- Vertical: *Maintain*

- Intermolar Width: *Maintain*
- Inter canine Width: *Maintain*
- Buccolingual Inclination: *Maintain*

Mandibular Dentition

- A - P: *Maintain*
- Vertical: *Maintain*
- Intermolar Width: *Maintain*
- Inter canine Width: *Maintain*
- Buccolingual Inclination: *Maintain*

Facial Esthetics: *Maintain the acceptable profile*

Treatment Plan

A Damon Q® .022" slot self-ligating appliance (Ormco, Glendora, CA) was indicated, utilizing standard torque brackets for both upper and lower incisors. Bilateral compressed coil springs between the central incisors and canines were prescribed to open spaces for implantation of the congenitally missing maxillary lateral incisors. Although maxillary lateral incisor width ranges from 5 to 7 mm, a 7mm space is preferable for implant surgery. Bone screws (2x12mm OrthoBoneScrew®, Newton's A Ltd, Hsinchu, Taiwan) were indicated bilaterally in the infrazygomatic crests to control incisal flaring during space opening, and to achieve Class I buccal segments with optimal width for the implant sites. Class II early light short elastics were planned to retract the maxillary anterior segment and reduce the overjet.

Bone augmentation, followed by guided bone regeneration (GBR) when the implants are placed, was planned to increase the apical bone dimension and prevent an apical fenestration problem. The

retention plan was for fixed anterior and clear overlay retainers in both arches.

Appliances and Treatment Progress

Following extraction of the remaining 3rd molars, passive self-ligating brackets with standard torque were bonded on upper arch. The initial archwire was .014" CuNiTi with resin "pearls" bonded on the ends of the wire to prevent mucosal irritation. Open coil springs were placed bilaterally, between the central incisors and canines, to open spaces for restoration of the missing maxillary lateral incisors.

After one month of initial alignment and leveling in the upper arch, the lower arch was bonded, utilizing standard torque brackets in the mandibular anterior region, and fitted with a .014" CuNiTi archwire (Fig. 11). At the same appointment, another set of open

coil springs were placed between the upper left 2nd premolar and 1st molar to open a space for restoration of the mesial caries on the 1st molar (Fig. 12).

Five months after the initiation of treatment, the maxillary archwire was replaced with a .018" NiTi wire. The maxillary midline diastema was closed, and Atherton's patches were noted distal the upper central incisors (Fig. 13). The latter transient gingival defects apparently contributed to insufficient



■ **Fig. 10:**
The initial clinical examination revealed the congenital absence of two maxillary lateral incisors and maxillary midline diastema.



■ **Fig. 11:**
Standard torque brackets were bonded on both upper and lower incisors. Open coil springs were placed bilaterally between the central incisors and lateral incisors to open spaces for restoration of the missing maxillary lateral incisors.



■ **Fig. 12:**
Other open coil springs were placed between the upper left 2nd premolar and 1st molar to open a space for restoration of the mesial caries on the 1st molar (circle).

papillae between the central incisors and the implants.

In the 6th month of treatment, archwire changes were .014x.025" CuNiTi in the upper arch and .018" NiTi in the lower. Drop in hooks were inserted into the brackets of the upper canines bilaterally. The patient was instructed to wear Class II early light short elastics (*Parrot 5/16, 2oz.*) bilaterally from the upper canines to the lower 1st molars to retract the upper anterior teeth and reduce the overjet.

One month later, a progress panoramic radiograph was exposed to evaluate axial inclinations and

reposition brackets on inadequately aligned teeth (*Fig. 14*). The brackets of the upper right central incisor and 1st premolar were repositioned as needed to achieve a precise finished alignment.

After 8 months of initial alignment and leveling in both arches, the archwire was changed .017x.025" low friction TMA in the lower arch and ligated with a figure-eight tie using a .012" SS. Drop in hooks were inserted into the brackets of the lower canines, and elastometric chains were attached from the lower canines to 2nd molars to retract the mandibular anterior segment (*Fig. 15*).

Two weeks later, a .017x.025" low friction TMA

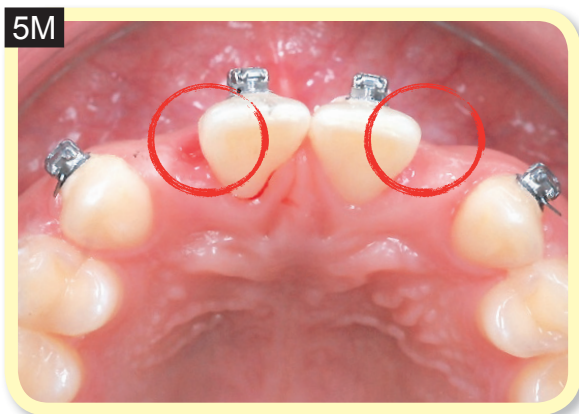


Fig. 13:
The maxillary midline diastema was closed but an Atherton's patch (red circles) occurred along the edentulous ridge distal to the maxillary central incisors.

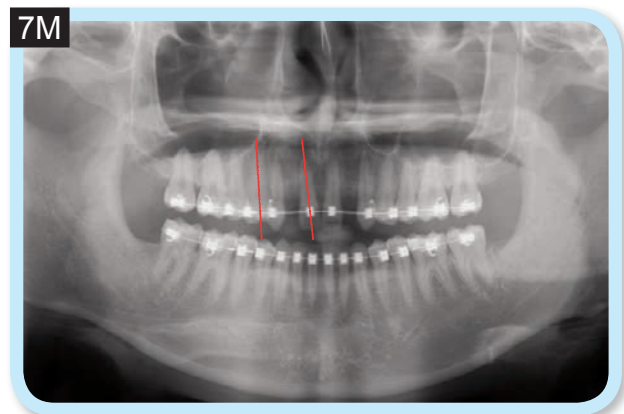


Fig. 14:
A progress panoramic radiograph was exposed to evaluate axial inclinations (red lines) and reposition brackets on inadequately aligned teeth.

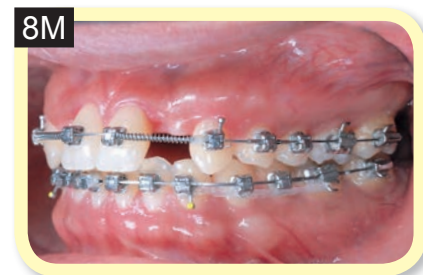
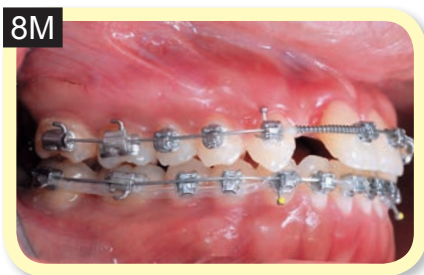


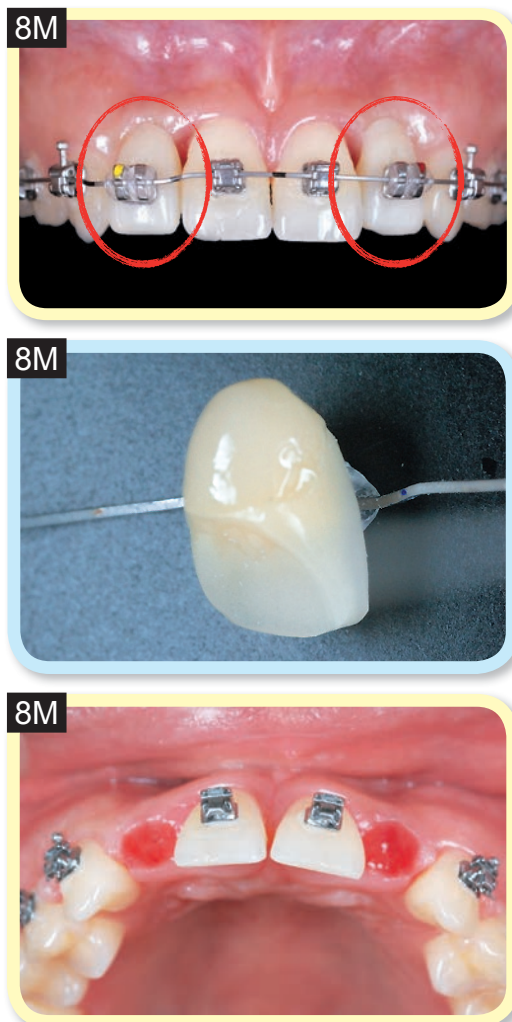
Fig. 15:
The archwire was changed .017x.025 low friction TMA in the lower arch and ligated with a figure-eight tie using a 0.012" SS. Drop in hooks were inserted into the brackets of the lower canines, and elastometric chains were attached from the lower canines to 2nd molars to retract the mandibular anterior segment.

archwire was used on the maxillary arch. Two resin pontic teeth were bonded in the upper arch to replace the missing lateral incisors. The modified ovate pontic teeth were designed to eliminate or at least minimize the "black triangle" between the teeth and the interproximal papillae. This procedure precluded the need to augment the edentulous ridges in height (Fig. 16). Bilateral Parrot 5/16, 2oz Class II early light short elastics were used from the

upper canines to the lower 1st molars.

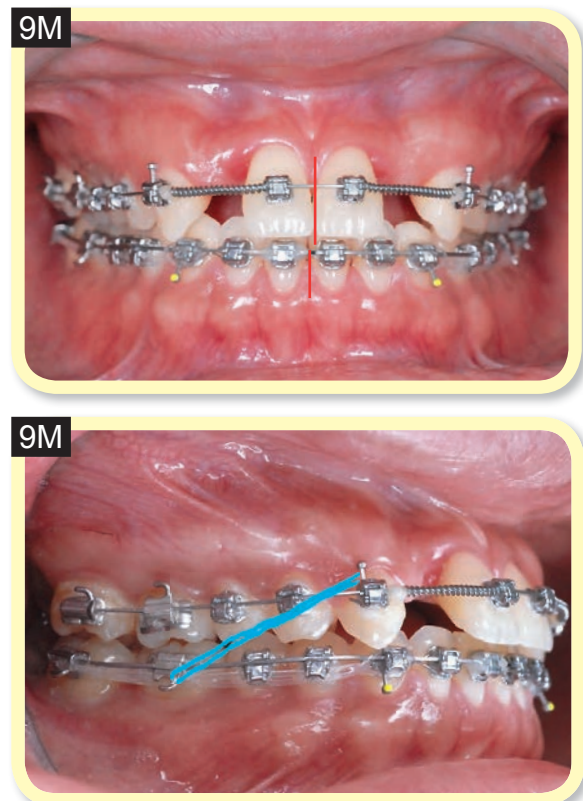
One month later, Class II early light short elastics were progressed to heavier elastics (Fox 1/4, 3.5oz.) only on the right side, because of the upper midline had shifted to the left (Fig. 17). At the same appointment, the present patient complained about a painful sensation over his TMJ area, which might have been caused by occlusal interferences during the orthodontic treatment. Mild analgesia medication helped to relieve the patient's discomfort.

In the 11th month, a 2mm overjet of the anterior segment was noticed. E-A bone screws (2x12mm



■ Fig. 16:

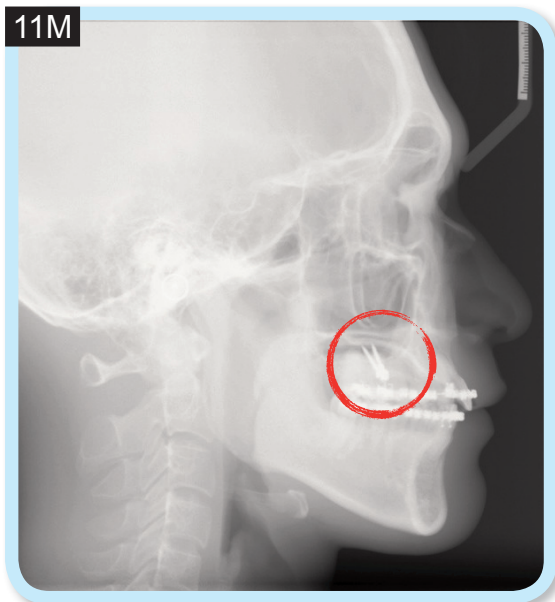
Two resin pontic teeth (red circles) were bonded on the upper arch to replace missing lateral incisors. The modified ovate pontic teeth were fabricated to eliminate or minimize of the "black triangle" between the teeth, so little or no ridge augmentation was required prior to the final restoration.



■ Fig. 17:

The Class II early light short elastics (Fox 1/4, 3.5oz.) were used only on the right side because the upper midline had shifted to the left.

OrthoBoneScrew®) were implanted bilaterally in the infrazygomatic crests (Fig. 18). Class II early light short elastics (*Fox 1/4, 3.5oz*) were used bilaterally from the upper canines to the lower 1st molars to retract the upper anterior teeth and to continue reduce the overjet.



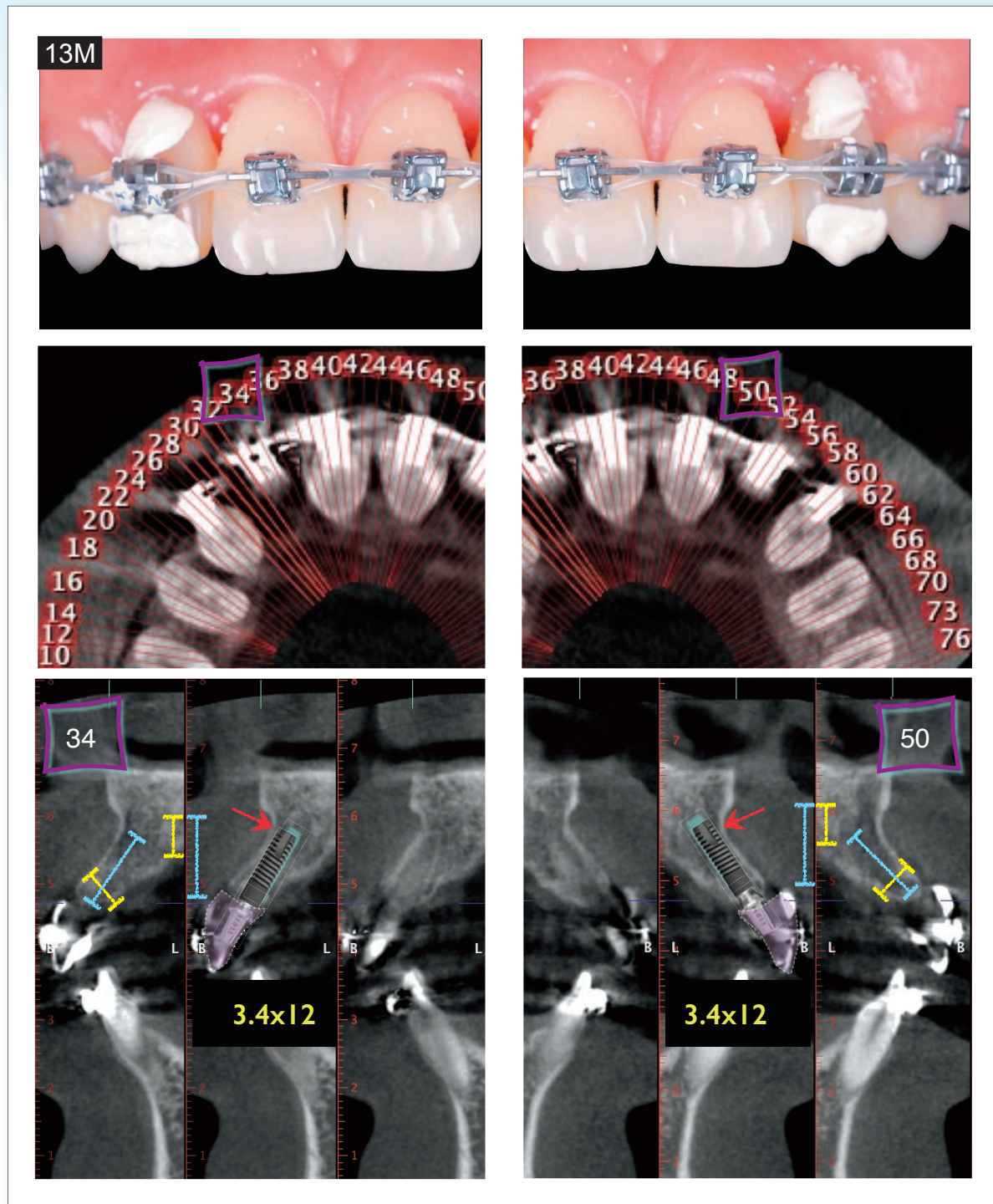
■ **Fig. 18:**
A 2mm overjet of the anterior segment was noticed. E-A bone screws (2x12mm *OrthoBoneScrew®*) were implanted bilaterally in the infrazygomatic crests (red circle).

Implant Placement

A preoperative CT scan was used to evaluate the alveolar bone volume (Fig. 19). The spaces were 6mm in width on the right side and 6.5mm in width on the left side. *Temp-Bond®* (*Kerr Corporation, Orange, California*) was cemented on the two resin pontic teeth surfaces to simulate the future prosthesis position. Radiographic slices from the CT scan showed the alveolar process was intact at the crest and was ~1 mm thick along the facial surface. Following the 2B-3D rule, the implant was inserted virtually into a slice of the CT scan to confirm the appropriate diameter and length of the fixture, as well as to be consistent with the ideal prosthetic position of the implant-supported crown.

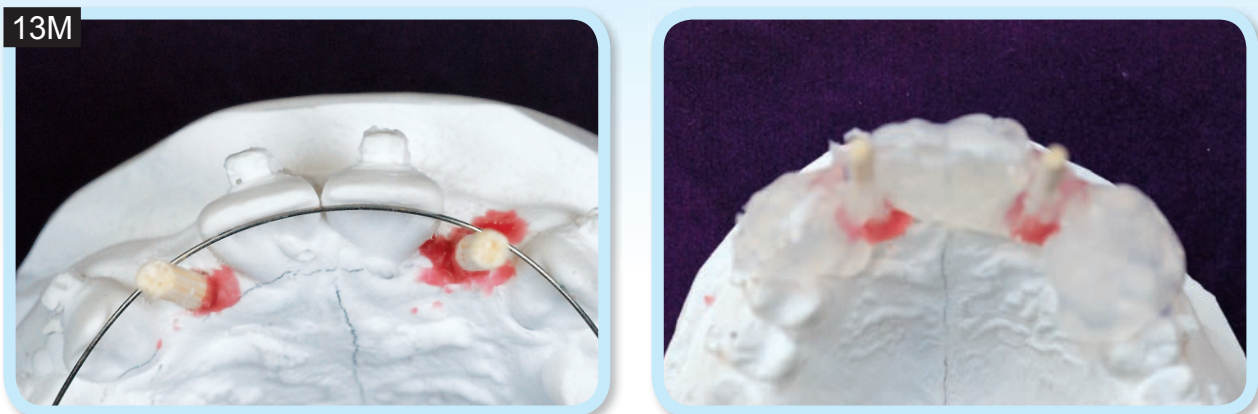
The angulation and location of the fixture were duplicated on the cast, and a surgical stent was prepared² (Fig. 20) to facilitate precise implant placement in three dimensions. The implant fixtures were positioned 3mm below the future crown margin, with a distance of at least 1.5mm from the adjacent teeth. Since there was insufficient bone volume on the apical third of the alveolar bone on both sides, simultaneous maxillary bone grafting and implant placement was indicated.

A crestal incision was performed at the palatal line angle of the edentulous space with a No.15c scalpel. Sulcular incisions were made on the buccal and palatal sides of the adjacent teeth for flap reflection. After exposing the bone with full-thickness flaps, the buccal-palatal width of the implant site was measured with the dental calipers. The mesial-distal width and depth was measured with a periodontal probe (Fig. 21).



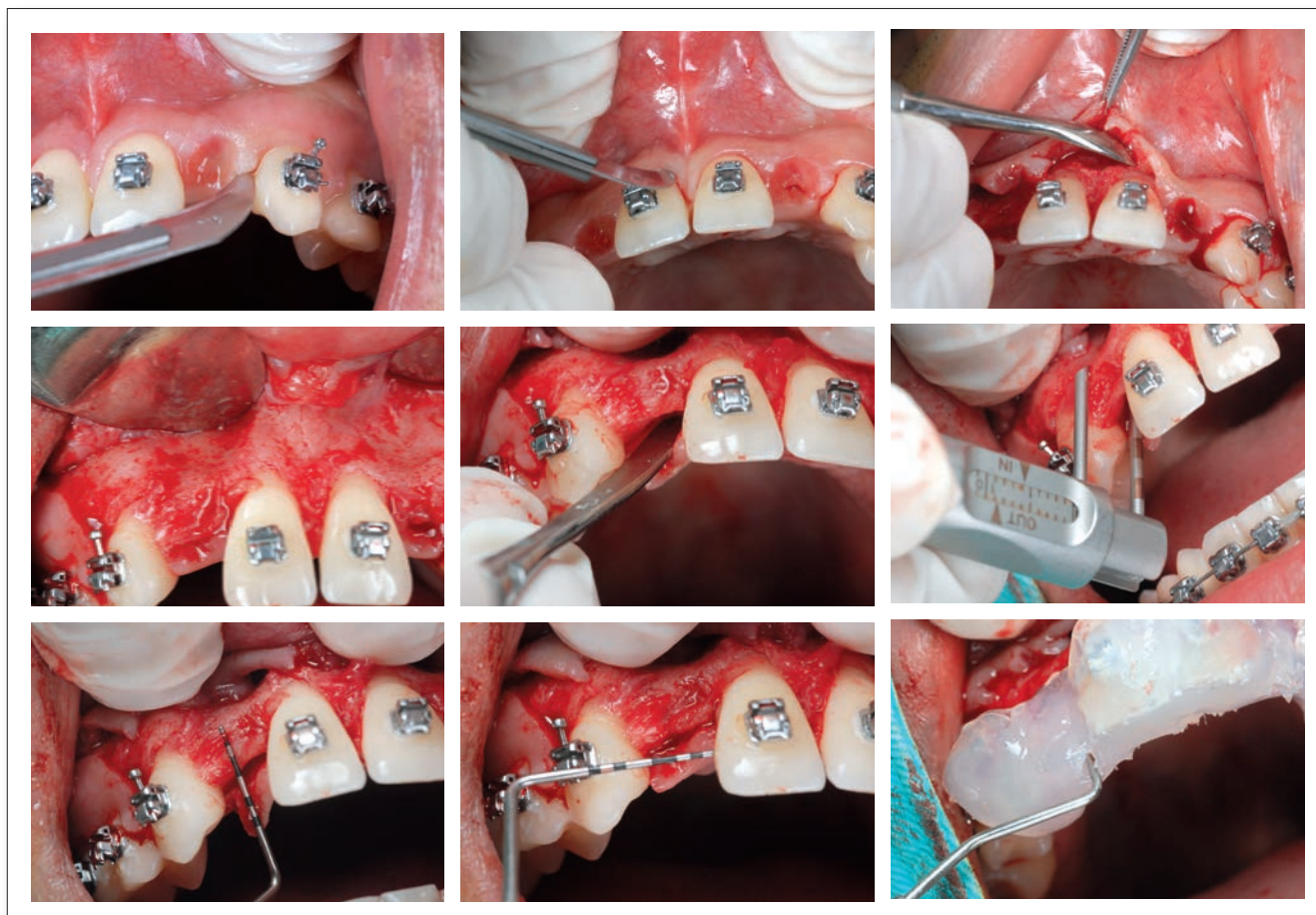
■ Fig. 19:

A preoperative CT scan was used to evaluate alveolar bone volume. There was insufficient bone volume on the apical third of both edentulous spaces, so simultaneous maxillary bone grafting and implant placement was indicated. Temp-Bond® (Kerr Corporation, Orange, California) was cemented on the two resin pontic teeth surfaces to simulate the future prosthesis position. Radiographic slices from the CT scan (No.34 and No.50) showed the alveolar process was intact at the crest and was ~1 mm thick along the facial surface.



■ Fig. 20:

A surgical stent was fabricated to guide the path for the osteotomy burs and the archwire helped confirm that the proposed implant position follows the 2B-3D rule.



■ Fig. 21:

A crestal incision was performed at the palatal line angle with a No.15c scalpel. Sulcular incisions were made on the buccal and palatal sides of the adjacent teeth for flap reflection. After exposing the bone with full-thickness flaps, the buccal-palatal width was measured with dental calipers. The mesial-distal width as well as the depth of the osteotomy was measured with a periodontal probe.

The surgical stent, fitted to the teeth, served as a guide for the first lancer drill to initiate the osteotomy. A surgical guide pin was placed in each osteotomy and the occlusal view revealed the location of the further fixtures was expected to follow the arch form (Fig. 22). Consistent with the desired position for the final prostheses, the path of the fixture insertion was carefully prepared step-by-step with the surgical burs. Before implant placement, bilateral apical fenestrations of the labial bone were noticed. The fixtures, 3.4mm in diameter and 12mm in length, were inserted bilaterally

and closing screws (*healing caps*) were placed. Subsequently, bone grafting procedures were performed to correct the apical fenestrations.

Autogenous bone grafts were harvested from the anterior nasal spine and lower piriform aperture by using a bone chisel and a bone scraper. A buccal-releasing incision was made at the distofacial line angle of the left maxillary canine to the right maxillary canine for increasing the flap reflation. The bone grafting material (*Bio-Oss®*, Geistlich Biomaterials, Princeton, NJ) and anterior nasal spine



■ Fig. 22:

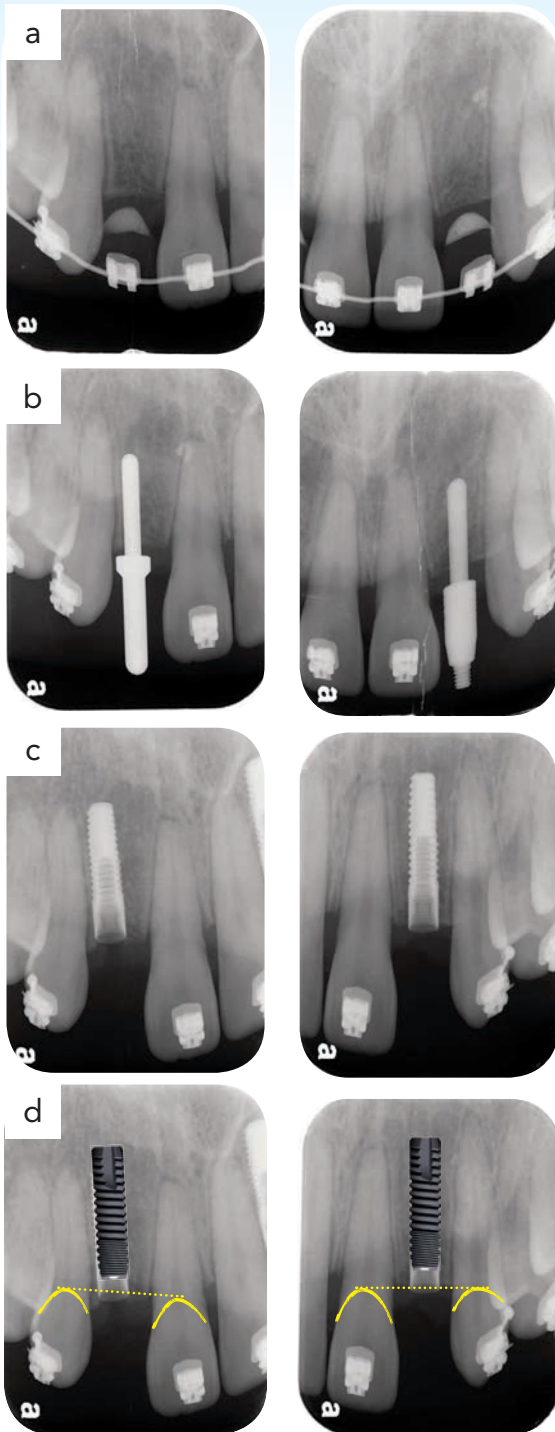
The surgical stent was fitted to guide the first lancer drill for the initial osteotomy. Before implant placement, the apical fenestrations of the labial bone were noticed (arrows). The fixtures, 3.4mm in diameter and 12mm in length, were inserted bilaterally and closing screws were placed.

chips mixed with whole blood were used to cover the apical fenestrations. A collagen membrane (Bio-Gide®, Geistlich Biomaterials, Princeton, NJ) was positioned over the bone grafting material. The soft tissue flap was repositioned and closed with interrupted 4-0 Gore-Tex® sutures (W. L. Gore & Associates, Flagstaff, AZ). The archwire and the resin pontic teeth were repositioned to maintain the space (Fig. 23). Comparison and pre-op and post-op periapical radiographs (Fig. 24) indicated the implants may be too superficial.



■ Fig. 23:

The fenestration areas (arrows) were filled with the bone grafting material (Bio-Oss®, Geistlich Biomaterials) and anterior nasal spine chips mixed with whole blood. A collagen membrane (Bio-Gide®, Geistlich Biomaterials) was positioned over the bone grafting material. The flap was repositioned and closed with interrupted 4-0 Gore-Tex sutures. The archwire and the resin pontic teeth were repositioned to maintain the space.



■ **Fig. 24:**
Serial periapical X-rays showing pre-operation and post-operation of implants.

Three weeks after the implants were placed, the sutures were removed. Orthodontics treatment was initiated with Class II elastics (Fox 1/4, 3.5oz.) bilaterally from the upper canines to the lower 1st and 2nd molars to retract the maxillary anterior segment to reduce the overjet.

After a three month healing period, exposure of the cover screw over the upper left lateral incisor was noticed (Fig. 25), suggesting the implants were placed too superficial to achieve an ideal gingival contour (Fig. 26). The pre-op and post-op series of



■ **Fig. 25:**
Notice the exposure of the cover screw over the upper left lateral incisor.



■ **Fig. 26:**
The gingival margins of the central incisors are normally at the same level or slightly lower than those of the canines, while the gingival margins of the lateral incisors are lower than those of the central incisors.

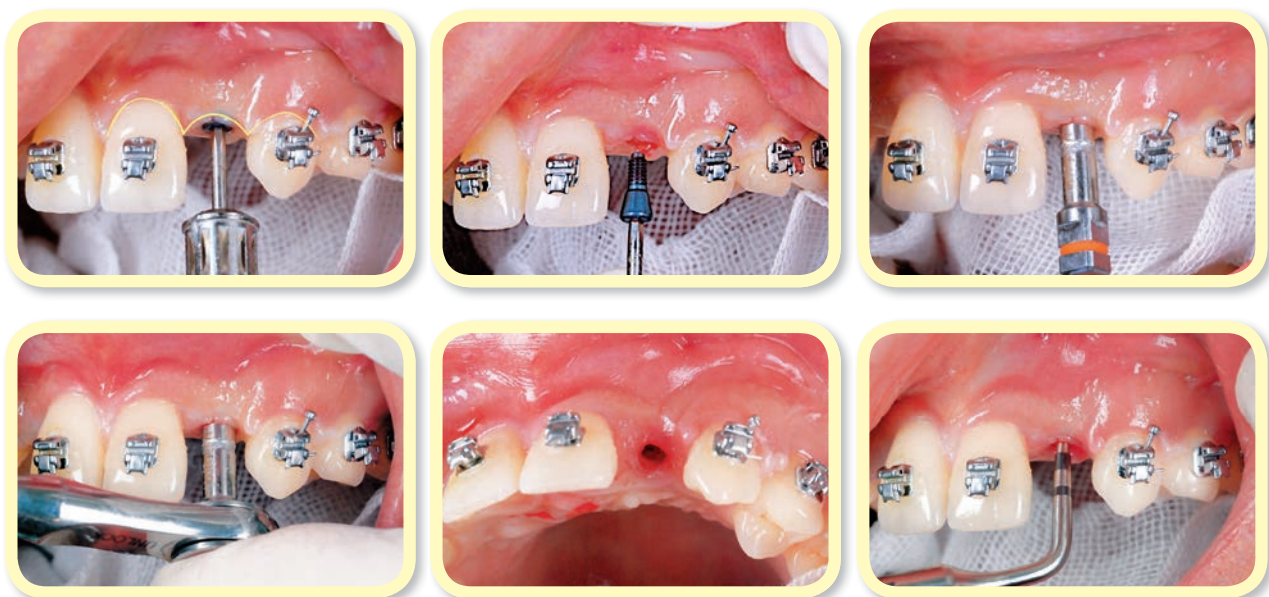
periapical X-rays (Fig. 24) revealed: 1. spaces of the congenital missing lateral incisors had been created, 2. surgical guide pins were placed to assess the orientation of the osteotomies, 3. post-operative periapical radiographs show the implants in position, and 4. evaluation of each implant relative to axial inclination and cemento-enamel junction (CEJ) of adjacent teeth showed that the implants were ~2mm too occlusal.

Ideally, an implant should be placed ~0.5 mm below the osseous crest, and 1-2 mm below the facial CEJ of the adjacent teeth (Fig. 24) to achieve a more natural contour of the gingival margins (Fig. 26).³ Treatment options to correct the problem were:

1. repositioning of the implants, or
2. soft tissue management of the lateral incisors.

To optimize esthetics with the most predictable procedure, a second stage of surgery was performed to position the implants ~2mm deeper into the alveolar process. The cover screws were removed with a screw driver, and the fixtures were extracted by reversing the ratchet wrench to fracture the initial osseointegration at the implant interface. An implant depth gauge was used to check the depth of the socket (Fig. 27).

Upon the placement of an implant into a surgical site, there is a cascade of molecular and cellular processes that provide for osteogenic cell differentiation and new bone growth and along the biomaterial surface.⁵ To insure an ideal healing response, the previous fixtures were not used again. Following the manufacturer's recommended drilling and insertion protocol, the twist drill Ø 3.2mm



■ Fig. 27:

The cover screws were removed by using a screw driver and the fixtures were reversed by using a ratchet. After osseointegration was broken, the fixtures were removed from the sockets. An implant depth gauge was used to check the depth of the implant site.

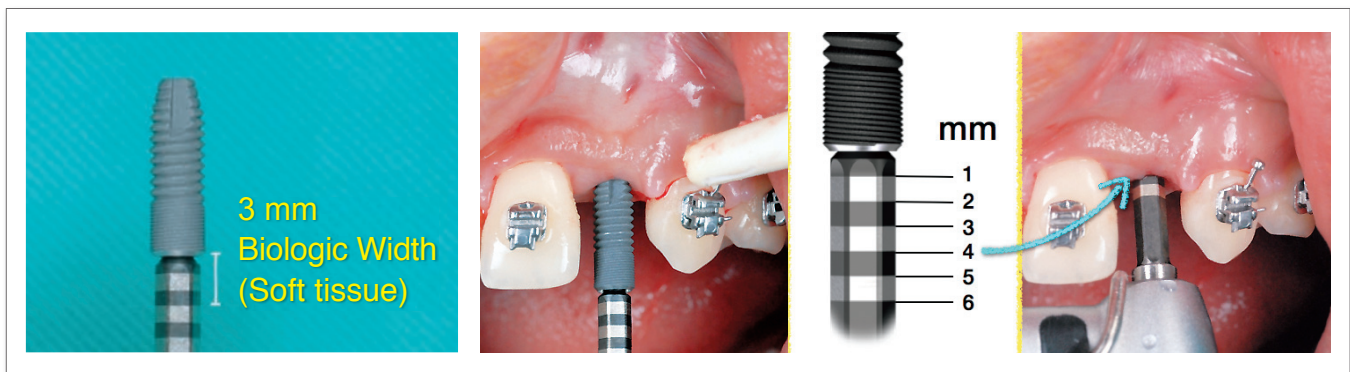
was used to drill each implant site 2mm deeper (Fig. 28), and a new fixture (3.5x11mm OsseoSpeed™ TX, Dentsply International, York, PA) was installed. According the 2B-3D rule,² a 3mm biological width of soft tissue is required, meaning the guide pin should submerge into the soft tissue until the 2nd white band just disappeared (Fig. 29). An implant depth gauge was used to check the depth of the fixtures relative to the gingival margin was about 4mm. Overall, the clinical procedures were identical for the left (Fig. 29) and right (Fig. 30) sides. Flared healing abutments (Ø4.5-H4) were used to help form the peri-implant mucosal contour to conform to the cervical contour of the restoration. The distal

separated papilla of the right implant was closed with an interrupted 5-0 Chromic Gut suture. From the occlusal view, the healing abutments were in an optimal position relative to the arch form (Fig. 31).

Two resin pontic lateral incisors were mounted on an .017x.025" low friction maxillary TMA archwire and trimmed to simulate a harmonious gingival margin. This optimal relationship is more predictable for the future abutment and prosthesis when the implant is positioned according to the 2B-3D rule. Following the revision surgeries, post-operative periapical X-rays confirmed that the implants were in the correct positions. Radiographic slices from



■ Fig. 28:
The previous fixtures were not used again. Following the manufacturer's recommended drilling and insertion protocol, the twist Drill Ø 3.2 was used to drill the implant site 2 mm deeper.



■ Fig. 29:
A brand new implant fixture (3.5x11mm OsseoSpeed™ TX) was installed. Following the 2B-3D rule, the 3mm biological width of soft tissue should remain, meaning the guide pin should be submerged into the soft tissue until the 2nd white band disappeared.



■ Fig. 30: After finishing the left side implant installation, the right implant was installed following the same procedure.



■ Fig. 31:

An implant depth gauge was used to check the depth of the fixtures to the gingival margin (GM); it was about 4mm. The flared healing abutments (Ø4.5-H4) were used to help form a peri-implant mucosal contour to approximate the restoration cervical contour. The distal separated papilla of the right implant was closed with an interrupted 5-0 Chromic Gut suture. From the occlusal view, the healing abutments were placed within the arch form.

the CT scan showed that the alveolar process supplemented with the bone graft material fully covered the implants in three dimensions (Fig. 32).

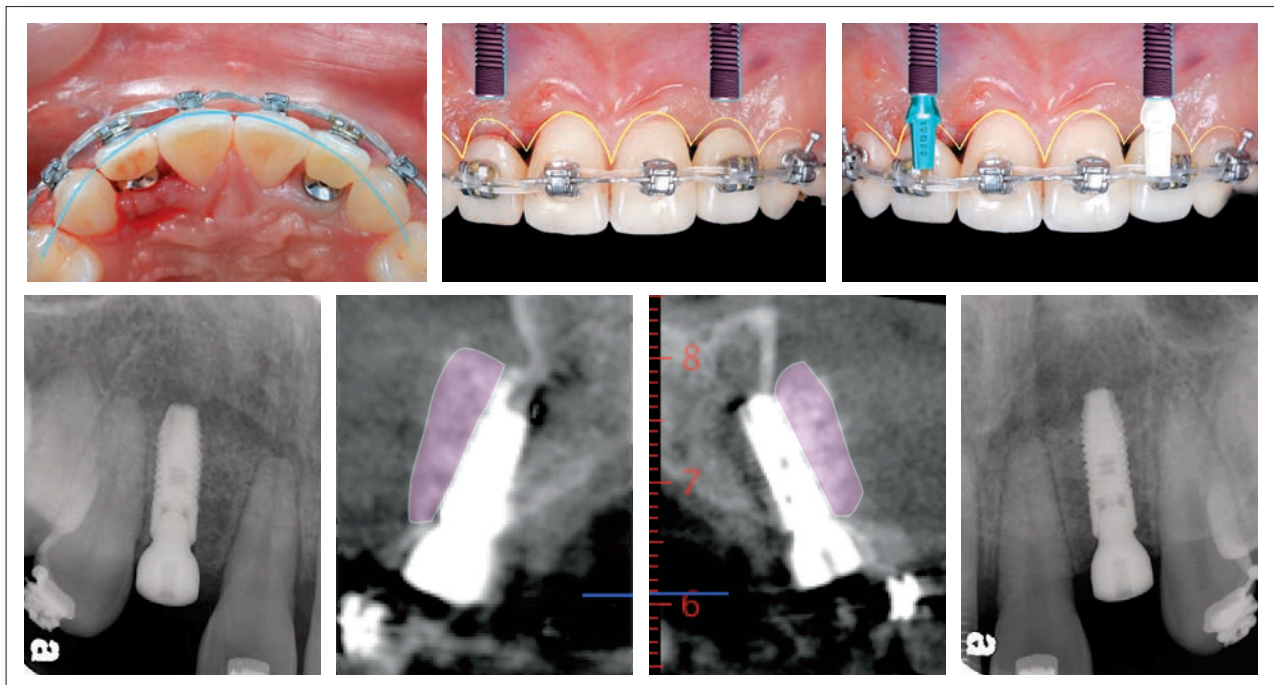
Orthodontic Finishing Stage

In the 20th month, the alignment of the dentition was almost complete, but the buccal flaring of the upper right posterior segment was noted. The .017x.025" low friction TMA archwire was adjusted to deliver -20° of torque in the right posterior maxillary segment to adjust the angulation of the posterior teeth (Fig. 33).

included 10 months for the two implant surgeries with post-op healing phases, all brackets were removed. To prevent relapse of the 4mm maxillary midline diastema, elastics were used to completely close the space between the upper two central incisors, and a multi-stranded stainless steel wire was bonded on the palatal surface to serve to achieve long-term retention (Fig. 34). Clear overlay retainers were delivered for both arches, and the patient was scheduled for fabrication of the implant prosthesis (Fig. 35).

Implant Prosthesis Fabrication

In the 24th month of orthodontic treatment, which One month later, a marker pen was used to



■ Fig. 32:

The .017x.025 low friction TMA maxillary archwire is fitted with two resin pontic teeth. The harmonious gingival margin helps predict the desired abutment contour according to the 2B-3D rule. Post-operative periapical X-rays show that the implants are inserted into the appropriate positions. Radiographic slices from the CT scan show that the alveolar process is fully covered with the bone graft material.



■ Fig. 33:

Buccal flaring out of the upper right posterior teeth was noticed. The .017x.025 low friction TMA maxillary archwire was adjusted with -20° in the affected area to correct the problem.



■ Fig. 34:

Preventing relapse of the maxillary midline diastema required definitive space closure with elastics followed the bonding of a multi-strand stainless steel wire on the palatal surface of the incisors to provide long-term retention.



■ Fig. 35: Post-orthodontic treatment intraoral photographs.

delineate the desired tooth proportion of the upper right central incisor and the portion that was subsequently removed with a diamond fissure bur (Fig. 36). Following The Abutment Decision Tree® copyrighted in 2009 by Dr. Baldwin Marchack (<http://simpletooth.com>), the stock abutments (ZirDesign™ Dentsply, Waltham, MA) were chosen. The gingiva

formers were removed and the ZirDesign™ abutments (Ø4.5mm and 3mm cuff height) were fitting. The soft-tissue margin, the desired vertical dimension and the mesial-distal width were outlined on the abutments with a fine-tip permanent marker. The ZirDesign™ abutments were positioned on the implants, and secured with light finger force (Fig. 37).



■ Fig. 36:

A marker pen was used to delineate the desired tooth proportion of the upper right central incisor and the portion that was subsequently removed with a diamond fissure bur.



■ Fig. 37:

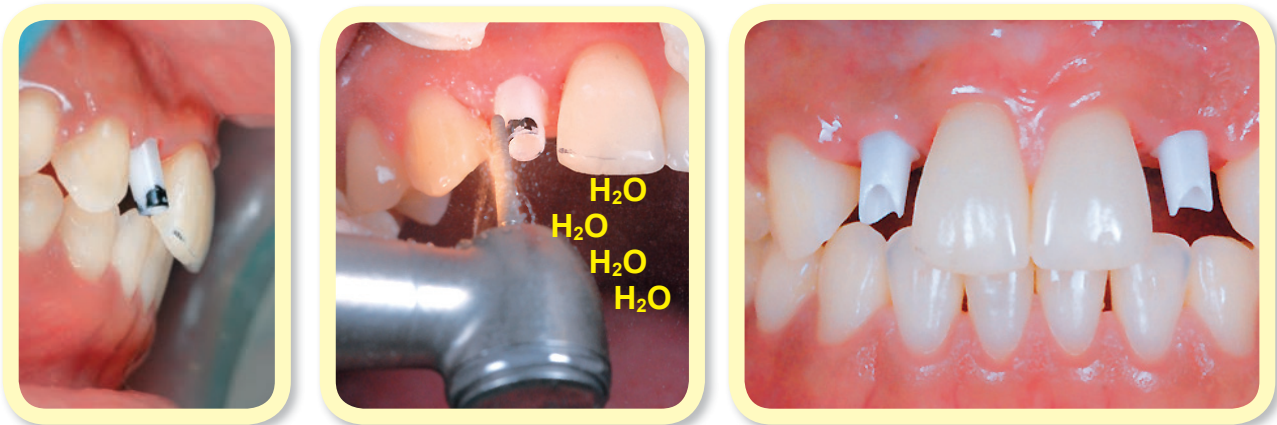
The gingiva formers were removed and the ZirDesign™ abutments (Ø4.5mm and 3mm cuff height) were fitted. The soft-tissue margin, the correct vertical dimension and the mesial-distal width were outlined on the abutment with a fine-tip permanent marker. ZirDesign™ abutments were positioned in the implants and secured with the abutment screws by tightening with light finger force.

The abutments were then modified with a diamond bur mounted on a high speed handpiece to accommodate occlusal function while maintaining a desirable soft tissue contour. The post height of the abutments were reduced to provide 2 mm of occlusal clearance for the fabrication of the porcelain crowns.

To prevent micro-cracks during grinding, excessive heat development with the bur was avoided using high volume water cooling during the grinding procedure (Fig. 38). The buccal thickness of the abutments was reduced as needed.

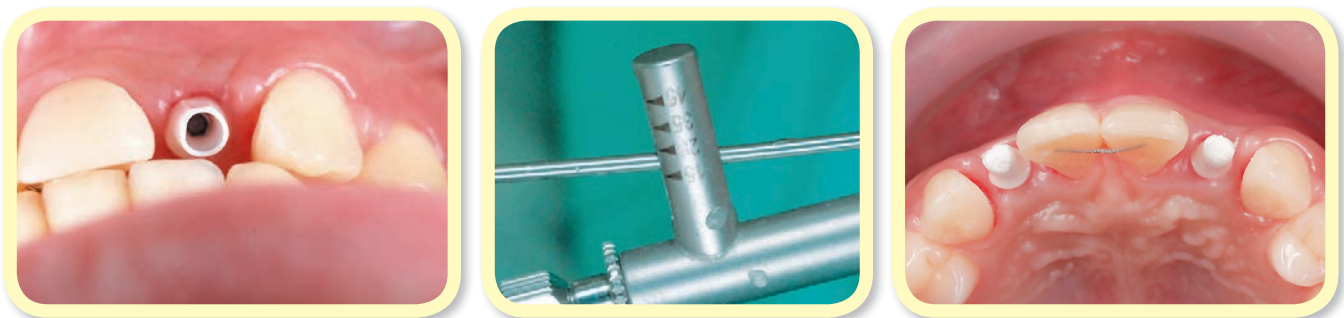
Before taking an impression, the abutment screws were torqued to 20-N-cm with a screw driver and a torque ratchet (Fig. 39). Double gingival retraction cords were packed into the peri-implant sulcus, and a direct impression was obtained with polyvinyl siloxane (Fig. 40), which was then poured with type IV dental stone.

The post-treatment periapical X-rays showed that the ZirDesign™ abutments were in the desired position. The provisional restorations were fitted, carefully inspected intraorally, and polished with a rag wheel to a smooth, semi glossy finish (Fig. 41).

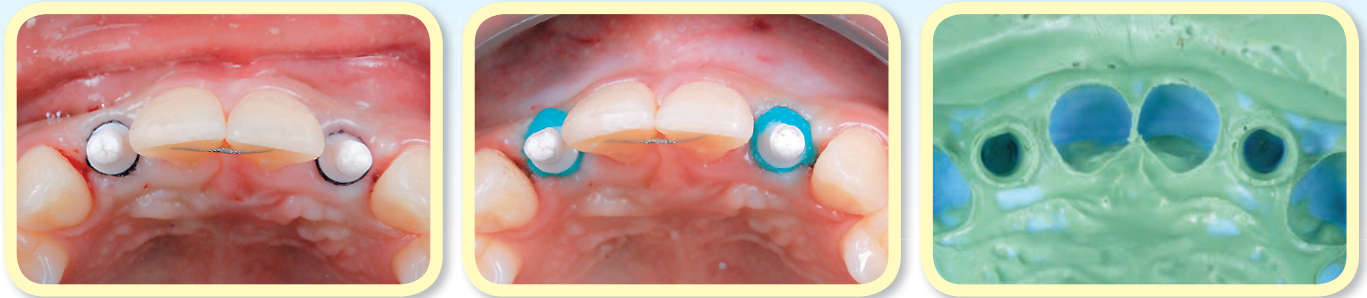


■ Fig. 38:

The post height of the abutments were reduced to provide two mm of occlusal clearance for the fabrication of the porcelain crowns. Excessive heat development was controlled with water cooling (H_2O) during the grinding process to prevent micro-cracks.



■ Fig. 39: The abutment screws were torqued to 20-N-cm with a screw driver and a torque ratchet.



■ Fig. 40:

Two gingival retraction cords were positioned in the peri-implant sulcus with a packing instrument. A direct impression was obtained with polyvinyl siloxane.



■ Fig. 41:

The post-treatment periapical X-rays showed that the ZirDesign™ abutments were inserted in the right positions. The provisional restorations were fitted, carefully inspected intraorally, and polished with a rag wheel to a smooth, semi glossy surface.

Two weeks later, the full ceramic crowns were fitted, and the abutments were carefully inspected. The permanent crowns showed some occlusal and contour discrepancies that required adjustment. The porcelain margin was modified to achieve adequate marginal seating and esthetics, as well as to develop a dental profile that was consistent with the adjacent teeth (Fig. 42). The desired morphology was carefully adjusted to achieve a natural appearance. An undesirable tooth shape may contribute to a blunted papilla (*black triangle*), but it can at least be partially corrected with restorative

procedures. Prosthetic reshaping of dental contours can lengthen the contact area apically, displacing the soft tissue labially so that there is at least partially filling the black triangle. After completion of the final prosthesis, appropriate tightness of the contact area was confirmed with articulating paper. Following clinical adjustment and verification of the fit and occlusion, cotton balls were placed over the abutment screws to prevent them being sealed with the restorative composite. The permanent crowns were completed and luted into place extra-orally with permanent cement (*Maxcem Elite®* Kerr

Corporation, Orange CA). After removing the superfluous cement, the full ceramic crowns were seated intraorally and the luting cement was light cured (Fig. 42).



■ Fig. 42:

Final subtle adjustments for the permanent restoration achieved a light occlusal contact, and the appearance of the restoration that was in harmony with the adjacent natural dentition.

Results Achieved

Maxilla (*all three planes*):

- A - P: *Protruded*
- Vertical: *Maintained*
- Transverse: *Maintained*

Mandible (*all three planes*):

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

Maxillary Dentition

- A - P: *Maintained*
- Vertical: *Maintained*
- Intermolar Width: *Maintained*
- Inter canine Width: *Maintained*
- Buccolingual Inclination: *Maintained*

Mandibular Dentition

- A - P: *Maintained*
- Vertical: *Maintained*
- Intermolar Width: *Maintained*
- Inter canine Width: *Maintained*
- Buccolingual Inclination: *Maintained*

Facial Esthetics: The acceptable profile has been maintained

Retention

The maxillary fixed retainer was bonded on the two central incisors. Upper and lower clear overlays were delivered, with the instructions to wear the retainers full time for the first 6 months and nights only thereafter. The patient was trained in home care as well as in maintenance of the retainers.

Final Evaluation of Treatment

The final ABO CRE score¹ was 7 points. The major residual discrepancies were: alignment / rotation 3 points, overjet 2 points, and root angulation 2 points. The patient's principal concern was addressed by opening space and restoring the congenitally missing maxillary lateral incisors with implant-supported prostheses. Smile esthetics were substantially improved by closing the diastema, establishing optimal incisal exposure, and providing for an optimal gingival display. The occlusal function was improved by achieving optimal protrusive guidance and occlusal contact in centric occlusion. Overall, dental esthetics, smile dynamics and occlusal function were substantially improved. The patient was well satisfied with the result.

DISCUSSION

Congenital absence of one or more teeth (*hypodontia*) is the most common developmental dental anomaly in humans. Prevalence reportedly ranges from 2.3% to 10.1%. Silverman⁶ reported that Werther and Rothberg in 1936 found 2.3% of 1,000 schoolchildren were missing 1 or 2 teeth, and maxillary lateral incisors were the most frequently missing teeth. However, more recent studies have indicated the prevalence of hypodontia is ~5%, with the maxillary lateral incisor being the second most commonly missing tooth. The mandibular second premolar was the most common.⁶

There are several treatment modalities available to correct missing maxillary lateral incisors. Each of the approaches has inherent advantages and disadvantages, but all should be considered when evaluating a specific patient. The two major treatment approaches are orthodontic space closure

and restoration with a fixed prosthesis or single-tooth implant.⁷

In considering canine substitution, there are several patient-specific dento-facial criteria that must be considered: degree of malocclusion, amount of crowding, facial profile, canine shape and color, lip level, and gingival contours.^{8,9} A fixed prosthesis or single-tooth implant is usually indicated if any of the above criteria are not optimal. Patients with a missing permanent incisor(s) superimposed on a significant malocclusion should be managed with a comprehensive treatment plan that optimizes esthetics, function and long-term dental health.

Canine substitution may require extraction of a deciduous canine to facilitate movement of the permanent canines to contact the central incisor. Lateral incisor brackets on the canines help correct the facial surface to simulate a lateral incisor. Furthermore, it may be necessary to correct the contour of the incisor edge of the canine, and then position the bracket relative to the gingival contour, to achieve optimal soft tissue esthetics.

Class I skeletal and dental relationships, with no significant crowding or dento-alveolar protrusion is usually a good indication for implant-supported prostheses to restore the missing canines. As the permanent canine is moved distally to create space for a prosthesis or implant, an optimal alveolar ridge is created, but it is important to correct the maxillary midline and optimize the smile-line to achieve optimal esthetics.

The first step in opening space for a tooth-supported prosthesis or single-tooth implant is to determine

how much space is needed for an optimal outcome. There are several methods that can be used: 1. according to the “golden proportion”¹⁰ the lateral incisor should have a ratio of 1:1.618 relative to the dental incisor, 2. use the contralateral lateral incisor as a reference¹¹ if it has normal shape and proportions, 3. perform a Bolton analysis,¹² and/or construct a diagnostic wax set-up. Generally, the maxillary lateral incisor width ranges from 5 to 7 mm, but implant placement surgery placement is difficult if the space is <7mm. It is often wise to open the space to 7mm, place the implant, and then close space as needed to achieve the correct proportion with the adjacent central incisor.

There are three types of tooth-supported, fixed restorations that are commonly considered: 1. resin-bonded to one or more teeth, 2. cantilevered from the canine or central incisor, and 3. conventional full-coverage prosthesis. The primary consideration among these options is conservation of tooth structure. Ideally, the treatment choice is the least invasive option that satisfies both the esthetic and functional objectives for the patient.

Currently, the single-unit implant-supported prosthesis is the most common treatment alternative for the replacement of a missing lateral incisor. For implant treatment to be successful, there must be an adequate intercoronal and interradicular space, consistent with appropriate root angulation of the adjacent teeth. The adjacent teeth should be stable and their apical areas remote from the planned implant site.¹³

Dental implant-supported prostheses conserve adjacent tooth structure, and have excellent success and survival rates. However, they are expensive,

and multiple procedures are required, including at least one surgery. The quantity and quality of bone must be adequate in the implant site or the patient will need a separate surgical procedure for ridge augmentation. There should be a minimum of 10mm of bone height and a minimum of 6.0mm of bone width in the proposed implant site. A cone beam CT radiograph is essential for assessing available bone prior to implant surgery.

A diastema is an area of interdental space between two or more teeth, and the problem is most frequent between the maxillary central incisors. The problem may result from a tooth size discrepancy, missing teeth or a hypertrophic labial frenum. It may be secondary to a malocclusion such as overjet or incisor protrusion.¹⁴ A diastema due to congenitally absent maxillary lateral incisors can be managed with canine substitution or opening space for a prosthesis. Orthodontic space closure is subject to interdental spacing reappearing after treatment. This problem is best managed by bonding a permanent retainer on the lingual surfaces of the affected teeth.

Patients with a hypertrophic labial frenum may require a surgical consult for a frenectomy. This procedure involves sectioning the frenum and repositioning it to prevent the diastema from reopening.

Atherton's patch¹⁵ is a gingival depression that occurs when space between teeth is opened rapidly because the interproximal papilla remains adjacent to the tooth that is not being moved. The deterioration of the interproximal papilla is an esthetic concern for implant-supported prostheses. Kokich¹⁶ proposed an advancement flap to create

a more natural papilla adjacent to an implant placed in an edentulous space compromised with an Atherton's patch. The technique consisted of placing a 2 mm healing abutment following implant placement via a submerged technique. Kokich¹⁶ also pointed out that the age of the patient is an important factor for management of Atherton's patch. Natural reformation of the papilla is predictable in young patients with growth potential, but the same problem in adults adults may fail to heal and restore the papilla.

The present patient complained about a painful sensation over the temporomandibular joint as the maligned teeth were corrected. This problem self-corrected once the dentition was aligned.

The potential for developing periodontal fenestrations and dehiscences must be carefully evaluated. Exposure of alveolar bone during periodontal and oral surgery procedures may reveal fenestrations and dehiscences that can complicate the outcome during the healing process.¹⁷ The maxillary first molar, mandibular first molar, as well as the mandibular canine and first bicuspid area are high risk zones for bone deficiencies and must be carefully evaluated during and after oral surgery procedures. Fenestrations and dehiscences may occur in multiple areas of the same patient and bone augmentation may be necessary before or during implant placement particularly if the procedure is in an area where a tooth was extracted.¹⁸

Sufficient alveolar bone volume and favorable architecture of the alveolar ridge are essential for obtaining ideal function and esthetics following implant therapy.¹⁹ Grafts are generally classified

according to their original source as follows: 1. autograft: a. oral: mandible symphysis, retromolar area, maxillary tuberosity. b. extraoral: calvarium, iliac, tibia, clavicle, scapula. 2. allograft: freeze-dried bone allograft (FDBA), demineralized freeze-dried bone allograft (DFDBA), for example: Puros® (Zimmer Dental Inc., Carlsbad, CA), ProSpace® (B. Braun Medical, Bethlehem, Pennsylvania), DBX Putty® (Densply, York, PA). 3. xenograft: anorganic bovine bone, coralline hydroxylapatite (HA), for example: Bio-Oss®, Geistlich Biomaterials, Princeton, NJ. 4. alloplasts: low density hydroxyapatite (HA), beta-tricalcium phosphate, dense HA, bioglass, polymer, calcium sulfate, for example: Bone Ceramic® (Straumann, Basel, Switzerland). Guided bone regeneration (GBR) uses a barrier membrane over an osseous defect to prevent soft tissue from occupying the bone defect and preventing normal bone healing.

A predictable intraoral GBR approach was developed in the late 1980s and early 1990s.²⁰ It has become a predictable surgical method for enhancing new bone formation in peri-implant bone deficiencies and alveolar ridge defects. The technique can be applied to extraction socket defects, horizontal and vertical ridge augmentation sites, and is also helpful for correction of osseous dehiscence and fenestration defects adjacent to implants. Factors that have been suggested that may inhibit bone healing with GBR: smoking, excessive swelling, passive flap tension, cortical penetration, morphology, length and orientation of the defect, membrane fixation, and materials used. The method for using GBR to reduce the loss of ridge volume is well documented, but it requires

a long healing period before the implant can be placed.²¹

Bone adaptation or integration of an implant is characterized by a series of biological reactions that start with bone turnover at the interface (*a process of localized necrosis*), followed by rapid repair. The wound healing response is guided by an activation of macrophages leading to tissue turnover and new osteoblast differentiation on the implant surface. Implant surface topography plays an important role in regulating biological factors that guide the development of the bone-implant interface (Fig. 28).²² For this reason, endosseous implants must never be reused even in the same patient.

A modified ovate pontic has the following advantages: 1. excellent esthetics because it produces a correct emergence profile, 2. provides adequate function, 3. more convenient hygiene, 4. an effective seal preventing air or saliva leakage, 5. presents a natural contour of the free gingival margin and interdental papilla, 6. eliminates or minimizes "black triangles" between the teeth, and 7. little or no ridge augmentation is required prior to the final restoration (Fig. 16).²³

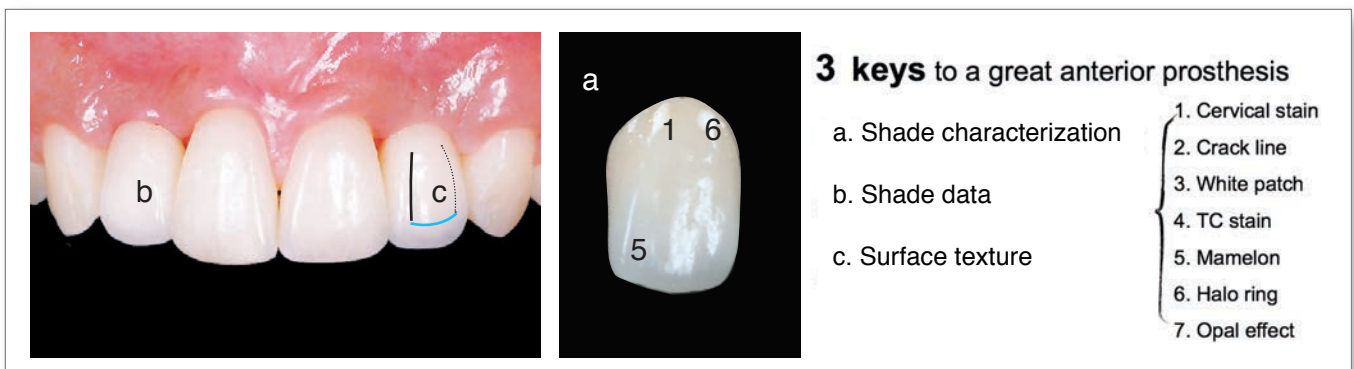
Planning tooth contacts, connectors, and embrasures is important for restoring an appropriate smile. The connector (*also referred to as the interdental contact area*) is where the incisors and canines "appear" to touch. The contact point is greatest between the central incisors and tends to progress apically from the midline to the posterior dentition. The embrasures are the triangular space incisal to the contact area,

and they should become larger as the teeth progress posteriorly. The gingival shape of the mandibular incisors and the maxillary lateral incisors should exhibit a symmetrical half-oval or half-circular shape. The maxillary centrals and canines should exhibit a gingival shape that is more elliptical. Thus, the gingival zenith, the most apical point of the gingival tissue, is located distal to the longitudinal axis of the maxillary central incisors and canines. The gingival zenith of the maxillary lateral and mandibular incisors should coincide with their longitudinal axis. (Figs. 32 and 42).²⁴ The loss of papilla can lead to a cosmetic deformities called “black triangle disease” which may result in phonetic problems and lateral food impaction. Reconstruction of a lost interdental papilla is one of the most challenging and least predictable procedures. Abnormal tooth shape may contribute to a “missing” papilla, and appropriate restorative techniques may be used as a creeping procedure to displace soft tissue to simulate a new papilla. By a prosthetic reshaping of the contours of the teeth, the contact point may be lengthened and located more apically to reduce the embrasure to enhance coronal displacement of the interdental gingiva to simulate a papilla (Fig. 42).²⁵

There are 3 keys for creating an esthetic anterior prosthesis:

1. Shade characterization
2. Shade data
3. Surface texture (Fig. 43).

The porcelain mix is created by mixing porcelain powder with liquid, and applying it to the crown with a paintbrush. Tissue paper is used to absorb any excess moisture. The pink colored porcelain turns more yellow to simulate dentine underneath the enamel of a natural tooth. A white porcelain mix turns into a light colored, transparent porcelain when fired, which replicates the natural appearance of enamel. The dental technician must increase the size of the crown because the porcelain shrinks slightly during firing. A photograph is used to adjust the shade of the porcelain, and layers are then built up to match the appearance as the patient’s adjacent teeth. After firing, a bur is used to grind the porcelain into the desired shape to match the adjacent teeth. The curved surface of the tooth is smooth to match the other teeth, and it’s size is adjusted as needed. A final furnace firing program



■ Fig. 43: 3 keys to a great anterior prosthesis including: 1. shade characterization, 2. shade data, 3. surface texture.

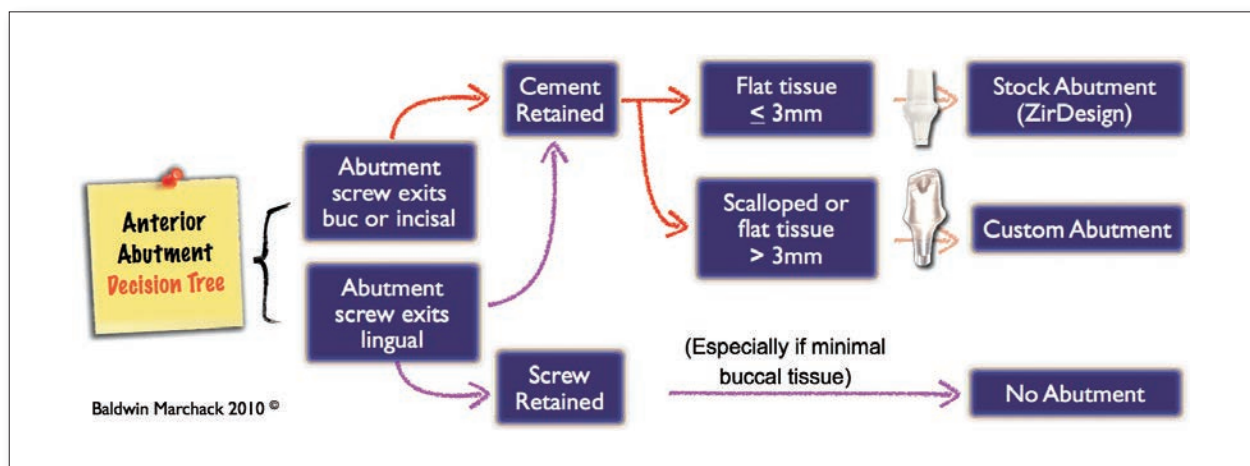
is used to glaze the crown and produce a shiny, natural finish.

A common technique to prepare for fixed prosthetic impressions is packing a cord in the gingival sulcus to control bleeding and assist in achieving good retraction of soft tissue before inserting the impression material. Packing a double retraction cord in the sulcus achieves better tissue displacement and results in a superior impression which facilitates a better result for the laboratory, dentist and patient. Packing two cords has distinct advantages over a single cord: 1. restoration margins are better defined and less likely to result in a deformed impression. 2. In a deep sulcus, using two cords helps prevent tissue from collapsing over the top of a single cord. Tissue collapse restricts access of the impression material to the restoration margins and can cause the material to tear (Fig. 40).²⁶

In 2009, Dr. Baldwin Marchack (<http://simpletooth.com>) successfully copyrighted "*The Abutment Decision Tree*" which includes flowcharts to simplify

the decision making process when clinicians arrive at the restorative phase of a patient's implant treatment. "*The Abutment Decision Tree*" focuses on principles and guidelines for selecting appropriate abutments and designing definitive prostheses for the single posterior or anterior implant, as well as for multiple implants to achieve optimal restorations. The presentation is of interest to both the experienced and novice practitioner, because it enhances the decision making which enables the restorative dentist to collaborate with the surgeon, and direct the laboratory technician relative to the design of each partially or fully edentulous implant procedure (Fig. 44).

ZirDesign™ is a two-piece component, fabricated in zirconia that is easily customized to provide an anatomically correct prosthetic solution with pristine esthetics. The color of the abutment offers a favorable base for creating outstanding esthetic porcelain work. ZirDesign™ works with all existing crown materials and the restoration can be luted with glass-ionomer or composite cement.



■ Fig. 44: "*The Abutment Decision Tree*" copyrighted by Dr. Baldwin Marchack.

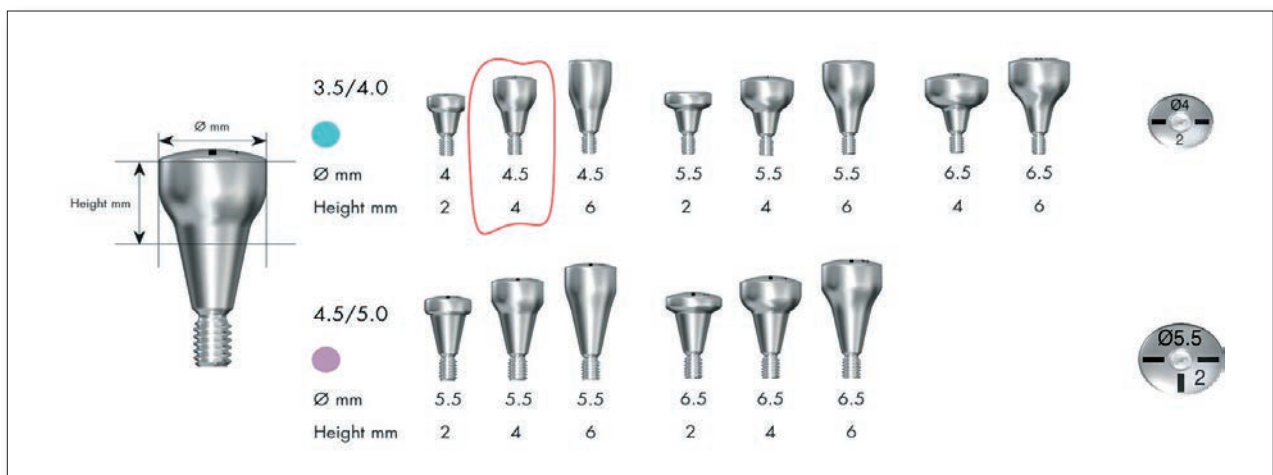
ZirDesign™ abutments can also be prepared by hand or secured in an Implant Replica. Note that water spray cooling is used to avoid creating micro-cracks due to overheating. Design the preparation with a shoulder or a chamfer to support an all-ceramic crown. Be sure to preserve rounded inner corners, and avoid sharp edges and corners to ensure a good fit between the abutment and the all-ceramic crown. Any inadvertent grinding below the final crown margin should be polished, preferably using a silicon rubber wheel with diamond paste. Cement the crown onto the abutment, and the permanent cementation can be performed with glass-ionomer or composite cement depending on the type of restoration. Zirconia cannot be etched. To bond it to the abutment, keep the surface rough to provide adequate mechanical retention.²⁷

Healing abutments are the screws placed after second-stage surgery and before the prosthesis insertion. They are available in different lengths to

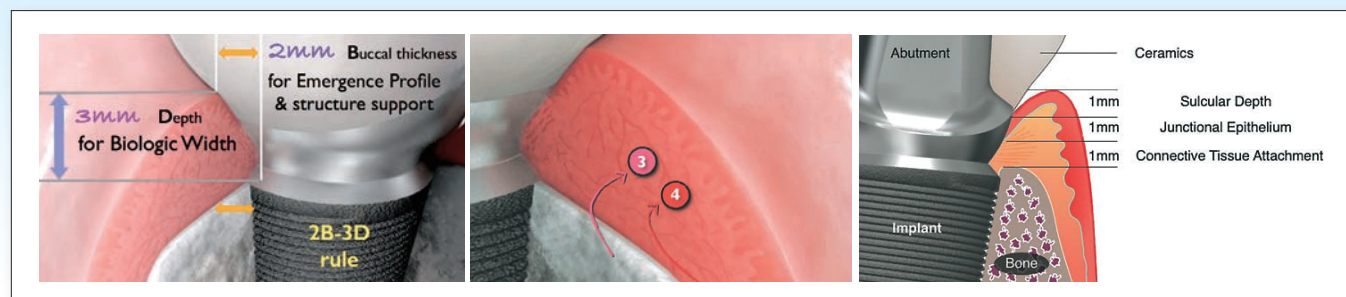
project through the soft tissue into the oral cavity. They may be screwed directly into the fixture or in some systems, onto the abutment during second-stage surgery.

When esthetics is paramount, healing should be completed around the healing abutment to stabilize the gingival margin prior to crown fabrication. Healing abutments of appropriate length are then selected to ensure that the metal porcelain interface of the restoration is situated subgingivally (Fig. 45).²⁸

Based on the biologic evidence, the 2B-3D rule is an ideal implant placement guide.² What is the 2B-3D rule? 2mm of buccal bone thickness should be preserved and the implant should be placed 3mm below the future prosthesis cervical margin. This 2B-3D rule is a practical guide, for both single implants or full mouth rehabilitation, to achieve ideal implant positions. When these conditions can not be satisfied at the time of implant placement, bone



■ Fig. 45: Healing abutments of appropriate length were selected to ensure that the metal porcelain interface of the restoration extends subgingivally.



■ Fig. 46:

2mm of buccal bone thickness helps prevent gingival recession because it provides for a more abundant collateral blood supply (3) from the cortical bone as well as within (4) the adjacent connective tissue. The implant head should be placed **3mm apical** to the future labial prosthesis margin position in order to allow development of the desired emergence profile, esthetics, and biological width.

augmentation with GBR, bone reduction, lingually positioning of the implant or a smaller implant diameter may be necessary to ensure long-term stability of both hard and soft tissues (Fig. 46).²

Conclusion

Implants are commonly used to replace congenitally missing lateral incisors in orthodontic patients, but the restorations are often challenging because the alveolar crest is too narrow for the implant and may require bone augmentation. When the orthodontist opens the space, the papilla heights are adversely affected, and some patients have altered passive eruption after treatment that affects the level of the gingival margins.

Orthodontists typically limit tooth-reshaping to incisal edge adjustment. However, effective interdisciplinary treatment requires an effective interaction by all the clinicians to achieve an excellent smile. Dentists can control tooth shape by adding or taking away from the tooth, crown, or laminate.

The pleasing result achieved for the present patient required a series of complex clinical procedures, including removal and repositioning of the original implants. Because of the manner in which the complications were handled, this case report provides important information for clinicians. Carefully analyzing the outcomes provides an opportunity to improve clinical methodology and develop a more comprehensive treatment philosophy for future patients.

This difficult malocclusion ($DI = 20$) was treated to a very good alignment ($CRE = 7$), and both the patient and the clinician were pleased with the results.

Acknowledgment

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Discrepancy Index Worksheet

TOTAL D.I. SCORE

20

OVERJET

0 mm. (edge-to-edge)	=	
1 – 3 mm.	=	0 pts.
3.1 – 5 mm.	=	2 pts.
5.1 – 7 mm.	=	3 pts.
7.1 – 9 mm.	=	4 pts.
> 9 mm.	=	5 pts.

Negative OJ (x-bite) 1 pt. per mm. per tooth =

Total

0

OVERBITE

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

Total

0

ANTERIOR OPEN BITE

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

Total

0

LATERAL OPEN BITE

2 pts. per mm. per tooth

Total

0

CROWDING (only one arch)

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

Total

0

OCCLUSION

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

Total

2

LINGUAL POSTERIOR X-BITE

1 pt. per tooth

Total =

0

BUCCAL POSTERIOR X-BITE

2 pts. per tooth

Total =

0

CEPHALOMETRICS

(See Instructions)

ANB $\geq 6^\circ$ or $\leq -2^\circ$ = 4 pts.Each degree $< -2^\circ$ _____ x 1 pt. = _____Each degree $> 6^\circ$ _____ x 1 pt. = _____

SN-MP

 $\geq 38^\circ$ = 2 pts.Each degree $> 38^\circ$ _____ x 2 pts. = _____ $\leq 26^\circ$ = 1 pt.Each degree $< 26^\circ$ _____ x 1 pt. = _____I to MP $\geq 99^\circ$ = 1 pt.Each degree $> 99^\circ$ _____ x 1 pt. = _____

Total

0

OTHER

(See Instructions)

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

Identify:

Total

10

IMPLANT SITE

Lip line : Low (0 pt), Medium (1 pt), High (2 pts)

= _____

Gingival biotype : Low-scalloped, thick (0 pt), Medium-scalloped, medium-thick (1 pt), High-scalloped, thin (2 pts)

= 1x2=2

Shape of tooth crowns : Rectangular (0 pt), Triangular (2 pts)

= 2x2=4Bone level at adjacent teeth : ≤ 5 mm to contact point (0 pt), 5.5 to 6.5 mm to contact point (1 pt), ≥ 7 mm to contact point (2 pts)

= _____

Bone anatomy of alveolar crest : H&V sufficient (0 pt), Deficient H, allow simultaneous augment (1 pt), Deficient H, require prior grafting (2 pts), Deficient H&V (3 pts)

= 1x2=2

Soft tissue anatomy : Intact (0 pt), Defective (2 pts)

= _____

Infection at implant site : None (0 pt), Chronic (1 pt), Acute (2 pts)

= _____

Total

8

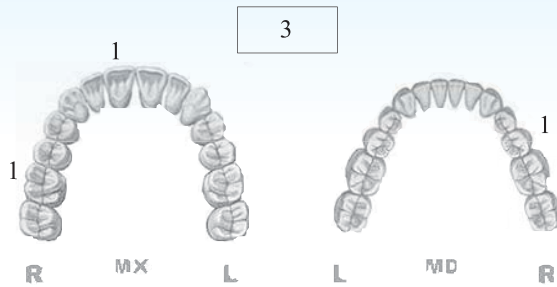
Cast-Radiograph Evaluation

Case #

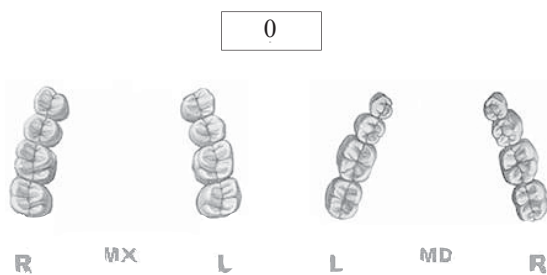
Patient

Total Score: **7**

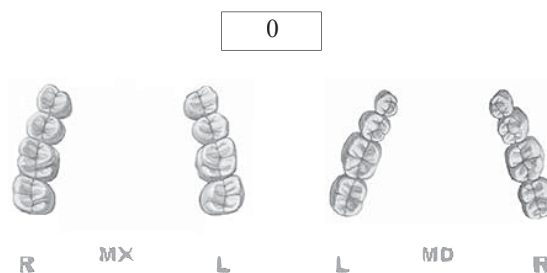
Alignment/Rotations



Marginal Ridges



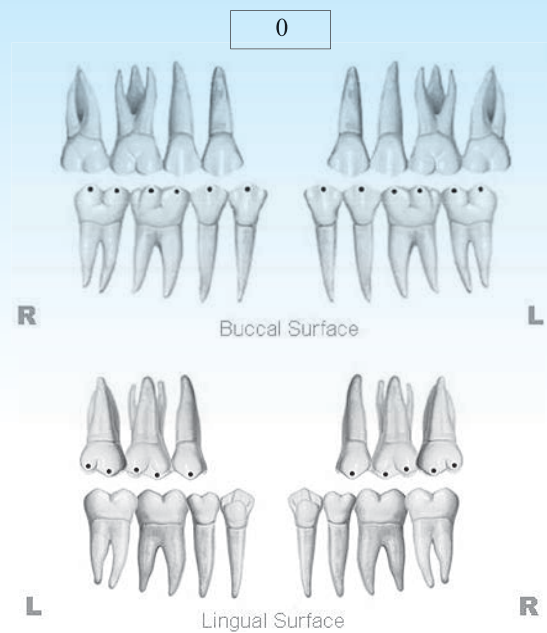
Buccolingual Inclination



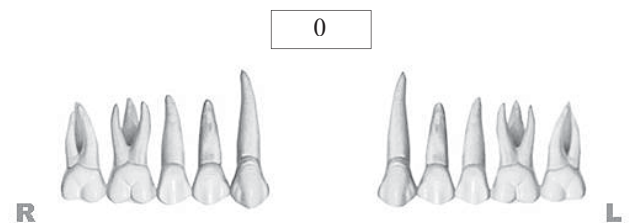
Overjet



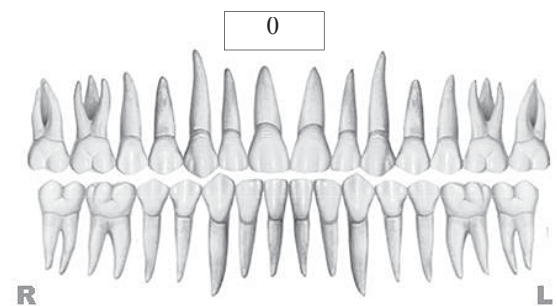
Occlusal Contacts



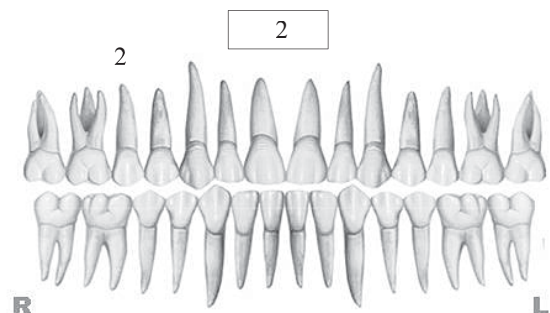
Occlusal Relationships



Interproximal Contacts



Root Angulation

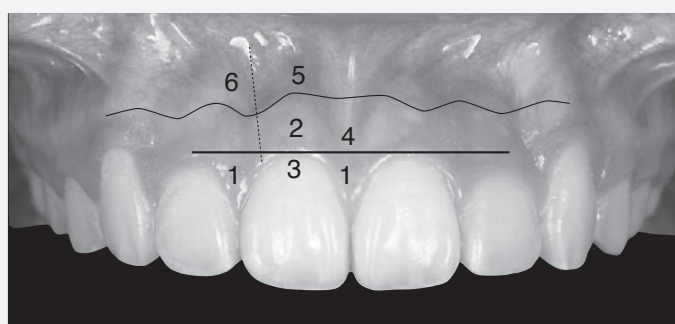


INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink & White Esthetic Score

Total Score: = **5**

1. Pink Esthetic Score



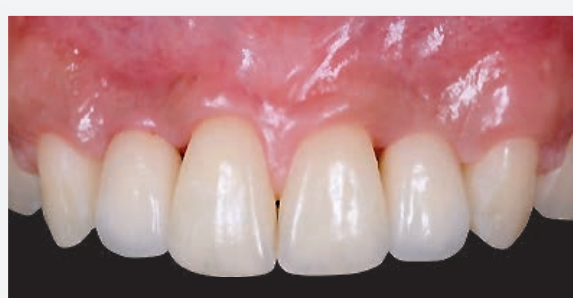
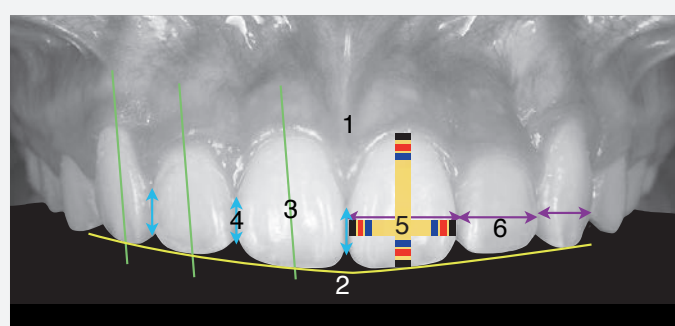
Total = **2**

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

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

2. White Esthetic Score (for Micro-esthetics)

Total = **3**

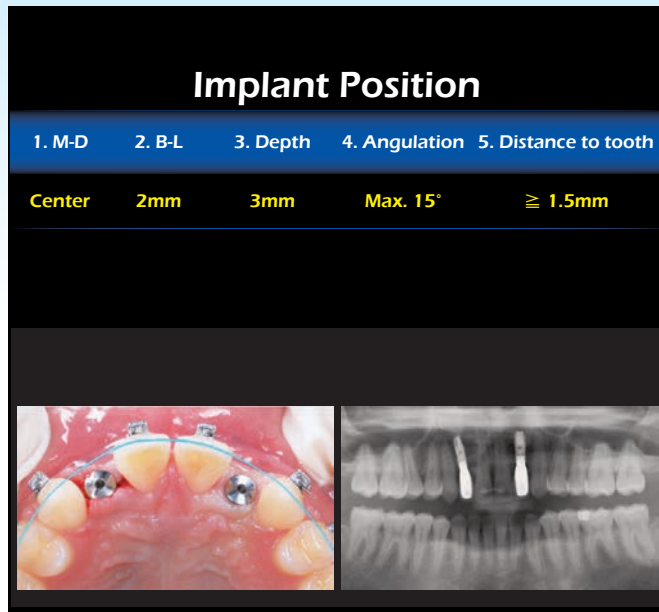


1. Midline	0	1	2
2. Incisor Curve	0	1	2
3. Axial Inclination (5°, 8°, 10°)	0	1	2
4. Contact Area (50%, 40%, 30%)	0	1	2
5. Tooth Proportion (1:0.8)	0	1	2
6. Tooth to Tooth Proportion	0	1	2

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

Implant-Abutment Transition & Position Analysis

3. Implant Position

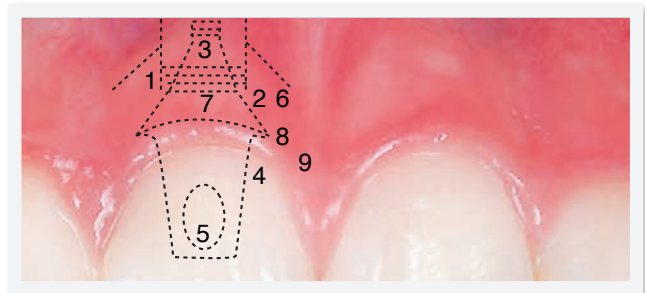


Total = **1**

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

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

4. Abutment transition Contour



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

Total = **1**

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

- | | | | |
|------------------------------|----------|----------|-----------------|
| 1. Fixture Cervical Design | N | Y | bone level |
| 2. Platform Switch | N | Y | platform |
| 3. I-A Connection Type | E | I | 11° morse taper |
| 4. Abutment Selection | S | C | cement-retained |
| 5. Screw Hole Position | P | B | incisor |
| 6. Marginal Bone Loss | 0 | 1 | 2 |
| 7. Modified Gingival Contour | 0 | 1 | 2 |
| 8. Gingival Height | 0 | 1 | 2 |
| 9. Crown margin fitness | 0 | 1 | 2 |

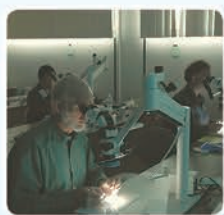


南加大植牙專科進修課程 2015

時間：7/19~20, 2015 (日, 一 - 演講與實作 workshop)
9/20~21, 2015 (日, 一 - 演講與實作 workshop)
11/22~23, 2015 (日, 一 - 演講與實作 workshop)
1/25, 2016 (一 - 美國演講)
1/27, 2016 (三 - 美國可選修的 cadaver workshop)
1/29~30, 2016 (五, 六 - 美國演講, 畢業典禮)
8/30, 2015 (日 - 視訊教學)
10/18, 2015 (日 - 視訊教學)
12/13, 2015 (日 - 視訊教學)
1/26, 2016 (二 - 美國演講)
1/28, 2016 (四 - 美國可選修的 cadaver workshop)
1/31, 2016 (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 24 號 (2015 年 7 月到 12 月)
USC Campus and Millennium Biltmore Hotel Los Angeles. 506 South Grand Avenue. Los Angeles, CA 90071-2607

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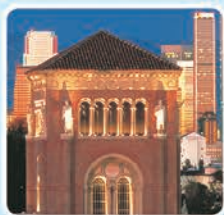
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西班牙

地中海鑲復學院 (MPI) 進修團

主辦單位：金牛頓藝術科技

時間：2015年4月15~22日

地點：Castellón, Spain

行程安排

- | | |
|----------|--|
| 04/15 | 台灣出發 |
| 04/16 | 抵達巴塞隆納 |
| 04/17~18 | 自選行程：巴塞隆納觀光－狂野藝術重鎮 |
| 04/19 | 自選行程：瓦倫西亞觀光
抵達Castellón－西班牙地中海風情 |
| 04/20~21 | MPI 課程：進階假牙講座及模型操作
伴有遊艇觀光，佛朗明哥舞蹈及豐富特色餐點 |
| 04/22 | 離開巴塞隆納 |
| 04/23 | 抵達台灣 |

團費及內容

- (1) 課程學費：81000元台幣（2000歐元）/ 2天
含全彩紙本講義，電子黑白講義，
全套假牙（含軟硬組織、下顎頭骨等）模型組，及MPI紀念品。
- (2) 巴塞隆納市區觀光：未定，含當地導遊。
- (3) 瓦倫西亞觀光：4000台幣，含當地導遊。
- (4) 六天住宿費 / 雙人房：12,000台幣
- (5) 當地交通：未定
- (6) 機票 / 經濟艙：45,000台幣，預計搭乘國泰 + 瑞士航空

以上費用皆為暫定，共計**約15萬台幣**。

預計招收人數：**20人**，南加大植牙課程校友及學員優先。

報名方式：03-5735676 或 course@newtonsa.com.tw 朱央如



Full-Cusp Class II Malocclusion with Bilateral Buccal Crossbite (Scissors-Bite) in an Adult

Abstract

Full-cusp Class II malocclusion with posterior buccal crossbite and an overjet exceeding 10mm, usually requires orthognathic surgery for an optimal correction. However, the use of extra-alveolar bone screws for anchorage has expanded the therapeutic envelope for conservative, nonextraction treatment. The dentoalveolar correction was facilitated by a 5-7mm retraction of the entire maxillary arch to achieve a Angle Class I molar relationship. Near ideal dental alignment was accomplished with passive self-ligating brackets, early light short elastics, posterior cross elastics, and bite turbos on lower molars. This challenging malocclusion with a discrepancy index (DI) of 22 was treated in 26 months to a Cast-Radiograph Evaluation (CRE) score of 22 and a Pink & White Esthetic Score of 3. (Int J Ortho Implantol 2015;37:60-79).

Key words:

excessive overjet, Angle Class II molar relationship, OrthoBoneScrew, extra-alveolar miniscrews, posterior buccal crossbite, Damon self-ligating brackets, early light short elastic, posterior criss-cross elastics, posterior bite turbos.

History and Etiology

A 25-year-old male patient presented for orthodontic consultation with two chief concerns: facial esthetics and crooked teeth (Figs. 1-3). There was no contributory medical or dental history. The etiology of the malocclusion was consistent with ectopic eruption of the permanent 1st molars into a buccal crossbite relationship, and a long-term lip trap, i. e. habitual posturing of the lower lip between the mandibular and maxillary incisors. Despite the severity of the malocclusion (DI 22), the patient was treated to an excellent result without orthognathic surgery (Figs. 4-6). Pre-treatment and post-treatment radiographic documentation is presented in Figs. 7 and 8, respectively. The pre-treatment cephalometric analysis (Table 1) revealed a modest Class II skeletal pattern (ANB 5°) with a mandibular plane angle (SN-MP 30°) that was within normal limits. Horizontally impacted mandibular 3rd molars were noted in pre-treatment panoramic radiograph (Fig. 7). Following extraction of all four third molars, 26 months of active treatment produced a well aligned (CRE 22) dentition with Class I buccal segments and a much improved esthetic appearance (Figs. 4-9). The details for diagnosis and treatment will be discussed below.

Dr. Ming-Jen Chang,

Lecturer, Beethoven Orthodontic Course (Left)

Dr. Ming-Wei Wei,

Instructor, Beethoven Orthodontic Course (Left)

Dr. Chris Chang,

Founder, Beethoven Orthodontic Center

Publisher, International Journal of Orthodontics & Implantology (middle)

W. Eugene Roberts,

Consultant, International Journal of Orthodontics & Implantology (right)



■ Fig. 1: Pre-treatment facial photographs



■ Fig. 4: Post-treatment facial photographs



■ Fig. 2: Pre-treatment intraoral photographs



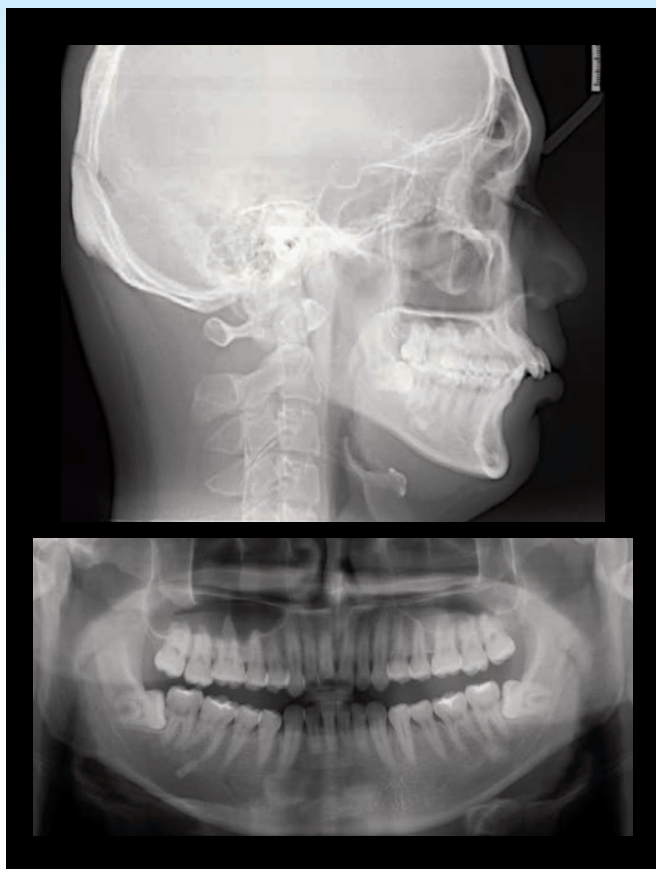
■ Fig. 5: Post-treatment intraoral photographs



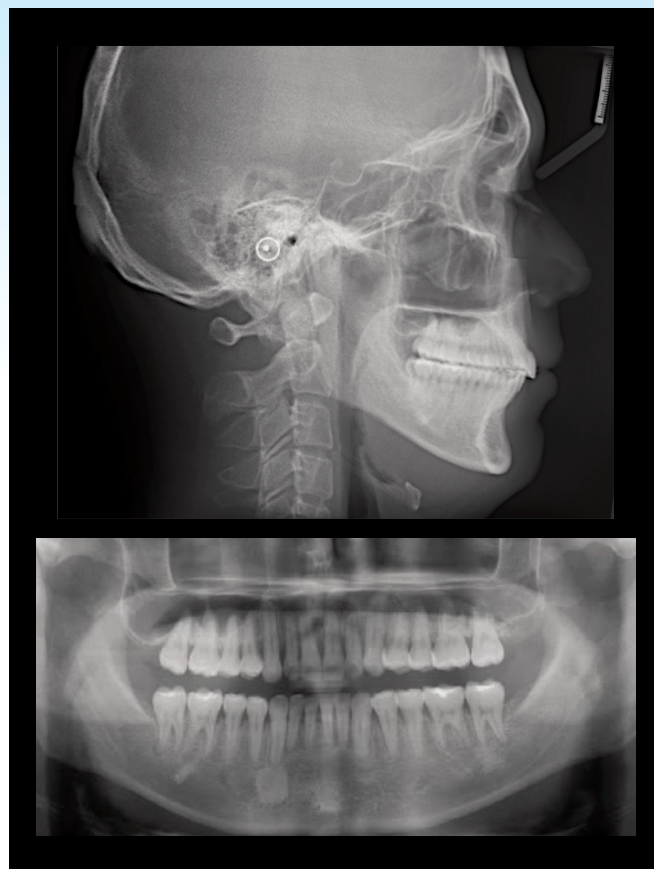
■ Fig. 3: Pre-treatment study models (casts)



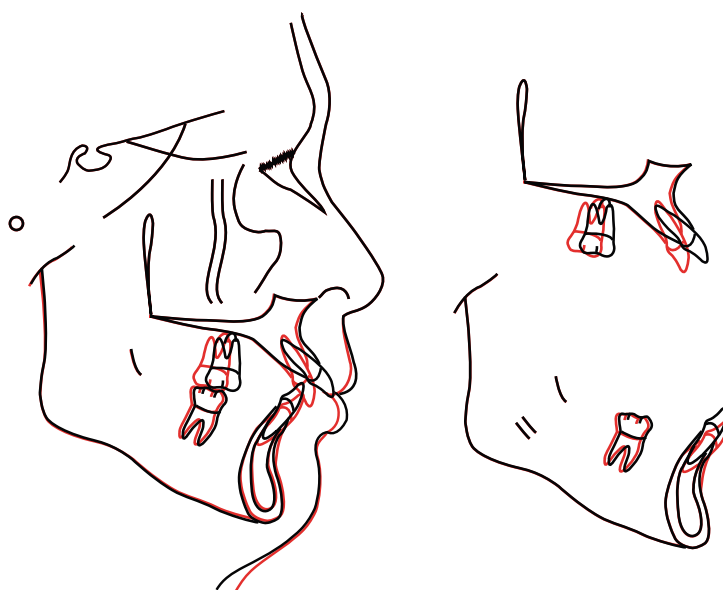
■ Fig. 6: Post-treatment study models (casts)



■ **Fig. 7:**
Pre-treatment panoramic and lateral cephalometric radiographs



■ **Fig. 8:**
Post-treatment panoramic and lateral cephalometric radiographs



■ **Fig. 9:**
Superimposed tracings of pre-treatment (black) and post-treatment (red) lateral cephalometric radiographs document the skeletal and dental treatment.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	89°	88°	1°
SNB°	84°	84°	0°
ANB°	5°	4°	1°
SN-MP°	30°	28°	2°
FMA°	23.5°	21.5°	2°
DENTAL ANALYSIS			
U1 TO NA mm	10 mm	4 mm	6 mm
U1 TO SN°	129°	108°	21°
L1 TO NB mm	6 mm	7 mm	1 mm
L1 TO MP°	96°	101°	5°
FACIAL ANALYSIS			
E-LINE UL	0 mm	-2 mm	2 mm
E-LINE LL	3 mm	-1 mm	4 mm

■ Table 1: Cephalometric summary

Diagnosis

Skeletal:

1. Skeletal Class I (SNA 89°, SNB 84°, ANB 5°)
2. Mandibular plane angle (SN-MP 30°, FMA 23.5°) was within normal limits (WNL)

Dental:

1. Bilateral Angle Class II malocclusion (5mm)
2. The overbite was 5 mm and overjet was 10 mm
3. Mild crowding: 2 mm in the upper, and 3 mm in the lower arch
4. Bilateral maxillary 2nd and 3rd molars were in buccal cross bite
5. Maxillary 3rd molars were erupted, and the mandibular 3rd molars were horizontally impacted

Facial:

Acceptable profile and slightly protrusive lower lip

The ABO Discrepancy Index (DI) was 22¹ as shown in the subsequent worksheet.

Specific Objectives of Treatment

Maxilla (all three planes):

- A - P: *Retract*
- Vertical: *Maintain*
- Transverse: *Make coincident with the lower arch*

Mandible (all three planes):

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

Maxillary Dentition

- A - P: *Retract the entire arch to correct buccal interdigitation*
- Vertical: *Maintain*
- Inter-molar Width: *Constrict in the 2nd molar area*

Mandibular Dentition

- A - P: *Maintain*
- Vertical: *Maintain*
- Inter-molar / Inter-canine Width: *Maintain*

Facial Esthetics: Correct lip protrusion

Treatment Plan

Complying with the patient's desire to avoid orthognathic surgery and the extraction of any teeth except the 3rd molars, a treatment plan was

proposed to place extra-alveolar (E-A) bone screws (2x12mm OrthoBoneScrew®, Newton's A Ltd, Hsinchu, Taiwan) into the infrazygomatic crests bilaterally, to retract the entire maxillary arch. Posterior bite turbos and bilateral posterior criss-cross elastics were applied to facilitate bite opening and correct the bilateral posterior buccal crossbite. Class II early light short elastics (ELSE) were used to retract the upper anterior teeth and reduce the overjet.

In the last phase of active treatment, section the maxillary archwire distal to the canines, and use vertical elastics to settle in the maxillary buccal segments to the finished the mandibular arch. Remove the fixed appliances and retain the corrected dentition with upper & lower clear retainers.

Appliances and Treatment Progress

Treatment was initiated after all the 3rd molars were extracted (Fig. 10). The bracket system was a Damon Q® .022" slot self-ligating appliance (Ormco, Glendora, CA). To counter the side effects of Class II elastics, the maxillary anterior teeth were bonded with high

torque brackets. The initial archwire was .014" CuNiTi with resin "pearls" bonded on the ends to prevent mucosal irritation.

After one month of initial alignment and leveling in the upper arch, the lower arch was bonded, utilizing low torque brackets in the mandibular anterior region, and fitted with a .014" CuNiTi archwire (Fig. 11). Buttons were bonded on the lingual surfaces of both lower 2nd molars (Fig. 12) and cross elastic (Chipmunk 1/8, 3.5oz) were used in the second molar area bilaterally. At the same appointment, posterior bite turbos (composite resin bonded on the occlusal surface) were placed on both mandibular 1st molars to open the bite to facilitate correction of the bilateral buccal crossbite (Fig. 13). The first 5 months of treatment was dedicated to correcting the posterior crossbites.

Four months after the initiation of treatment, the maxillary archwire was replaced with a .016" NiTi wire. One month later, the posterior crossbites were corrected, the cross elastic were stopped, and drop in hooks were inserted into the brackets of the bilateral upper 1st premolars. The patient was



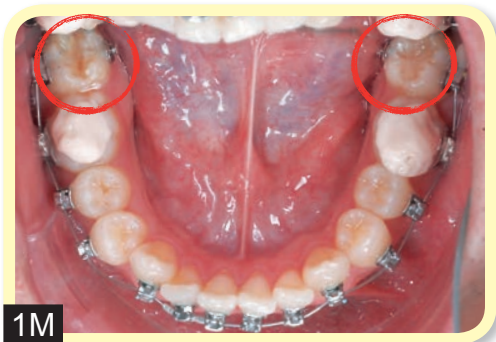
■ Fig. 10:

Prior to treatment there was an asymmetric excessive overjet that precluded placing lower anterior brackets without preliminary alignment of the upper arch and/or the use of posterior bite turbos.



■ Fig. 11:

To counter the effect of Class II elastics, the maxillary anterior teeth were bonded with high torque brackets and the low torque brackets were selected for the lower anterior teeth.



■ Fig. 12:

Buttons were bonded on the lingual surface of the lower 2nd molars bilaterally.

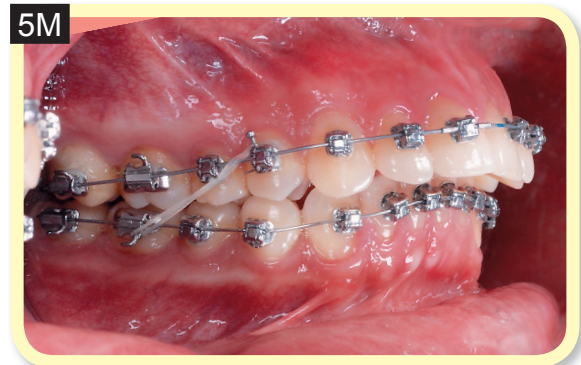


■ Fig. 13:

Cross elastics were attached bilaterally from the upper 2nd molars to the lower 2nd molars. Posterior bite turbos were placed on the mandibular 1st molars to open the bite for crossbite correction.

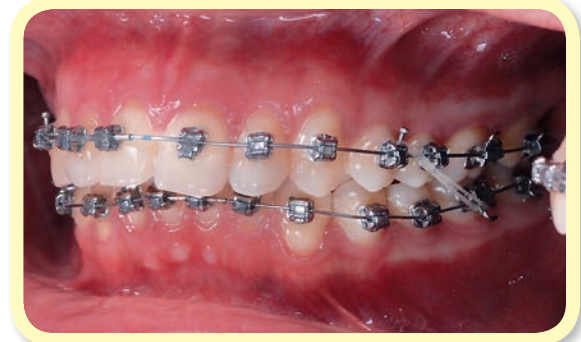
instructed to wear Class II early light short elastics (*Hummingbird* 1/8, 2oz.) bilaterally from the upper 1st premolars to the lower 1st molars to retract the upper anterior teeth and reduce the overjet (Fig. 14).

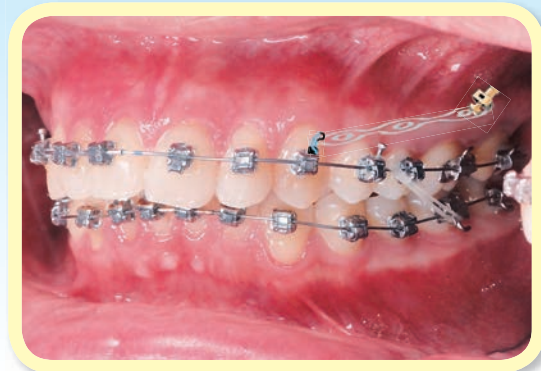
Six months into active treatment E-A bone screws (2x12mm *OrthoBoneScrew*®, *Newton's A Ltd, Hsinchu, Taiwan*) were implanted bilaterally in the infrazygomatic crests. Drop in hooks were inserted into the brackets of the upper canines, and elastometric chains were attached from the upper canines to the E-A screws to retract the maxillary anterior segment (Fig. 15). At the same appointment, the archwires were changed to .018" NiTi in the upper arch and .016" NiTi in the lower arch.



■ Fig. 14:

Class II early, light short elastics were worn bilaterally full time, from the upper 1st premolars to the lower 1st molars to retract the upper anterior teeth and reduce the overjet.

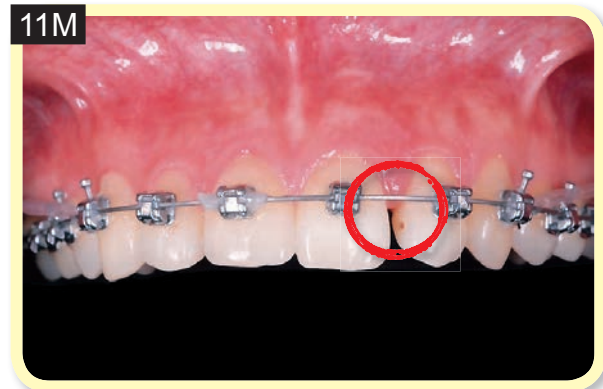




■ Fig. 15:

Extra-alveolar bone screws (2x12mm OrthoBoneScrew®, Newton's A Ltd.) were implanted bilaterally into the infrazygomatic crests. Drop in hooks were inserted into the brackets of the bilateral upper canines. Using elastometric chains attached from the upper canines to the screws to retract the maxillary anterior segment.

In the 8th month, archwire changes were .014x.025" CuNiTi in the upper and .018" NiTi in the lower. One month later, a .017x.025" low friction TMA archwire was used on the maxillary arch open coil springs were placed between the left central and lateral incisors to open a space for restoration of the mesial caries on the upper left lateral incisor (Fig. 16). A .014x.025" CuNiTi archwire was used on the mandibular arch.

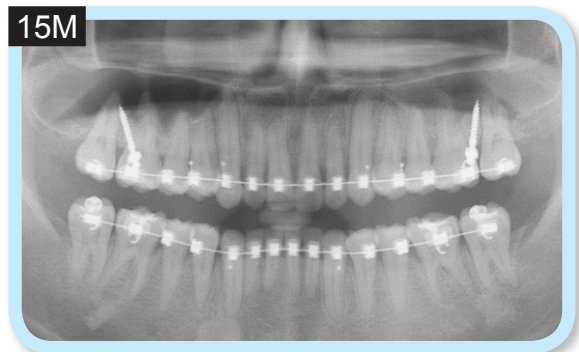


■ Fig. 16:

An open coil spring was used to open space for the restoration of mesial caries on the upper left lateral incisor.

In the 13th month, the archwire was changed to .016x.025" stainless steel (SS) in the upper arch, and .017x.025" low friction TMA in the lower arch. The bimaxillary anterior segments were ligated with a figure-eight tie using a .012" SS.

After 15 months of active treatment, a progress panoramic radiography was exposed to evaluate axial inclinations and reposition brackets on inadequately aligned teeth (Fig. 17). The interproximal contact of upper and lower incisors were stripped as needed to reduce the black triangles (Fig. 18). One month later, the archwire was changed to a .016x.025" SS in the lower arch. The excessive anterior overjet was improved from 10 mm to 3 mm.



■ Fig. 17:

A progress panoramic radiography was taken to evaluate the relationship between axial inclination and bracket position of each tooth.



■ Fig. 18:

The interproximal contact of upper and lower incisors were stripped to reduce the black triangles. After interproximal enamel reduction, an elastomeric chain was applied to close the space. Reshaping the crowns and closing space produced a more harmonious tooth contours.

In the 18th month, all brackets were repositioned as needed to achieve a precise finished alignment, and a .014x.025" CuNiTi archwire was used in the upper arch. Two months later the buccal posterior crossbite on the right side was tending to relapse, so cross elastics (*Chipmunk* 1/8, 3.5oz) were used again on the right second molars. The upper archwire was changed to .016x.025" SS and full arch elastomeric chains were applied to close all residual spaces.

22nd month after the initial of treatment, the anterior overjet was reduced to 1.5 mm. Class II elastics (*Bear* 1/4, 4.5oz.) were worn bilaterally full time, from the upper canines to the lower 1st molars and cross elastics were stopped.

After 23 months of active treatment, outcome assessment was performed on prefinish records to evaluate treatment progress and plan the finishing sequence of treatment (Figs. 19-22).

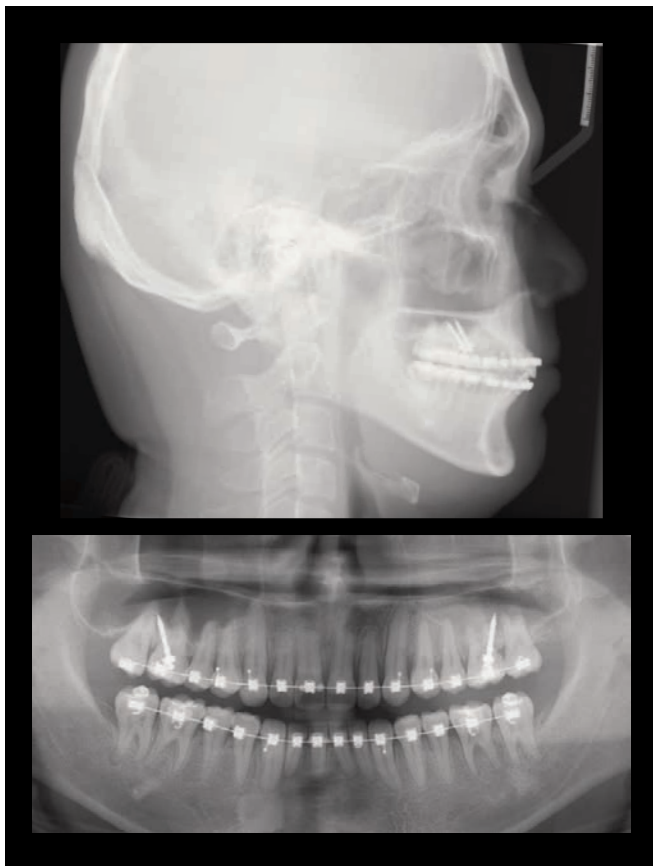


■ Fig. 19:

Interim-treatment facial and intraoral photographs at 23 months of treatment



■ **Fig. 20:**
Interim-treatment study models at 23 months of treatment



■ **Fig. 21:**
Interim-treatment pano and cephalometric radiographs at 23 months of treatment

Interim-Treatment Progress

Date of Records: 23 months after initial treatment

Maxilla:

- A - P: *Retract*
- Vertical: *Maintain*
- Transverse: *Reduced to coincide with the lower arch*

Mandible:

- A - P: *Anteriorly positioned*
- Vertical: *Maintain*
- Transverse: *Maintain*

Maxillary Dentition:

- A - P : *Molars and incisors retracted*
- Vertical: *Molars and incisors maintained*
- Inter-molar Width: *Constricted*
- Inter-canine Width: *Expanded*
- Buccolingual Inclination: *Excessive*

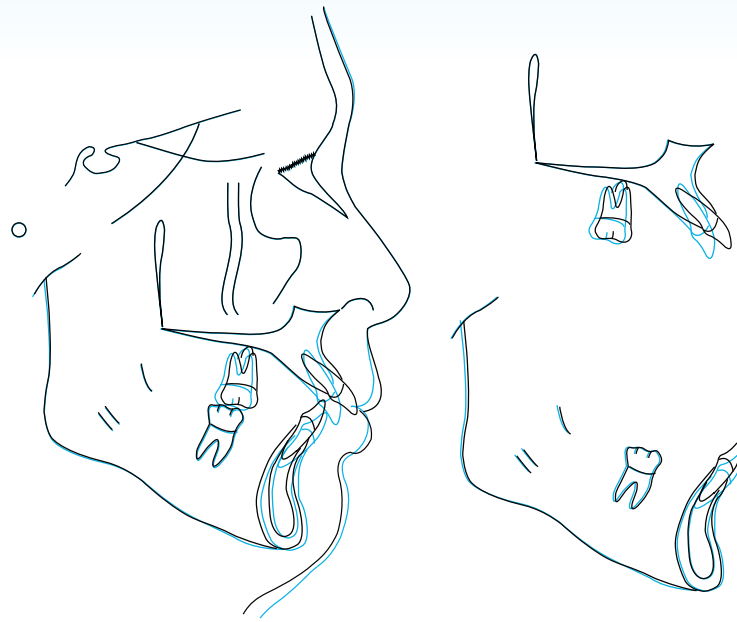
Mandibular Dentition:

- A - P: *Molars maintained, incisors intruded with increased axial inclination*
- Vertical: *Molars and incisors maintained*
- Inter-molar Width: *Decreased*
- Inter-canine Width: *Expanded*
- Buccolingual Inclination: *Maintained*

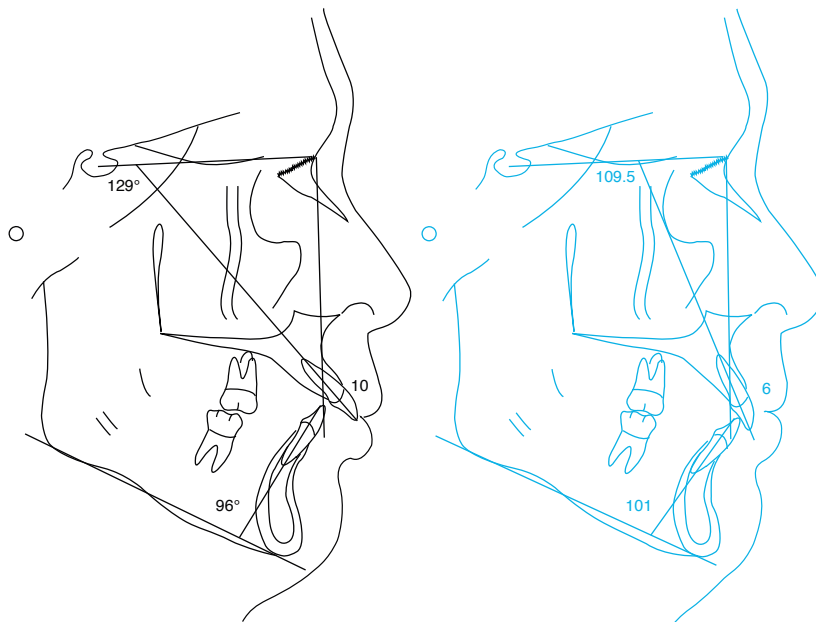
Anticipated Future Treatment

The interim-treatment (*prefinish*) revealed substantial improvement in the overjet, bilateral posterior

buccal crossbite and lower lip protrusion (Fig. 19). Axial inclination of the upper incisors had been reduced from 129° to 109.5° , U1-SN (mm) was reduced from 10 to 6 mm, but the L1-MP angle was increased from 96° to 101° (Fig. 23).



■ Fig. 22: Interim-treatment superimposed tracings at 23 months of treatment



■ Fig. 23:

Interim-treatment cephalometric tracings revealed that flaring of the upper incisors had been reduced from 129° to 109.5° . U1-SN (mm) was reduced from 10 mm to 6 mm, and the L1-MP was increased from 96° to 101° .

The CRE (*Cast-Radiograph Evaluation*) progress score is routinely used about six months before debonding to check for remaining discrepancies. Panoramic radiography was used to check the angulation of dentition in order to reposition brackets.

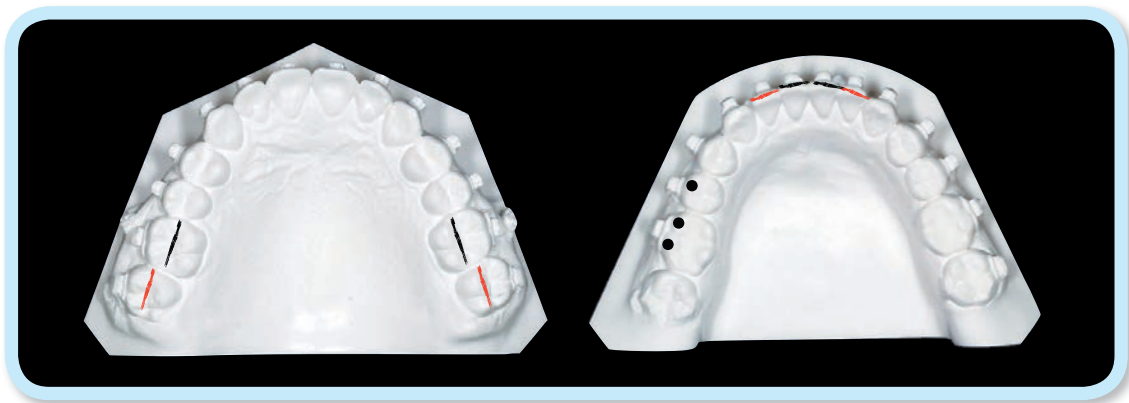
The aim of the prefinish evaluation was to reduce the CRE score from 40 to no more than 26 points.

The following to do list is based on progress CRE score of 40 was expected to be accomplished in about 3 months:

1. Detailed bending to correct multiple rotations (Fig. 24).
2. Retract the upper anterior segment to reduce the overjet (Fig. 25).

3. Arch coordination to improve the occlusal relationship and dental contacts (Fig. 26).

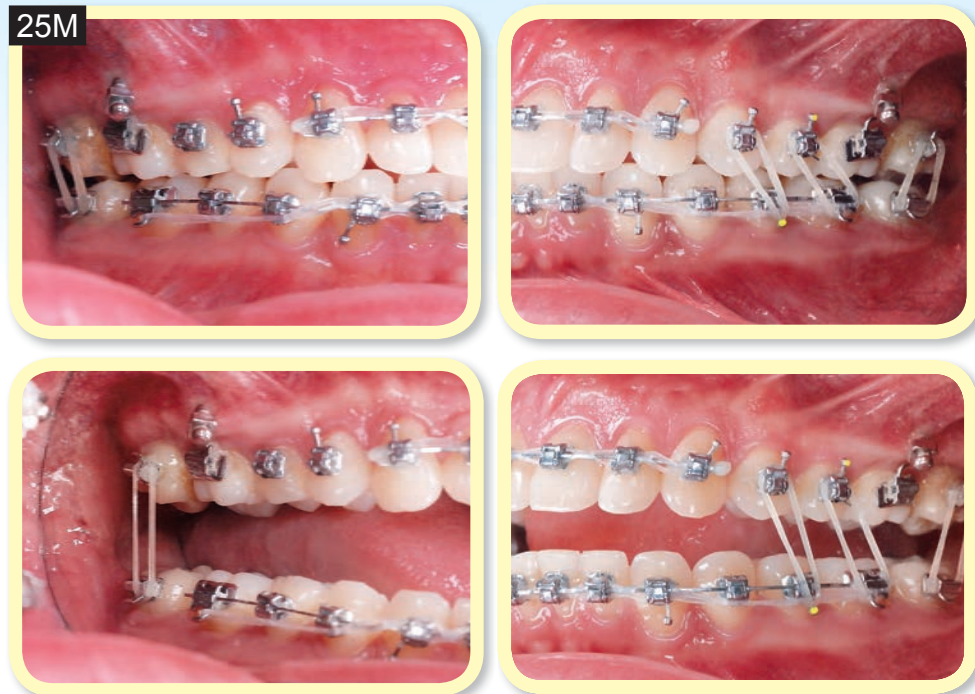
During the last 3 months of treatment, finishing bends and vertical elastics were used to efficiently finish the occlusion. One month prior to the completion of active treatment, the upper archwire was sectioned distal to the cuspids, and the lower archwire was cut distal to the 1st molars. Up and down (*vertical*) elastics (*Chipmunk 1/8, 3.5oz*) were used to improve the the intermaxillary contacts of the posterior teeth (Fig. 26).² After 26 months of active treatment, all appliances were removed, and clear overlay retainers were delivered for both arches.



■ Fig. 24: Detailed bending were used to correct rotations in the upper 2nd molars and the lower anterior region.



■ Fig. 25: The upper anterior segment was retracted with Class II elastics to reduce the overjet.



■ Fig. 26:

Arch coordination was used to improve occlusal relationship and contacts. The upper archwire was sectioned distal to the cuspids, and the lower archwire was cut distal to the 1st molars. Up and down (vertical) elastics (Chipmunk 1/8, 3.5oz) were used to improve the the intermaxillary contacts of the posterior teeth.

Results Achieved

Maxilla (all three planes):

- A - P: Retracted
- Vertical: Maintained
- Transverse: Coincident with lower arch

Mandible (all three planes):

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

Maxillary Dentition

- A - P: Retraction of the entire maxillary arch
- Vertical: Maintain

- Inter-molar Width: Coincident with lower arch

Mandibular Dentition

- A - P: Maintain
- Vertical: Intrude incisors
- Inter-molar / Inter-canine Width: Maintain

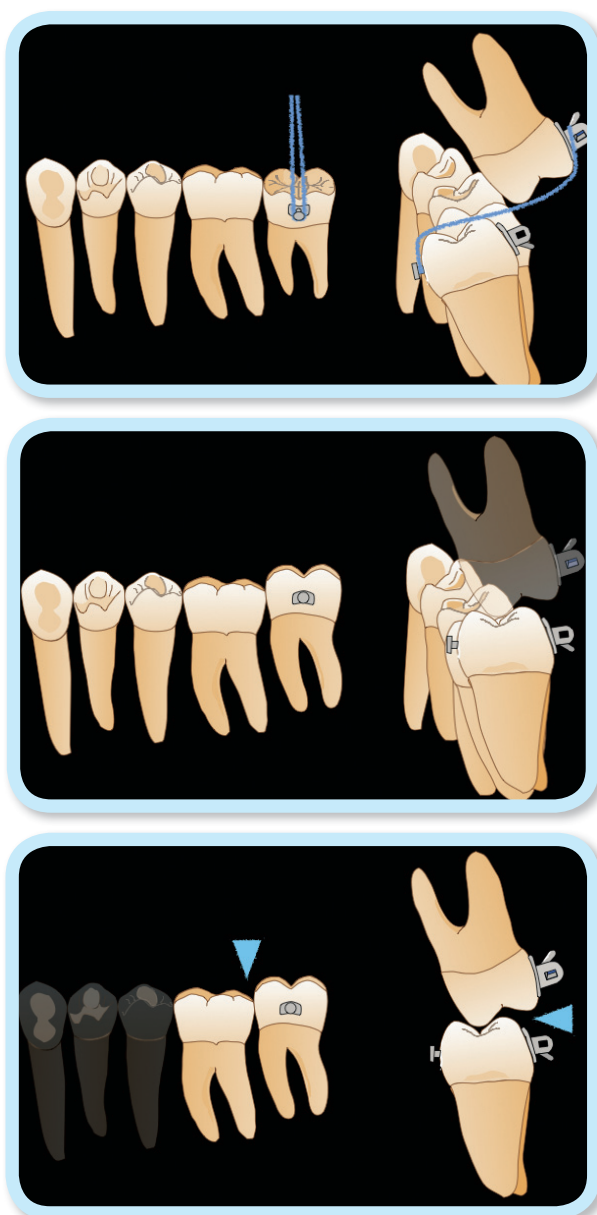
Facial Esthetics: Retraction of both lips

Retention

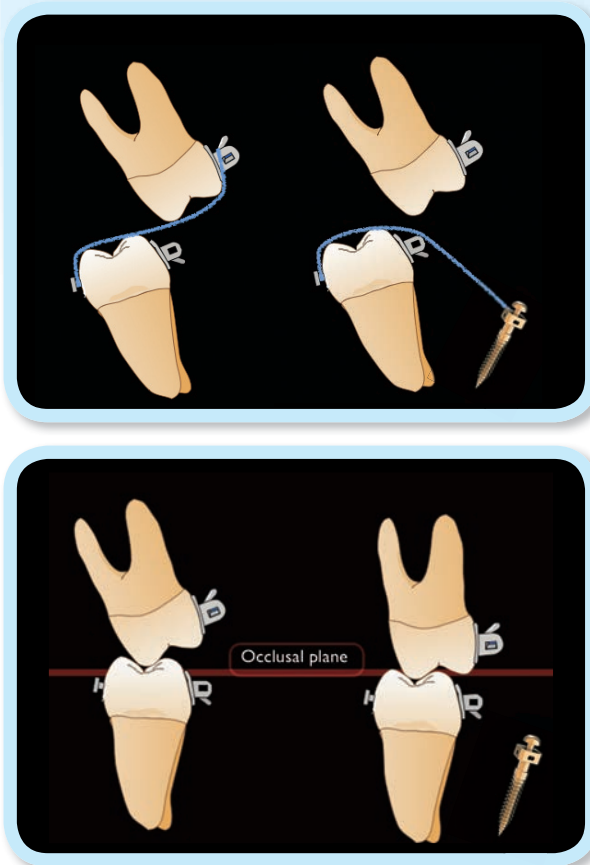
Upper and lower clear overlays were delivered, with the instructions for full time wear for the first 6 months and nights only thereafter. The patient was instructed in home care as well as in maintenance of the retainers.

Final Evaluation of Treatment

The final ABO CRE score¹ was 22 points. The major residual discrepancies were: alignment / rotation 5 points, marginal ridges 5 points, buccal overjet 5 points, and occlusal contact 4 points. Most of the CRE problems involved the maxillary 2nd molars (Figs. 27 and 28).



■ **Fig. 27:**
A side effect of the cross elastics was extrusion of the 2nd molars producing marginal ridge discrepancies.



■ **Fig. 28:**
The extrusive nature of cross elastics (left) is compared to the intrusive and uprighting force delivered via the extra-alveolar bone screws (right). Thus, the pre-mature contact between the maxillary 2nd molar palatal cusps and the central fossae of the mandibular 2nd molars is a side effect of the cross elastics.

The major esthetic concerns, severe overjet and protrusive lips, were well corrected and a solid Class I molar relationship was achieved. The bilateral buccal crossbites (scissors-bite) were well corrected.

Discussion

Excessive overjet may have an extrinsic etiology due to habits such as thumb sucking or overuse of pacifiers at a young age. Probably the most common cause of overjet is a lower lip trap which may be

secondary to oral habits. An excessive overjet greatly increases the risk of injuring the protruded upper front teeth. Malaligned teeth can render the biting of food difficult or impossible, and excessive overjet may result in speech impediments. Incompetent lips due to excessive overjet may present an unattractive appearance, subjecting a child to teasing and poor psychosocial development.

Excessive overjet ($>10\text{mm}$) in an adult usually requires orthognathic surgery,³ but no treatment should be rendered without a thorough evaluation of the dental and facial patterns. The first impression for the present patient may be an underlying skeletal discrepancy that is associated with flared incisors and soft tissue protrusion.⁴ Although the ANB angle was 5° , the severe flaring of the maxillary incisors is more directly related to a long-term lower lip trap. The lack of a severe skeletal discrepancy favors conservative management of the Class II malocclusion rather than resorting to orthognathic surgery.

In an adult, correcting a full unit Class II molar relationship is a challenging task. Extracting maxillary first premolars and finishing in a Class II molar relationship is a typical approach, but that would be difficult to achieve for the present patient because his buccal segments were already in a full cusp Class II occlusion. Furthermore, the patient wanted to avoid extractions and orthognathic surgery, so the viable option was extra-alveolar bone screws in the infrazygomatic crests (IZC) to retract the entire maxillary arch.⁵⁻⁶ With a combination of precise diagnosis and reliable mechanics, the present severe malocclusion was resolved in 26 months without extractions or orthognathic surgery.

At the beginning of treatment, the bilateral buccal crossbite was the first priority.⁷ Posterior bite turbos with cross elastics were used for the early correction of the crossbite. These straight forward mechanics successfully corrected the buccal crossbite within 5 months, but side effect of the cross elastics compromised the result with regard to alignment of maxillary second molars. The CRE score documented multiple problems with 2nd molar alignment, including steps between mandibular molars (*Fig. 27*), and pre-mature contact between the maxillary 2nd molar palatal cusps and the central fossa of the mandibular 2nd molars (*Fig. 28*). There were multiple 2nd molar alignment problems: 1. excessive buccal overjet, 2. marginal ridge discrepancy, and 3. occlusal contact discrepancies. Second molar intrusion with E-A bone screws helped to offset some of the molar alignment problems by delivering an intrusive force (*Figs. 27 and 28*).⁸

Extra-alveolar bone screws in the IZCs were used for anchorage at about 6 months into treatment when a .014"x.025" CuNiTi upper archwire was in place. Low-friction self-ligating brackets enhance alignment of malposed teeth,⁹ but the relatively small archwire does not fill the slot, so retraction forces may rotate teeth and create marginal ridge discrepancies. Carefully monitoring of changes in occlusion and tooth angulation is important for well-controlled early retraction of the buccal segments.

Torque selection is very important for full arch retraction. High torque brackets on maxillary incisors and low torque braces on mandibular incisors counters the changes in axial inclination that are expected with E-A retraction forces and Class II

elastics.¹⁰ The entire maxillary dentition was retracted about 6mm (*Table 1*), and a 1mm proclination of the lower incisors was necessary to resolve the 10mm overjet. Torque control and finishing bends in the archwires were required during finishing. Additional finishing bends and/or bracket repositioning for the maxillary 2nd molars would have improved the CRE score. However, it is difficult to perceive 2nd molar alignment problems intraorally, so a set of pre-finish casts about 3-6 months before the end of active treatment is very helpful. In retrospect, the second molar problems could have been corrected when the largest archwire (.017x.025" TMA) was in place.

Precise diagnosis is a key to successful treatment. The dental relationship for the present case appeared to be a skeletal Class II div.1 malocclusion; however, the skeletal relationship was only an ANB of 5° (*Table 1*) so the malocclusion was primarily a dentoalveolar problem. If Class II div.1 cases have reduced lower facial height and a low FMA angle,¹¹ excessive masseter muscle force is probable.¹² The etiology of the current Class II div 1 malocclusion appears to be the result of a poor oral habit: lower lip trap. Myofunctional therapy (MFT) is important for long term success following active orthodontic treatment to correct habit-induced malocclusions. Tongue and lip posture training are important adjuncts during the retention phase.¹³

The post-treatment cephalometric radiograph suggests a reduced pharyngeal airway (*Fig. 8*) so possible respiratory problems should be monitored

during retention. If the patient develops obstructive sleep apnea (OSA) symptoms, additional treatment may be indicated.¹⁴

Conclusion

Correction of a full cusp Class II malocclusion with a 10mm overjet in an adult usually requires extractions and/or orthognathic surgery. Improved diagnostic methods and the development of extra-alveolar bone screws anchorage has introduced a new paradigm for correction of severe dentoalveolar malocclusions without extractions or extensive surgery. Furthermore, the method is highly efficient because up to 6 mm of maxillary retraction was achieved in 26 months of active treatment time.¹⁵

Careful diagnosis and simplified mechanics are important for soliciting patient compliance. The rapid progression of treatment and the simplified mechanics facilitated oral hygiene and provided a positive experience for the patient. The patient's oral habits should be managed with MFT and his potential for OSA should be monitored.

Acknowledgment

Thanks to teacher Paul Head for proofreading this article.

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Discrepancy Index Worksheet

TOTAL D.I. SCORE 22

OVERJET

0 mm. (edge-to-edge)	=	
1 – 3 mm.	=	0 pts.
3.1 – 5 mm.	=	2 pts.
5.1 – 7 mm.	=	3 pts.
7.1 – 9 mm.	=	4 pts.
> 9 mm.	=	5 pts.

Negative OJ (x-bite) 1 pt. per mm. per tooth =

 Total = 5

OVERBITE

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

 Total = 3

ANTERIOR OPEN BITE

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

 Total = 0

LATERAL OPEN BITE

2 pts. per mm. per tooth

 Total = 0

CROWDING (only one arch)

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

 Total = 2

OCCCLUSION

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

 Total = 8

LINGUAL POSTERIOR X-BITE

 1 pt. per tooth Total = 0

BUCCAL POSTERIOR X-BITE

 2 pts. per tooth Total = 4

CEPHALOMETRICS (See Instructions)

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

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

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

SN-MP

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

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

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

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

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

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

 Total = 0

OTHER (See Instructions)

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

Identify:

 Total = 0

IMPLANT SITE

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

 Total = 0

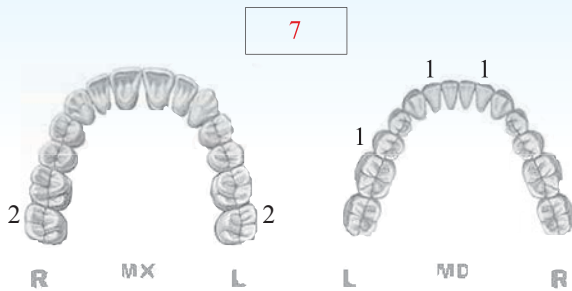
Cast-Radiograph Evaluation

Interim-Treatment Progress

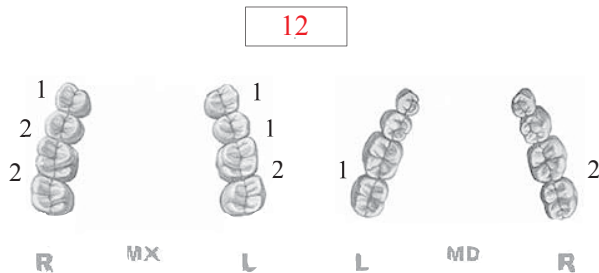
Case # 1 Patient

Total Score: **40**

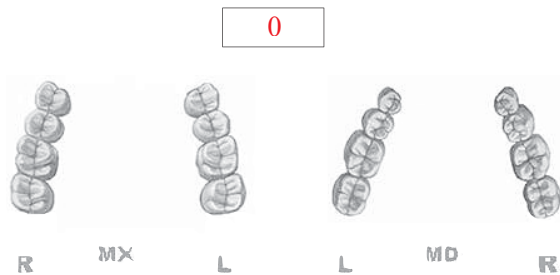
Alignment/Rotations



Marginal Ridges



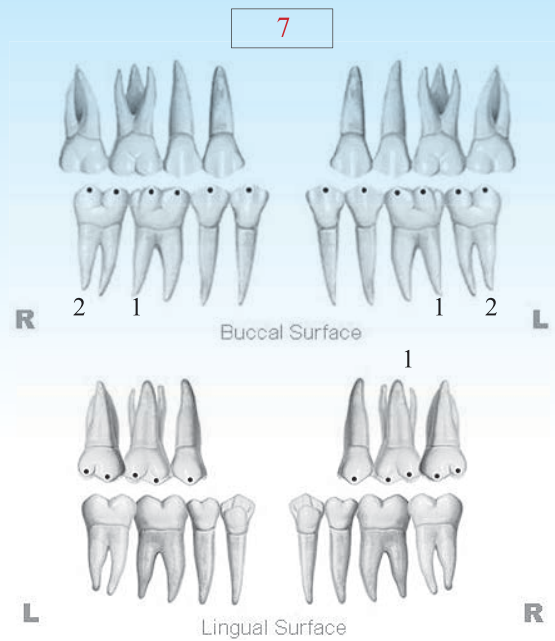
Buccolingual Inclination



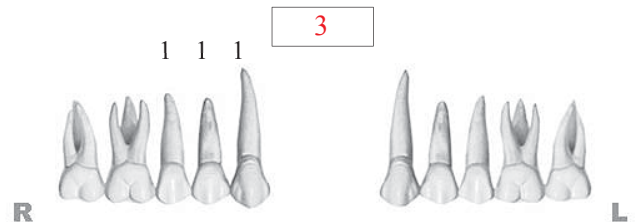
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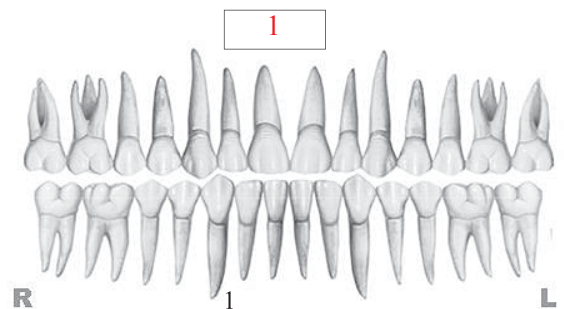
Occlusal Contacts



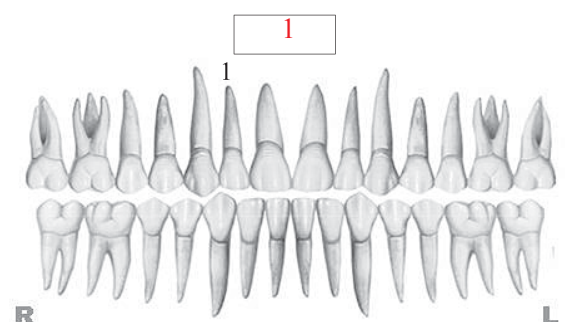
Occlusal Relationships



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.

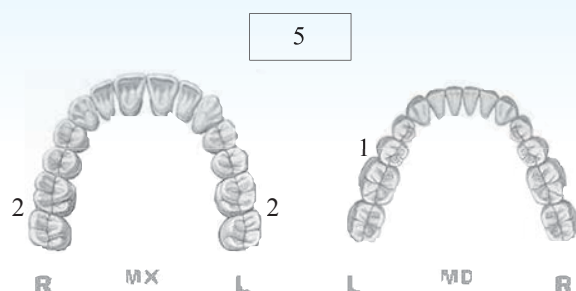
Cast-Radiograph Evaluation

Interim-Treatment Progress

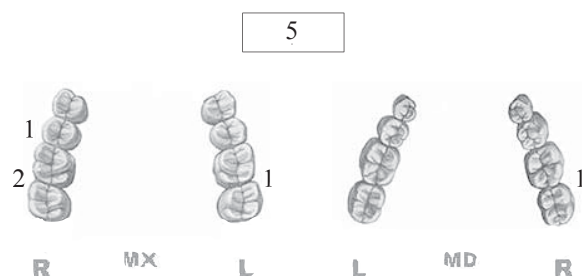
Case # 1 Patient

Total Score: **22**

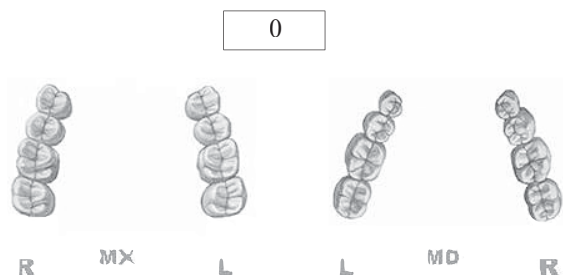
Alignment/Rotations



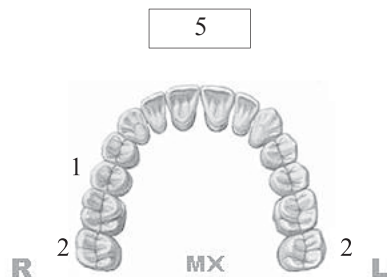
Marginal Ridges



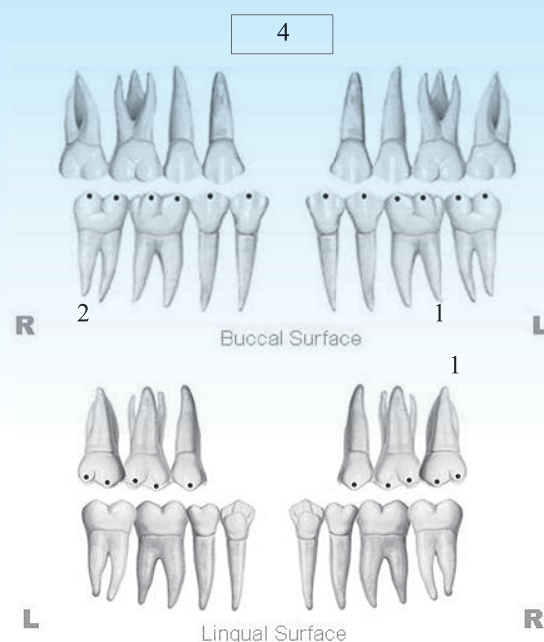
Buccolingual Inclination



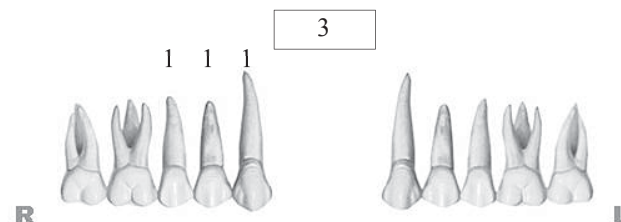
Overjet



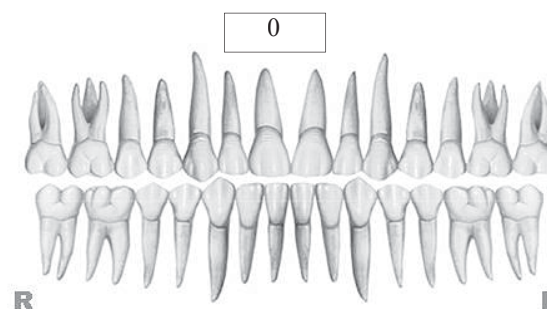
Occlusal Contacts



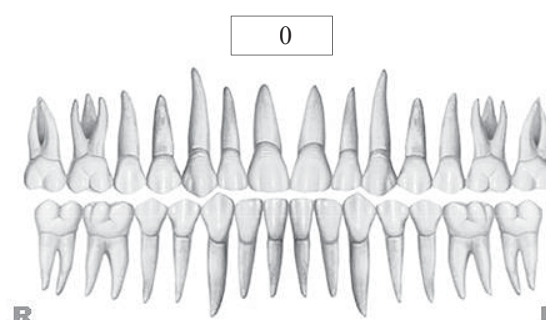
Occlusal Relationships



Interproximal Contacts



Root Angulation

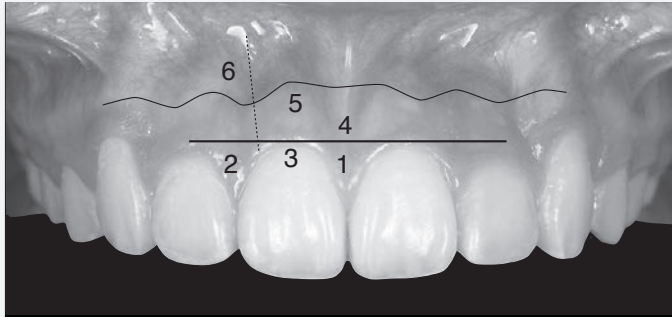


INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink & White Esthetic Score

Total Score: = **3**

1. Pink Esthetic Score

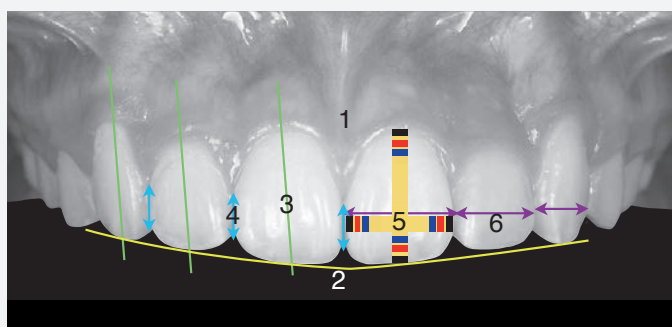


1. Mesial Papilla	0	1	2
2. Distal Papilla	0	1	2
3. Curvature of Gingival Margin	0	1	2
4. Level of Gingival Margin	0	1	2
5. Root Convexity (Torque)	0	1	2
6. Scar Formation	0	1	2

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

Total = **1**

2. White Esthetic Score (for Micro-esthetics)



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

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

Total = **2**

Beethoven International Damon, OBS & VISTA Workshop

2015 6/16~6/19, 12/1~4



LECTURER: Dr. Chris Chang

CEO, Beethoven Orthodontic and Implant Group. He received his PhD in bone physiology and Certificate in Orthodontics from Indiana University in 1996. As publisher of *International Journal of Orthodontics & Implantology*, he has been actively involved in the design and application of orthodontic 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 consultant to *International Journal of Orthodontics & Implantology*.

Dear Chris:

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

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



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

Dear Chris:

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

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



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

For more information and registration, visit

<http://iworkshop.beethoven.tw>



Like

Chris Chang



On Facebook



VISTA for Impacted Cuspid In-house Workshop (Pig Jaw)



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

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



VISTA:
Vertical Incision Subperiosteal Tunnel Access

Keynote Workshop

Make your presentation great

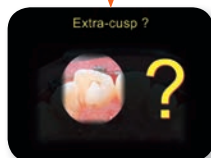
"I've been a Keynote user and lecturer for 9 years. In June I had the opportunity to attend Newton's A's Introductory Keynote course. To my surprise, I still learn a lot from this supposed to be basic course.

If you think this is a computer course that will show you step-by-step how to use the application, please reconsider. This course is to teach you hands-on, clinical presentation tips. After this course I'm sure that any of you can go back and give a better presentation in your daily dental practice.

If you want to improve communication in your practice, and with patients, this 8-hour course is definitely worth it."

~ **Dr. Rungsi Thavarungkul, Thailand**

Lecturer, Advanced Keynote Animation and Illustration Workshop



Damon, OBS & VISTA



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 Cuspid
- 10:00—10:10 Break
- 10:10—12:30 Damon + Screw *Dr. John Lin*
- 12:30—13:30 Lunch
- 14:00—17:00 VISTA for Impacted Cuspid 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

Damon & OBS Workshop

includes two half-day lectures, two half-day chair-side observation sessions, one model practice and one surgical hands-on 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.

Fees: USD 2,600

Early bird rate:
USD 200 off by 2015 4/16, 9/24

Keynote Presentation workshop

includes one day 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 local transportation, meals and one nights of shared accommodation (double occupancy).

Fees: USD 500

Early bird rate:
USD 100 off by 2015 4/16, 9/24

Registration:

A 50% deposit is required to complete registration.

To make a payment by wire, please contact us at course@newtonsa.com.tw or call +886-3-5735676 for more information.



2015

3/22 09:00-17:00

從青少年矯正到 合併植牙治療的省思

主講：張慧男及貝多芬團隊



徐玉玲

安徒生兒童牙科院長
貝多芬矯正課程講師
國際矯正植牙學會院士



曾淑萍

彼德潘牙醫診所院長
台中大大兒童牙醫診所醫師
國際矯正植牙學會院士



彭緯綸

安徒生兒童牙醫診所醫師
成大醫學中心兒童牙科代訓醫師
國際矯正植牙學會院士



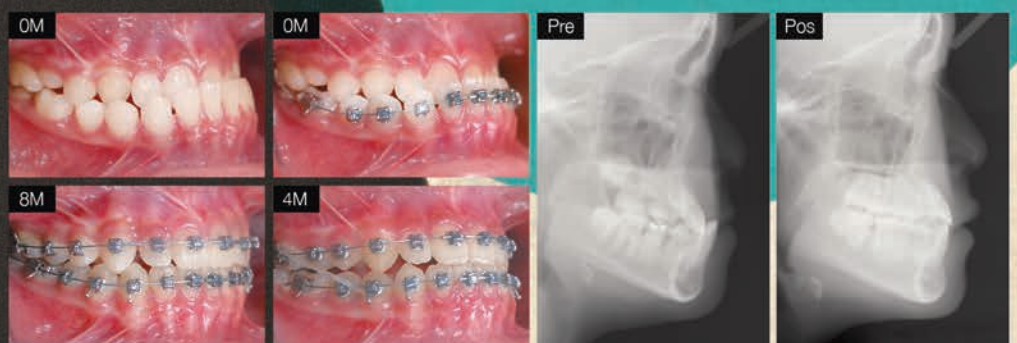
曾令怡

高雄醫學大學學士
小雅牙醫診所醫師
國際矯正植牙學會院士

早期矯正治療 的綜合考量



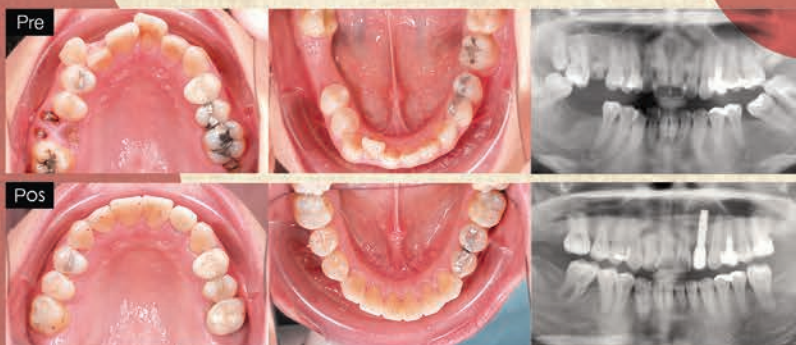
兒童牙科的早期治療主要在處理萌發中的恆齒問題，以促進骨骼的正常發展，並減輕日後矯正的複雜度。因此，早期治療的重點在於解決眼前的局部問題，但臨床上卻缺乏針對患者整體情況做出完整診斷、擬定全面的治療計畫，並依據此計畫決定適當的介入時機。講者將整理多年經驗並明確指出臨床診斷依據，幫助我們決定什麼樣的情況該進行早期介入，而哪些往往是造成消耗病患治療熱情，以及醫師延長治療時間的早期治療陷阱。希望透過本演講可以協助醫師輕鬆判斷「如何執行」或「不執行」早期治療。



2

矯正與植牙 合併治療的思考流程

矯正與植牙的聯結，是目前的牙醫趨勢。植牙前，經由矯正治療能夠給予牙齒妥善的空間規劃；矯正中，透過預先補骨、補肉可以改善植牙環境，甚至藉由放置植體來減少後續骨整合所需的時間，並作為矯正的錨定，矯正與植牙的關係實在密不可分。因此，現今患者越來越能夠接受矯正與植牙兩者的合併治療，治療計畫的安排與思考流程乃越趨重要。張慧男醫師將帶領貝多芬與金牛頓團隊示範矯正與植牙合併治療的病例，並延伸探討兩者間合併治療的注意事項，引領大家從治療開始到結束，一步步地檢視這類案例的處理要點。



蘇笙璋

金牛頓植牙中心院長
南加大植牙課程台灣負責人
國際矯正植牙學會院士



陳惠華

成大口醫部牙周病科兼任主治醫師
建志牙醫診所主治醫師
國際矯正植牙學會院士



林詩詠

長青牙醫聯盟特聘專任醫師
諾貝爾牙醫診所副院長
國際矯正植牙學會院士



李雙安

高雄醫學大學牙醫學士
滿祥聯合牙醫診所醫師
國際矯正植牙學會院士

演講 時刻表

早期矯正治療的綜合考量

09:00~10:10 曾令怡+彭緯綸 / 張慧男

10:40~12:10 曾淑萍+徐玉玲 / 張慧男

12:00~13:00 午餐

矯正與植牙合併治療的思考流程

13:00~14:30 李雙安+林詩詠 / 張慧男

15:00~16:30 陳惠華+蘇笙璋 / 張慧男

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

演講地點：國立成功大學醫學院第三講堂（台南市小東路1號）

費用：3/13前北醫及台南市牙醫師公會會員1500元，
非會員 2000元，研究生及住院醫師 800元。

3/13後北醫及台南市牙醫師公會會員2500元，
非會員 3000元，研究生及住院醫師 1500元。

報名專線 07-226-0030 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

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輕鬆製作簡報

繪圖簡報達人

最新版 Keynote Workshop 高效簡報學習法 系列課程



K1 簡報聖經 2015.07.09

學習重點：1. 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 2015.08.06

學習重點：1. Dr. Kokich 十大演講秘訣 2. 準備演講九步驟 3. 多媒體剪輯

K3 賈伯斯令人目眩神迷的五項演講技巧 2015.09.03

學習重點：1. 賈伯斯五項演講技巧 2. 幻燈片設計概念 3. 幻燈片修改應用



49折!

Keynote 高效學習寶典

本寶典包含：

- (1) K1~K3
- (2) K4~K6
- (3) 2014, 2015 課程視訊

備註：

- (1) 課程當日之前結清款項才能享有本優惠。
- (2) 舊生報名K1~K3須繳訂金，課程日退還。
- (3) 若取消報名，適用下述K4~6退款說明。



講師
Dr. Rungsi Thavarungkul

K4
K5
K6

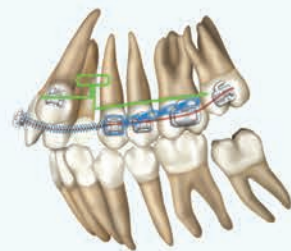
精修繪圖及動畫技巧 2015.12.05-07

- 世界第一堂最完整的最新版 Keynote 6 課程。
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- 利用 Keynote 創造複雜的構件。
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備註：

1. 限額 25 名，以繳費順序為依據。
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Newton's A
金牛頓藝術科技

















2015

戴蒙系統鉅作，愛用好評如潮

3大台柱全面回饋

1/1 - 3/25止

《高CP值好物》Damon 3MX × 《常勝軍推薦》Damon Q × 《指標性美力》Damon Clear

Sale	10人份	20人份	50人份
	<p>贈品</p> <ol style="list-style-type: none"> 1. .014 Damon Copper Ni-Ti 10條 2. .014x.025 Damon Copper Ni-Ti 10條 3. .019x.025 Damon Colored TMA-Honeydew 5條 <p>特價NT\$ 90,000</p> 	<p>贈品</p> <ol style="list-style-type: none"> 1. .014 Damon Copper Ni-Ti 20條 2. .014x.025 Damon Copper Ni-Ti 20條 3. .019x.025 Damon Colored TMA-Honeydew 10條 4. D3MX器械 1支 <p>特價NT\$ 180,000</p> 	<p>贈品</p> <ol style="list-style-type: none"> 1. Damon Copper Ni-Ti 100條(任選) 2. Bondable Tube 200顆 (6th 四象限各50顆) <p>特價NT\$ 450,000</p> 
	<p>贈品</p> <ol style="list-style-type: none"> 1. .014 Damon Copper Ni-Ti 10條 2. .014x.025 Damon Copper Ni-Ti 10條 3. .019x.025 Damon Colored TMA-Honeydew 5條 <p>特價NT\$ 100,000</p> 	<p>贈品</p> <ol style="list-style-type: none"> 1. .014 Damon Copper Ni-Ti 20條 2. .014x.025 Damon Copper Ni-Ti 20條 3. .019x.025 Damon Colored TMA-Honeydew 10條 4. Damon Q 器械 1支 5. Enlight(光照含氟矯正專用黏著劑) 1支 6. Ortho Solo(多功能光照黏著基底劑) 1瓶 <p>特價NT\$ 200,000</p> 	<p>贈品</p> <ol style="list-style-type: none"> 1. Damon Copper Ni-Ti 150條(任選) 2. Bondable Tube 120顆 (6th 四象限各30顆) <p>特價NT\$ 500,000</p> 
 <p>5+5 3+3</p> <p>+ DAMON Q</p> <p>54/45</p>	<p>贈品</p> <ol style="list-style-type: none"> 1. .014 Damon Copper Ni-Ti 10條 2. .014x.025 Damon Copper Ni-Ti 10條 3. .019x.025 Damon Colored TMA-Honeydew 5條 4. Enlight(光照含氟矯正專用黏著劑) 1支 <p>特價NT\$ 132,000</p> 	<p>贈品</p> <ol style="list-style-type: none"> 1. .014 Damon Copper Ni-Ti 20條 2. .014x.025 Damon Copper Ni-Ti 20條 3. .019x.025 Damon Colored TMA-Honeydew 10條 4. Enlight(光照含氟矯正專用黏著劑) 1支 5. Ortho Solo(多功能光照黏著基底劑) 1瓶 <p>特價NT\$ 264,000</p> 	<p>贈品</p> <ol style="list-style-type: none"> 1. Damon Copper Ni-Ti 100條(任選) 2. Clear Debonding Plier 1支 3. Bondable Tube 40顆 (6th 四象限各10顆) 4. .019x.025 Damon Colored TMA-Honeydew 30條 5. Damon Clear + Q Typodont 1個 <p>特價NT\$ 660,000</p> 
	 <p>SDC ProLign Kit 加購優惠價 NT\$ 39,999</p>	 <p>SDC Mini Ortho Kit 加購優惠價 NT\$ 6,500</p>	

A Dentist on the Cutting Edge, Who Promotes Education with Digital Technology

Article originated from Dentists of New Taipei City

Chief Editor of Dentists of New Taipei City & Interviewer: Yu-Wen Kuo

Translator: Ellen Tsu

English Editor: Paul Head



■ Fig. 1:

Different from other Apple authorized resellers, which are mainly located in the downtown area, the main store of Newton's A is located on the second floor of Chiao-Da Magnificent Building, Jian Zhong First Road, in the east district of Hsinchu City.

When walking into "Newton's A" located on Jian Zhong First Road in Hsinchu City, the first impression might be that there's no difference from any other Apple authorized reseller: lots of iPhones, iPads, MacBooks and the latest Apple products are on display, all provided for customers to try out. But when you thumb through complimentary magazines on the sales counter, you will be surprised to find out they are actually academic orthodontic and implantology journals. Meanwhile, in the conference room, a professional orthodontic course is being conducted.

This unusual combination of dentistry and Apple computers seems to harmonize seamlessly in Newton's A. This is all due to the prominent orthodontist, Dr. Chris Chang, who has built up Newton's A all on his own.

Dr. Chris Chang has been studying orthodontics for several years. He not only received his PhD in Orthodontics from Indiana University, but is also an ABO Diplomat. In addition, he founded International Association of Orthodontists and Implantologists (IAOI) and serves as the President of the Association.



Introduction: Dr. Chris Chang

- Founder of Beethoven Orthodontic Center, Taiwan
- Publisher of International Journal of Orthodontics & Implantology
- Taiwan Orthodontic specialist
- Certified Orthodontist, American Board of Orthodontics (ABO)
- Ph.D, Dept. Orthodontics, Indiana University-Purdue University in Indianapolis

Furthermore, he founded the Beethoven Dental Group, which includes the disciplines of orthodontics, dental implant, general dental practice, and pedodontics, and is the most famous dental clinic in Hsinchu.

Why would a dentist want to invest in an Apple authorized reseller business? How has he managed to combine computers with his own profession and create such a unique dental education system?

His passion and enthusiasm for Apple has turned him from a user into a teacher.

During his studies in the United States, Dr. Chang had used an Apple computer. After starting his orthodontic practice in Taiwan, he stopped using Apple computers for a long while because the Windows system was at that time the mainstream in Taiwan. It wasn't until 2005 that he again used Apple, their iMac series. "After I had used it for one week, I was totally addicted to it," Dr. Chang confesses.



■ Fig. 2:
Located on Jiangong First Road in Hsinchu City, Beethoven Orthodontic Center was founded in 1996.



■ Fig. 3:
Upon entering the door, people will first see iMacs from different periods, which is a very creative decoration.

There were sometimes technical problems while using Apple computers. With his strong thirst for knowledge, he spent a lot of time consulting with people working in Apple's authorized resellers. Disappointingly though, none of them could give him any satisfactory answers. *"They thought Apple-buyers must learn how to use it by themselves. They were responsible only for selling, not for teaching,"* Dr. Chang says. He believes this should not be the attitude of Apple store owners. As a result of his passion for Apple products, the thought of opening his own Apple education center sprang to mind.

Dr. Chang had already owned a second floor store on Jian Jhong First Road for more than 2 years, but had never used it. *"Why not use this space and turn it into an education center?"* Dr. Chang thought to himself.

Just at that time, Mrs. Chang happened to be in Chicago and visited the Apple Store, which she was very impressed with. Dr. Chang asked his wife to take some photos of the Apple Store in Chicago; by imitating the store's decoration they prepared to build up their ideal Apple education center.

However, things didn't go as smoothly as they had imagined.



■ Fig. 4: The commodious display space decorated with App icons is very creative and exquisite.



■ Fig. 5:

Dr. Chris Chang is very enthusiastic about teaching. Numerous testimonials and the classic picture of his idol, Steve Jobs holding a Macintosh, are laid out in the store.

"In the middle of our interior decoration, we started to contact Apple about joining their alliance, but we were rejected," Dr. Chang tells me. He explained that the first steps of the correct procedure should be applying and qualifying for opening an Apple Store and then the decoration. Although Dr. Chang promised Apple that he could have his Apple education center decorated just the same as other Apple stores, he was still refused a license by Apple.

The main reason lay in Apple's policy for opening new retail stores in Asia at that time, which stated that an Apple store should be opened near a train station, department store or in a busy commercial center. However, Newton's A was located on the



■ Fig. 6: There are all the latest Apple products to be tried out in the display area.



■ Fig. 7:

In the spacious meeting room, students all use Mac laptops to attend the class.



■ Fig. 8:

Dr. Chang explaining in detail how to use Keynote to create Ceph quickly, with all participants paying full attention to him.



■ Fig. 9:

Dr. Chris Chang, Yu-Wen Kuo, Chief Editor of "Dentists of New Taipei City," and students.

second floor of a residential area, which made Apple seriously doubt the viability of the store's operation. Dr. Chang didn't give up. He directly contacted Apple's headquarters in Taiwan and with a well thought out presentation, he went there and personally explained his business plan. *"After our hour-long presentation, they held a meeting for one and half hours. Half of them said yes and the other half rejected us,"* recalls Dr. Chang. Although Apple's headquarters in Taiwan agreed with Dr. Chang's idea, they couldn't directly grant the application due to the company policies. Yet, they were willing to help him strive for the chance. Finally, in December 2007, Newton's A succeeded in gaining the authorization and opened on January 1st 2008.

"Nothing is impossible," states Dr. Chang. If you prepare yourself well enough, you will be able to convince people that your decision is reasonable and deliberate. *"There are lots of things we can surely achieve, and the foundation of Newton's A proves that!"* concludes Dr. Chang.

With an original intention of being mainly educational, but including sales, Newton's A is different from other Apple stores. *"Our position is for education, not only for sales display,"* continues Dr. Chang. He believes that there should be some Taiwanese who specialize in this field and teach Apple-users how to use the Apple system correctly, instead of only retailing it. In that way, the promotion of Apple products can be truly effective. Newton's A therefore provides every customer with free teaching programs for iPhone and iWork for the first 3 years after purchase. After that, they continue providing their customers with a 10 hour free educational service; in doing so, they are enabling customers to learn how to use their Apple products easily and quickly.

Since establishing his highly effective Keynote workshop, Dr. Chang is constantly being invited to hold speeches in Taiwan and all over the world.

After founding Newton's A, the next step for Dr. Chang was to think about how to combine it with his profession, dentistry.

"Many people are interested in computers. But it is not common for someone to be interested in computers and at the same time, know how to apply it to orthodontics," explains Dr. Chang. Entering an over-saturated marketplace has never been his personal goal. Instead, he wants to adventure into land which has not yet been explored. This is the kind of challenge that counts.

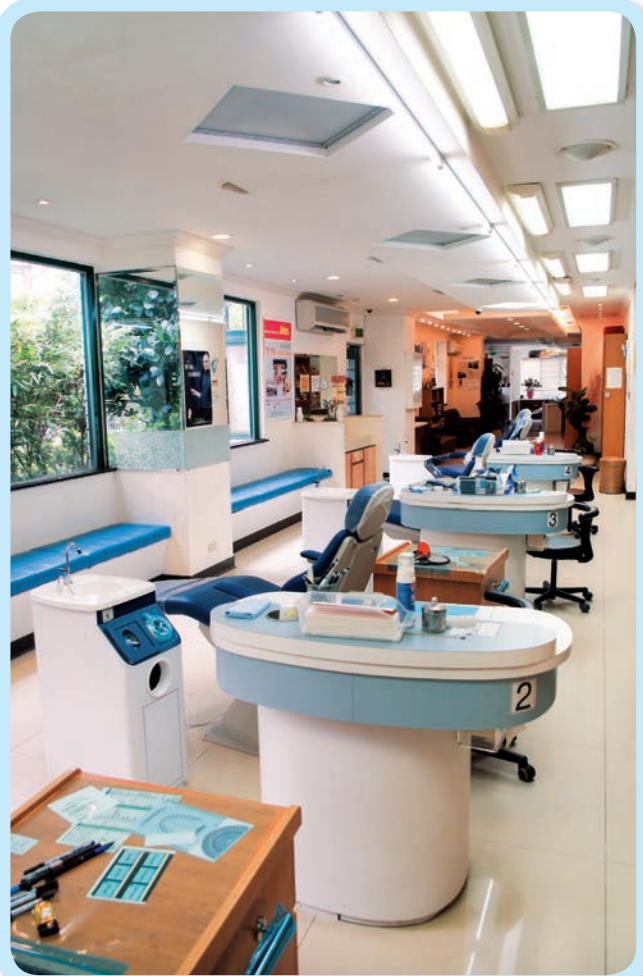
Dr. Chang uses a story of a Jew to expand on his thoughts: There was a Jew who opened a gas station. His business thrived and prospered. Another Jew then thought that since the population had increased due to the gas station opening, he could open a restaurant next door. Another Jew thought he could open a hotel nearby. But if they were Chinese, other Chinese would instead also open gas stations and the price of gas would fall. Then, due to competition, prices would continually decrease while even more gas stations were opened. Dr. Chang wants to break this traditional mode of thinking and do something different. *"And I want to do my best!"* he confesses.

Dr. Chang has already exclusively applied Apple's Keynote to sorting data in his clinics and also combined it with his lectures, which have now developed into a highly effective way of presenting. After Newton's A was founded, he advanced further and designed professional Keynote workshops, which has made his dental presentations as



■ Fig. 10:

Dr. Chang was invited to give a speech in the South African Society of Orthodontists' 50th anniversary symposium



■ Fig. 11:

The decoration and arrangement of his clinics are very simple, just as Steve Jobs advocated.



■ Fig. 12:

Andersen Pedodontic Center, one of Dr. Chang's dental clinics, is also located on Jian Zhong First Road. It mainly provides pedodontic treatment. The design of this clinic is a fairy tale style.



■ Fig. 13:

Dr. Chris Chang loves art, and so he decorates his clinics with many paintings and books.

fascinating as TED talks. Not only dentists, but even business people and sales reps swarm to Dr. Chang's Keynote workshops. They hope they can become masters of presentation after having been instructed by him.

"Whatever we say is a presentation." Dr. Chang thinks that presentation skills are very important in all kind of professions. He keeps learning and improving his presentation skills through teaching. He imparts all of his knowledge to his students and has even created *"Keynote treasure box,"* which is for students to learn Keynote more easily and improve their presentation skills more quickly.

With fine medical and professional presentation skills, Dr. Chang believes that an additional fringe benefit is having chances to give lectures around the world. At the beginning of July, he went to New Zealand and Australia for speeches. When he gave a speech in New Zealand, an 85-year-old professor told him personally that it was the best lecture he had ever heard in 30 years.

In 2009, after Dr. Chang had given his first ever speech in the American Association of Orthodontists (AAO), a professor ran to him in the airport and said *"I have attended AAO for more than 20 years. How could I not have listened to your speech? I've never had the opportunity in all those years!"* In 2013, Dr. Chang gave a speech in AAO for the second time. The lecture hall with 1700 seats was totally packed with people even standing at the back of the hall listening.

Dr. Chang's lectures are so popular that he has received invitations from over 20 different countries within the last few years, which has filled up his already busy schedule. His lectures currently need to be reserved 1 to 2 years in advance and he

is considered as one of the best speakers in the world; even though his lecture fee is not the cheapest, invitations are continually being received from all five continents. The most important thing for him is that audiences will benefit and return from a rewarding journey after attending his lectures.

In August, Dr. Chang was invited to be the Keynote speaker in the South African Society of Orthodontists' 50th anniversary symposium (SASO). Immediately following his speech, he received a standing ovation from all the attending dentists; it was the very first time in the 50 year-long orthodontic history of South Africa that that had occurred. The present SASO Director-General was totally astonished and could hardly believe what he saw. Currently, invitations to hold speeches in the U.S.A., Europe, South America and other countries are still being arranged.

Publishing journals and eBooks, Dr. Chang is on the cutting edge of education.

Aside from giving speeches and teaching, Dr. Chang has another vocation— publishing a professional dental journal. In 2006, he published News & Trends in Orthodontics (NTO); there were only 8 pages in the first issue. It has since been renamed the International Journal of Orthodontics & Implantology (IJOI), which combines two different dental fields, orthodontics and implantology. It now includes more information and has been developed as a professional English periodical with more than 100 pages in each issue.

There is a joke in the publishing industry which goes: *"If you want to harm someone then just ask them to publish a journal!"* However, this is not true in Dr. Chang's case. He not only publishes his own journal, but has done so with aplomb, as can be seen by the rapid development and success. What made him want to publish a journal and how has he achieved it?

About 10 years ago, he started learning how to use Damon brackets and since they were different from the original orthodontic bracket system he had been using, he initially had problems with them. To solve these problems, he often consulted with his professor in the U.S.A. *"Every time I asked my professor for his advice, I made notes. Afterwards, when I gave a speech, I shared this experience with my audience and told them how I had conquered these problems,"* explains Dr. Chang.

However, there was only a limited amount of people who attended his speeches and in order to help every doctor who encountered the same problems as he had had, he thought about publishing a journal to share his knowledge. When he discussed the idea with his professor, Dr. John Lin, Dr. Lin initially thought he must be kidding. However within just two years, this journal has turned from only an 8 page journal to one with more than 100 pages. Why are the case studies in this journal not written in Chinese, but completely in English? As many professionals keep asking the same questions while he lectures abroad, now they can receive the answers from this international journal.

When closely reading over the IJOI, one discovers that more than 10 pages, with detailed descriptions, are devoted to each case study, not just 4 or 5 pages as is common in most other journals. With step by step detailed pictures as a perfect visual aid for understanding, each step of the treatment is fully and clearly represented.

"I think that over the past hundred years, the blind spot of orthodontic journals or textbooks has been in the brief descriptions of the case: it explains to the reader only the before and after, occasionally with a few figures

of the "in between". It is not common to see the whole process recorded from A to Z and to show every step in treating the case." By recording and sharing every step of each case, he believes it will then become an essential part of the doctors' understanding and will then distinguish IJOI from other journals. *"I believe it helps young doctors a lot!"* adds Dr. Chang.

The case studies in IJOI are based on the Diplomate written examination format of the American Board of Orthodontics (ABO). Basically, the author will be required to write a long essay, which is a time-consuming process. To ensure each issue is published on time, Dr. Chang's process of editing follows the example of Henry Ford who said, *"Nothing is particularly hard if you divide it into small jobs."* He has therefore divided the whole editing process into small steps. First, his resident dentists will respectively work on their own writings. Second, after he has examined their essays, he will pass these essays on to a native English teacher to edit and rewrite them. Third, the essays will be sent to his professor, W. Eugene Roberts, in the U.S.A. for the final revision. Finally, those essays will be rechecked and then printed.

During this process, students who write the case study need to contemplate deeply and develop a full understanding of each step of the treatment. Dr. Chang notes that many doctors have improved their understanding significantly after finishing their writing.

Besides the journal, Dr. Chang also makes use of his Mac knowledge to publish ebooks. On January 19th, 2012, Apple released iBooks Author and on the very next day, the Newton's A team started digitalizing



Fig. 14: All of the Beethoven dental group's clinics have adopted Apple's computers, so clinic assistants must be familiar with using them.

their editing work. 42 days later, the first ebook *Orthodontics* was published. Even employees from Apple headquarters in America could hardly believe it and said, *"It is almost impossible! How can you publish an eBook just 42 days after the software has been released?"* Dr. Chang explains with a smile that they were already familiar with all of the Apple software, including Keynote, since they had been using them as their editing software. With edited reports, plus data and videos of his speeches already in their database, they were able to edit an informative digital ebook in such a short time.

Although the ebook was finished very quickly and sent to the iBookstore for further examination, the process of setting the price didn't go as smoothly and took a lot of time. Dr. Chang recalls, *"In the beginning, the maximum price limit of an Apple ebook was US\$14.99, which was later raised to US\$49.99. However, we wanted to sell it for US\$600 or split it into two ebooks and sell them for US\$299 each. We spent 6 months solely discussing this issue."* Just when Dr. Chang's team had decided to compromise and considered splitting it into 12 ebooks, Apple eventually agreed with Dr. Chang's idea that the price of professional books shouldn't be the same as that of general books. Therefore, *Orthodontics* was split into two volumes and finally sold for US\$299.99 each. These two ebooks are still the most expensive in the Apple iBookstore.

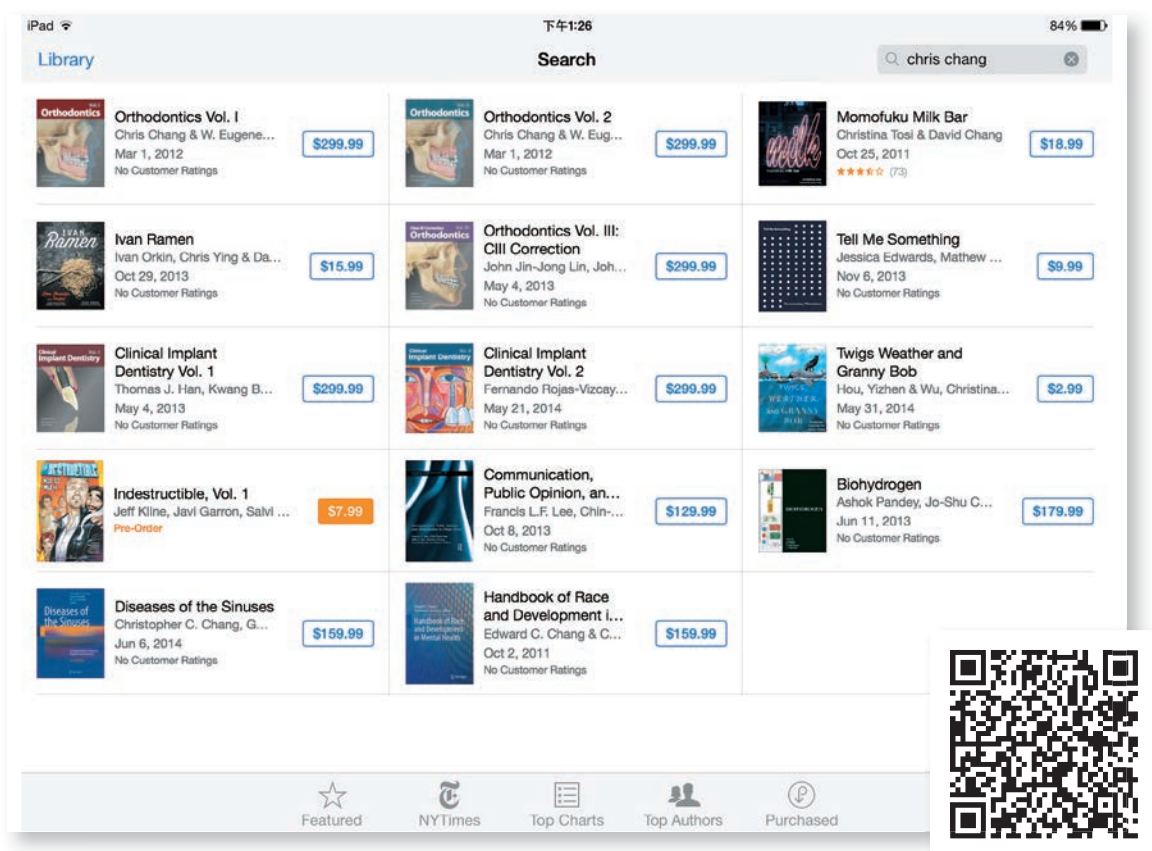


Fig. 15: *Orthodontics*, written by Dr. Chris Chang & W. Eugene Roberts, retails at US\$299.99, which makes it the most expensive ebook in the Apple iBookstore. One can get the access to Dr. Chang's eBooks with the QR code above.

Education is his lifetime vocation.

"In short, there are several educational methods: lessons, publishing journals, publishing ebooks and even providing free educational videos on YouTube." For Dr. Chang, despite all of these different forms, the entire focus is on education.

"Some ways of education are able to educate many people at a time, others educate only a few people at a time, but these people are globally influential. Both of these methods have their own merits, yet, if I can effectively use and combine both of these styles, then that couldn't be any better."



Fig. 16:
Dr. Chris Chang with chief editor Kao after the interview.

Therefore, Dr. Chang makes use of all kinds of media to promote education on a large scale. He has started to recruit some elite students and wishes to teach them all he has learned in his life. He adds, *"My students might be only a small number, but each of these students could become another 'Dr. Chris Chang' in 20 years' time. This will contribute to the society."*

In fact, dentists who have been taught by Dr. Chang are far more than just ten or twenty people. There are already over thousands of students from all around the world who have attended his training programs and academic classes. But, in the spirit of the mantras *"Stay hungry, stay foolish"* and *"Real artists simplify,"* he keeps working hard to learn and educate dental professionals. That is why Dr. Chang is such a respected and great figure.

He has accomplished:

1. Promoting orthodontics.
2. Expanding the available learning resources.
3. Making use of technology to teach people how to learn more efficiently.
4. Promoting English teaching and learning to become internationally accepted.
5. Issuing a free global orthodontic journal.
6. Operating the training institution of primary clinics more productively.
7. Making Taiwan more visible and prominent through his speeches.

If you asked me whom I appreciated the most in the field of orthodontics and regard as an orthodontic master for his epochal contributions, then I, without hesitation, would tell you Dr. Chris Chang; a truly wonderful and great person.



Chris Chang, DDS, PhD

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Dr. Gianluca Gambarini

2015.2.7 (Sat.) Taipei 重新認識3D根管治療知識、技能與技術



SPEAKER

Dr. Gianluca Gambarini, MD, DDS

Full-time Professor of Endodontics, University of Rome, La Sapienza, Dental School. Head of the Endodontic Department. Responsible for both pre-and postgraduate students endodontic programme.

International lecturer and researcher, he is author of more than 450 scientific articles, three books and chapters in other books. He has lectured all over the world (more than 350 presentations) and has been invited as a main speaker in the most important international (AAE, IFEA, ESE) and national endodontic congresses in Europe, North and South America, Asia, Middle East, Australia and South Africa. He has also lectured as an invited speaker in many Universities worldwide. During his academic career he gained many awards and recognition, and was responsible of many scientific projects with national and international grants.

Official member of ANSI/ADA and ISO Committees for Endodontic Materials. Active member of IADR, Italian Society of Endodontists (SIE) and European Society of Endodontology (ESE), Associate member of AAE. Member of the scientific committee and/or reviewer of the most important international endodontic and dental journals. Former Scientific editor of the Italian Journal of Endodontics (G.It. Endo), official Journal of Italian Society of Endodontists (SIE), he is currently Chairman of the Clinical Practice Committee of the ESE.



INFORMATION OF LECTURE

The course will present a new approach to root canal procedures, and will focus on assisting clinicians understanding of root canal complexities and limitations of current available techniques. It will show problems often encountered, and give some clinical solutions and operative protocols.

The day will be 15 tips and tricks (principles) that when applied systematically take much of the guess work out of Endo.

As one learned scholar once said – Endo is easy if you can “See” (referring to Lighting, Magnification and Radiography) and You can “See”(having a 3D picture of the anatomical complexities that await you). Of course Endo will always have unexpected challenges and what we choose ‘not to see’ is always an option that will also be discussed. How do we locate the Second Mesio Buccal canal in Upper First Molars or the Lingual canals of Lower Lateral Incisors anyway Missed canals are the biggest single cause of our failures – world over.



RECOMMEND



謝義興 醫師

國防醫學院教授兼系主任
三軍總醫院牙科部部主任

『人以銅為鏡，可以正衣冠，以古為鏡，可以見興替，以人為鏡，可以知得失』。對從事臨床工作的醫師來說，在醫學生時期能有一本好的教科書作為知識的基礎與臨床入門的導引，是絕對必須的；在成為專業牙醫師後，面對臨床上疾病的千變萬化，除了精巧熟練的臨床技術外，能具有與時俱進的專業素養，更為重要。

本次非常榮幸能邀請享譽國際的 Prof. Gianluca Gambarini 蒞台演講有關『重新認識3D根管治療的知識、技能與技術』，演講的內容將從3D根管治療的基礎知識出發，佐以最新醫學文獻、技術乃至器械材料等發展做進一步的闡釋及說明，對從事根管治療領域的醫師，無異是最好的一面鏡子也是最佳的成長機會，誠摯的邀請您一同享受這場學術演講。

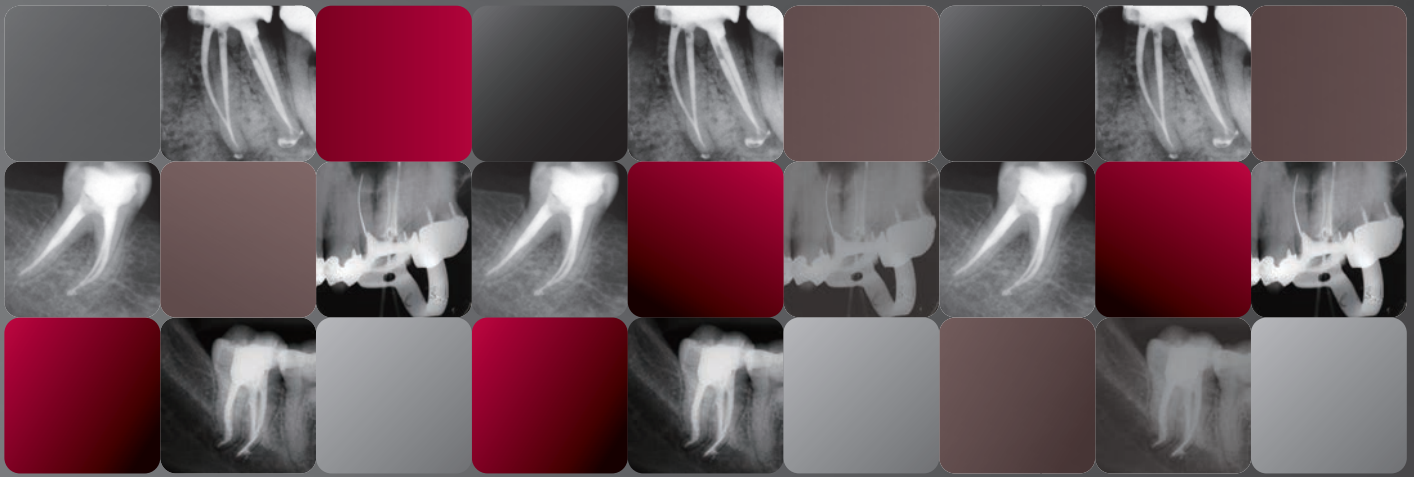


鍾明邦 醫師

中華民國牙髓病專科醫師
三軍總醫院根管治療科專任主治醫師

面對錯綜複雜的根管形態，良好的根管清創與修形以及三度空間緻密封填扮演治療成功重要的角色，Dr. Gambarini 是世界知名的根管治療大師，發表多篇國際級的文章並經常受邀至世界各地演講，相信在一天的學術饗宴之後，每位聽講者都能滿載而歸。





COURSE OUTLINE

- Minimally invasive endodontic access? Reality or myth?
- Problems in locating canal orifices and understanding anatomy from orifice to apex. Management of calcified canals
- Working length determination. Basic principles and clinical hints
- The role and influence of canal curvatures. What makes a canal complex?
- Differences between 2d and 3d curvatures. Role of CBCT in endo.
- Instrumentation : working into canal and working out from canal
- 3d shaping : how to avoid iatrogenic errors and ideally address all canal walls
- Manual Glide-path . Needs and different methods
- How to perform canal preparation : reciprocation vs rotary techniques, Apical finishing
- Elimination of bacteria and of pulp remnants. Necrotic vs vital cases.
- The shaping and cleaning concept. Irrigating protocols and materials
- Cleaning non-instrumented and instrumented areas
- Cold vs warm obturation techniques and materials
- How to achieve three dimensional obturation
- Post-endo restoration. Why direct, why posts?, why non direct?



SCHEDULE

08:30~09:00	Registration Time
09:00~10:15	Lecture
10:15~10:30	Morning Break
10:30~12:30	Lecture
12:30~13:30	Lunch Break
13:30~15:00	Demonstration
15:00~15:15	Break
15:15~16:30	Lecture
16:30~17:00	Q & A



INFORMATION OF LECTURE

Organizer	三軍總醫院牙體復形暨根管治療科 中華民國牙髓病學會
Co-Organizer	湧傑企業股份有限公司
Speaker	Dr. Gianluca Gambarini
Time	2015/2/7 (Sat.) 9:00am~5:00pm
Venue	台灣金融研訓院 - 菁業堂 (2-3F) 台北市中正區羅斯福路三段62號
Fee	2015/1/26前 主協辦單位 會員2000元 / 非會員2500元 2015/1/26後 主協辦單位 會員2500元 / 非會員3000元
Registration	02-27788315 分機#124王小姐/ #131林小姐 請先電話報名並於三日內，至郵局劃撥費用 (於通訊欄註明報名場次) 戶名：湧傑企業股份有限公司 帳號：17471807
Certification	參加者發給繼續教育學分 (紙本學分證明 100 元)
Remark	活動備茶點及午餐，素食請先告知 報名未出席者恕不退還既收款項

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Feedback from Damon, OBS & VISTA Workshop in December



Dear Chris,

First of all, I'd like to thank you for conducting such a great workshop!

Attending your workshop has been an excellent way of learning and performing complex treatments with simple and effective mechanics.

Your way of transmitting knowledge is very professional, high-tech, and it's very easy to learn.

There were no secrets.

I would also like to thank Dr. John Lin for his lecture about class III treatments, he presented a

realistic view of the diagnosis and treatment plan. He is a great doctor and a nice person. It was very nice to see him 6 years later.

To put it simple, *it is the best workshop in the world*, and I will never forget such wonderful experiences in Taiwan.

Thank you again! Hope to see you soon!

 *Dr. Alejandro Ramírez*
Clínica Ramírez, Canary Islands



It is a great pleasure to be one of the participants in this valuable workshop and I would like to thank Drs. Chris and John, and all the staff in Newton's A and Beethoven for their great support in this workshop.

This workshop has been *very interesting, very useful, very practical and very well-done*. I enjoyed every part of the workshop. What I learned during this workshop did make a difference in the way I did my job and the way I can improve my practice in the future.

I strongly recommend future Orthodontists to attend this workshop!



Dr. Ashwaq Abdulghafar
Bahrain

Many thanks to Dr. and Mrs. Chang and the entire Beethoven team for your tireless efforts in making your workshop a very empowering and enriching experience for me.

Dr. Chris' lecture was engaging and entertaining and I found myself completely rapt in attention.

His knowledge in orthodontics is unparalleled. I am truly amazed by how he makes the most difficult concept so easy to understand. *I have learnt so much more in these few days than I had in the last 30 years.*

All in all a world class workshop!

Thank you, Dr. & Mrs. Chang and the Beethoven team.



Best regards

Dr. Seet Ai Ling

Simply amazing! It was very brilliant to meet Dr. Chris and his team. His concepts of creativity and simplicity in orthodontic practice are what I have never seen before. *It was a unique experience that I will surely put into my office's routinely practice.*



Fabio Michelletti

Brazil

Feedback from Doctors in Malaysia



I have been a dental implantologist since 1990, and nine years ago I studied Orthodontics and have been practising both disciplines ever since. I was very fortunate to have excellent mentors along the way. My new mentor, Dr. Chris Chang is one of the pioneers in bone screw Orthodontics. Meeting with him and being trained by him at his renowned Beethoven Education Center in Taiwan transformed my career. I now practise ortho-implant combined treatment as part of my specialty.

Dr. Chang showed me by his own example that a true dental professional must continue to challenge himself and pursue knowledge as a lifelong undertaking, motivated by the need to offer quality service to one's patients. Building trust through professional

competence has been an important component in my relationship with patients. That is why I will pursue new knowledge to serve them well. Dr. Chang challenged me to take this examination.

He is also willing to share his knowledge and experience via his training programmes and speaking engagements. Only a confident man is not afraid of competition. Instead, he uses competition to challenge himself and be ahead of the curve, so to speak.

As an aside, he is also an entrepreneur who owns the Apple franchise for Taiwan, and an ardent fan of the late Steve Jobs. All these speak about the qualities of Dr. Chris Chang. It is a bonus to have a great wife, Ms. Shu-Fen by his side. What a winning combination!

Dr. Kamsiah Gulam Haider

 Kuala Lumpur



STAY HUNGRY, STAY FOOLISH

Being Dr. Chris' orthodontic student is one of the Best & Smartest choices I have ever made for my dental career and orthodontic learning journey. Dr. Chris is an excellent teacher and mentor, whose lecture is clinically orientated. Based on his concept of "Real Artists Simplify," learning Orthodontics in "Chris Chang's" way is always interactive and interesting, motivating you to learn more. His Keynote presentations, enhanced with Dr Rungsi's excellent illustration, are always overwhelming, and catching every audience's eyes & heart. Visualised treatment procedures and orthodontic concepts are another

A+ point to his course. Incorporation of OBS has made impossible complex orthodontic cases possible.

At this moment, all the Malaysian doctors, who are the current participants in this program, felt extremely honoured to have had this chance to become the 1st batch of Beethoven Mini Residency Program for Orthodontics taught by Dr. Chang and held overseas from Taiwan. With the help of e-learning study materials, which is uniquely and exclusively adopted ONLY in Dr Chris' courses, it has created a much more efficient way in learning Orthodontics and Implantology. Dr. Chris, Ms. Shufen, Dr. Ming-Jen Chang, and Beethoven & Newton's A Team are the best Ortho team ever, and the role model for all to learn from!

陳依虹

President, Family Care Dental in Malaysia



大陸正畸菁英班心得回饋

最早知道張慧男醫生是緣於一次他來大陸的講學，當時聽了一天的課，感覺開闊了不少思路，就一直期盼著能有進一步的學習機會。

後來終於有機會參加他的培訓班，通過三天的學習、參觀，張醫生毫無保留的講解、授課，不只在**技術理念上有更新**，對**診所的管理思維**也有很大轉變，這是做為一個初晉診所管理者最大的收穫。讓我想要更多向張醫生學習，努力提高診療水平和管理能力，把自己的診所經營的更完善！張醫生同太太積極的人生態度、鍥而不捨的追求自己目標的精神、嚴謹的診療和科研方式、幽默的溝通方法，也都深深影響著我。對我來說，此行，在正畸學方面的收穫很大，在人生態度方面收穫更大！

同時，本來就是蘋果迷的我，現在更迷蘋果產品了。因為我越來越意識到，蘋果精神，是一種**追求極致**的精神！感謝貝多芬和金牛頓！

李响 瀋陽牙醫



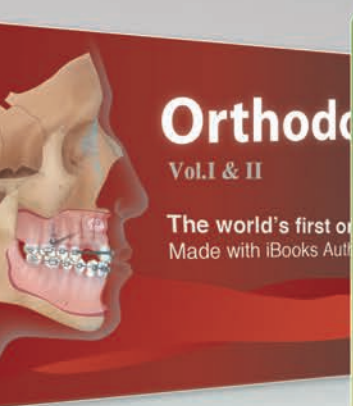
這次行程，對自己學習應用矯正，是意義非凡的，沒有課程能夠這樣生動闡釋我們所想學、所要學的知識。讓人開心的是，在張慧男醫師的課程裡都有，讓此行收穫巨大。配合 Keynote & iBooks，也讓我在課後更深刻的理解所學知識！也感謝提供的見習機會，近距離感受貝多芬、及金牛頓強大的醫療團隊和管理流程，明年見！

秦菲 石家莊迪曼齒科

很幸運地在2014上海的Ormco Forum聽到了張慧男老師的講課，也很慶幸自己參加了這次貝多芬矯正精英班的課程。這次台灣之行對於我不僅是**技術上、理念上**的觸動，更是靈魂上的震撼。張慧男老師精湛的演講、詼諧的風格、毫無保留的分享自不用說，最深深打動我的是其**專一、專心、專注**的治學風格，如師，如友，足以受益一生。當然，還結識了很多台灣當地優秀的年輕醫生，互相交流，開闊眼界。感謝這些人生路上的師長、家人、朋友！



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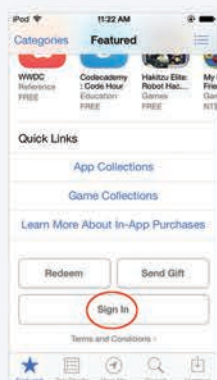
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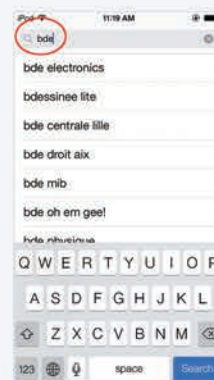
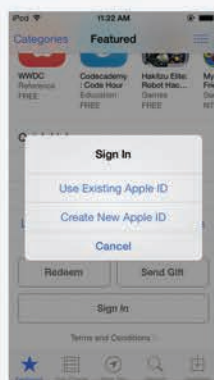
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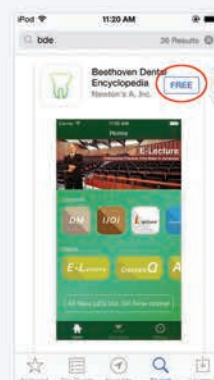
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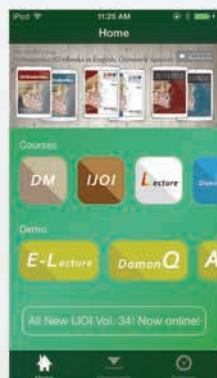
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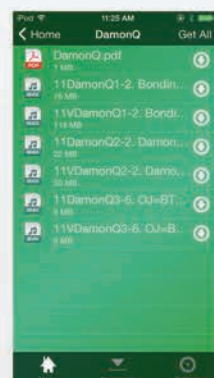
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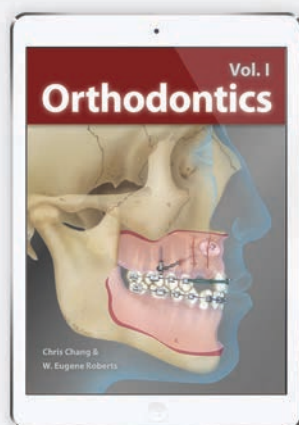
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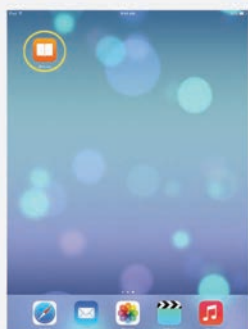
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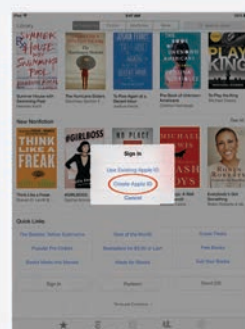
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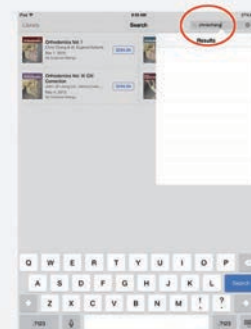
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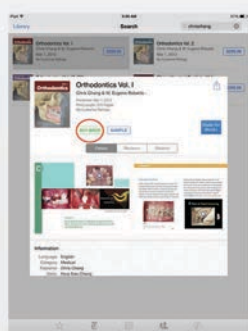
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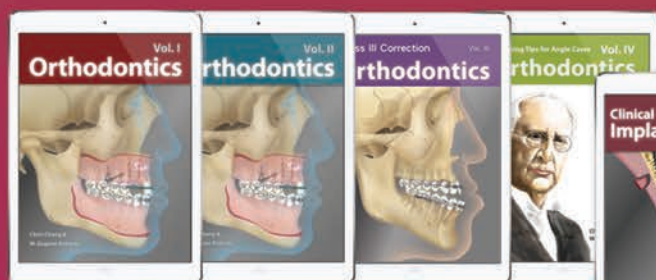
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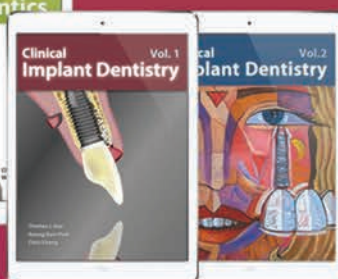
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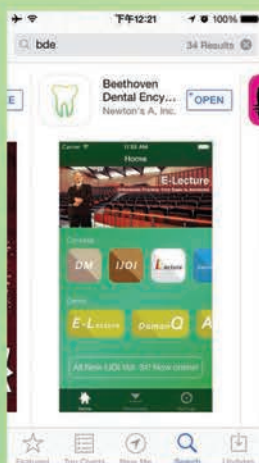
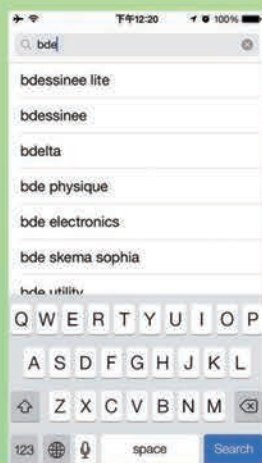


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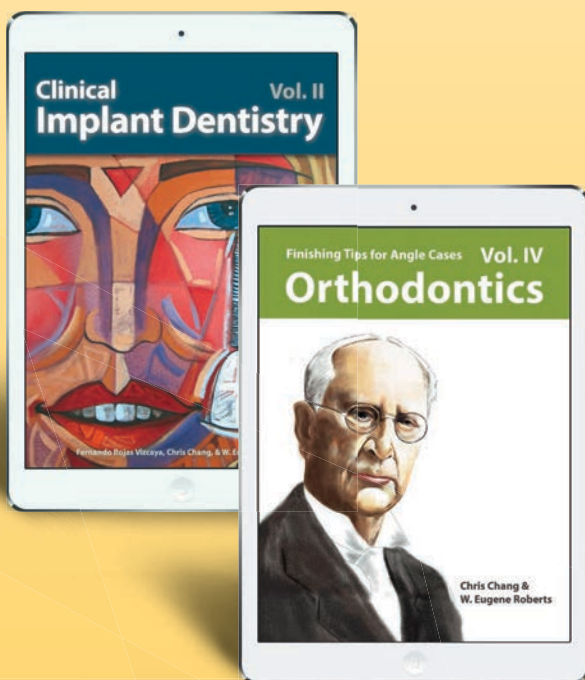
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