2013 Beethoven International Damon & OBS Workshop, June session; Group photo at the study room of Dr. Chris Chang.

熱愛學矯正

2013~2014

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。**

0M
8M
Damon + .014 Cu NiTi

0M
7M
Damon Clear

Damon矯正課程

使用最新一代矯正器 Damon Q 進行課程，歡迎舊生報名參加。

【課程】9:00 - 12:00
【實習】另外安排

	台北(二)	台中(四)	台北(二) NEW	LECTURE	LAB
1	6/4	6/13	10/15	理想入門病例+Damon Q點著	Bonding (Damon Q) + BT
2	6/25	6/27	10/22	快速矯正療程四部曲	Ceph + Photo
3	7/2	7/4	10/29	簡捷有效的錨定系統	Damon + OrthoBoneScrew I
4	7/16	7/18	11/26	不拔牙與拔牙分析	Damon + OrthoBoneScrew II
5	7/23	7/25	12/3	Damon 診斷流程及微調	Finish Bending
6	8/6	8/8	12/10	完工檢測及報告示範	Fixed Retainer (FR)
7	8/13	8/15	2/11/14*	維持及復發；病例示範	Presentation Demo
8	8/27	10/3	2/18	矯正力學及診斷分析 (1)	DDX + Case Reports I
9	9/17	10/17	2/25	軟硬組織及診斷分析 (2)	DDX + Case Reports II
10	9/24	10/31	3/4	兒童矯正及診斷分析 (3)	DDX + Case Reports III
11	10/1	11/28	3/18	成人矯正及診斷分析 (4)	DDX + Case Reports IV

矯正植體課程

【課程】9:00 - 12:00
【實習】13:30 - 20:00

新竹(三) **2013** 10/16 （含午、晚餐）

International workshop
Keynote & managment
OrthoBoneScrew & Damon

2013
A班 6/18-20
B班 11/19-21

0M 7M
overjet 12mm
Damon + Bite Turbo + Early Light Short Elastic

矯正進階課程

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

【新竹】9:00 - 12:00
【高雄】14:00 - 17:00

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

助理訓練課程

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

【課程】10:00 - 14:30
【實習】15:00 - 20:00

新竹(五) **2013** 10/11、18 （含午、晚餐）

課 程 資 訊

上課地點

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

【新竹】
金牛頓藝術科技公司
/ 新竹市建中一路25號2樓

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

【高雄】
國立科學工藝博物館-南館
/ 高雄市三民區九如一路797號（107研討室）

報名專線

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＊每次上課請依最新一期 IJOI 公告為主

矯正精修課程

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

【課程】9:00 - 12:00

新竹(二) 精修V
6/11　7/9　8/20　9/10　10/8　11/5　12/17
2014/1/7　3/11　4/15　5/13

Lessons learned from this year's AAO meeting

Philly, a vibrant city, hosted the American Association of Orthodontists (*AAO*) 113th annual meeting from May 3rd to 7th, 2013. I was honored to be invited to present one of my favorite topics: Non-surgical approaches to Class III malocclusion. This trip turned out to be so far the most precious experience in my professional life.

The AAO annual meeting is undoubtedly the most prestigious stage in our profession. With the help of Dr. Gene Roberts, our group (*Drs. John Lin, Johnny Liaw and I*) was able to present the Taiwanese approach, which signifies the use of buccal shelf screws, of treating severe Class III malocclusion. This is the first time in an AAO meeting that a group of speakers have collectively verified the same approach in their own individual cases; fully supported by publications and studies in a 3D ebook format, which had been organized prior to the meeting. This eBook is a great and valuable resource for people who are interested in our treatment modalities and it certainly received a great deal of attention at this meeting.

After the presentation, Dr. Tom Mulligan, the famous orthodontic author, publicly attested that he should have his license revoked as he could not treat those cases presented by our Taiwanese group. His comments might well have been a joke, but, I believe it is nevertheless true that we have successfully developed a minimally invasive approach to solve challenging Class III malocclusion, previously never attempted in the history of Orthodontics.

We should treasure this opportunity to increase the popularity of our treatment modality, so that even more patients can benefit from our invention. This 3D eBook certainly is the best way to help us reach that goal. Let's stick together and keep writing to make our eBooks a hit. We may be few, but united, we are mighty.

Chris Chang DDS, PhD, Publisher

Examiner
Dr. W. Eugene Roberts

Examiner
Dr. Tom Pitts

Examiner
Dr. John J. J. Lin

Consultant
Dr. Frederick J. Regennitter

Consultant
Dr. Tucker Haltom

Consultant
Dr. J. Michael Steffen

Consultant
Dr. Larry White

Examiner
Dr. Thomas Han

Examiner
Dr. Kwang Bum Park

Examiner
Dr. Homa Zadeh

Examiner
Dr. Fernando Rojas-Vizcaya

Consultant
Dr. Baldwin W. Marchack

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Consultant
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Dr. John Lin, *Consultant*
Dr. Frank Chang, *Consultant*
Dr. Johnny Liaw, *Consultant*
Dr. Chris Chang, *Publisher*

Please send your articles to **beethoven.tw@gmail.com**

2013 費城 AAO 年度大會
台灣 Class III 演講團隊大放異彩
由診斷三圓環談 Class III 治療中，正確診斷之重要性

A. 不辭勞苦宣揚矯正治療理念

　　今年的 AAO (American Association of Orthodontists，即美國矯正學會) 年度會議在美國費城 (Philadelphia) 舉辦，為了推廣 IJOI (International Journal of Orthodontics and Implantology) 雜誌及電子書和三類異常咬合之新書，我們一行人行李堆積如山 (圖一)，若非搭乘商務艙，必定超重。演講結束後，金牛頓攤位上人潮洶湧 (圖二、三)，因有高品質的雜誌及專書讓聽完演講之聽眾參考。慧男及高老師之用心與努力實在令人感動。想當年慧男要創辦此雜誌時 (當時雜誌名稱為 NTO，即 News and Trends in Orthodontics)，曾詢問我意見，我認為私人辦雜誌為一件困難的事，沒想到越是困難越難不倒慧男，他偏要辦得更好。

　　這些年來，雜誌由早期幾頁中文內容，逐漸演變為英文內容，使之更趨國際化，由早期 Damon 系統及骨釘之應用逐漸演進到矯正加上植牙，正符合植牙與矯正跨領域結合的未來趨勢，其中，雜誌內英文文章內容均經過 Roberts 老師親自校對，病例報告更是以 ABO (American Board of Orthodontics，即美國齒顎矯正專科醫師委員會) 標準作參考，且每期厚達百頁以上，質及量俱佳。並無私地免費分享給國內外矯正界人士，如此努力推廣矯正之熱忱與成就，讓身為團隊之一份子的我深深引以為榮。此一台灣矯正之光，已在全球矯正界引起注意，慧男所主辦之國際班，也從早期個位數參加人數，增加為 20 人以上之大團體，上一屆上課成員有來自巴西、哥倫比亞、泰國、韓國及美國多位醫師參加，下一屆國際班亦已額滿，持續地發展下去，我深信台灣的矯正教育系統及治療方式確實可征服全世界。

■ 圖一：
電子書總編輯余承勳、李明憲醫師、張慧男醫師、高淑芬老師、筆者 (由左至右) 與帶到 AAO 推廣之堆積如山之 IJOI 雜誌、Class III 專書、文宣、電子書及國際班課程資料。

■ 圖二：
李明憲醫師 (左) 及承勳 (右) 於展示區，向前來詢問之世界各國矯正醫師說明 IJOI 雜誌及矯正電子書內容。

林錦榮 醫師
《國際矯正植牙期刊》總顧問
前中華民國齒顎矯正學會理事長（2000~2002）
《創意矯正》(Creative Orthodontics) 作者

■ 圖三：
拿著矯正書的俄羅斯醫師與其中兩位作者慧男
（右二）及筆者（左一）合影。

B. AAO 演講加書籍出版，雙倍效果

這是筆者第四次於年度大會演講 Class III 相關主題，也是成效最好的一次，同一次大會中有四位台灣醫師演講 Class III 內容（圖四），相當具有震撼力。其中，演講內容亦包含了由廖炯琳理事長首先使用並風行國內的頰棚骨釘使用法 (Buccal Shelf Bone Screw)，用以治療困難三類異常咬合，既簡單又有效。此次以台灣骨釘治療系統成功治療大量困難的 Class III 案例，勢必改變一般矯正醫師提到骨釘就會直接聯想到韓國之骨釘的傳統想法。

從前三次 AAO 之演講經驗中，一般來說，筆者之三類異常咬合演講結束後，聽講者對於演講內容大概會隨著時間漸漸忘卻，這次有雜誌及書可供聽講者參考，可讓聽講者隨時回顧演講內容。在此要特別感謝慧男與高淑芬老師之努力邀稿，我總算把三類異常咬合之診斷三圓環觀念再一次更完整地重現，且又有泰國醫師 Rungsi 所繪之世界上最寫實的完美示意圖解，再加上慧男、筆者、廖炯琳理事長及 Rungsi 等以 ABO 標準呈現的眾多令人嘆為觀止之 Class III 症

例，是目前世界上少有的 Class III 一流參考書。除湧傑公司發行的紙本書之外（圖五），慧男更以其在矯正電子書上之難得經驗，同時出版了 Class III 電子書，慧男及高老師擁有世界上少見的優秀蘋果電腦工程師群，已成功出版過多本矯正電子書，除不必攜帶笨重之紙本書外，其於書中所提供之生動活潑教學影片，幾乎是矯正界從來沒有過的矯正教材，慧男的努力不但在台灣矯正界之教育貢獻極大，對世界上之矯正界亦是，已成為世界上未來矯正電子書之標竿。

2013 AAO 台灣醫師演講

日期/時間	講者/題目
5/5 (日) 13:45 ~ 14:30	John Lin Tough Class III Malocclusions Made Easy
5/6 (一) 08:00 ~ 09:30	Chris Chang with Hugo DeClerck Can CIII be effectively treated without orthognathic surgery
5/6 (一) 10:20 ~ 11:05	Eric Liou The Tx of CIII with TADs and submucosal injection of PRP
5/6 (一) 14:00 ~ 14:30	Johnny Liaw CIII Tx with TADs = A paradigm shift for cost-effective camouflage Tx

■ 圖四：
參加2013年 AAO 之台灣矯正醫師及演講內容。
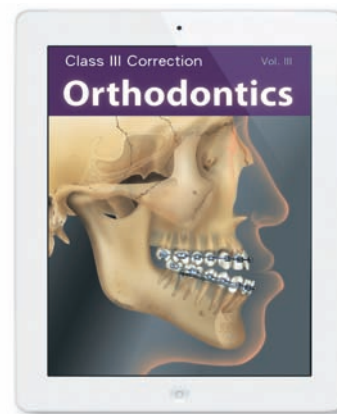
■ 圖五：
於2013年5月 AAO，同時發行 Class III Correction 之電子書及紙本書。

C. 張慧男醫師優異之演講征服了美國 AAO，台灣 Class III 團隊在 AAO 發光發熱

感謝張慧男醫師之恩師 Eugene Roberts 於 2011 年邀請筆者與慧男於印第安那大學校友會演講，之後，更進一步安排我們台灣四位矯正醫師於 AAO 年會上演講三類異常咬合治療之主題（圖六）。

慧男對演講報告相當有天份，2005 年，筆者參加第一屆在曼谷舉辦的亞洲 Damon forum，泰國醫師 Rungsi 為當時唯一使用 Keynote 作簡報的醫師，大家均被其酷炫又精彩無比之 Keynote 演講所吸引，筆者乃特別請教 Rungsi，他除熱心教導我外，還給了我 Keynote 原始檔；返台後我將此檔案交給慧男，完全沒用過 Keynote 的他竟然於短時間內不斷努力研究並進而了解 Keynote 的使用技巧。至今慧男更在國內推廣如何利用 Keynote 簡報達到一場成功的演講，不但精進了一般開業醫師的演講技巧，亦讓國內教學醫院更加強演講之方法，在國內的牙科演講中起了革命性影響。

今年二月，慧男在美國奧蘭多 (Orlando) Damon Forum 的演講，大大地征服了會議中所有的聽眾，其中包括 Dwight Damon，其本人亦讚不絕口。今年 AAO，慧男在近二千人之大會場中同樣以一流之演講內容及講演方式迷倒所有聽眾。雖然慧男已是一流講師，但其在前往美國 AAO 會議路上卻仍非常認真準備演講內容，且再三複習預講，難怪演講如此轟動成功。

我雖然已聽過慧男多次演講，卻仍很難學好他成功的 Keynote 演講。再三分析，除了慧男非常熟悉 Keynote 之應用外，他已學會 Vincent Kokich 及 Steve Jobs 等世界級大師之絕竅，很懂得刪除不必要之素材，集中講出要說明的重點。筆者則每次想完整呈現病例內容而使用太多幻燈片，最後較難以聚焦。

慧男不但連貫地引用筆者之診斷三圓環，強調診斷之重要，且從容不迫地請筆者於演講廳中站起來接受聽眾掌聲，感謝筆者提出此簡單實用之診斷三圓環，慧男一流的演講中，筆者意外地也沾光，在 AAO 給聽眾們對台灣治療 Class III 的團隊精神留下深刻印象。

理事長廖炯琳亦同樣強調由他最早開始使用之頰棚骨釘及一些令人嘆為觀止之困難三類異常咬合治療，使參加 AAO 之醫師們對於台灣使用獨特骨釘治療困難三類異常咬合留下相當深刻的印象。

劉人文醫師則演講其用骨釘治療三類異常咬合伴有 PRP submucosal injection 之研究，劉醫師是 AAO

■ 圖六：
筆者、Eugene Roberts 醫師、張慧男醫師、廖炯琳醫師（由左至右）於 AAOF 品酒晚會，由紅酒達人 Roberts 提供他的 Jawbone 紅酒，上有牙齒移動之機轉的圖示，非常好喝。

常客，其招牌擴弓方法 [1] (Alt RAMEC = Liou's Alternate Rapid Maxillary Expansions and Constrictions) 及面弓牽引治療三類異常咬合，在 AAO 已享有盛名，此次其他演講 Class III 的外國醫師中，有多位醫師均提及並採用 Alt RAMEC 方法，也是矯正界的台灣之光。

D. 由國王新衣談 Hugo De Clerck 之演講

慧男被安排與 Hugo De Clerck 之 point vs counter-point 之演講場次 (圖七)，雖然兩方沒什麼討論交集，然而 De Clerck 貧乏之內容、單調的簡報方式與簡單的 Class I 前牙錯咬病例報告，完全被慧男精彩之演講及極困難又治療得令人嘆為觀止之病例給完全比下去。De Clerck 的演講目前在世界矯正界非常火紅，不知內情的人嚮往他的四片骨板 (four mini-plates) 治療方法，其比面弓牽引更有效 [2,3,4]，且 De Clerck 以色彩顯示之電腦斷層圖片包含在他的治療中，一般聽眾被這類證據導向 (Evidence Based) 之研究搞迷糊，以為是最棒的三類異常咬合之治療法。

記得去年筆者在 Damon Forum 演講前，哥倫比

■ 圖七：
由左至右：Hugo De Clerck 醫師、Eugene Roberts 醫師、張慧男醫師。第二天由 Roberts 主持，Hugo 及慧男針對 Class III 不作正顎手術之治療，Hugo 以骨板於年幼病患治療，慧男以骨釘治療成年病人為主。

亞女教授 Patricia Vergara Villarreal 向我提及仰慕 De Clerck 之作法，並想應用到病人身上，幸好聽我的演講分析後即刻改觀，沒讓哥倫比亞之 Class III 小病患受四骨板治療之折磨。其他沒有機會聽筆者分析 De Clerck 方法的醫師，例如今年一月來台演講的 MacLaughlin 醫師，他認為困難的 Class III 症例也需仿效 De Clerck 之四骨板作法，然而此方法於簡單病例沒必要，於真正嚴重病例亦無長期有效的效果。

E. Hugo De Clerck 三類異常咬合治療法

在上顎之顴弓下緣 (Infrazygomatic arch) 下方及下顎犬齒區各裝上迷你骨板 (mini-plate)，令病患帶三類牽引之橡皮筋 (Class III elastics) 的方法 (圖十 B)，已有研究顯示其產生之移骨效果比使用面弓 (Face mask protraction) 來得有效 [3,4]，且沒有使下顎朝順時鐘旋轉 (Clockwise rotation of the mandibular plane) 之缺點。另外，其利用彩色電腦斷層方式顯示其治療的效果，在傳統矯正治療中很少使用，使其治療方法顯得更神奇有效，造成各國矯正界爭相邀請之奇特現象。

筆者以臨床醫師之實際角度切入，不以測顱攝影分析值 (Cephalometric Analysis) 等數據檢視其成效，而是檢視其臨床療效及長期穩定性。幸好 De Clerck 於 2009 年發表正式且比較完整的三病例 [2]，且有三年左右之短期追蹤，加上此篇文章發表至今又已經過 3～4 年，剛好滿足三類異常咬合之病例需長期追蹤，以用來判斷治療成功與否。

使用 4 片骨板之大手術作法，將引起 10 來歲可憐小病患相當之腫痛，且治療完成後將 4 片骨板拆掉時病患得再忍受一次腫痛。上顎顴弓下 (infrazygomatic arch) 成功率高，下顎犬齒區對於 10 來歲之小病患而言，則因要打在犬齒牙根附近，成功率較低且技術敏感。
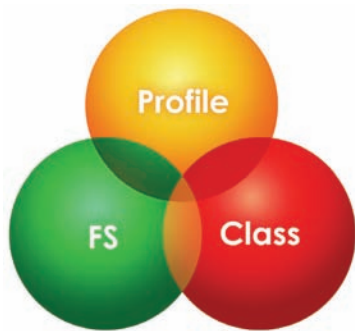
如果10來歲小病患受此大手術之折磨得到的是可以取代將來正顎手術 (Orthognathic Surgery) 矯正的命運，則小病患所受之苦尚可接受，若嚴重三類經過如此痛苦且近乎殘忍之作法後，仍然逃避不了正顎手術之命運，則可憐的小病患顯然是白受苦了。

F. 評論 Hugo DeClerck 之三病例

De Clerck 於文章中完整報告三病例，且有近5年之追蹤[2]。

以下筆者將以此次在 AAO 演講所強調之診斷三圓環 (圖八) 為基準，來分析 Hugo De Clerck 以4骨板治療簡單的 Class III 並無必要，而治療嚴重之 Class III 則沒有實際效用。

Keys to CIII Dx & Tx Planning

■ 圖八：
筆者 Class III 之診斷3圓環，不必依靠不確定之遺傳因素及複雜且容易令人混淆的測顱攝影分析，直接分析病人之側貌 (profile)、咬合功能性位移 (Functional Shift=FS) 及咬合分類 (Class=Classification of malocclusion)

▌ 病例一

具有功能性位移 (Functional Shift)，CR 側臉應屬正常文章中提及的病患咬合具有功能性位移 (Functional Shift，簡稱 FS)，其中未說明其所拍之側臉是 CR (Centric Relation) 或 CO (Centric Occlusion)，依治療前後比較，筆者推測治療前之側臉應是 CO，因其顯得有些下顎前突 (prognathic)，若所顯現為 CR，側臉則應是下顎正常 (orthognathic)。依筆者之診斷三圓環，應

是預後不差之輕微三類異常咬合，可以簡單矯正並治療成功，然而此例卻經由4骨板之治療，是過度治療 (Over Treatment) 的案例，若該病例是筆者之女兒，我絕對不會以如此複雜且麻煩的手術開刀用4骨板來治療。

圖九 A 為筆者之病例，此例僅用簡單之咬合斜面板 (Inclined Bite Plane) (圖九 B) 治療成功，並無必要用複雜之面弓牽引，甚或4骨板治療。若與治療前 CO 側臉比較，效果很戲劇化，容易聯想到是否用所謂之移骨裝置 (Orthopedic Appliance)，如面弓牽引所得之療效。與治療前 CR 側臉比較其變化極少，因治療前 CR 側臉即很正常，戲劇化之療效在於原來病患之咬合就有功能性位移。


CO　　CR　　post Tx

■ 圖九A：
此例治療後之側臉若與治療前 CO 側臉比較，則很戲劇化，若與 CR 側臉比較變化不大，因此治療前一定要以 CR 側臉來診斷。

■ 圖九B：此例只用一塊簡單斜面板治療成功。

▌病例二

　　頰側咬合分類為一類咬合（Classification）此例於文章中未提及功能性位移，筆者懷疑其亦有咬合之功能性位移，其略微前突之側臉（mild prognathic），令人擔心是否為嚴重三類異常咬合，但仔細檢查其咬合可發現，其近心階（早期混萌齒列期，上下第二乳大臼齒遠心面之距離）實在非常小，若以恆第一大臼齒（其口內照沒照到，容易引起誤診，但由測顱攝影明顯顯示為 Angle Class I）判斷應是 Class I，亦即頂多此例只算 Pseudo Class III，容易治療且預後良好（圖十）。
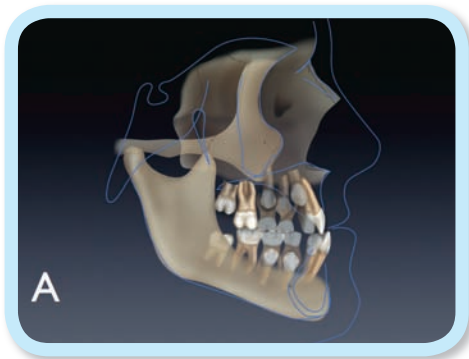
■ 圖十A：

(Courtesy of Dr. Rungsi's diagram. Diagram according to De Clerck's article [2]) De Clerck 文章中之 patient 2, 雖然有前牙錯咬，但乳第二大臼齒為很小之 mesial step（口內照未能看到恆第一大臼齒），而由 Ceph tracing 可清楚看出恆第一大臼齒為 Class I 咬合，非 True Class III，充其量只能稱之為 Pseudo Class III，容易治療且預後佳。
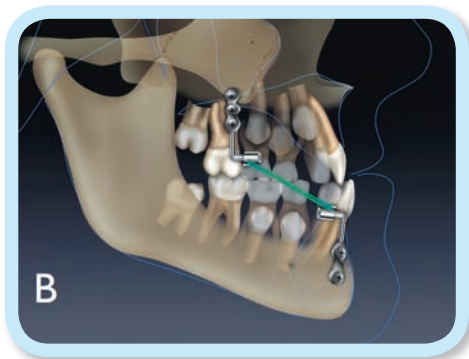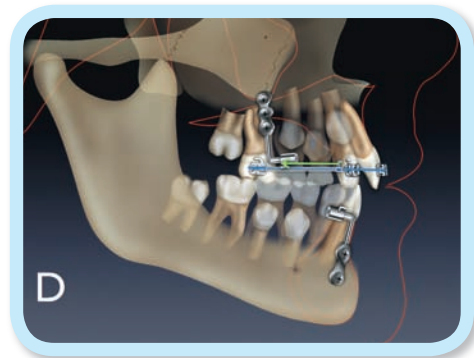

■ 圖十B：

De Clerck 未診斷出其為簡單之 Pseudo Class III，竟然使用很辛苦的四骨板與 Class III elastics 治療。

■ 圖十C：

在骨板上使用 Class III elastics，竟然將 Class I 咬合拉成有很大的 overjet 之 Class II 咬合 此為過度治療，非所謂 Class III 之 over correction。


■ 圖十D：

再利用上顎之骨板，將上顎第一大臼齒拉回成 Class I，是非常不必要的過度來回治療。

■ 圖十E：

終於再把大臼齒拉回成 Class I，是誤診之下的過度治療。

此例幾乎只看到前牙錯咬及略微前突之側臉就誤診為嚴重三類異常咬合，給予大手術之4骨板療法，並很荒唐地把原來 Class I 之咬合往前拉成嚴重 big overjet 之 Class II 咬合，如此作法並非所謂 Class III 治療之 over-correction，而是診斷不當下的 over-treatment，有些殺雞用牛刀，小題大作。筆者再次強調，依診斷3圓環其屬於一類咬合，用簡單矯正治療即可。圖十一為筆者之病例，雖然乳齒列為嚴重有極大近心（遠比 De Clerck 病例二嚴重）階之三類異常咬合，卻只要使用簡單咬合板即可治療成功。
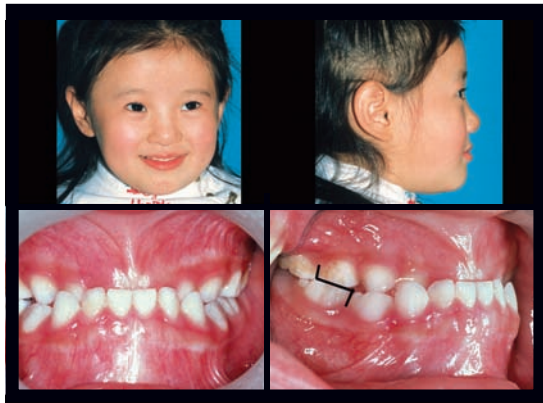

■ 圖十一A：
此一嚴重之乳齒列 Class III 病例咬合雖看來很嚴重，卻只用簡單咬合斜面板治療。

■ 圖十一B：
利用簡單咬合斜面板成功治好乳齒列 Class III，因此 De Clerck 之 Class I 前牙錯咬病例2，實在不應該以4骨板大手術做無謂的過度治療成 Class II，再以骨板拉回成 Class I。

■ 病例三

側臉嚴重下顎前突 (severe prognathic profile)，此為3例中最為嚴重之例。依筆者診斷3圓環其治療前即為嚴重下顎前突 (prognathic)，雖然可以短期治療成功，卻將因下顎之晚期生長變得再前突。De Clerck 不管其為嚴重下顎前突之三類異常咬合之診斷，使用4骨板治療確實短期內效果驚人，但只追蹤到15歲9個月即可看出下顎因晚期生長已復發成前突，而患者將繼續成長到18～20歲，勢必下顎更為前突（圖十二）。
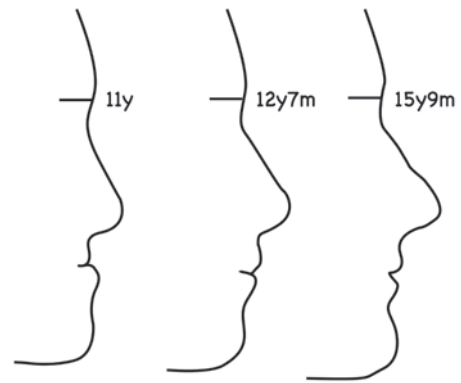
■ 圖十二：
De Clerck 文章中之病例 3 是一非常嚴重之 Class III，雖然經過1年7個月之4骨板牽引結果，相當戲劇化，但到15歲9個月即已產生復發成下顎前突，到20歲將更為前突，難怪 De Clerck 無法秀此例之更長期追蹤。

筆者之演講在 De Clerck 前一天，筆者認為其治療的方法，未經簡單正確之診斷即盲目使用大手術4骨板牽引治療，有誤導矯正醫師之疑慮，所以在演講中詳細剖析其文章中3個病例。結論是簡單病例如前兩例根本不必用大手術4骨板之牽引治療；困難如病例3，為極嚴重之三類異常咬合，縱使早治療，但長期預後差。聽眾們對我直接了當之分析似乎有些震驚，但對於筆者以大量 Class III 長期追綜及困難 Class III 之非手術治療又不得不信，而對於筆者評 De Clerck 之論點半信半疑！

第二天 De Clerck 與慧男同台論壇。筆者心中有些忐忑不安，依2009年發表已有3年多之追蹤，再加今年已2013年，其病例應該有7年以上之追蹤。若他

能夠發表第三個嚴重病例之成功追蹤就等於宣判筆者之診斷 3 圓環沒用。 只要 De Clerck 秀出病例 3 之長期追蹤仍維持穩定且正常側臉外觀，即可證明筆者之評論有問題。依筆者看法 De Clerck 理應秀病例 3 之漂亮治療成果，但他實在秀不出來，因於 15 歲 9 個月已經復發，到近 20 歲將更嚴重，果真他沒秀病例 3，筆者總算鬆了一口氣。

　　另外，讓人跌破眼鏡的是他竟然秀原為一類咬合之非常簡單的病例 2，奇怪他怎麼好意思秀此非三類異常咬合之簡單病例？唯一能解釋的是他仍不懂 Class III 之正確診斷，仍誤診此簡單一類咬合為嚴重之三類異常咬合。更誇張的是他將一類咬合拉成二類咬合，形成第一大臼齒為二類咬合伴有大 overjet，接著再以原來之上顎骨板將前突之齒列向遠心移回原來之一類咬合。如此將一類咬合拉成二類咬合，再拉回一類是很不必要之來回治療，且用的是侵犯性極高之 4 骨板大手術，作法實在不可思議，連續兩天聽筆者，慧男及 De Clerck 演講的醫師如美國矯正界好友 Larry White（Journal of Clinical Orthodontics 之前主編），Tom Mulligan（矯正熱門暢銷書 Common Sense Mechanics 之作者）聽了以後直呼不可思議，大嘆美國矯正界之 Class III 診斷應再加強（圖十三）。

■ 圖十三：
由左至右：Eugene Roberts 醫師、張慧男醫師、Tom Mulligan 醫師、筆者與 Larry White 醫師。筆者第一天 Class III 演講，Tom 及 Larry 全程參與，第二天亦從頭到尾聽完慧男及 De Clerck 之演講，因此感觸良多，大嘆美國齒列矯正界之三類異常咬合之診斷應再加強。

結論：

(1) 非常高興參加今年在費城舉辦的 AAO 年度大會，來自台灣的 Class III 演講成功表現台灣 Class III 骨釘治療之優越方法，亦提供參與者可購買參考之 Class III 專書及電子書。

(2) 希望 IJOI 團隊能繼續維持發行質量俱佳之世界級矯正雜誌、新書、電子書，於世界矯正界之教學方面做更多之貢獻。

(3) 希望於科技突飛猛進之今日，勿忽略診斷基本功，而一味嚮往新的侵犯性治療法，例如 De Clerck 使用之四骨板 Class III 療法。

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2014 贝多芬正畸精英班

Beetho en nternationa amon, OBS STA or shop

03/11~03/14, 2014

讲师：张慧男医师

现任贝多芬正畸植牙集团负责人，于 1996 年取得美国印第安那普渡大学齿颚正畸研究所博士学位，也是《国际正畸植牙期刊》(International Journal of Orthodontics & Implantology, IJOI) 发 行人。他长期致力于正畸植体 (orthodontic bone screws) 的研发及运用。

讲师：林锦荣医师

现任林锦荣齿列正畸中心院长，于美国马楷大学取得正畸硕士学位，是一位国际知名的正畸讲师，他同时也是《创意正畸》(Creative Orthodontics) 一书作
畸植牙期刊》(Inter
Orthodontics & Imp
顾问。

亲爱的张医师：

　　我身为一位讲师和正畸医师，透过这次台湾学习的经验，获得很多专业上的成长。我带回了最新、最棒的知识、技术和实用的工具，包含如何利用苹果电脑制作一流的简报，这一切都要归功于您的指导。我也在迷你骨钉的运用和治疗优点上，获得许多宝贵的学术参考资料。

　　除了对您万分的感谢外，我也要感谢您热心助人的夫人，以及您专业的诊所员工。在他们身上我看到了一种组织、关怀和功能性的模范。我永远不会忘记我在贝多芬集团学习期间所获得的关注和协助，不论每个人所担任的角色和功能 。

Dr. a ri ia rgara i arr a righ r ho on is h i i ar ni rsi .C .o ogo a

亲爱的张医师：

　　我只能说这个课程远远超乎我的期望，这真是太棒了的学习经验。张医师和林医师世界级的演讲，以及您们多年累积的知识、经验和智慧，都反映在您们所呈现的案例中。我也很珍惜有机会在您忙碌的诊间，观摩着您如何积极、轻松地实践您在课程上所传授的秘诀。

　　首先，身为极具创意的教育家，您鼓励我们要有创造力来思考治疗方式。其次，您介绍我们您的工作系统，以及 Damon 及 这些工具来帮助我们在自己的实务工作中也获得成功。最后，您激励我们要持续改进这个系统。我个人由衷感谢您给我们的这三个建议 。

John . . ong DD D C r ino Ca i ornia

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11:00—12:00	精致的正畸完工 案例示范
12:30—13:30	午餐
14:00—15:00	儿童牙科、植牙中心参观
15:00—18:30	正畸门诊见习

第二天，3/12（三）

09:00—10:30	Optimized Orthodontic Treatment I 优化正畸治疗（1） Dr. Chris Chang
10:30—11:00	休息
11:00—12:30	Optimized Orthodontic Treatment II 优化正畸治疗（2） Dr. Chris Chang
12:30—13:50	午餐
14:00—15:00	OBS 模型实作
15:00—18:30	正畸门诊见习

第三天，3/13（四）

|	
09:00—10:00	美学上的修整 Esthetic Finishing
10:00—10:10	休息
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~ **Dr. Rungsi Thavarungkul, Thailand Lecturer,**
进阶 Keynote 课程－精修绘图简报达人讲习班讲师

Extra-cusp ?

Extra-cusp ?

第四天，3/14（五）

09:00—10:00	Keynote 简介： 组织简报用的患者档案
10:00—10:10	休息
10:10—11:30	高效简报要点 (1)
11:30—13:30	午餐
14:00—15:30	高效简報要點 (2)
15:30—15:45	休息
15:45—17:00	信息视觉化
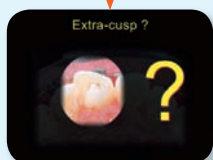
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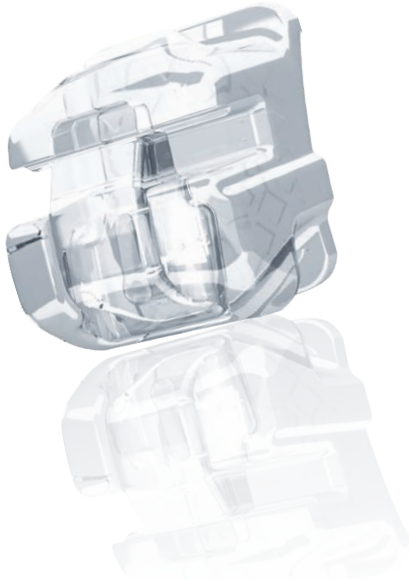
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Dr. Christopher Ho
August 25, 2013
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RECOMMEND

Dr. Christopher Ho 畢業於雪梨大學，並在倫敦進行學士後研究，取得贗復碩士。回國後任教於雪梨大學，同時也是UCLA 植牙學會的教員：並且在雪梨擁有一家私人診所，提供贗復與植牙方面的治療。此次，會中將會針對複合樹脂與陶瓷材料進行深入探討，其中包括黏著系統的分析，以及樹脂材料的選擇。透過不同的傳遞方式來達到前後牙審美的最佳表現。並教導與會醫師如何雕塑理想的牙齒型態，如何利用小技巧達到視覺上的美觀。並針對間接復形物從材料選擇、製備、表面處理、黏著流程，以及臨時假牙的製作，進而到最後的研磨與打亮，毫不保留的與大家分享他的個人心得，對於美學有興趣的您千萬不要錯過！

SPEAKER

Dr. Christopher Ho
BDS Hons, Grad Dip Clin Dent
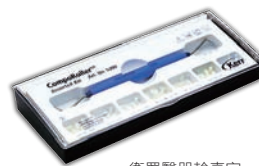(Oral Implants), M. Clin Dent (Pros)

Dr. Christopher Ho received his Bachelor of Dental Surgery with First Class Honours at the University of Sydney. He has completed graduate training in the Graduate Diploma in Clinical Dentistry in Oral Implants at the University of Sydney, and a Masters of Clinical Dentistry in Prosthodontics with Distinction from Kings College, London.

Dr. Ho lectures extensively on aesthetic and implant dentistry and is involved with the evaluation and development of new dental products and materials. He is a member of the Planning Committee, a Mentor and Lecturer for the Oral Implant Diploma at the University of Sydney. He is a Faculty member of the UCLA Masters in Implant Dentistry Certificate programs and is a Senior Visiting Clinical Teacher at Kings College London, United Kingdom.

He has a referral-based restricted private practice in prosthodontic and implant dentistry in Sydney, Australia.

INFORMATION OF LECTURE

Organizer： 台北醫學大學牙醫學系牙體復形學科
台北醫學大學附設醫院牙科部

Co-Organizer： 湧傑企業股份有限公司

Time： 2013/8/25 (Sun.) 9:00am~5:00pm

Venue： 台北醫學大學綜合大樓16F 演講廳
（台北市信義區吳興街250號）

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Comprehensive Treatment of Oligodontia: Orthodontics, Sinus Lift Bone Grafting, and Implant-supported Prostheses

This report describes the interdisciplinary treatment of an acquired malocclusion in an adult male that was associated with oligodontia and anterior crossbite. Six premolars were congenitally missing, four in the maxilla and two in the mandible, resulting in multiple, intermaxillary edentulous areas. In the mandibular arch, all spaces were closed and incisors were retracted to correct the anterior crossbite. In the maxillary arch, space was consolidated to develop implant sites to replace the the missing first premolars. Due to inadequate bone height bilaterally, the edentulous areas were restored with dental implants placed with simultaneous sinus lift, bone grafting procedures. Prosthodontic restoration was then completed using implant-supported crowns. Occlusal function, dental esthetics and the smile-line were markedly improved. (Int J Ortho Implantol 2013;31:16-39.)

Key words: oligodontia, self ligation bracket, sinus lift, bone grafting, lateral approach, osteotome technique, sinus membrane perforation, implant-supported prosthesis

History and Etiology

A 23-year old man presented with a chief complaint of chewing problems due to multiple missing teeth (*Figs. 1-3*). The dental history revealed a probable genetic pattern associated with congenital absence of all four maxillary premolars and both mandibular second premolars. There was no other contributing medical history. Pretreatment photographs (*Figs. 1-2*) showed a relatively straight profile with inadequate maxillary incisor exposure when smiling. The nasolabial angle was within normal limits (*WNL*), but

Fig. 2: Pretreatment intraoral photographs

Fig. 1: Pretreatment facial photographs
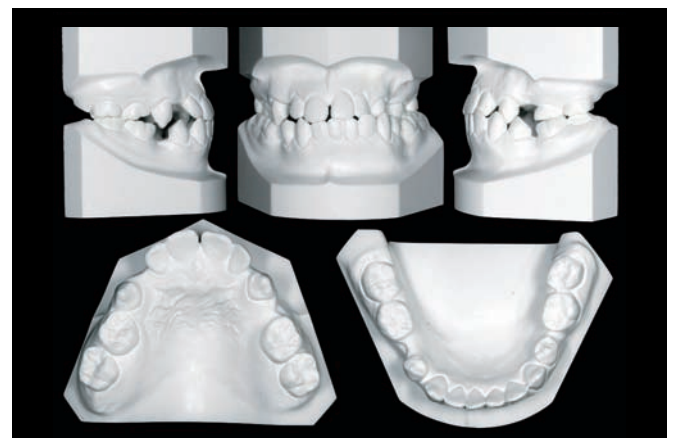
Fig. 3: Pretreatment study models

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

■ *Fig. 4:*

Post-treatment facial photographs showing considerable improvement in facial profile


■ *Fig. 5: Posttreatment intraoral photographs*

■ *Fig. 6: Posttreatment study models*

the lower lip was slightly protrusive relative to the upper lip. His chin point shifted to the left, there was a 5mm midline discrepancy.

The patient was treated to an acceptable result as shown in Figs. 4-6. Lateral head and panoramic radiographs before and after treatment are illustrated in Figs. 7-8, respectively. Radiographic evaluation revealed that all four maxillary premolars and both mandibular second premolars were missing (*Fig. 7*). Restorative neglect contributed to drifting and supra-eruption of other teeth, resulting in both functional and esthetic problems. Overall, the dentofacial management is documented with superimposed cephalometric tracings (*Fig. 9*). Careful examination of the pretreatment panoramic radiograph revealed morphologic asymmetry of the condyle heads (*Fig. 10*), which contributed to the mandibular deviation (*Fig. 1*).
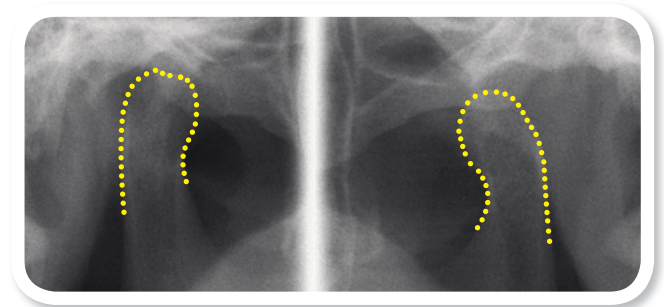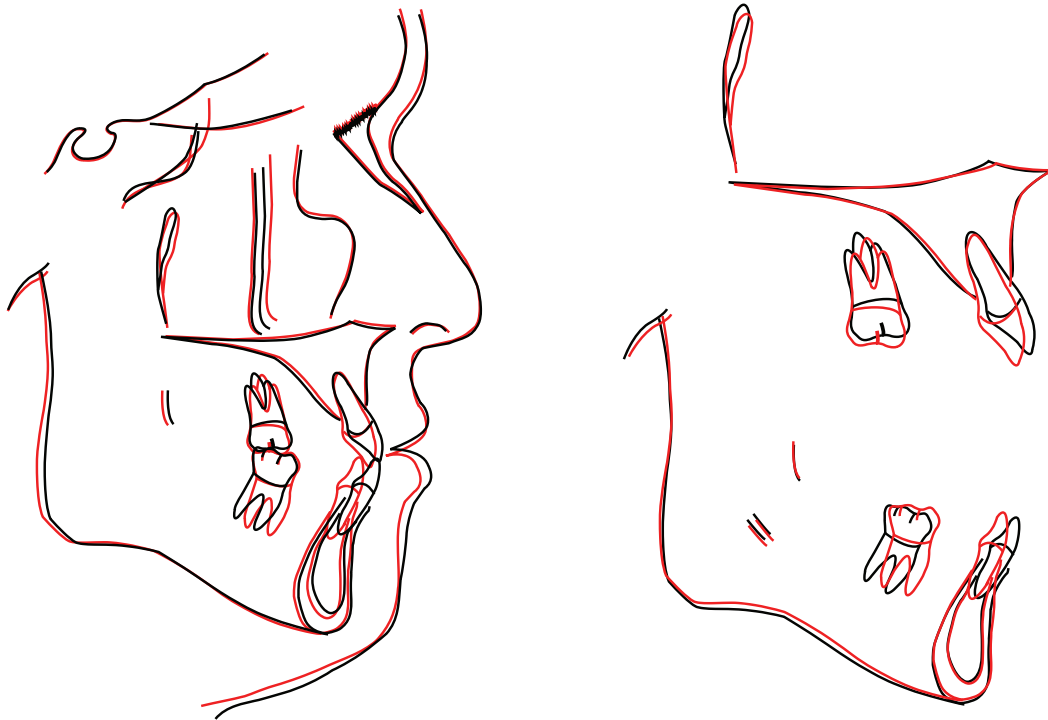

■ *Fig. 10:*

The morphologic asymmetry of the condyle heads was noted.
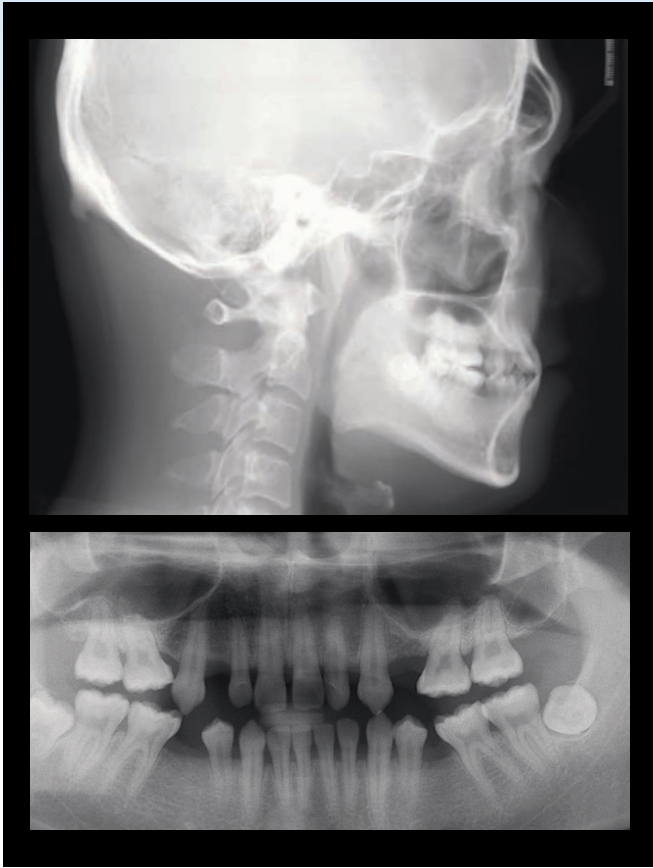
Fig. 7: Pretreatment pano and ceph radiographs.
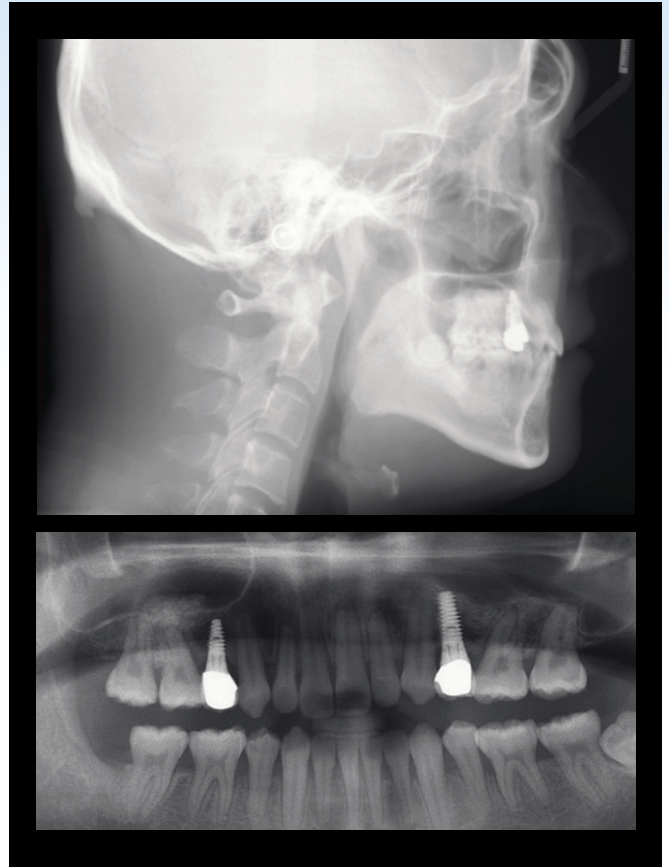
Fig. 8: Posttreatment pano and ceph radiographs.

Fig. 9: uperimposed tracings revealed the tipping of maxillary and mandibular incisors, mesial movement of mandibular molars.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	80.5°	80.5°	0°
SNB°	80°	80°	0°
ANB°	0.5°	0.5°	0°
SN-MP°	26.5°	26.5°	0°
FMA°	19.5°	19.5°	0°
DENTAL ANALYSIS			
U1 TO NA mm	3.5 mm	2 mm	1.5 mm
U1 TO SN°	109°	101°	8°
L1 TO NB mm	3.5 mm	1 mm	2.5 mm
L1 TO MP°	91°	88°	3°
FACIAL ANALYSIS			
E-LINE UL	-3.5 mm	-2.5 mm	1 mm
E-LINE LL	-1 mm	-2 mm	1 mm

■ Table. 1: Cephalometric summary

Diagnosis

Skeletal:
- Skeletal Class I (*SNA 80.5°, SNB 80°, ANB 0.5°*)
- Low mandibular plane angle (*SN-MP 26.5°, FMA 19.5°*)
- Condylar heads are asymmetric in length

Dental:
- Class I molar relationship on the right
- Class II molar relationship on the left
- Canine relationship: Class III on the right side, Class I the left
- Anterior crossbite: upper left lateral incisor and canine were in crossbite; the upper right central and lateral incisors were edge-to-edge
- Mandibular midline: 5mm to the left of the facial and maxillary midlines

- Posterior lingual crossbite: maxillary left first molar ([#]14)

- Missing Teeth: all four upper premolars ([#]4, [#]5, [#]12, [#]13) and both second premolars ([#]20, [#]29)

- Spaces: maxillary midline diastema and multiple edentulous spaces in both arches

Facial:
- Straight profile with inadequate maxillary incisor exposure when smiling
- Slightly protrusive lower lip
- Facial asymmetry: the chin point was deviated to left The ABO Discrepancy Index (*DI*) was 44 as shown in the subsequent worksheet.[1] The major discrepancy (*12 points*) was the anterior crossbite, manifest as a negative overjet between the left upper and lower canines ([#]6 and [#]27) (*Figs. 2-3*).

Treatment Objectives

After careful review of the patient's facial profile, dental, and occlusal problems, the treatment objectives were as following:

- Close all of the spaces in the mandible.

- Close all of the spaces in the maxillary anterior region

- Leave 7mm spaces in the right and left maxillary first premolar regions for implant-supported crowns.

- Create sufficient alveolar bone volume for implant placement in the maxillary right and left first premolar regions.

- Establish normal overjet and overbite.

- Establish an Angle Class I molar and canine relationship.

The overall clinical objectives were to restore occlusal function and improve smile esthetics with interdisciplinary treatment, involving orthodontics, dental implant placement, and prosthetics.

Treatment Alternatives

Since the chin point was deviated and the condylar heads were asymmetric, orthognathic surgery would improve the facial profile, correct the deviation of the mandible, and allow complete closure of all space in the mandibular arch. Although this approach was probably the most ideal option, the patient was opposed to orthognathic surgery. Thus, a compromise treatment plan was devised involving only preprosthetic orthodontics treatment.

Treatment Plan And Sequence

1. Full fixed orthodontics appliance

2. Compressed NiTi open coil springs to create space for the implants in the maxillary first premolar regions

3. Establish a Class I preprosthetic occlusion with adequate protrusive guidance and canine protected lateral excursions.

4. Close all spaces in the mandible.

5. Sinus-lift bone grafting bilaterally to create sufficient bone height to place implants.

6. Place implants in the maxillary right and left first premolar regions.

7. Once the implants integrate, restore with crowns.

8. Retention of the corrected malocclusion using a clear retainer for both the maxillary and mandibular arches.

Appliances And Treatment Progress

Damon Q® 0.22" Brackets (*Ormco*) were used with standard torque in both arches. Compressed NiTi open coil springs were placed (*Fig. 11*) to open the spaces between the maxillary canines and first molars bilaterally. A bite turbo was bonded on the lingual surface of the left mandibular canine to facilitate the correction of anterior crossbite (*Fig. 12*). The patient was instructed to wear Class III elastics (*Parrot 5/16", 2 oz.*) full time.
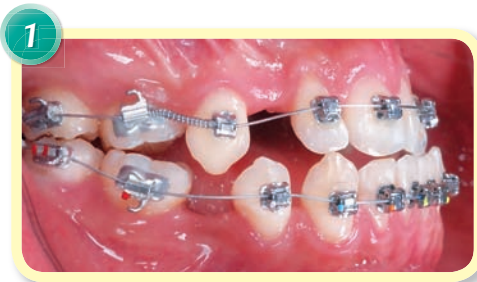

■ *Fig. 11,12:*

Compressed NiTi open coil springs were placed and a bite turbo was bonded on the lingual surface of the left mandibular canine.
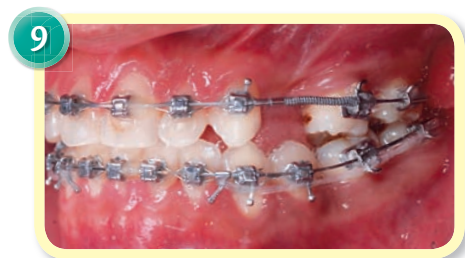
After 6 months of treatment, the overjet and anterior crossbite were improved to an edge to edge position (*Figs. 13-14*). In maxilla, the arch wire was change to .017x.025" TMA. In mandible, the arch wire was changed to .016x.025" SS, and power chains were placed to close the spaces. The Class III elastics were upgraded to 3.5 oz (*Monkey 3/8", 3.5 oz*).

In the 9th month (*Figs. 15-16*), the overjet and overbite were corrected and the protrusive guidance was established. Class III elastics and power chains were utilized to close the spaces in mandible.

In the 16th month, the right and left maxillary first premolar space were established, and the occlusion was adequately corrected for initiating implant placement (*Fig. 17*). A panoramic radiograph was exposed to confirm that the roots adjacent to the implant sites were parallel.

■ Fig. 15,16:
  The overjet and anterior crossbite were corrected and the protrusive guidance was established.
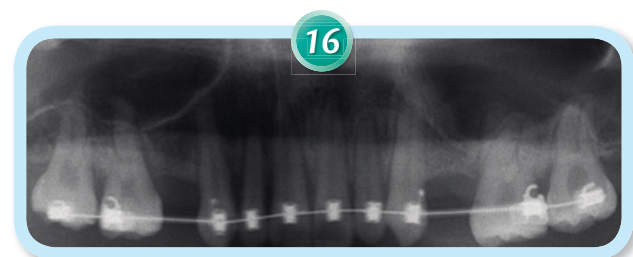

■ Fig. 17:
  The panoramic radiograph was exposed to confirm the roots adjacent to the implant sites were parallel.

Implant Placement

A preoperative CT scan was taken to evaluate alveolar bone volume (*Fig. 18*): 8mm in height x 6mm in width on the right, and 6mm in height x 5mm in width on the left. Since there was insufficient bone volume on both sides, simultaneous maxillary sinus grafting and implant placement was indicated.

Surgical stents were designed for precise implant placement in three dimensions. The implant fixture was positioned 3mm below the future crown

■ Fig. 13,14:
  The overjet and anterior crossbite were improved to an edge to edge position in 6 months.
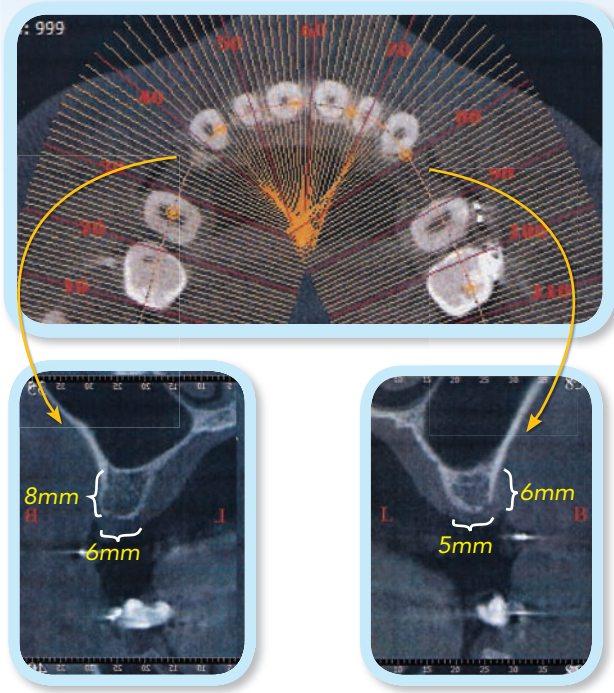
■ *Fig. 18:*

The spaces were created for the maxillary first premolar implants. The bone volume at the right is 8mm in height x 6mm in width; at the left is 6mm in height x 5mm in width.


■ *Fig. 19:*

Surgical stents were designed for precise implant placement in three dimensions.

margin, with a distance of at least 1.5mm from the adjacent teeth (*Fig. 19*).[2] The 2B-3D rule[2] for dental implant planning, placement and restoration was followed.

In the #12 area, a crestal incision was performed at the palatal line angle with a No.15c scalpel. Sulcular incisions were made on the buccal and palatal of the adjacent teeth for flap reflection. After exposing the bone with full-thickness flaps, the surgical stent was fitted to guide the first lancer drill for the initial osteotomy. The depth of the osteotomy was measured with a periodontal probe (*Fig. 20*). A surgical guide pin was placed, and a periapical X-ray revealed the remaining distance to the sinus floor (*Fig. 21*). An osteotome was used to push the sinus floor axially (*Fig. 22*), and the latter was broken with light strokes from a mallet. The Schneiderian membrane (*sinus membrane*) was then further elevated by the bone graft material (*Bio-Oss® Geistlich Biomaterials*), which was carefully pushed into the sinus cavity (*Fig. 23*).

Then, an implant fixture (*Ø4.1X11.5mm, TwStar® MegaGen® Taiwan*) was installed following the manufacturer's recommended drilling and insertion protocol. The implant achieved adequate primary stability and closing screw was placed. The flap was repositioned and closed with 5-0 nylon sutures (*Fig. 24*).

In the #5 area, the same surgical procedure was performed (*Figs. 25-26*). However, the sinus membrane was perforated accidentally, so it was necessary to perform a lateral window approach to
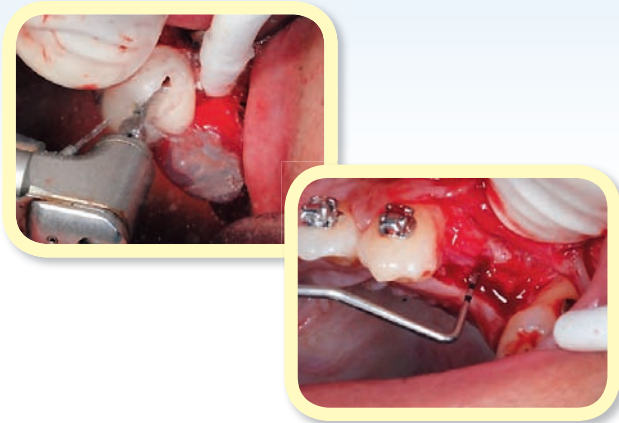
■ *Fig. 20:*

The surgical stent was fitted to guide the first lancer drill and the depth of the osteotomy was check with a periodontal probe.

■ *Fig. 21:*

The surgical guide pin was place and periapical X-ray was checked to evaluate the remaining from the sinus floor and the direction of the osteotomy.

■ *Fig. 22 An osteotome was used to push the sinus floor axially.*

■ *Fig. 23:*

The sinus membrane was then further elevated by the bone graft material.
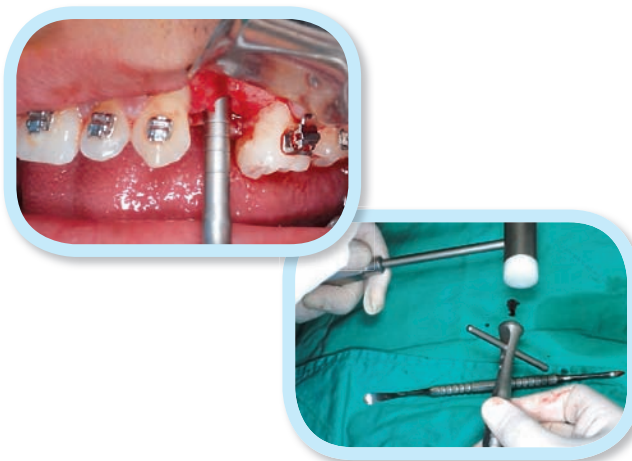
repair of the perforation. A buccal-releasing incision was made at the distofacial line angle of the right maxillary canine increase the flap reflation (*Fig. 27*). After the lateral wall of the sinus was exposed, an oval osteotomy was performed with a round bur mounted on a high-speed handpiece. A lateral brushing motion was used to carefully penetrate the sinus wall. The sinus membrane, usually seen as a dark shadow, was approached carefully until it was possible to observe slight movement of the surgical window. The sinus membrane was carefully and completely reflected from the floor and medial wall of the maxillary sinus. The perforated area was patched with a collagen membrane (*CollaTape® Zimmer*)(*Fig. 28*), and the bone graft (*Bio-Oss® Geistlich Biomaterials*) was gently packed into the inferior portion of the sinus cavity (*Fig. 29*). Then, a Ø4.1X8.5mm implant fixture (*TwStar® MegaGen® Taiwan*) was installed in the alveolar ridge osteotomy, and the other collagen membrane (*Lyoplant® Aesculap*) was positioned over the lateral window, extending about 3mm over sound
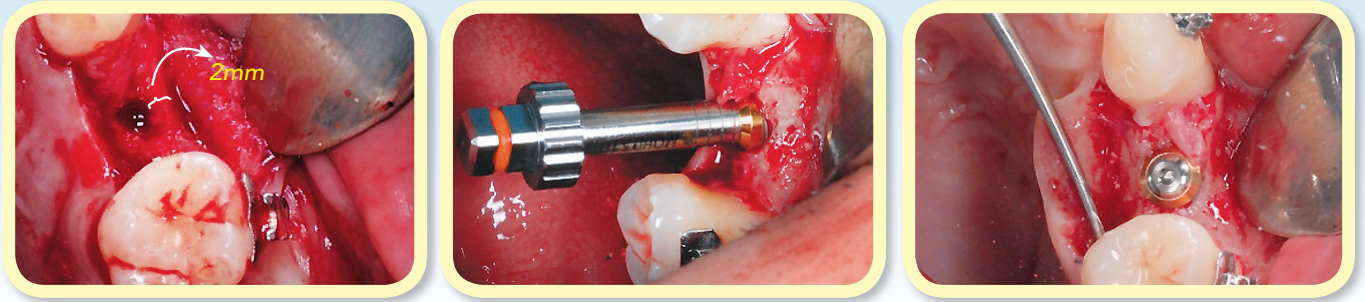
■ *Fig. 24:*
  The 2mm buccal bone plate was preserved, before implant fixture placement. All the SLA surface of implant fixture was placed into the osteotomy. Then the closing screw was secured.
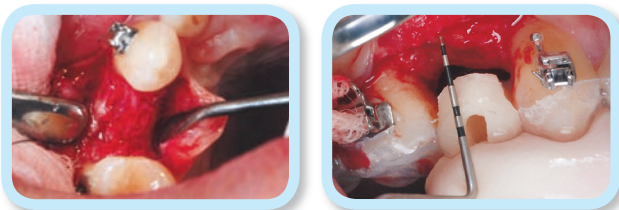

■ *Fig. 25:*
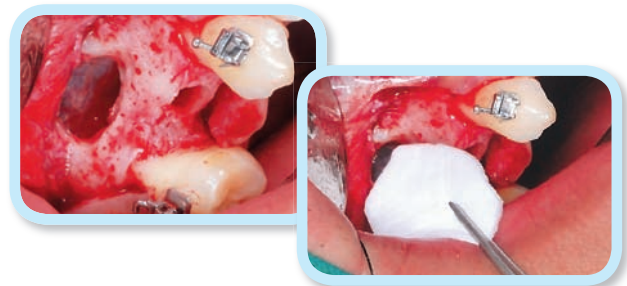 *The flap was elevated, and the future crown margin to the bone level was measured with a periodontal probe.*
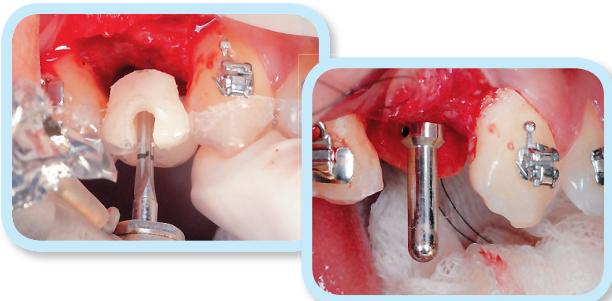

■ *Fig. 26:*
  The surgical stent was fitted to guide the first lancer drill. After the osteotomy was done, the surgical guide pin was placed and periapical X-ray film was checked.
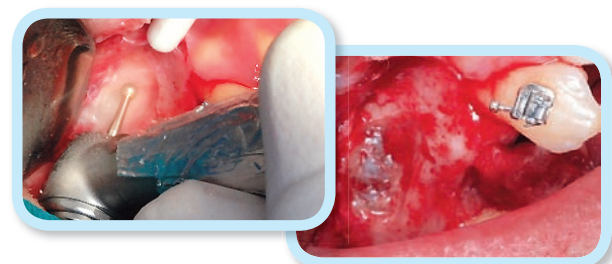
■ *Fig. 27:*
  The window was made with a round bur, and the Schneiderian membrane was seen as a dark shadow..

■ *Fig. 28:*
  The sinus membrane was completely reflected.
  The perforated area was patched with a collagen membrane.

bone. The flap was repositioned and closed with interrupted 5-0 nylon sutures (*Fig. 30*). Post-operative periapical radiographs were taken to check the position and angulation of the implants, as well as to confirm the integrity of the sinus membranes (*Fig. 31*).

The healing was uneventful, and the sutures were removed in a week (*Fig. 32*). Because vascular ingrowth occurs at a rate of ~1mm per month, graft infiltration with living bone requires several months. After 5 months of healing, the closing screw of maxillary left first premolar implant was partially exposed, indicating that the gingival biotype might be thin (*Fig. 33*). In retrospect, the implant should be positioned deeper.

■ *Fig. 29:*

ith the collagen membrane patching, the bone graft was then gently packed into the sinus cavity. Then, the   4.1X8.5mm implant fixture was installed.
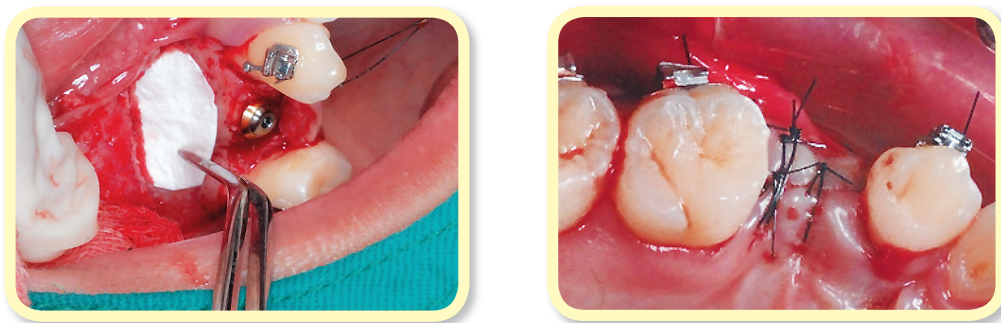
■ *Fig. 30:*

The other collagen membrane was positioned over the lateral window, extending about 3 mm over sound bone. The flap was repositioned and sutured.
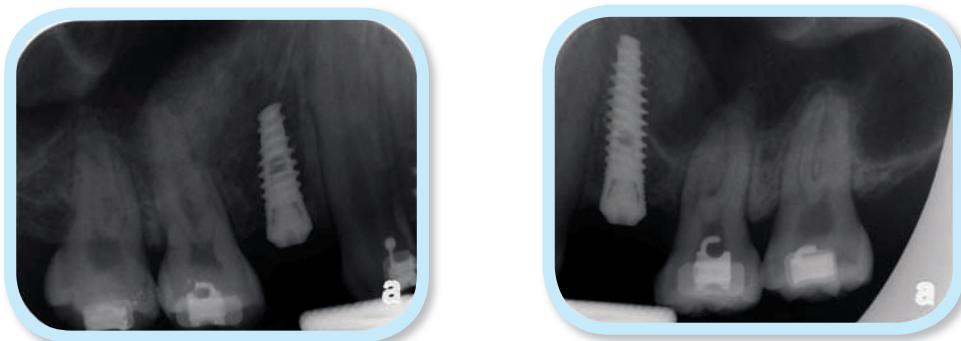
■ *Fig. 31:*

Post-operative periapical radiographs were taken to check the position and angulation of the implants, as well as to confirm the integrity of the sinus membranes.

1w p OP   1w p OP   1w p OP
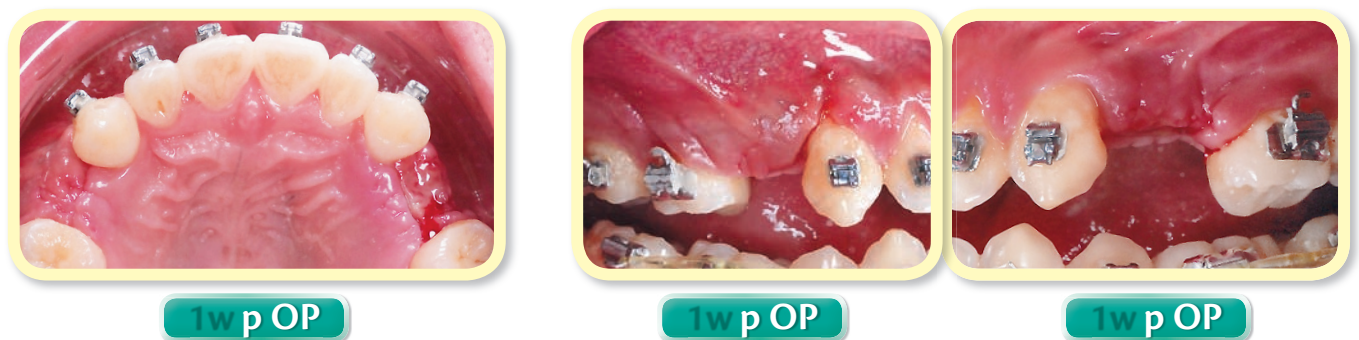
■ *Fig. 32 The healing was uneventful, and the sutures were removed in a wee .*

The second stage implant surgery was performed according to the classical Brånemark 2 stage, submerged fixture protocol.[3] A No.15c scalpel and diode laser were used to fully uncover the implant fixture. The closing screw was removed and replaced with a gingiva former which would enable the gingival margin to form properly during the healing period and ensure an ideal emergence profile around the future crown (*Fig. 34*).

Orthodontic Finishing Stage

Since the patient's mandibular midline was still 4mm to the left of the facial and maxillary midlines, an unsuccessful effort was made to correct the midline with an elastic (*Bear 1/4", 4.5 oz.*) from the left mandibular canine to the right maxillary canine (*Fig. 35*). In the 32nd month of orthodontic treatment, which included 13 months of implant healing, all brackets were removed. Clear overlay retainers were delivered for both arches, and the patient was scheduled for the implant prosthesis fabrication (*Fig. 36*).

Implant Prosthesis Fabrication

The gingiva formers were removed (*Fig. 37*) and the multi-post abutments (*Ø5.5mm and 2.5mm cuff height*) were tried on for fitting (*Fig. 38*). 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 (*Fig. 39*). The post height of the abutments were reduced to provide two mm of occlusal clearance for the fabrication of the porcelain fused to metal crown (*Fig. 40*). The cuff height of the abutments were also prepared to follow the soft tissue contour, and the buccal thickness of the abutments were reduced as needed.

■ *Fig. 33:*

After 5 months of healing, the healing cap of maxillary left first premolar implant was partially exposed.

■ *Fig. 34:*

A surgical scalpel and diode laser were used to fully uncover the implant fixture, and the cover screw was removed and replaced with a gingiva former.

■ *Fig. 35:*

An unsuccessful effort was made to correct the midline with an elastic (Bear 1/4", 4.5oz.) from the left mandibular canine to the right maxillary canine
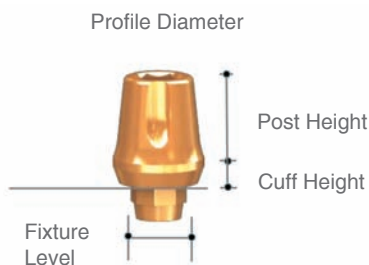

■ *Fig. 36:*

After 32 months of active orthodontic treatment, the brackets were all debonded.

■ *Fig. 37: The gingiva formers were removed.*

Multi-post

■ *Fig. 38: The profile of multi-post.*

■ *Fig. 39: The multi-post was modified.*

Before taking an impression, the abutment screws were torqued to 35-N-cm with a screw driver and a torque ratchet (*Fig. 41*). A gingival retraction cord was positioned in the peri-implant sulcus with a packing-placement instrument (*Fig. 42*). A direct impression was obtained with polyvinyl siloxane (*Fig. 43*), and poured with type IV dental stone. The casts were subsequently articulated using appropriate check-

■ *Fig. 40:*

The height of the abutments were reduced to provide two mm of occlusal clearance for the fabrication of the porcelain fused to metal crown

■ *Fig. 41:*

Before taking an impression, the abutment screws were torqued to 35-N-cm with a screw driver and a torque ratchet.
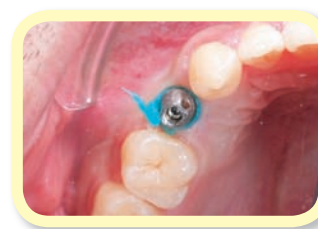
■ *Fig. 42:*

Gingival retraction cord was positioned in the peri-implant sulcus with a packing-placement instrument
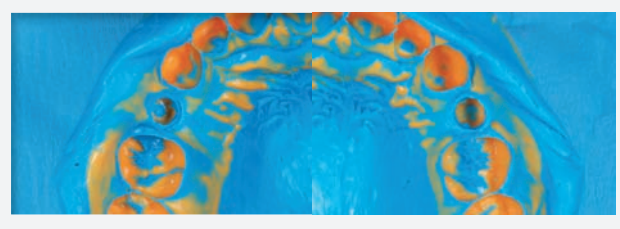
■ *Fig. 43: A direct impression was obtained with polyvinyl siloxane.*

bite records. A metal coping was fabricated by the laboratory, and the marginal integrity was verified with a dental explorer. After completion of the final prosthesis (*Fig. 44*), appropriate tightness of the contact area was confirmed with dental floss. After clinical adjustment and verification of the fit and occlusion, the permanent crowns were completed and luted into place with temporary cement . The crown removing lugs on the palatal side were trimmed off a week later (*Fig. 45*).

■ *Fig. 44: The completion of the final prostheses.*

■ *Fig. 45: The final prostheses were luted into place.*

Results Achieved

Maxilla (*all three planes*):
- • A - P: Maintained
- • Vertical: Maintained
- • Transverse: Maintained

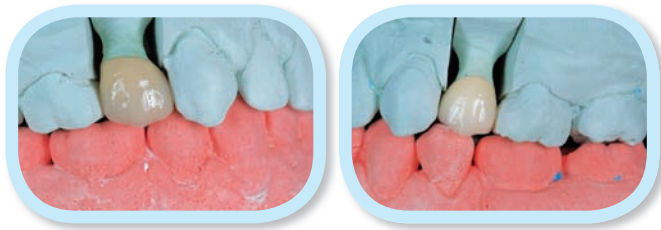Mandible (*all three planes*):
- • A - P: Maintained

- • Vertical: Maintained
- • Transverse: Maintained

Maxillary Dentition
- • A - P: Retracted
- • Vertical: Incisors extruded
- • Inter-molar / Inter-canine Width: Maintained

Mandibular Dentition
- • A - P: Incisors retracted
- • Vertical: Maintained
- • Inter-molar / Inter-canine Width: Maintained

Facial Esthetics: Maintained

Final Evaluation Of Treatment

The ABO Cast-Radiograph Evaluation (*CRS*) score was 27 points. The major discrepancies[1] were buccolingual inclination (*6 points*) and occlusal relationships (*7 points*)(*Fig. 46*). The facial asymmetry and residual midline discrepancy appeared to be major factors contributing to the compromised final occlusion. Details of the CRS scores are presented in the scoring sheet at the end of this report.

The smile esthetics were substantially improved by closing the interdental spaces, correcting the anterior crossbite, establishing optimal incisal exposure and providing for proper gingival
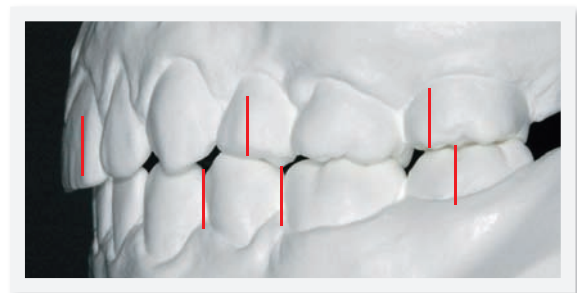
■ *Fig. 46:*

The major discrepancies were buccolingual inclination (6 points) and occlusal relationships (7 points).

display. The occlusal function was also improved by obtaining of adequate protrusive guidance and proper occlusal contact in centric occlusion. The missing right and left maxillary first premolars were also restored into occlusion by the implant-supported prostheses.

Overall, there was significant improvement in dental esthetics, smile dynamics and occlusal function. The patient was satisfied with the result.

Discussion

This patient had a genetically related disorder that is deemed oligodontia, because he has at least six missing teeth other than third molars. It is an inheritable disorder that he is likely to pass on to his children. Since the problem is probably common in his family, it is important for the patient to realize that early diagnosis and treatment with orthodontics and temporary anchorage devices is often indicated. Without interceptive orthodontics treatment, oligodontia can result in a severe acquired malocclusions that are difficult and expensive to correct. When oligodontia is diagnosed, the first oligation of the clinician is genetic counseling, which may involve referral to a medical geneticist.

The most obvious treatment plan for a patient with six missing premolars and generalized spacing is preprosthetic orthodontics to prepare the edentulous areas for six implant-supported prostheses (*Fig. 47*). However, the treatment plan for patients with multiple missing teeth should be based on a comprehensive evaluation of the facial profile, smile framework, and occlusion as well as on space requirements. Dr. Sarver's Treatment Optimization[4] approach is an important and useful treatment guideline.

For the present patient, the straight profile and appropriate axial inclination of the maxillary incisors (*U1 to SN angle 109°*) is an important diagnostic consideration favoring space closure in the mandibular arch. The anterior crossbite should be corrected by retracting the mandibular incisors, instead of flaring the maxillary incisors (*Fig. 48*). However, lower incisor axial inclination is within the normal range (*U1 to MP*), so it is important to maintain adequate root-lingual torque to prevent excessive mandibular incisor tipping. Additional factors favoring mandibular arch space closure are the atrophic (*resorbed*) edentulous spaces in the areas of the lower second premolars (*Fig. 49*).

It was not possible to correct the midline deviation with the routine space closure mechanics employed (*Figs. 35-36*). In retrospect, an OrthoBoneScrew® (*OBS*) in the right buccal shelf [5] was indicated
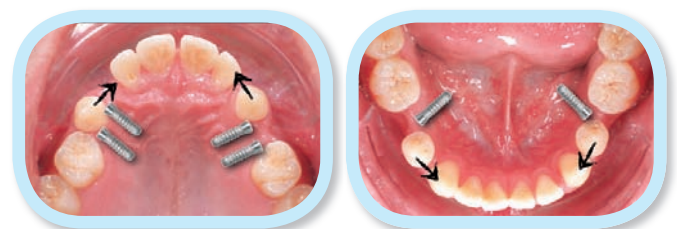
■ *Fig. 47:*

The most obvious treatment plan for a patient with six missing premolars and generalized spacing is preprosthetic orthodontics to prepare the edentulous areas for six implant-supported prostheses


■ *Fig. 48:*

The straight profile and appropriate axial inclination of the maxillary incisors is an important diagnostic consideration favoring space closure in the mandibular arch.

to provide osseous anchorage to correct the mandibular midline discrepancy (*Fig. 50*). The OBS approach would have considerably improved the occlusal interdigitation (*Figs. 45-46*) and the anterior alignment. In addition, the overjet could have been reduced by adjusting the marginal ridges on the maxillary incisors (*Fig. 51*). Overall, it appears that the use of OBS anchorage would have considerably improved the ABO cast-radiograph score of 27.

When an implant is placed, its position within the bone housing is the major determinant of the outcome. The Taiwan Star system has a 1.2mm smooth collar at the neck. According to the manufacture's handbook,[6] such implant fixtures can be placed as either submerged (*smooth collar in bone*) or non-submerged (*Fig. 52*). Under the present circumstances, the depth of implant placement and the abutment selection significantly impact the final prostheses. If the implant is placed as a submerged fixture, the crown margin should be located on the cuff height of the multi-post abutment (*Fig. 52*). Thus, the biological width can be accommodated by the cuff height of 2.5mm and the implant-abutment connection. On the other hand, if the implant is placed as non-submerged (*exposed*) fixture, the crown margin should be located on the implant platform, leaving the 1.2mm smooth collar for the biological width.

In the #12 area, the implant was placed as a non-submerged fixture. Following the unloaded healing phase, a multi-post abutment was used. Since the crown margin was located on the abutment, there was an unesthetic dark shadow at the gingival margin. In retrospect, a solid abutment would more
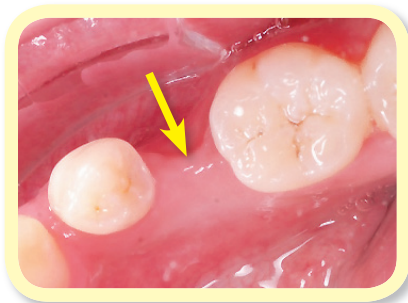
■ *Fig. 49:*
  The atropic ridge would complicate the dental implant treatment.
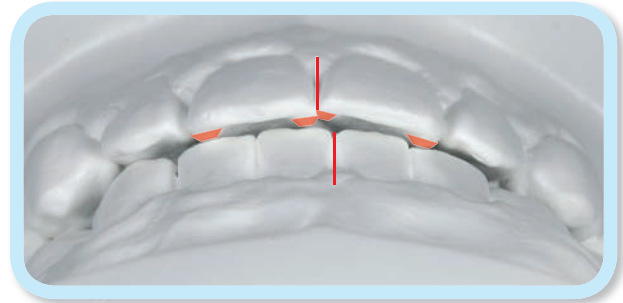
■ *Fig. 51:*
  The overjet could have been reduced by adjusting the marginal ridges (shown as orange shadows) on the maxillary incisors
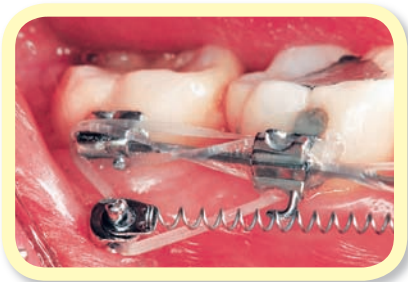
■ *Fig. 50:*
  The OBS in the buccal shelf was indicated to provide osseous anchorage to correct the mandibular midline discrepancy.

Solid Abutment

Biological Width
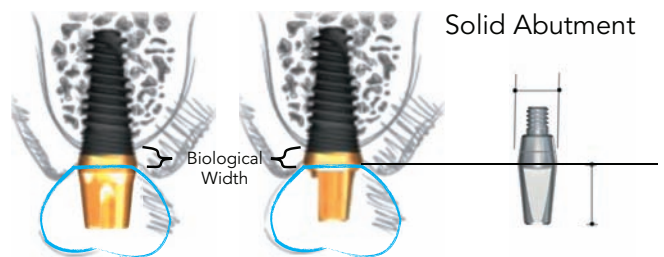
■ *Fig. 52:*
  The selection of abutment should be different based on different depth that TS implant fixture was placed.

appropriate for a better esthetic result.

There are increasing needs for dental implants in oral rehabilitation, but atrophic edentulous sites are a common problem (*Fig. 54*). The maxillary sinus elevation and grafting technique are effective and predictable surgical procedures for augmenting the available bone volume in the posterior maxilla.[7] There are two common approaches for maxillary sinus elevation: a lateral window (*a modified Caldwell-Luc procedure*),[8,9] and the osteotome technique (*crestal approach*).[10] The choice of the method is primarily dependent on residual bone height, implant length, and amount of bone grafting required.[11] Residual bone height is usually the most important factor in determining which augmentation technique that is most appropriate (*Fig. 55*).[1,12]

When the residual bone height is less than 4mm, the lateral window approach is preferred, because it offers a direct view of the sinus and better control of the surgical site. The implants can be placed simultaneously, if there is sufficient residual bone to provide primary stability. Alternatively, the implants can be placed after the graft maturation.

If the residual bone height is 4-5mm, the crestal approach may be indicated to lift the sinus membrane about 3-4mm to place an 8mm implant. The crestal approach is a more conservative surgery, with less post-operative discomfort, that focuses on localized augmentation of the sinus.

A residual bone height of 6-8mm is usually adequate for a short implant (*6-8mm*).[13] Short implants have proved reliable for patients with limited bone availability. The advantage is avoiding a ridge augmentation procedure, but masticatory stress

Submerged   Non-Submerged
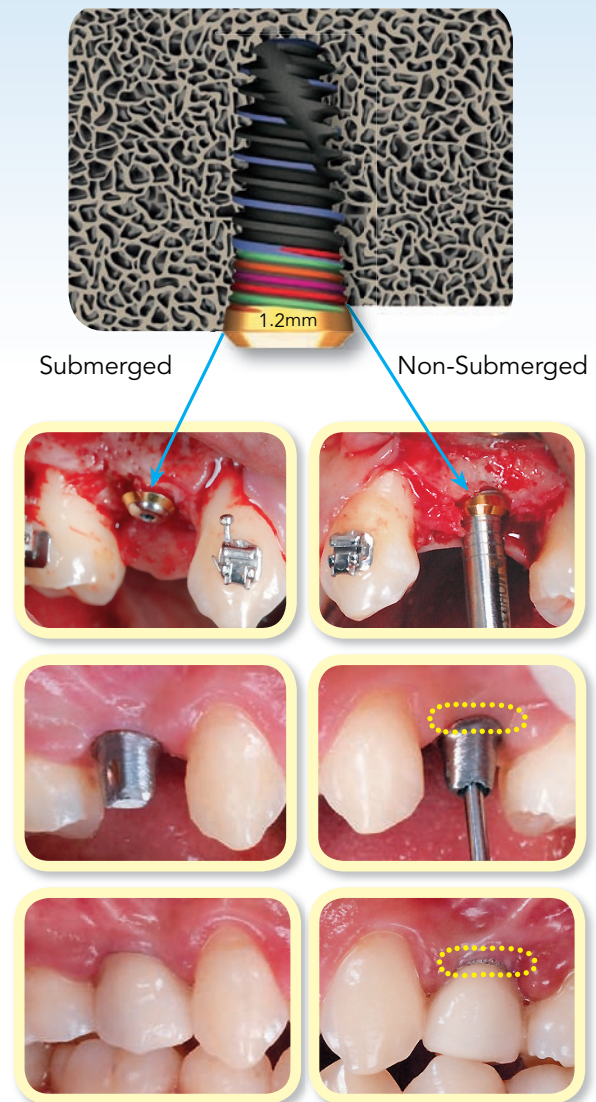
■ Fig. 53:

The TS implant fixture can be placed as submerged or non-submerged. The depth of the placement and the selection of abutment both impact the result of the final prostheses.
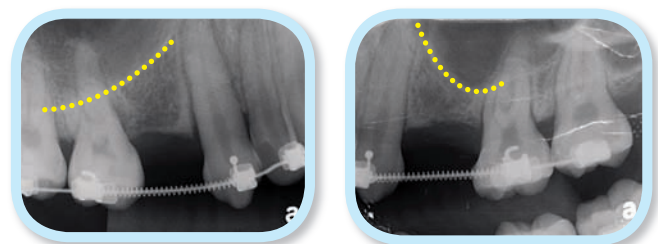
■ Fig. 54:

Atrophic edentulous sites are a common problemin the rehabilitation of the edentulous posterior maxilla with implant-supported prostheses.
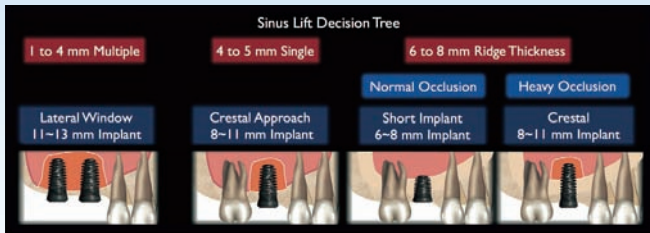
■ Fig. 55:

The choice of the method is primarily dependent on residual bone height, implant length, and amount of bone grafting required
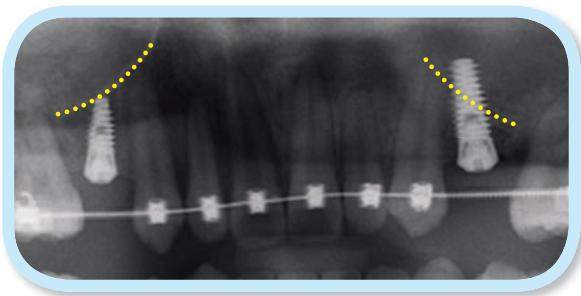
■ Fig. 56:

In the #12 area, the sinus membrane should have been elevated 3-4mm and a shorter (8 or 9mm) implant could have been used to reduce the chance of sinus membrane perforation

■ Fig. 57

A drill with a vertical stop could be used to control the depth of drilling and avoid penetrating the floor of the sinus.

must be managed by a shorter implant. Because of this mechanical disadvantage, short implants are often increased in width to increase the surface area of the bone-implant interface.

In light of the above decision-making process, the implant procedure in the #12 area could have been managed more effectively. The sinus membrane should have been elevated 3-4mm and a shorter (*8 or 9mm*) implant could have been used to reduce the chance of sinus membrane perforation (*Fig. 56*).[14,15] The osteotome technique is recommended when more than 6mm of residual bone height is present and an increase of about 3 to 4mm is expected.[15]

In the #5 area, the same osteotome technique resulted in sinus membrane perforation which required a more extensive surgical repair.[16] Sinus membrane perforation is not an absolute indication for aborting an augmentation procedure, but care should be taken during the drilling procedure. A drill with a vertical stop could be used to control the depth of drilling and avoid penetrating the floor of the sinus (*Fig. 57*). In retrospect, since the lateral window was performed in the #5 area, the implant length could have been longer (*~10-12mm*), instead of a short implant (*8.5mm*). The longer implants would have provided a long-term mechanical advantage for resisting functional stress.

Conclusion

Generally, treatment of oligodontia, six or more missing teeth, is a challenging restorative task.[17] To optimize both esthetic and functional outcomes, interdisciplinary management with orthodontics, implants, and prostheses is commonly required. For maximal patient benefit, an ordered diagnostic and treatment planning process is indicated:

Diagnosis should include a careful history of this familial trait. The patient may have family members who could benefit from interceptive orthodontics treatment.

Treatment planning is based on the facial profile and occlusion. For acquired malocclusions, space management may require orthodontics. Modest alignment problems can be restored with implants and prostheses. Implant site development with orthodontics is often a viable option.[17]

Orthodontics treatment is used to consolidate space and improve the occlusion to an acceptable level. Dental implants are placed in edentulous spaces, allowed to heal, and the gingival collar is developed, while the orthodontics is completed. After the fixed appliances are removed, abutments are fitted, prostheses fabricated, and the occlusion is restored.

When interdisciplinary *"ortho-implant-pros"* treatment is necessary, effective coordination is absolutely essential and is always challenging.

The result of the present case is not perfect; nevertheless, the report is still valuable information for most clinicians. Carefully analyzing the results provides an opportunity to improve methodology and develop a more comprehensive treatment philosophy.

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Discrepancy Index Worksheet

TOTAL D.I. SCORE = 44

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   =   17

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 2 pts.
Full Class II or III	=	4 pts. per side pts.
Beyond Class II or III	=	1 pt. per mm. pts. additional

Total   =   2

LINGUAL POSTERIOR X-BITE

1 pt. per tooth   Total   =   2

BUCCAL POSTERIOR X-BITE

2 pts. per tooth   Total   =   0

CEPHALOMETRICS   (See Instructions)

ANB ≥ 6° or ≤ -2°   =   4 pts.

 Each degree < -2° _____ x 1 pt. = _____

 Each degree > 6° _____ x 1 pt. = _____

SN-MP
   ≥ 38°   =   2 pts.
 Each degree > 38° _____ x 2 pts. = _____

   ≤ 26°   =   1 pt.
 Each degree < 26° _____ x 1 pt. = _____

1 to MP ≥ 99°   =   1 pt.
 Each degree > 99° _____ 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 3rd molars)	_____ x 2 pts. =	_____
Midline discrepancy (≥3mm)	@ 2 pts. =	2
Missing teeth (except 3rd molars)	_____ x 1 pts. =	_____
Missing teeth, congenital	6 x 2 pts. =	12
Spacing (4 or more, per arch)	2 x 2 pts. =	4
Spacing (Mx cent. diastema ≥ 2mm)	@ 2 pts. =	_____
Tooth transposition	_____ x 2 pts. =	_____
Skeletal asymmetry (nonsurgical tx)	@ 3 pts. =	_____
Addl. treatment complexities	_____ x 2 pts. =	_____

Identify:

Total   =   18

IMPLANT SITE

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

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

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

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

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)   =   1

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

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

Total   =   5

Cast-Radiograph Evaluation

Case #

Patient

Total C-R Eval Score: 27

Alignment/Rotations

1
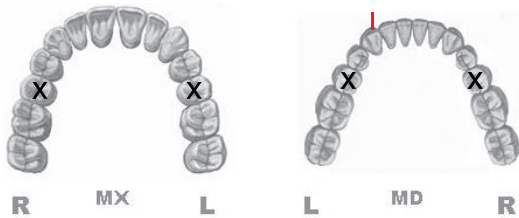
Marginal Ridges

4
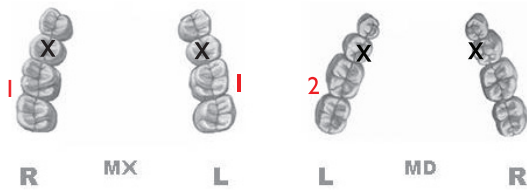
Buccolingual Inclination

6
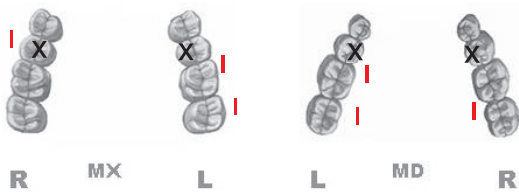
Overjet

4

Occlusal Contacts

2

Buccal Surface

Lingual Surface
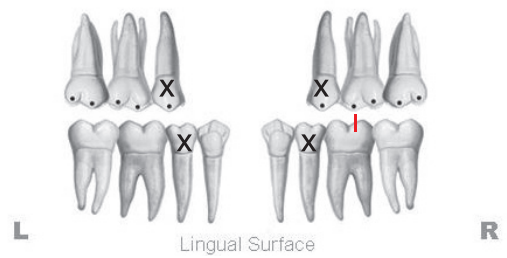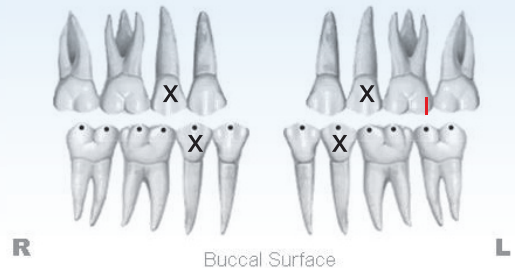
Occlusal Relationships

7

Interproximal Contacts

0
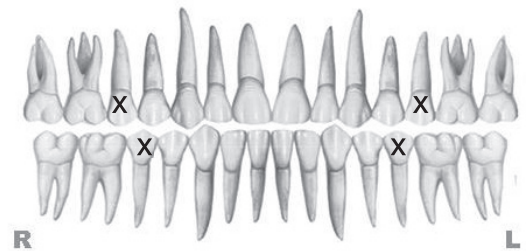
Root Angulation

3
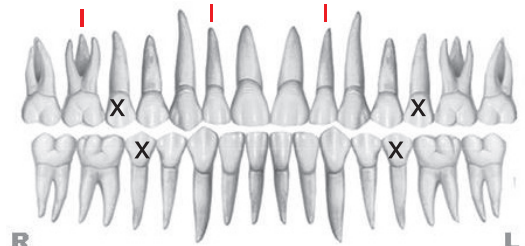
INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

IBOI Pink & White Esthetic Score

Total Score: = 9

1. Pink Esthetic Score
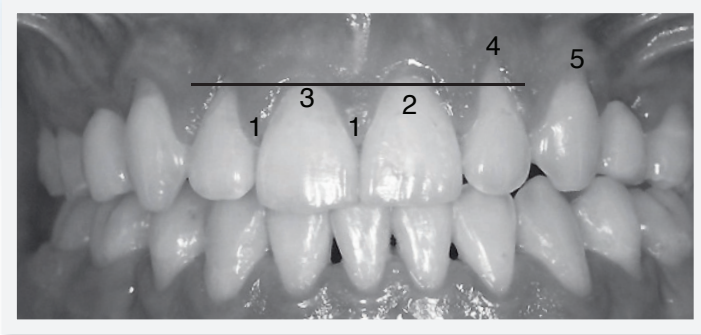
Total = 4

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)
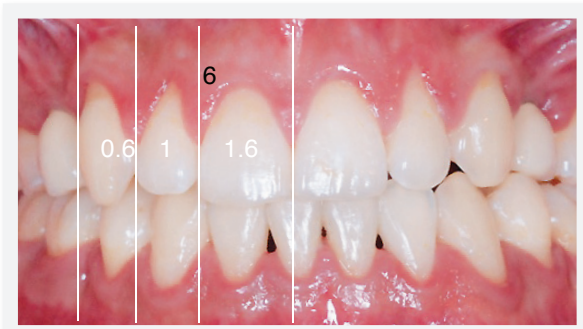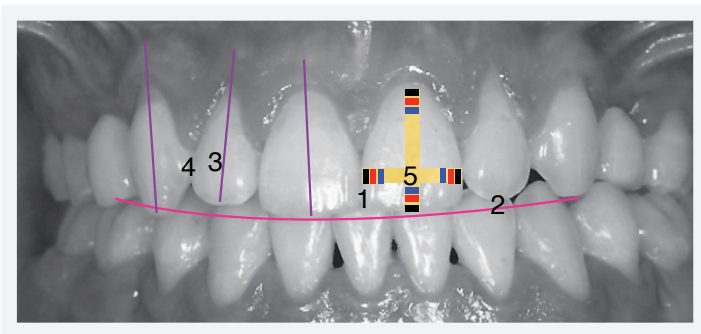
Total = 5

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

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

IBOI Pink & White Esthetic Score

1. Pink Esthetic Score

Total = **1**

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

2. White Esthetic Score (for Micro-esthetics)

Total = **1**

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

1. 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

2. White Esthetic Score (for Micro-esthetics)

Total = **2**

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

IBOI Implant-Abutment Transition & Position Analysis

3. Implant Position

Total = **2**

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

1. M & D (Center)	(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

Total = **2**

4. Abutment transition Contour

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

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

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

IBOI Implant-Abutment Transition & Position Analysis

3. Implant Position

Total = **2**

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

1. M & D (Center)	(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

Total = **2**

4. Abutment transition Contour

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

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

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

2014 Beethoven International Damon, OBS & VISTA Workshop

6/17~6/20, 12/1~12/4

LECTURER: Dr. Chris Chang

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

LECTURER: Dr. John Lin

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

Dear Chris:

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

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

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

Dear Chris:

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

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

John K.S. Tong, DDS, MAGD
Cupertino, California USA
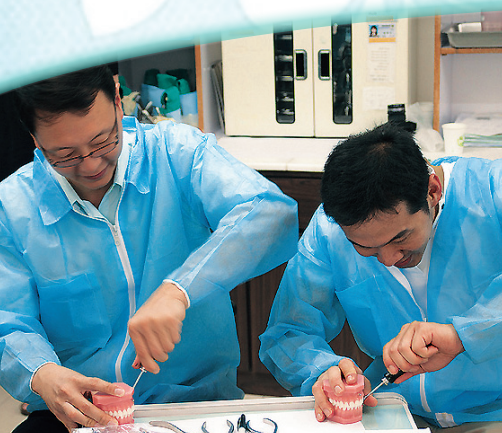
VISTA for Impacted Cuspids
In-house Workshop (Pig Jaw)

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

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

CTG

Elastic Chain

OBS

VISTA:
Vertical **I**ncision **S**ubperiosteal **T**unnel **A**ccess

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

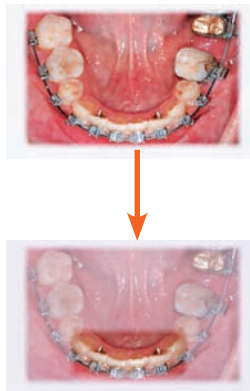|		
09:00—10:00	VISTA for Impacted Cuspids	
10:00—10:10	Break	
10:10—12:30	Damon + Screw	*Dr. John Lin*
12:30—13:30	Lunch	
14:00—17:00	VISTA for Impacted Cuspids In-office Workshop (*Pig Jaw*)	

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

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 04/17,10/01

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 04/17,10/01

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.

DAMON Study Club @台中

2013

9/14　陳建綱

中國醫藥大學牙醫學士
中華民國兒童牙科醫學會專科醫師
中華民國家庭牙醫學會專科醫師
台灣福爾摩沙植牙學會專科醫師
台灣口腔矯正醫學會 會員
康軒牙醫診所 主治醫師

Third Molar Management in Daily Orthodontic Practice

當後牙區的X光片顯示出第三大臼齒時，您第一個閃過的念頭是什麼？如果齒列中又有缺牙空間，您的第二個念頭是什麼？我們將用案例分享關於：矯正處置方法以及拔與不拔的考量。藉此來探討矯正治療對於第三大臼齒的價值與可行性。

11/9　陳易駿

中山醫學大學 牙醫學碩士/講師
齒顎矯正、兒童牙科 主治醫師
中華民國 齒顎矯正學會 專科醫師
中華民國 牙體復形學會 專科醫師
中華民國 植牙醫學會 專科醫師
美國齒顎矯正學會 會員 (AAO)
美國美容牙醫學會 Professional Member (AACD)

現代笑容美學
Modern Smile Esthetics

微笑永遠是一個人身上最好看的東西。　(The smile of yours is always the best looking thing you can wear.)

美學，是一門主觀還是客觀的學問？在美與醜之間，每個人都有自己的看法與選擇。牙醫師在臨床上如何替患者決定美與醜？又牙醫師覺得好看，但患者就一定滿意這樣的治療嗎？

牙醫學，是一門結合科學與藝術(Art & Science)的學科。現代笑容美學，著重於牙科美學的觀念，但是除了牙齒之外，還有許多軟硬組織間協調的考量因素。一個協調且好看的笑容，是患者與醫師所共同樂見的；臨床上滿意的結果端視牙醫師正確的診斷、治療計畫以及與患者良好的溝通。身為牙醫師如何才能運用已知的科學知識，從患者的角度出發，做到醫病雙方皆滿意的治療結果？你將會知道原來治療的結果不是偶然！

主辦單位　臺灣楓城牙醫學會

協辦單位　湧傑企業股份有限公司

時間　週六晚上 7:00 pm－9:00 pm

日期　9/14　Dr. 陳建綱
Third Molar Management in Daily Orthodontic Practice

11/9　Dr. 陳易駿
現代笑容美學
Modern Smile Esthetics

地點　中國文化大學推廣教育部 <台中教育中心>
台中市西屯區中港路二段128之2號3F

報名　請先電話報名 04-23058915 Ms張
費用每堂500元

學分　含學分證明每堂2學分，共4學分

DAMON Study Club @台北

2013

主辦單位　臺灣楓城牙友學會

協辦單位　湧傑企業股份有限公司

時間　週六晚上 7:00 pm – 9:00 pm

日期　9/7　Dr 邱琬棋
How to Achieve "Perfect Wire Application"！

11/23　Dr 林聖傑
二級不正咬合的治療策略

地點　台北市松江路69巷5號(蛙咖啡)
捷運松江南京站4號出口步行三分鐘

報名　請先電話報名 02-27788315
轉分機122 Ms楊，120 Ms邵
費用每堂500元

學分　含學分證明每堂2學分，共4學分

9/7　邱琬棋

中山醫學大學牙醫學士
台北醫學大學齒顎矯正學碩士
中華民國齒顎矯正學會專科醫師
永和耕莘醫院矯正專科醫師
信安牙醫診所主治醫師

How to Achieve "Perfect Wire Application"！

使用自鎖式系統矯正器已多年，也嘗試過各種wire搭配進行矯正治療，但在臨床的治療結果上，皆不盡相同！尤其是前牙 Anterior torque 之控制及掌握，此次將分享各種wire size對於不同病例之應用，同時也將探討 Damon Clear 透明矯正器在臨床上如何趨吉避凶！

11/23　林聖傑

陽明大學臨床牙醫研究所碩士
中華民國齒顎矯正學會專科醫師
台北榮民總醫院兼任主治醫師

二級不正咬合的治療策略

Class II malocclusion 是很變化多端的，臨床上可能會出現有很大的overjet或是很深的 overbite，可以有很凸的臉型或是不錯的外觀！所以會產生不同的治療策略。本次報告希望給大家看到不同的Class II 案例以及不同的治療方式！

Correction of Anterior Crossbite Complicated with Two Supernumerary Teeth

History And Etiology

A 12-year-1-month-old girl was accompanied by her parents for evaluation of a crowded dentition (*Fig. 1*). The chief complaint was an unesthetic smile due to a maxillary anterior crossbite and crowding. There was no other contributory medical or dental history. Clinical examination revealed an anterior crossbite, with blocked out right and left maxillary canines, and a bilateral class I molar relationship (*Figs. 2 and 3*). The patient was treated to an acceptable result as documented in Figs. (*4-6*); however, the treatment of the anterior crossbite (*Fig. 7*) was complicated by the presence of two supernumerary teeth (*mesiodens*) in the premaxillary region (*Figs. 8*). Figures 9 and 10 provide a direct comparison of the cephalometric and panoramic radiographs before and after treatment, respectively. Figure 11 shows the superimposition of the tracings for the before and after treatment cephalometric radiographs.

Diagnosis

Cephalometric and panoramic radiographs (*Fig. 9*) document the overall complexity of the malocclusion. A periapical radiograph (*Fig. 8*) revealed that one of the supernumerary teeth was superimposed just below the CEJ of the upper right central incisor, and its crown was oriented

Fig. 1: Pretreatment facial photographs

Fig. 2: Pretreatment intraoral photographs

Fig. 3: Pretreatment study models

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

Fig. 4: Posttreatment facial photographs

Fig. 5: Posttreatment intraoral photographs

Fig. 6: Posttreatment study models

in an occlusal direction. The other mesiodens was superimposed on the apical third of the upper left central incisor in an inverted orientation (*Fig. 8*). Although cephalometric and occlusal radiographs may provide additional information, but precise localization of each mesiodens requires 3D imaging. The latter was not deemed necessary for the present patient.

Skeletal:

- Skeletal Class III (*SNA 76°*, *SNB 75°*, *ANB 1°*)
- High mandibular plane angle (*SN-MP 43°*, *FMA 34°*)

Dental:

- Class I occlusal relationships on both sides
- Anterior crossbite from #7 to #10 (*Fig. 7*)
- 12 mm of crowding in the upper arch (*severe*)
- 3 mm crowding in the lower arch (*mild*)
- Blocked out maxillary canines
- Upper midline 2 mm left of the facial midline
  Facial: The profile was protrusive, primarily due to the prominent position of the lower lip.

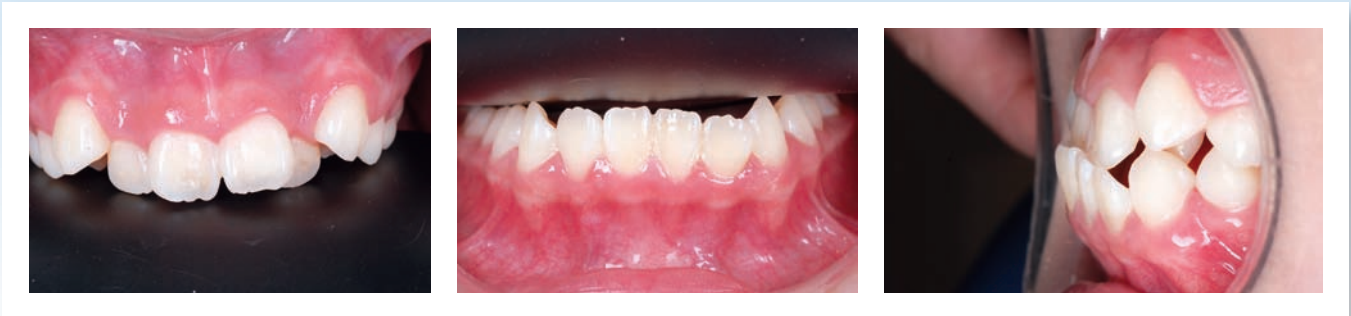ABO Discrepancy Index (*DI*) was 37 as shown in the subsequent worksheet.

■ *Fig. 7: Severely crowded upper anterior teeth and mildly crowded lower anterior teeth. Anterior crossbite with blocked out canine.*

■ *Fig. 8:*

Two supernumerary teeth were distributed in the premaxilla with opposite apico-coronal directions.

CEPHALOMETRIC

SKELETAL ANALYSIS

	PRE-Tx	POST-Tx	DIFF.
SNA°	76°	76°	0°
SNB°	75°	75°	0°
ANB°	1°	1°	0°
SN-MP°	43°	44°	1°
FMA°	34°	35°	1°
DENTAL ANALYSIS			
U1 TO NA mm	6 mm	7 mm	1 mm
U1 TO SN°	107°	110°	3°
L1 TO NB mm	10 mm	7 mm	3 mm
L1 TO MP°	97°	91°	6°
FACIAL ANALYSIS			
E-LINE UL	-1 mm	0 mm	1 mm
E-LINE LL	4 mm	2 mm	2 mm

■ Table. 1: Cephalometric summary

Specific Objectives Of Treatment

Maxilla (*all three planes*):
- A - P: Allow for normal expression of growth
- Vertical: Allow for normal expression of growth
- Transverse: Maintain

Mandible (*all three planes*):
- A - P: Allow for normal expression of growth
- Vertical: Allow for normal expression of growth
- Transverse: Maintain

Maxillary Dentition
- A - P: Maintain incisors and protract molars
- Vertical: Maintain
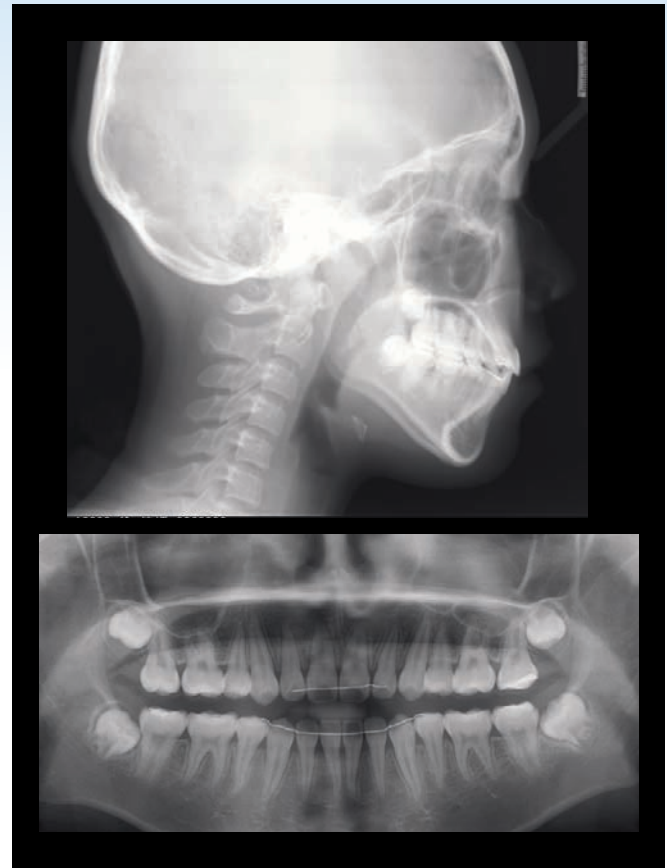- Inter-molar Width: Maintain

Mandibular Dentition
- A - P: Retract incisors and protract molars
- Vertical: Extrude consistent with normal growth
- Inter-molar / Inter-canine Width: Maintain
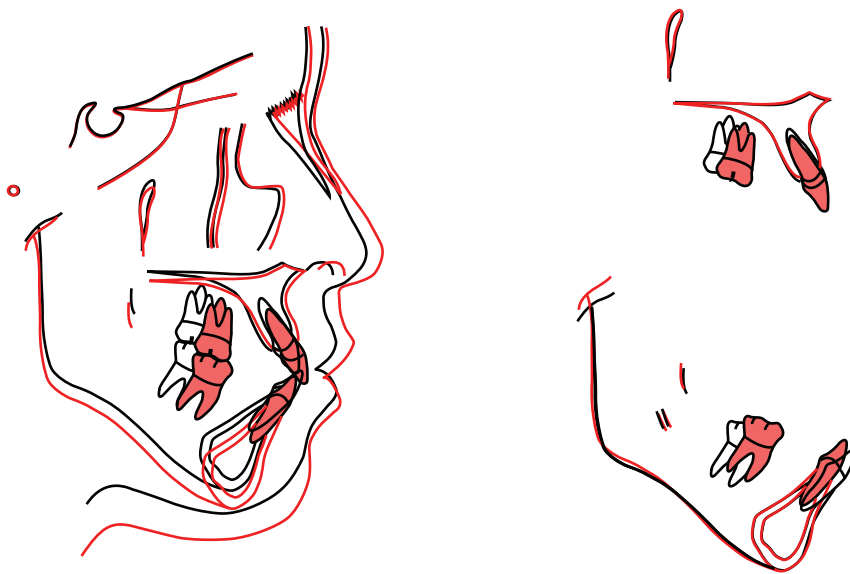
Facial esthetics:
- Maintain the upper lip relationship
- Retract the lower lip
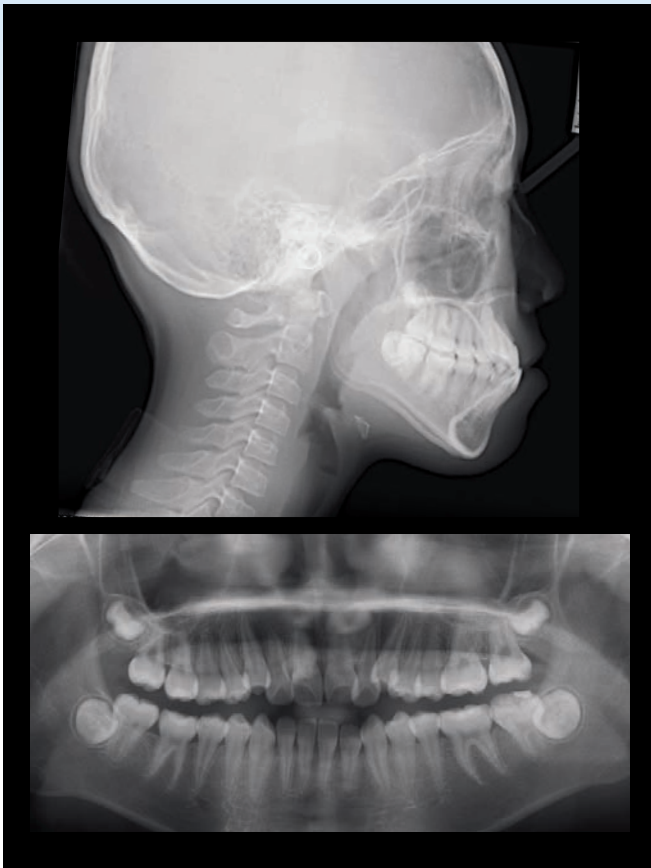
Fig. 9:   retreatment pano and ceph radiographs.

Fig. 10:   osttreatment pano and ceph radiographs.

Fig. 11:

uperimposed tracings show the noticeable growth and clockwise rotation of the mandible the marked lingual tilting of the lower incisors and the mesial shifts of the molars with unchanged class   relationship. The profile was improved.

Treatment Plan

- Extraction first premolars in all four quadrants to resolve crowding.

- Open the bite using anterior bite turbos to assist the anterior crossbite correction.

- Retract the canines to resolve crowding.

- Close residual space with elastics and power chains.

- Monitor and reassess the need for removing the supernumerary teeth during leveling and aligning.

- Correct root torque of upper lateral incisors.

- Retention: lower lingual fixed retainer and a clear overlay for the maxillary arch

Appliances And Treatment Progress

A .022" slot Damon Q bracket system (*Ormco*) was used. Standard torque brackets were bonded on the upper dentition. The upper lateral incisor brackets (*U2: +6°*) were bonded upside down to achieve improved facial root torque (*Fig. 12*). The initial archwire was .014" CuNiTi. Bite turbos were bonded on the lingual surface of the lower central incisors to assist anterior crossbite correction (*Fig. 13 and 17*). The upper left lateral incisor was ligature-tied to the archwire, but the slot was not engaged to avoid a heavy initial force (*Fig. 12*). A protective sleeve was placed between teeth #11 and 13. One month later, standard torque brackets were bonded on the lower dentition and a .014" CuNiTi wire was engaged. In

■ Fig. 12:
The brackets were bonded up-side down on the upper lateral incisors for torquing roots forward.


■ Fig. 13:
Two bite turbos were bonded on the lingual side of lower central incisors for disarticulation

the 3rd month of active treatment, the crowding had been relieved and the anterior crossbite was corrected. Subsequently, an upper .018" CuNiTi arch wire was placed and posterior bite turbos were bonded occlusally on the lower first molars, and the lingual turbos on the lower incisors were removed. Drop-in hooks (*Ormco*) were fitted in the vertical slot of the upper canines to secure class II elastics (*Quail 3/16" 2 oz*)(*Fig. 15*). To correct the lingual tipping of tooth # 18, a lingual button and short, light cross elastics (*Quail 3/16" 2 oz*) were used. In the 4th month

■ *Fig 14:*

   rogress photographs revealed the teeth with light forces in a passive system moved and followed the path of least resistance then extraction spaces were reduced rapidly and the dentition was aligned well.   ne of the supernumerary teeth exposed and extracted without any complications.
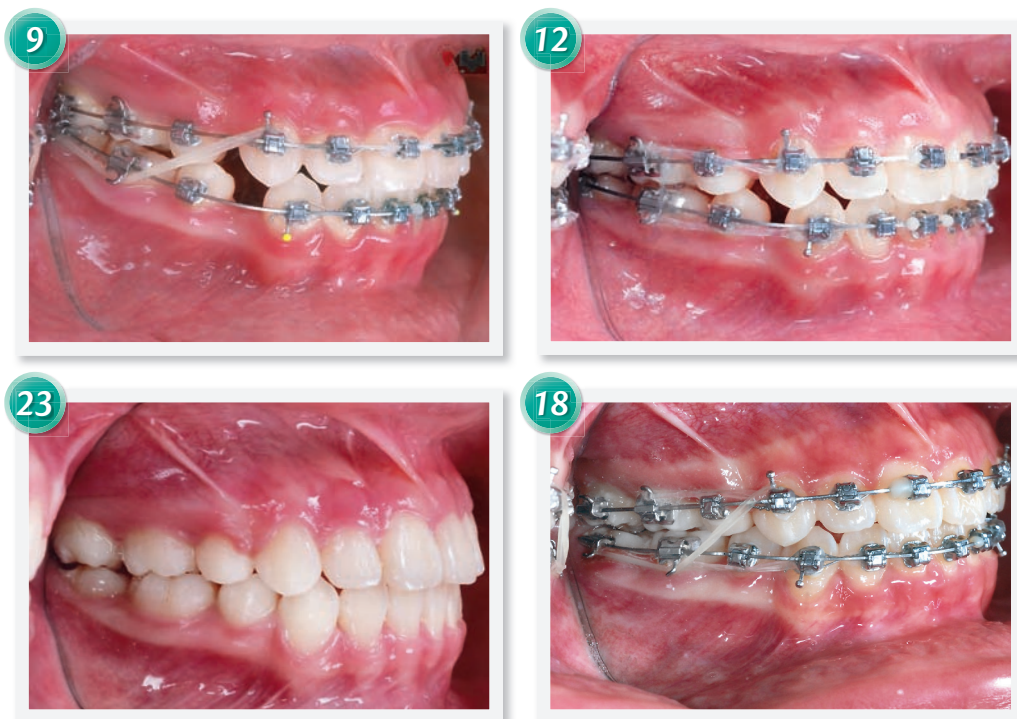

■ *Fig 15: Power chains and   type elastics were used for closing residual e traction spaces and detailing the occlusion.*

of treatment, a new upper .014x.025" CuNiTi arch wire and lower .018" CuNiTi arch wire were placed.

In the 5th month, an upper .017x.025" TMA wire and lower .014x.025" CuNiTi wire were utilized. A figure-eight ligature was tied across the six upper anterior teeth to maintain space closure. The palatally exposed supernumerary tooth on the right side was extracted (*Fig. 14 and 16*). In the 8th month, bite turbos were added on the palatal side of the upper central incisors to hold the overbite, and the bite turbos on the lower first molars were removed. Class II elastics

■ *Fig. 16: The tuberculate type of the supernumerary tooth.*
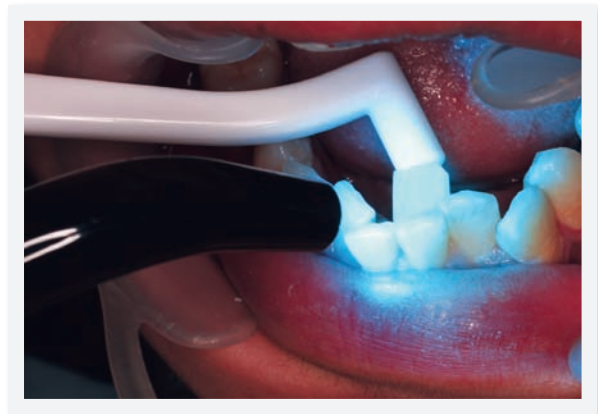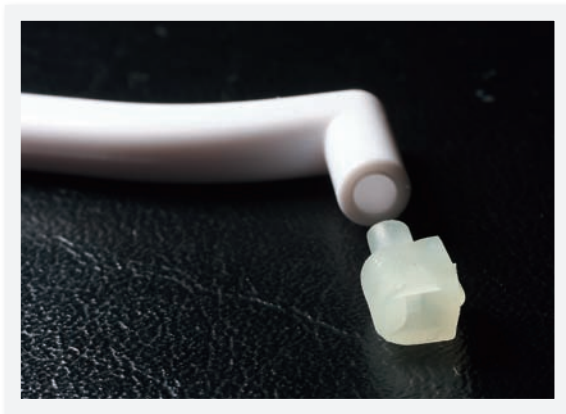
■ *Fig. 17:*

   Illustration for molding the lower lingual bite turbos with light-cured material that was filled in a detachable and rubbery silicone mold.
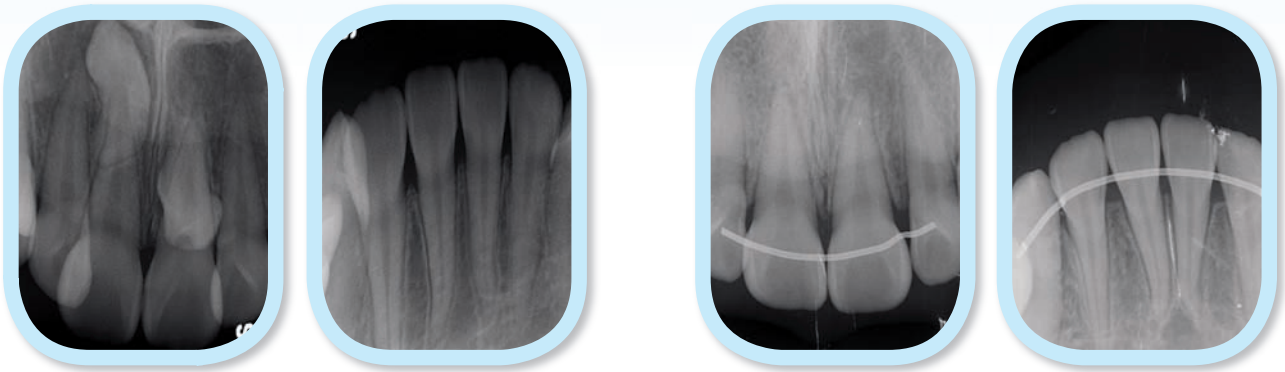
Fig. 18:
The pre-treatment and post-treatment periapical films revealed that no obvious root resorption was observed and the roots of the sentral lower incisores were too close.
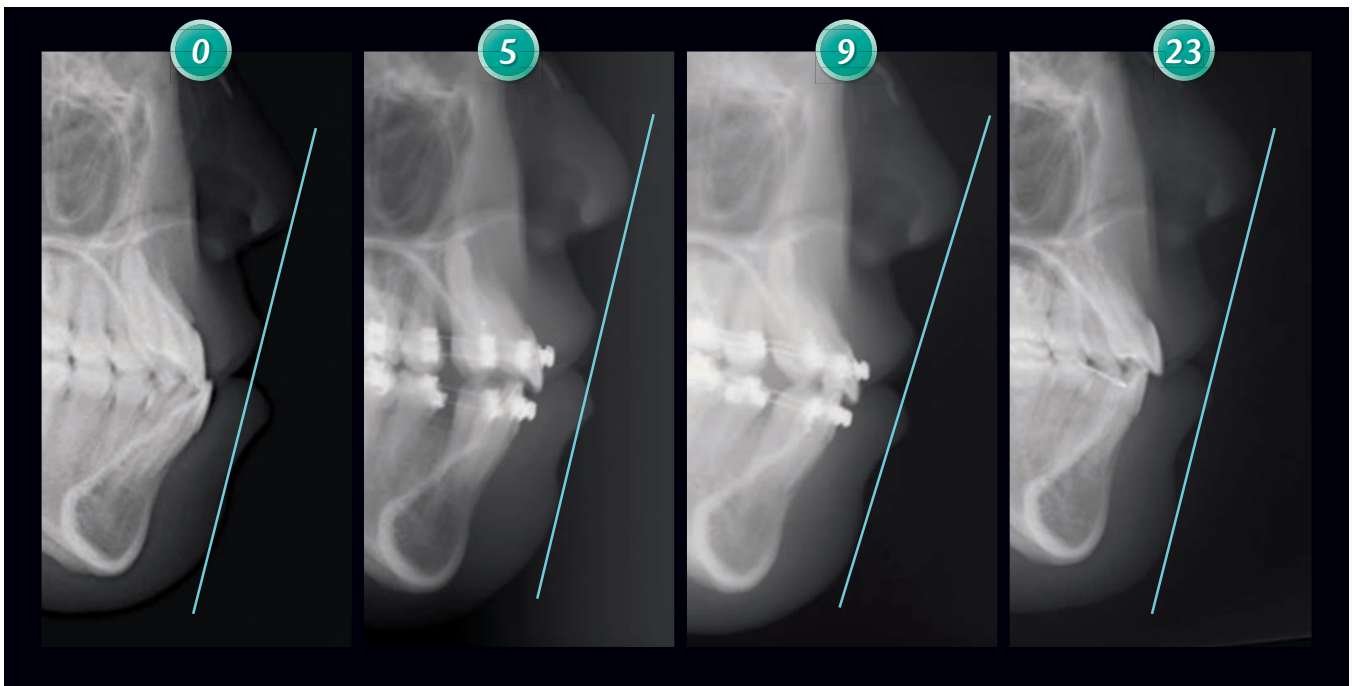
Fig. 19:
rogress cephalograms revealed that the profile and anterior crossbite had been rapidly improved in the initial five months with bite turbos bonded on the lingual side of lower central incisores.   inally the lip prominence was finally acceptable with respect to the   -line.

(*Fox 1/4" 3.5oz*) and triangular elastics (*Fox 1/4" 3.5oz*) on teeth #14, 19 and 20 were used to correct the lower lingual tipping. In the 10th month, the upper arch wire was changed to .019x.025" stainless steel and the lower arch wire was changed to .017x.025" TMA. Drop-in hooks were fitted on the lower canines for space-closure. A figure-eight ligature tie was applied to six lower anterior teeth to maintain space closure.

L-type elastics (*Fox 1/4", 3.5oz*) from the upper canines to the lower molars were used for class II correction and detailing of the occlusion (*Fig. 15*). In the 18th month, an off-set bend was incorporated for alignment of tooth #30. In the 19th month, the other supernumerary tooth was extracted using palatal flap surgery. In the 20th month, the bracket on tooth #10 was repositioned to a normal position to reduce the excess buccal root torque, and the arch wire was reduced to a flexible .014x.025" CuNiTi wire. In the 23rd month, all fixed appliances were removed and retainers were delivered (*Fig. 18*).

Results Achieved

Maxilla (*all three planes*):
- A - P: Anterior
- Vertical: Inferior
- Transverse: Maintained

Mandible (*all three planes*):
- A - P: Anterior
- Vertical: Increased consistent with favorable growth
- Transverse: Maintained

Maxillary Dentition
- A - P: Slight labial tipping of the incisors and forward movement of the molars
- Vertical: Slightly extruded incisors
- Inter-molar / Inter-canine Width: Increased / maintained

Mandibular Dentition
- A - P: Retracted incisors, forward movement of the molars
- Vertical: Increased
- Inter-molar / Inter-canine Width: Increased / Increased Facial Esthetics:
- An orthognathic profile was achieved (*Fig. 19*)

Retention

A fixed retainer was bonded on all the maxillary incisors. In the mandibular arch, a fixed retainer was bonded from #29 to #20 in the mandibular arch (*Fig. 18*). An upper clear overlay was delivered. The patient was instructed to wear it full time for the first 6 months and nights only thereafter. The patient was instructed in proper home hygiene care and maintenance of the retainers.

Final Evaluation Of Treatment

The major discrepancies in the anterior teeth were corrected to normal overjet and overbite (*Fig. 19*). All premolar-extraction space was closed. The 2mm

upper dental midline was corrected to be coincident with the facial midline. The blocked out canines were well aligned, and the gingival texture was healthy. The ABO Cast-Radiograph Evaluation score was 24 points, as documented on the form appearing later in this report. The score is within the usual limit of 34 for an ABO case report. As demonstrated in Figures 20-23, the following deviations from ideal were noted:[1]

- The upper left incisors and two upper second molars exhibited distal-in rotation, but the lower right premolar exhibited mesial-in rotation

- Marginal ridge discrepancy existed only between teeth [#]13,14 (*Fig. 20*)

- Discrepancies in buccolingual inclination were evident in teeth [#] 2, 3, 14 and 29 (*Fig. 23*)

- Excessive buccal overjet was observed at the buccally tilted upper right second molar

- Occlusal contact was absent for the distobuccal cusp of the lower left first molar

- Occlusal relationships (*interdigitation*) were not ideal for the canines and premolars (*Fig. 21 and 22*)

- Root angulation was not parallel between lower first incisors (*Fig. 18*)

Cephalometric analysis and super-imposition of the start and finish tracings (*Fig. 11*) revealed retraction of the lower incisors and flaring of
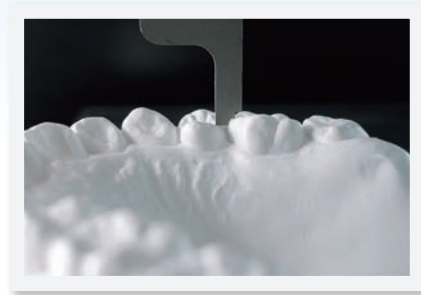
■ *Fig. 20: The marginal ridge discrepancy between # 13,14.*

■ *Fig. 21: The occlusal relationship at #6 deviated over 2mm.*

■ *Fig. 22: The occlusal relationship at #11 deviated over 2mm.*

the upper incisors. All the molars were moved mesially and the mandibular occlusal plane had a slight clockwise rotation. The upper incisors to SN increased from 107° to 110° and the lower incisors to the mandibular plane angle decreased from 97° to 91°. The mandible showed a substantial increase in length and both the lower molars and incisors were extruded.

Fig.23: The buccolingual inclinations in posterior teeth # 2, 3, 14 and 29.

Discussion

The major problems for the patient were the anterior crossbite and the crowding. The Discrepancy Index Score was 37.[2-3] To correct the anterior crossbite, there are six approaches suggested by Dr. Chang:[4]

1. Inclined plane: labial tipping of a single retroclined and unrotated tooth; treatment time is limited to 2 months to avoid excessive eruption of the posterior teeth in the early mixed dentition.

2. "2x4" appliance with bite turbos: correct multiple teeth in crossbite and/or rotated teeth with long span open coil springs and lower anterior lingual bite turbos.

3. "2x4" appliance with bite turbos followed by a full fixed appliance: correct anterior crossbite in the mixed dentition then treat permanent dental problems with a full fixed appliance.

4. Full treatment with Damon appliances, bite turbos, and early light short elastics (ELSE): Correct anterior crossbite with Damon passive ligature system, bite turbos and early light short elastics in the permanent dentition.

5. Full treatment (*Damon appliances, bite turbos, ELSE*) with bone screws: Correct severe anterior crossbite in permanent dentition with the Damon passive ligature system, bite turbos, ELSE, and bone screws. Bone screws can provide excellent anchorages for full arch movement, which significantly reduces the need for orthognathic surgery.

6. Orthognathic surgery

For the present patient's anterior crossbite, associated with a severely crowded dentition and a bilateral class I molar relationship, is best managed with the 4th approach (*full treatment*) combined with extraction of all 1st premolars. At the beginning, light force generated by a small diameter CuNiTi wire in the tube-like brackets guided the crowded teeth to the aligned positions.[5] Open coil springs used to create space is not indicated unless the teeth are too crowded to bond brackets. Bonding lingual bite turbos, instead of using an inclined plane to unlock interdigitation, allowed the malocclusion greater freedom of movement. To correct the protruded profile, all first premolars in all four quadrants were extracted to relieve the severe crowding. According to Dr. Chang's decision-making tree, there were 3 indications for extraction: protruded profile, high mandibular plane angle and severe crowding (*Table. 2*).[6] 2 oz. class II short elastics from the lower molars to the upper canines were used early, beginning immediately after the anterior crossbite was corrected. They allowed slight A-P correction and promoted development of the smile arc without

affecting arch leveling.[7] By using this system, the teeth were aligned into ideal positions gently, and the extraction spaces were closed rapidly (*Figs. 14 and 15*).

According to Lin's study,[8] anterior crossbite is a common malocclusion in Chinese children. The prevalence of pseudo class III malocclusion from age 9 to 15 years is 2.31%.[8] Orthodontic treatment of anterior crossbite may be complicated by unpredictable growth. Differential diagnosis is very important for the timing of anterior crossbite treatment. Lin's Three Rings Diagnosis system is an accurate method for diagnosing over 90% of anterior crossbite patients (*Fig. 24*).[9] Complicated diagnostic procedures are simplified into 3 items: Profile, Class, and Functional Shift. The patient presented with a

Diagnosis: the Three Rings Diagnosis
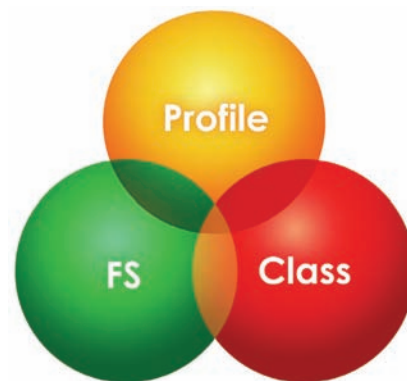
Profile : profile at centric relation, orthognathic or prognathic

Class : classification of canine and molar

FS : functional shift, Yes (CO≠CR), or No (CO=CR)

■ *Fig. 24:*

The anterior crossbite diagnosis system developed by Dr. Lin simplified the complicated diagnostic procedure.

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

■ Table. 2: The decison-making tree summarized by Dr. Chang aids in the decisions on extraction vs. non-exraction treatment plans.

orthognathic profile and the permanent first molars were in a Class I relationship bilaterally. Despite the girl's active pubertal development, this was a pseudo Class III malocclusion with a good prognosis for correcting the anterior crossbite and dental crowding.

Supernumerary teeth can have the following effects on permanent teeth: interfere with the eruption, cause ectopic eruption, contribute to crowding, cause root resorption, be manifest as pulp damage and/or undergo cystic degeneration.[10-11]

The most frequent site of occurrence is near the midline or in the terminal molar area. A panoramic radiograph is useful for imaging most supernumerary teeth, but for this patient, a periapical radiograph of maxillary anterior region provided a clearer image in 2-D (*Figs. 8 and 18*). The most important considerations are when and how to remove the

supernumerary teeth.[12] Since the supernumerary teeth closely approximated the crowded teeth, their removal was delayed until the anterior segment was aligned. As the crowding was gradually relieved, one of the supernumerary teeth erupted into the palate, allowing for a simple extraction. Unfortunately, the other inverted supernumerary tooth required palatal flap surgery for removal.

When blocked out palatally maxillary lateral incisors are corrected with light round wires, they are usually excessively tipped to the labial, and require a great deal of labial root torque. Bonding pretorqued brackets upside down reverses the torque from +6° to -6° which improves the inclination of the lateral incisors as they are aligned. Wire-bending and torquing springs can also be used to correct lateral incisor torque, but bonding the brackets upside down is more efficient. However, it is important to carefully monitor the alignment of the lateral incisors to avoid over-torquing them.

Conclusion

Anterior crowding and crossbite, in the presence of a bilateral class I molar relationship, were corrected rapidly with efficient mechanics. An unattractive dentition was dramatically reversed to a delightful smile in only a few months, but the growth of this young female was still somewhat unpredictable. For pseudo Class III or mild True Class III patients, there is a good prognosis. However, it is advisable to tell the patients that despite a high success rate of over 90%, there is no guarantee of 100% success.[9]

Acknowledgement

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Discrepancy Index Worksheet

TOTAL D.I. SCORE   37

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   =   **14**

OVERBITE

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

Total   =   **2**

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   =   **7**

OCCLUSION

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

Total   =   **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° or $\leq$ -2°   =   4 pts.

  Each degree $<$ -2° _____ x 1 pt. = _____

  Each degree $>$ 6° _____ x 1 pt. = _____

SN-MP
    $\geq$ 38°   =   2 pts.
  Each degree $>$ 38°   **5**   x 2 pts. = **10**

    $\leq$ 26°   =   1 pt.
  Each degree $<$ 26° _____ x 1 pt. = _____

1 to MP $\geq$ 99°   = (1 pt.)
  Each degree $>$ 99° _____ x 1 pt. = _____

Total   =   **12**

OTHER   (See Instructions)

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

Identify:

Total   =   **2**

IMPLANT SITE

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

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

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

Bone level at adjacent teeth : $\leq$ 5 mm to contact point (0 pt), 5.5 to 6.5 mm to contact point (1 pt), $\geq$ 7mm 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 pt)   = _____

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

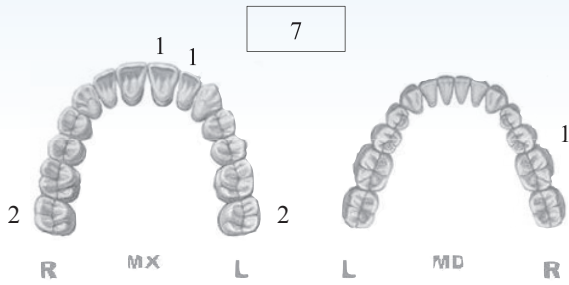Infection at implant site : None (0 pt), Chronic (1 pt), Acute(2 pts)   = _____
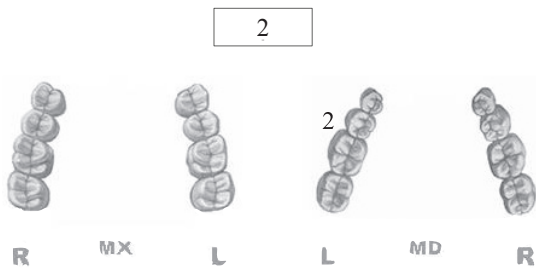
Total   =   **0**
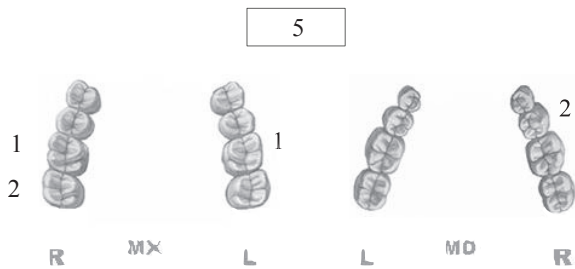
Cast-Radiograph Evaluation

Case #

Patient

Total Score: 24

Alignment/Rotations

7

1 1
1
2   2

MX   L   L   MD
R   R

Marginal Ridges

2

2

MX   L   L   MD
R   R

Buccolingual Inclination

5

1   1
2
2

MX   L   L   MD
R   R

Overjet

1

1

R   MX   L

Occlusal Contacts

1

1

R   Buccal Surface   1   L

Lingual Surface
L   R

Occlusal Relationships

6

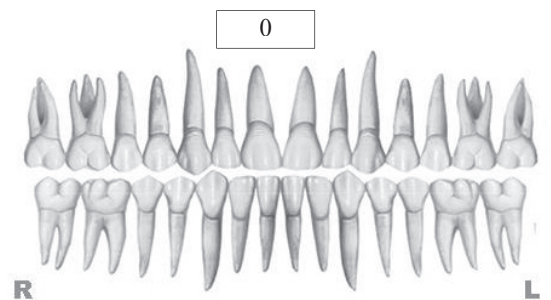1   2   2   1   2
R   L

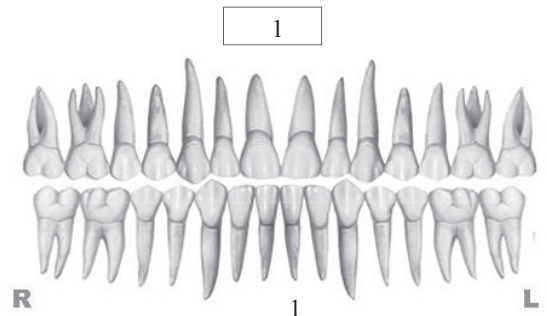### Interproximal Contacts

0

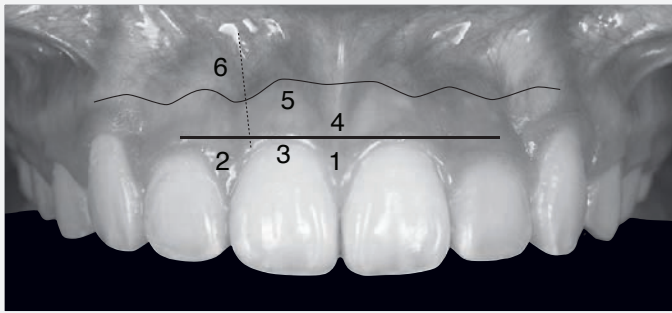R   L

Root Angulation

1

R   1   L

INSTRUCTIONS: Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.
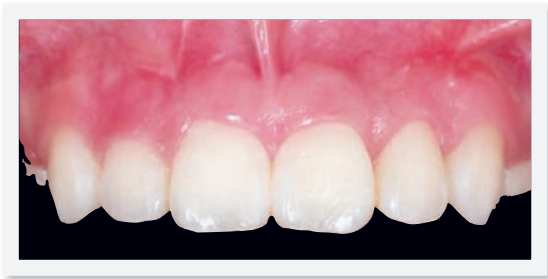
IBOI Pink & White Esthetic Score
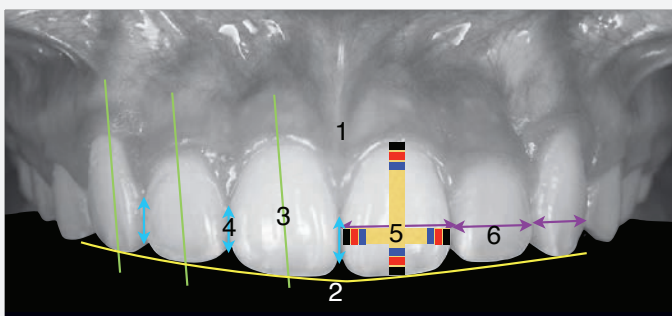
Total Score: = 6

Pink Esthetic Score

Total = 2

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

White Esthetic Score (for Micro-esrhetics)

Total = 4

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

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Class II Low Angle with Bilateral First Premolars Crossbite

History and Etiology

A young female, aged 27-years-old (*Fig. 1*), presented with a chief complaint of her irregular teeth arrangement and protruding upper anterior teeth (*Figs. 2-3*). There was no contributory medical or dental history. The clinical exam indicated that the bilateral first premolars were crossbite and a large overbite was noticed (*Fig. 2*). Her pre-treatment facial profile showed a straight profile with an acceptable soft tissue E-line projection. The pre-treatment intraoral photographs and study models revealed a bilateral end-on Class II molar relationship. The lower dental midline was shifted to the right side. No contributing habits were evident. The patient was treated to an acceptable result as documented in (*Figs. 4-9*). The cephalometric and panoramic radiographs document the pre-treatment conditions (*Fig. 7*) and the post-treatment results (*Fig. 8*). Superimposed cephalometric tracings document the treatment achieved (*Fig. 9*). The details for diagnosis and treatment will be discussed below.

Diagnosis

Skeletal:

- Skeletal Class II (*SNA 84°, SNB 79°, ANB 5°*)
- Low mandibular plane angle (*SN-MP 29°, FMA 22°*)

Fig. 1: Pretreatment facial photographs

Fig. 2: Pretreatment intraoral photographs

Fig. 3: Pretreatment study models

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

■ *Fig. 4: Posttreatment facial photographs*

■ *Fig. 5: Posttreatment intraoral photographs*

■ *Fig. 6: Posttreatment study models*

Dental:

- Bilateral Class II malocclusion The overbite and overjet were both 6mm.

- Moderate crowding of about 3mm in the upper arch and severe crowding of about 12mm in the lower arch.

- Mandibular dental midline was 2mm deviated to the right side of the facial midline.

- Bilateral crossbite malocclusion over first premolar areas.

Facial:

- Straight profile with acceptable nose and lip position.

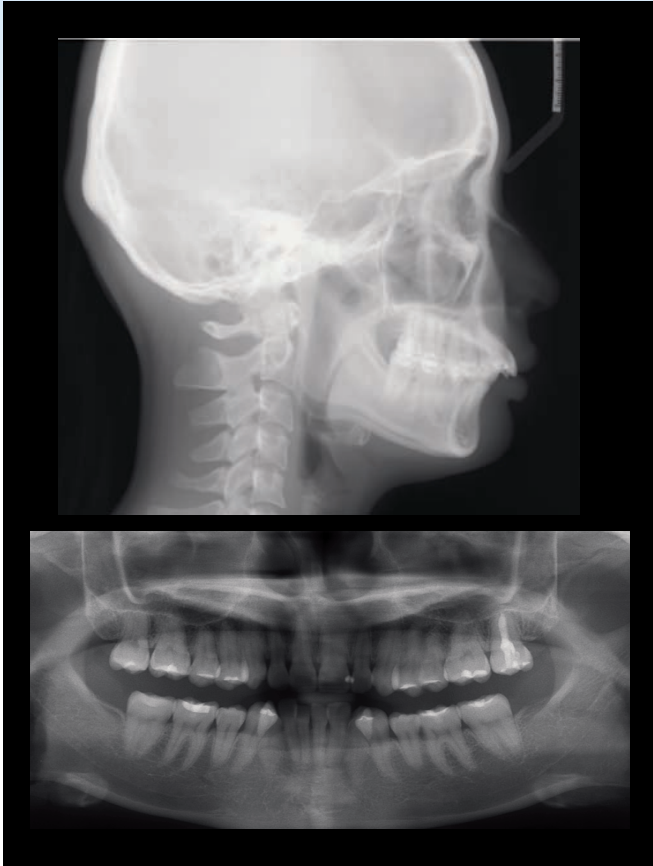The ABO Discrepancy Index (*DI*) was 31 as shown in the subsequent worksheet.

Specific Objectives Of Treatment
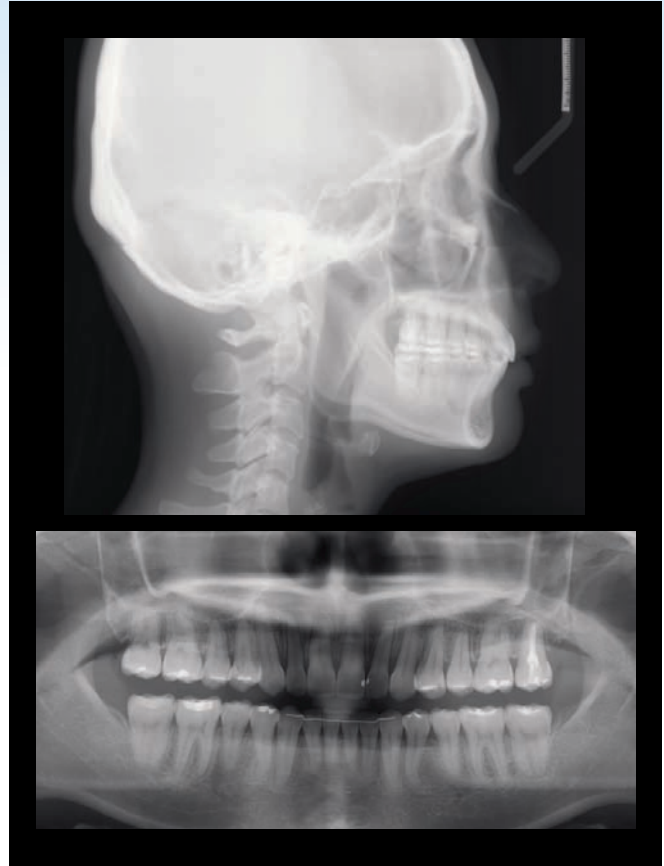
Maxilla (*all three planes*) :
- A - P: Retract
- Vertical: Maintain
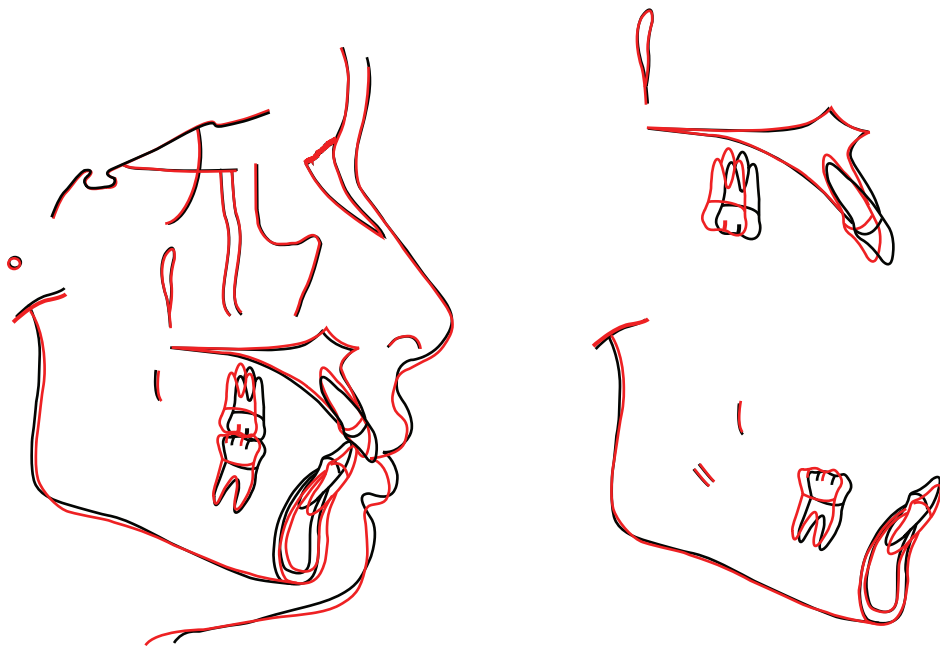- Transverse: Maintain

Mandible (*all three planes*) :
- A - P: Maintain
- Vertical: Maintain
- Transverse: Expand the premolar area

Fig. 7: Pretreatment pano and ceph radiographs.

Fig. 8: Posttreatment pano and ceph radiographs.

Fig 9:   uperimposed tracings

Maxillary Dentition
- A - P: Retract
- Vertical: Maintain
- Inter-molar Width: Maintain

Mandibular Dentition
- A - P: Maintain
- Vertical: Maintain
- Inter-molar / Inter-canine Width: Maintain but expand the premolar area

Facial Esthetics: Maintain

Treatment Plan

The main objectives of this case were 1. to correct the premolar crossbite and 2. to retract the upper dentition. In order to correct the crossbite, after the braces were placed on the lower arch , bilateral posterior occlusal bite turbos were added to open the bite (*Fig. 10*) and lingual buttons were bonded on the lower first premolar (*No. 21 and No. 28*) lingual site (*Fig. 11*). The purposes of bite turbos and lingual buttons were to disocclude the upper and lower teeth and facilitate the use of the corssbite elastics from #5 and #12 buccal site to the #21 and #28 lingual buttons.

Based on her straight lateral facial profile, a non-extraction treatment with a full fixed orthodontic appliance was indicated to align and level the dentition. To retract the protruded anterior teeth, two bone screws (*2x12mm OrthoBoneScrew, Newton's A inc.*) were inserted bilaterally in the infrazygomatic crest as the anchorage for retraction.

After the final detailing, the fixed appliances were removed and the corrected dentition was retained with a clear retainer in upper arch and fixed anterior retainer in lower arch.
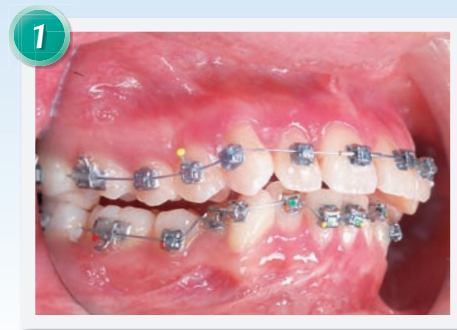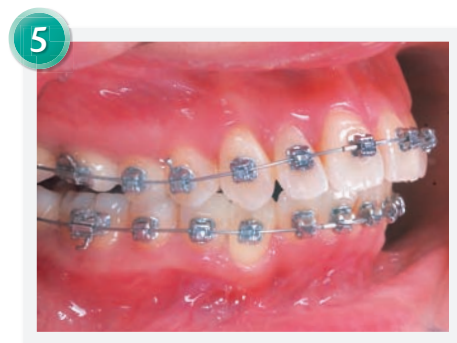

■ Fig. 10:
Lower arch was bonded and an bite turbo was placed on upper second molars.
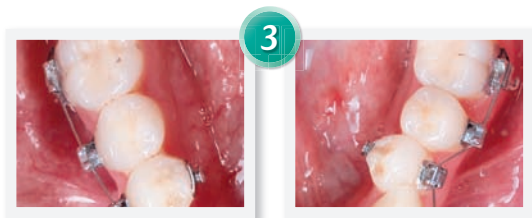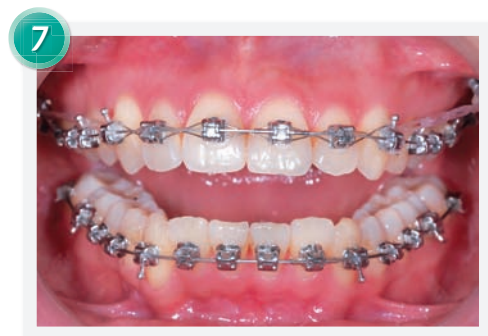

■ Fig. 11:
No. 21 and No. 28 lingual side were bonded with lingual buttons.

■ Fig. 12:
After 4 months, lower dentition crowding was relieved and the crossbite was corrected.

■ Fig. 13:
Two miniscrews were inserted into the IZC for upper arch distalization .

■ Fig. 14: Class III elastic was used.

Appliances And Treatment Progress

A 0.022" slot Damon Q bracket system (*Ormco*) was used. The mandibular arch was bonded with low torque braces on the anteriors. The archwire sequence for the upper arch was .014 CuNiTi, .018 CuNiTi, .014x25 CuNiTi, .017x25 TMA, and .019x25 SS. The lower archwire sequence was .013 CuNiTi, .018 CuNiTi, .014x25 CuNiTi, . 017x25 TMA, and .019x25 SS.

The initial archwire of the maxillary arch was .014 CuNiTi, and after one month, mandibular arch was bonded and the first archwire was .013 CuNiTi. The posterior bite turbos were placed on the maxillary 2nd molars (#2 and #15). In the 3rd month, the lingual

side of lower first premolars (#21 and #28) were bonded with buttons. The crossbite elastics (*3/16", 2oz*) from the lower 1st premolars (#21 and #28) to the upper 1st premolars (#5 and #12) were introduced to correct the crossbite.

In the 4th month of treatment, the crossbite was corrected (*Fig. 12*) and the archwires were changed to .018 CuNiTi on both arches. Class II elastics (*3/16", 2oz*) from the upper 1st premolars to lower 1st molars were used to resolve the sagittal occlusal discrepancy.

In the 6th month of treatment, .014x25 CuNiTi archwires were placed in the upper and lower arches.

In the 7th month of treatment, a cephalometric film was tacken to evaluate the angulation of the anterior teeth. Two bone screws (*2x12mm OrthoBoneScrew, Newton's A inc.*) were inserted into the infrazygomatic crest. The upper 3-3 were ligated together by figures-of-eight. Elastometric chains were attached from the upper canines to the screws in order to distalize the upper dentition (*Fig. 13*). The Class III

■ Fig 15:

Inter Proximal Reduction (middle) was performed on upper 2-2 to reduce black triangles. (left: before IPR, right: after IPR and post-treatment)

elastics from the lower lower canines to upper screws were used to retract the lower dentitions (*Fig. 14*).

In the 9th month of treatment, the upper archwire was changed to .019x25 SS. Two hooks were clamped between the upper lateral incisors and canines bilaterally. The elastometric chains were linked from the hooks to the screws and kept as Class III elastic from the lower canines to the upper screws until the 13th month of treatment.

In the 12th month of treatment, the lower archwire was changed to .017x25 TMA. To reduce the black triangles between the lower incisors, the teeth were stripped and the space was closed using elastometric chains.

In the 16th month of treatment, Class II elastic (*1/4", 3.5 oz*) from the upper canines to lower 1st molars were used to resolve the sagittal discrepancy.

In the 21th month of treatment, a panoramic film was taken to evaluate the bracket positions relative to the axial inclinations of all teeth. Inter proximal reduction was performed on the upper 2-2 to reduce black triangles (*Fig. 15*).

Two weeks prior to the completion of active treatment, the light up-and-down elastics (*1/8", 3.5 oz*) were used from the upper 2nd molars to lower 2nd molars for final detailing. After 27 months of active treatment, all appliances were removed. Upper clear overlay and fixed anterior (*Md 3-3*) retainers were delivered for both arches.

■ *Fig. 16: Healthy gingival was noted after crossbite was corrected.*

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-Tx	POST-Tx	DIFF.
SNA°	84°	82°	2°
SNB°	79°	78°	1°
ANB°	5°	4°	1°
SN-MP°	29°	28°	1°
FMA°	22°	21°	1°
DENTAL ANALYSIS			
U1 TO NA mm	13mm	9mm	4mm
U1 TO SN°	113°	104°	9°
L1 TO NB mm	8mm	12mm	4mm
L1 TO MP°	108°	109°	1°
FACIAL ANALYSIS			
E-LINE UL	-1mm	-3mm	2mm
E-LINE LL	0.5mm	-2mm	1.5mm

■ Table. 1: Cephalometric summary

Results Achieved

Maxilla (*all three planes*) :
- A - P: Maintained
- Vertical: Maintained
- Transverse: Maintained

Mandible (*all three planes*) :
- A - P: Advanced
- Vertical: Maintained
- Transverse: Expanded in premolar area

Maxillary Dentition
- A - P: Slightly retracted
- Vertical: Intruded
- Inter-molar / Inter-canine Width: Maintained

Mandibular Dentition
- A - P: Slightly advanced incisors
- Vertical: Maintained
- Inter-molar / Inter-canine Width: Maintained

Facial Esthetics: Maintained

Retention

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

Final Evaluation Of Treatment

The ABO Cast-Radiograph Evaluation score was 27 points. The major discrepancies were in the occlusal relation-ships, alignment/rotation, buccolingual inclination, occlusal contacts, marginal ridges and root angulation. Because of the end-on ClassII relationship, the biggest discrepancy was in the occlusal relationship (*14 points*).

The gingival texture is healthy without any bony dehiscence or bone loss (*Figs. 8, 16*). The bilateral crossbite was corrected and the mandibular first premolar areas were expanded from 22mm to 35mm (*Fig. 17*).

Although this was a non-extraction treatment, the facial profile has still changed. The upper lip has slightly retruded by about 0.5 mm. The lower labiomental angle has incrased from 90° to 100° and has become much fuller. The lateral profile has changed and is smoother and gentler than before the treatment (*Fig. 18*).

Overall, the ClassII bilateral first premolars crossbite with a straight profile case treatment ended with to an satisfactory result. The final dentition and facial esthetics are perfect.

■ *Fig. 17:*

Lower arch width was expanded from 22mm (left. red line) to 35mm (right. red line). The inter canine width was kept the same of 25mm (left, right blue line)

■ *Fig. 18: Lateral profile, before and after treatment.*

Discussion

It is widely accepted that orthodontic movement can alter esthetics, and orthodontists have suggested that occlusion and facial beauty are interdependent.[1-3] So, orthodontists have attempted to predict how orthodontic tooth movement affects existing facial balance and find out what kind of treatment is favorable for this patient. The most important issue is "*extraction or not ?* "

In the past, the diagnostic tool for decision "*whether to extract or not*" was normally cephalometric radiographs.[4] However, Tweed[5] concentrated on the position and inclination of the mandibular incisors in relation to the basal bone and he also presented that the inclinations of the mandibular incisors are 90° when related to mandibular borders and the FMIA is 65°.[6] Unfortunately, totally reliance on cephalometric analysis sometimes leads to esthetic problems.[7,8] Because there are multiple factors which can influence the values of cephalometric radiographs. Michiels[9] concluded that (*1*) measurements involving cranial base landmarks are inaccurate in defining the

actual clinical profile; (*2*) measurements involving intrajaw relationships were slightly more accurate in reflecting the true profile; (*3*) no measurement is 100% accurate; and (*4*) the soft tissue thickness and axial inclination of incisors are the most important variables in inaccuracy. Another reason may be: different cephalometric analyses are used to examine the same patient, therefore, different diagnoses, treatment plans, and results can be generated. This disparity makes treatment planning based totally on cephalometry ill-advised. Cephalometric normative values may not be accurate because of different soft tissue posturing, etc.[4]

Instead of using cephalometric radiographs, several lines and angles have been used to evaluate soft tissue facial esthetics. The most commonly used is the E-line, which was described by Ricketts. When referring to the ideal E-line relationship, the lower lip should be coincident with a line from the nasal tip to the anterior chin, and the upper lip should be about 1mm behind it.[10] Ricketts also described soft tissue by relating beauty to mathematics. The divine proportion was used by the ancient Greeks (*ratio of 1.0 to 1.618*) and was applied by Ricketts to describe optimal facial esthetics.[11]

In this case, four premolars could have been extracted because of the crowded dentition and the protruding upper anterior teeth. But this decision might have worsened the esthetics because the patient had a straight profile.

It's fortune that the invention of the skeletal anchorage (*dental implants, miniplates and screws*)

can solve the crowded dentition without sacrificing the teeth and allow a more efficient and easier distalization. Preceding skeletal anchorage, there were many appliances for maxillary molar distalization, both intraorally, such as pendulum or distal jet, etc [12-15] or extraorally, such as head-geal.[16] But the intraoral distalization appliances always develop reciprocal, adverse side effects such as premolar extrusion and flaring of the incisors.[17] The extraoral appliances are anesthetic and need patient compliance. The forward movement of the distalized molars during anterior tooth retraction and patient non-cooperation often offsets the treatment effect and prolongs the treatment time.[15, 18]

When managing low-angle patients with crowding in the mandibular arch, the extraction of teeth might be a concern. Extraction may deepen the anterior overbite and make treatment more difficult. Alignment of the teeth without extractions may flare the incisors and deleteriously affect the facial profile. To minimize these problems, the mandibular molars should be distalized.[18] However, there have not been many studies of mandibular molar distalization except for lip bumper investigations. The lip bumper was shown to not only distalize the molars but also to procline the incisors.[19, 20]

To achieve the best results, the treatment plane for this end-on Class II malocclusion with straight profile and low mandibular plane angle patient was non-extraction. We chose bone screw for molar distalization and Damon's light force system to solve the crowding problem. This treatment plane required posterior movement of the maxillary dentition and anterior movement of the mandibular dentitions.

The IZC bone screws not only retracted the whole upper dentition but also were the anchorage of the mandibular teeth. We used ClassIII elastics from the lower canines to the upper screws to retract the lower dentition and relieve crowding, too. This method reduce the placement of bone screws on the lower buccal shelf and save the patient's money.

Comparing the pre-treatment and post-treatment panoramic film, we can see that after the treatment, the lower posterior teeth are more upright. This is the MEAW effect of Damon and bone screws.

The superimposition revealed that the upper incisors were intruded and retracted, and the upper molars were intruded and had moved distally. The lower incisors were moved almost bodily forward and the lower molars were uprighted and tipped back. The overbite and overjet has been reduced and the depth of the lower labiomental fold has been decreased and become smooth. The reasons that the lower incisors did not flare out bucally when the crowded dentition was aligned may be 1. The class III elastic from lower canine to upper bone screws created space. 2. The IPR (*Inter Proximal Reduction*), the main purpose of which was to reduce black triangles, made another space for the elastometric chain to retract the lower dentition and to keep the lower anterior angulation lingually.

The superimposition showed that the upper molar was slightly intruded and lower molar was

mildly extruded as a result of molar distalization. The mandibular plane angle decreased 1°. This is a different outcome from the wedging effect of the distalization appliances. When molars have been distalized by the distalization appliances, the appliances tend to open the mandibular plane and create a wedging effect. However, distalization with screws did not open the mandibular plane. The elastometric chains connected to the screws offer the controlled vertical force to prevent molars extrusion and maintain the mandibular plane angle.

The clinical crown of the uprighted 2nd molar is shorter than before (*Fig. 19*). It is important to

educate our patients to clean this area and prevent pericoronitis. If the distance from the 2nd molar to ascending ramus is limited, molar distalization will be contraindicated.

After the treatment, the intercanine width was kept and the 1st premolar area had expanded 13mm. Due to the light force of the Damon system, after the expansion, no bone dehiscence and gingival recession was noticed and the final result is good and healthy.

Conclusion

The decision of orthodontic treatment may need more consideration about profile change. Extraction may cause narrowed smiles with dark corners or dished-in profiles. The Damon system and bone screws can relieve severe crowding and maintain the patient's good profile with non-extraction treatment. The early light short elastics and bite turbos can easily correct the crossbite.

■ *Fig.19:*

After treatment (right) the clinical crown of 2nd molar was shorter than before treatment (left).

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Discrepancy Index Worksheet

TOTAL D.I. SCORE   31

OVERJET

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

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

Total   =   3

OVERBITE

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

Total   =   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   =   7

OCCLUSION

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

Total   =   8

LINGUAL POSTERIOR X-BITE

1 pt. per tooth   Total   =   1

BUCCAL POSTERIOR X-BITE

2 pts. per tooth   Total   =   0

CEPHALOMETRICS   (See Instructions)

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

  Each degree $<$ -2° _____ x 1 pt. = _____

  Each degree $>$ 6° _____ x 1 pt. = _____

SN-MP
   $\geq$ 38°   =   2 pts.
  Each degree $>$ 38° _____ x 2 pts. = _____

   $\leq$ 26°   =   1 pt.
  Each degree $<$ 26° _____ x 1 pt. = _____

1 to MP $\geq$ 99°   =   1 pt.
  Each degree $>$ 99° __ 9 x 1 pt. = 9

Total   =   9

OTHER   (See Instructions)

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

Identify: Trans-alveolar impaction

Total   =   0

IMPLANT SITE

Lip line : Low (0 pt), Medium (1 pt), High (2 pts)   =_____
Gingival biotype : Low-scalloped, thick (0 pt), Medium-scalloped, medium-thick (1 pt), High-scalloped, thin (2 pts)   =_____
Shape of tooth crowns : Rectangular (0 pt), Triangular (2 pts)   =_____
Bone level at adjacent teeth : $\leq$ 5 mm to contact point (0 pt), 5.5 to 6.5 mm to contact point (1 pt), $\geq$ 7mm 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)   =_____
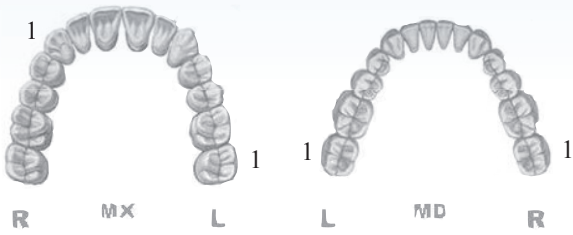Infection at implant site : None (0 pt), Chronic (1 pt), Acute(2 pts)   =_____

Total   =   0

Cast-Radiograph Evaluation

Occlusal Contacts

2

Case #   1   **Patient**

Total Score: **23**

Alignment/Rotations

4

1

1   1   1

R   MX   L   L   MD   R

R   L

Buccal Surface

L   R

Lingual Surface

Marginal Ridges

1

1

R   MX   L   L   MD   R

Occlusal Relationships

10
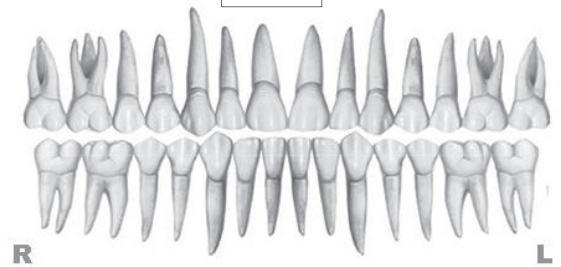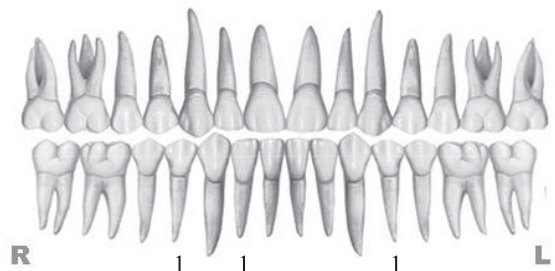
1   1   1   2   2   2   1

R   L

Buccolingual Inclination

3

1
1   1

1

R   MX   L   L   MD   R

Interproximal Contacts

0

R   L

Overjet

0

R   MX   L

Root Angulation

3

1   1   1

R   L

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: = 4
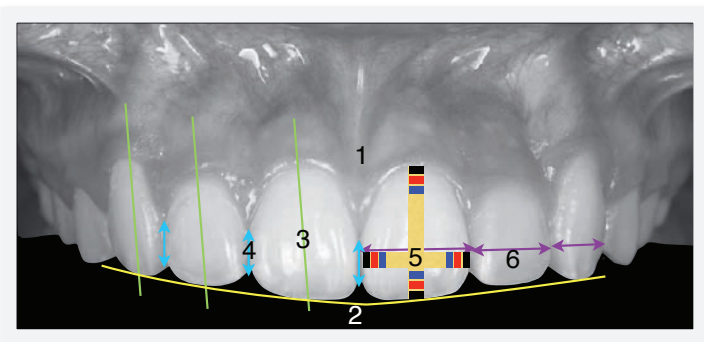
Pink Esthetic Score

Total = 2

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

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

White Esthetic Score (for Micro-esthetics)

Total = 2

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

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

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

引言

　　一位24歲女性經由她的牙醫師轉介來本診所做矯正諮詢 (圖 1)。她的主訴是當使用有部分缺牙的後牙齒列切斷食物或是咀嚼時，感覺十分困難 (圖 2-3)。患者沒有任何重大醫療病史，但她曾接受過非常多牙科治療，包括拔牙、根管治療、補牙等。為了能達成理想的咬合功能，我們擬定了包含矯正、植牙、贋復的整合性治療計畫。關於診斷和治療的流程細節將於接下來內容做討論，而最終達到一個令患者滿意的治療結果 (圖 4-9)。
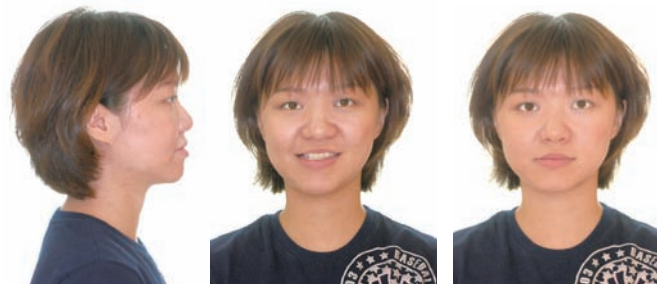
診斷

　　經由放射性檢查可讓我們了解此患者不正咬合的嚴重複雜程度 (圖 7)。由於左上第二小臼齒缺牙時間過久，造成第一大臼齒往近心側傾斜以及上顎竇腔室化的擴大，因此缺牙位置無法提供植牙足夠的齒槽骨空間。為了能利用植牙支撐性贋復物來恢復缺牙的左上齒列，做鼻竇增高術或是矯正重建空間是必要的。

骨性：

- 第三類不正咬合 (SNA 86°, SNB 87°, ANB -1°)
- 植牙空間不足：#13 & 15

齒列 ：

- 右側第一類大臼齒關係
- 左側第三類犬齒關係
- 缺牙：#1, 5, 13, 15, 16, 19, 32

■ 圖 1. 治療前外觀照

■ 圖 2. 治療前口內照

■ 圖 3. 治療前模型照

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■ 圖 4. 治療後外觀照

■ 圖 5. 治療後口內照

■ 圖 6. 治療後模型照

- 前牙錯咬：#6 - 10
- 後牙錯咬：#4
- 下顎齒列擁擠
- 上顎中線偏顏面中線右側2毫米，下顎中線偏上顎中線右側3毫米
- 不密合贗復物：#7, 8, 9, 10
- 未完整根管治療：#6

顏面：

- 正常側顏面輪廓伴隨輕微外突的下唇
- 下巴偏右 (圖 10)
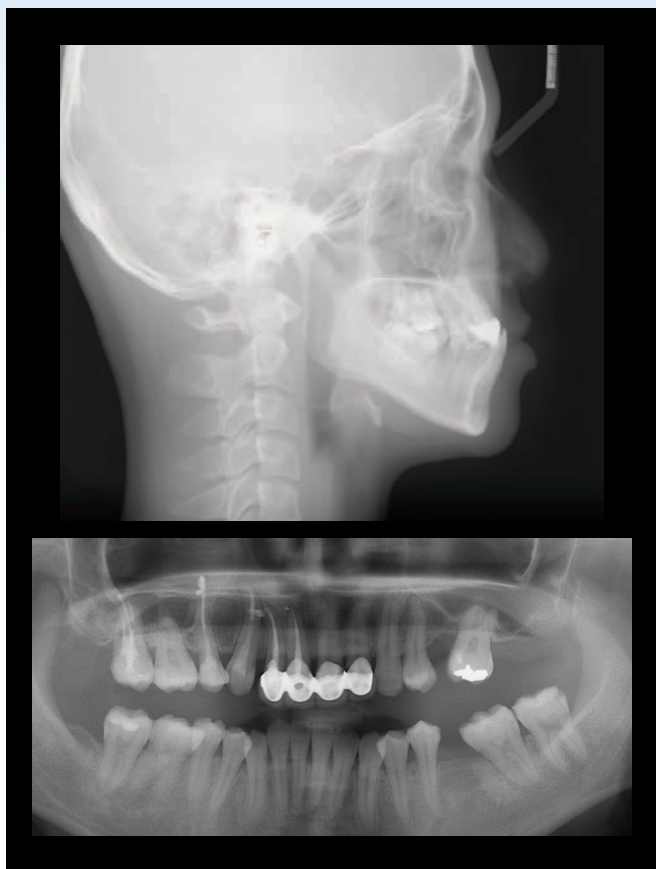
SPECIFIC OBJECTIVES OF TREATMENT

上顎 (分三象限而論)：

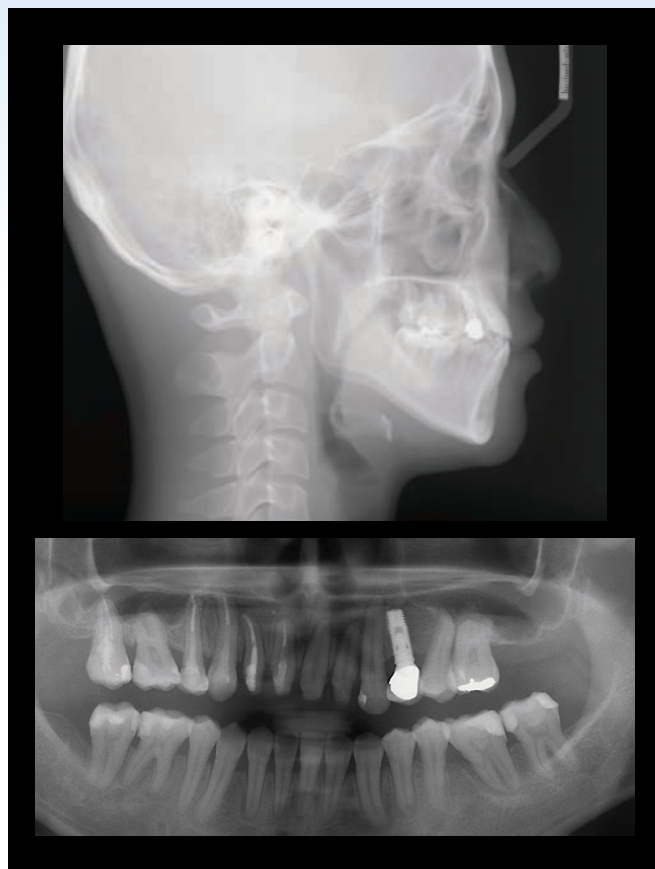- 前後關係： 維持
- 垂直關係： 維持
- 橫向關係： 維持

下顎 (分三象限而論)：

- 前後關係： 維持
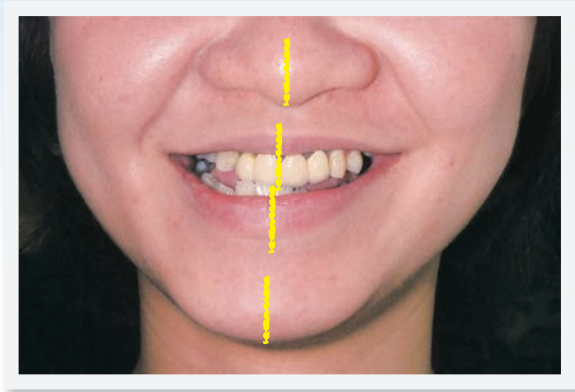- 垂直關係： 維持
- 橫向關係： 維持

齒列：

- 改善第三類犬齒和大臼齒不正咬合關係
- 改正前後牙錯咬
- 創造足夠植牙空間於上顎小臼齒區

■ 圖 9. 治療前後 X 光片重疊比較顯示上顎門牙牙冠向外傾斜、下顎門牙向下縮和下顎大臼齒向後傾。

■ 圖 7. 治療前 X 光片

■ 圖 8. 治療後 X 光片

■ 圖 9. 治療前後 X 光片重疊比較顯示上顎門牙牙冠向外傾斜、下顎門牙向下縮和下顎大臼齒向後傾。

■ 圖 10.
上顎中線偏顏面中線右側 2 毫米 , 下顎中線偏上顎中線右側 3 毫米 且下巴向右偏斜。

- 舒緩下顎擁擠的齒列並關閉多餘空間
- 改正中線
- 重新製作假牙於 #7、 8、9、10
- 矯正治療完畢後，製作植牙支撐贗復物于上顎小臼齒

顏面美觀：

- 後縮外突的下嘴唇

在 ABO Discrepancy Index (DI) 得分為39，詳細表格列於文章後面附件。[1]

治療計劃

對於這個非對稱性第三類不正咬合的治療，我們曾提出正顎手術的建議，然而患者選擇採取拔除右下第二小臼齒的偽裝式計畫。關於重建左上後牙齒列有兩種方式：1. #13缺牙位置植牙，2. 將 #12往後拉以騰出空間來植牙。由於第一種方式較困難且較難預測結果，因此我們採用矯正的方式來重新分配空間，以利提供植牙所需的骨頭高度。

為了調整分配齒列，全口固定矯正裝置是其適應症。在治療初期，我們於左上犬齒和第一小臼齒中間騰出空間以當作之後植牙的位置。使用下顎前牙咬合墊高來幫助改善 overbite 和 overjet。第三類橡皮筋可解決矢狀向的咬合差異，而細微的彎線則可達到最終的咬合結果。在拆除固定矯正裝置時，我們在前牙黏上固定維持器 (上顎2-2, 下顎3-3)

治療的裝置與流程

當拔除右下第二小臼齒後，將上下顎黏上0.022" Damon Q® 矯正器 (Ormco)。我們在上顎前牙的暫時假牙部分是使用 low torque 矯正器，來避免牙齒往外 (圖 11)。而咬合墊高黏於下顎正中門牙以促進前牙錯咬的改善 (圖 12,13)，並教導患者整天戴第三類橡皮筋 (Parrot 5/16, 2 oz.)。

在治療的第四個月，於 #11和 #12之間放置 NiTi open coil spring(圖 14)。合併使用前牙咬合墊高和第三類橡皮筋，使我們在四個月內就可以將 overjet 由原本的 -2毫米改善到 1毫米 (圖 12,13)。在治療第七個月時，將主線換到 .014 × .025 CuNiTi，並將咬合墊高改位置至上顎小臼齒。

在治療第八個月時，將主線換到 .017 × .025 TMA，並將咬合墊高移除。於上顎第一大臼齒舌側黏上鈕扣，開始拉錯咬橡皮筋到下顎大臼齒矯正器的頰側槽管。使用 power chains 來關閉下顎牙弓的空間。
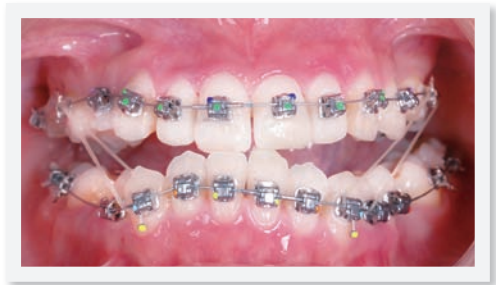
再經過了十個月，下顎牙弓的空間已經關閉，而且 #12後移至原 #13缺牙的位置 (圖15)。此時我們拍攝一張環景全口 X 光片來評估植牙的空間 (圖16)，並規劃植牙的相關流程。

植體的放置

在手術前，請患者去拍攝3D 斷層掃描，來評估骨頭的密度與體積。經量測高度為13毫米、頰舌側寬度為6毫米，適合我們種植 4x11.5毫米的 EZ Plus 植體。其解剖構造如圖17所示。製作一個手術模板來引

Fabricate 4 Individual Ortho. Provisional Crowns
Smile & Gingival-driven Bonding Position

■ 圖 11.
裝上上顎前牙四顆獨立的暫時假牙後，參考患者微笑和牙齦邊緣高度來黏矯正器。

■ 圖 12.
在下顎門牙黏上咬合墊高並戴第三類橡皮筋 (2oz parrot, U6 to L3)

2 oz

■ 圖 13,14.
經過四個月的治療，前牙錯牙已改善至 edge to edge

導我們其近遠心和頰舌側的位置。植體必須放置在預計未來假牙邊緣之下 3 毫米，且其傾斜的角度不可超過 15 度，與鄰牙的距離至少要有 1.5 毫米 (圖 18-19)。[2]

手術一開始使用 15 號刀片在牙堉正中做切線，而用 12 號刀片將鄰牙的頰舌側做 sulcular incisions。 翻好全層粘膜骨膜瓣將骨頭暴露出來後，可將頰側翻瓣縫在臉頰，而顎側翻瓣用 needle holder 夾住往顎側拉，如此便可得到清楚的手術視野 (圖 20)。

藉由手術模板來引導我們將植體放置在預計未來假牙的邊緣之下 3 毫米 (圖 21)。使用 bone scraper 將骨頭做修整後 (圖 22)，測量其寬度為 6.5 毫米。因此選用 4.0 x 11.5 毫米的植體，並依照廠商建議的流程將其植入。在鑽骨頭的過程中需留意要保留頰側骨頭至少 2 毫米的厚度。之後將 healing abutment 鎖上 (圖 26-27)。

在植體植入後我們發現頰側有一骨頭凹陷處，不過植體周圍骨頭並沒有任何穿孔的現象 (圖 26)。接著從 tuberosity 取一塊游離牙齦移植 (圖 28a,b)，用 15c 刀片將上皮層刮除 (圖 29)。將處理好的結締組織移植置於頰側翻瓣內側，並使用羊腸線將其縫合固定 (圖 30-31)。最後把頰顎側翻瓣復位好，用 5-0 尼龍線進行縫合。一個禮拜後拆線和拍攝術後觀察的根尖片 (圖 32a-c)。經過六個月癒合期的等待，裝上假牙。

矯正完工的階段

拍攝環景全口 X 光片來評估矯正器位置與牙齒長軸的相對關係。在完成矯正治療的前兩個禮拜，將上顎的主線切線到犬齒的遠心側，請患者配合戴後牙齒列的 up-and-down 橡皮筋 (2 oz)，來達到最後頰側咬合的調整。 我們使用主線的順序為：.014 NiTi, .014x25 NiTi, .017x25 TMA, 和 .19x25 SS。進行了 31 個月的治療後，將所有的裝置移除，換上前牙固定維持器 (Mx 2-2, Md 3-3) 及上顎透明活動維持器。
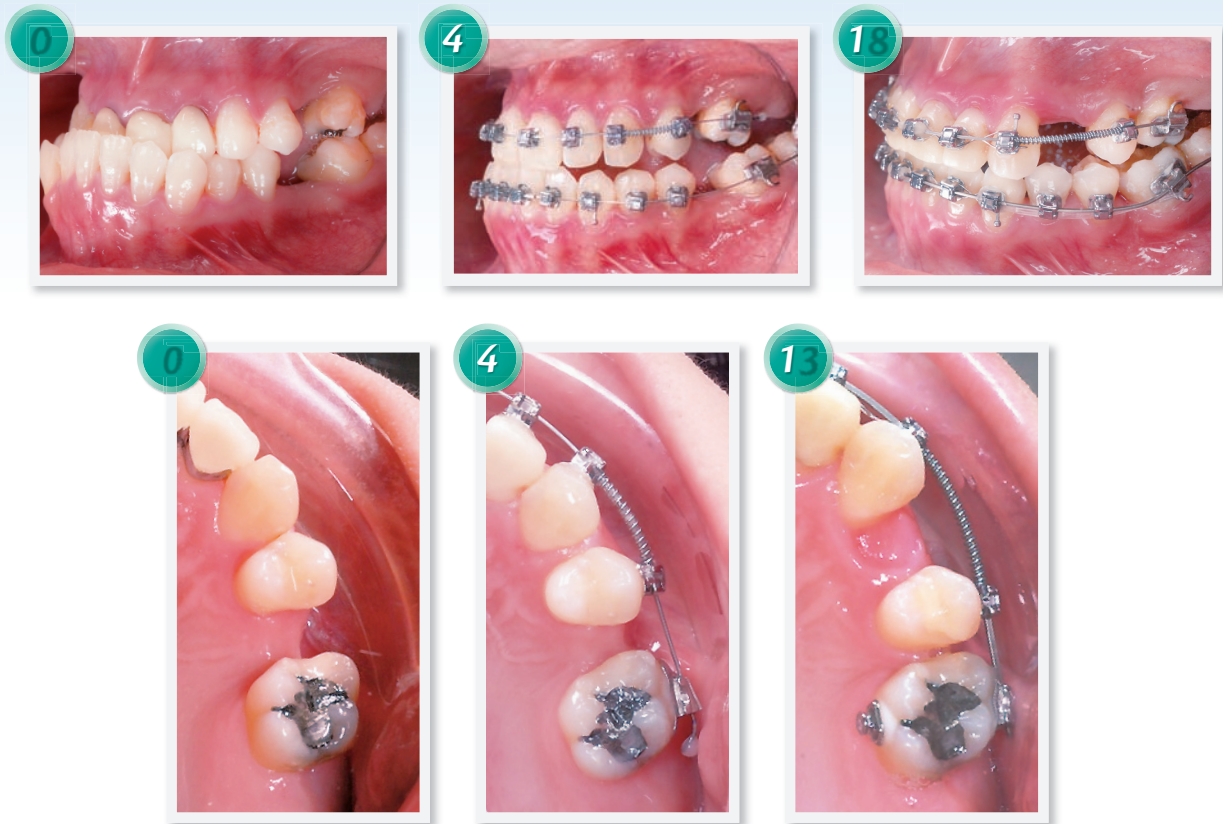
■ 圖 15.
　使用 open coil spring 將 #12 往後推以騰出植牙的空間。在治療的第十三個月時，發現在 #11 遠心側有 Atherton's patch。
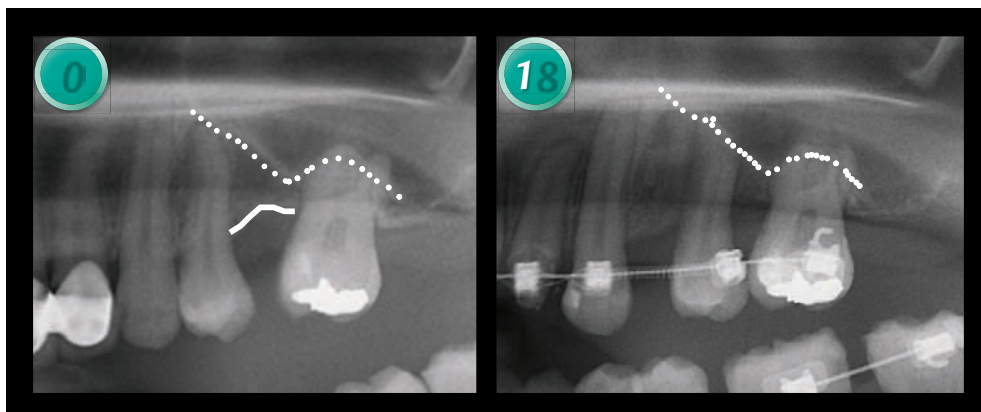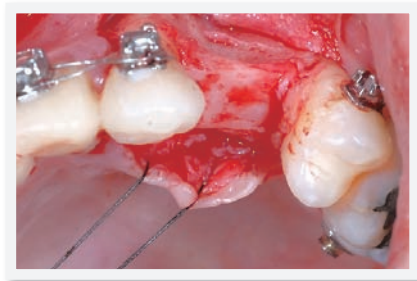

■ 圖 16.
　使用 open coil spring 將 #12 往後推以騰出植牙的空間。在 #12 的骨頭高度相較於 #13 能提供較足夠的植牙空間 (sinus floor 和 tilted bone level)。
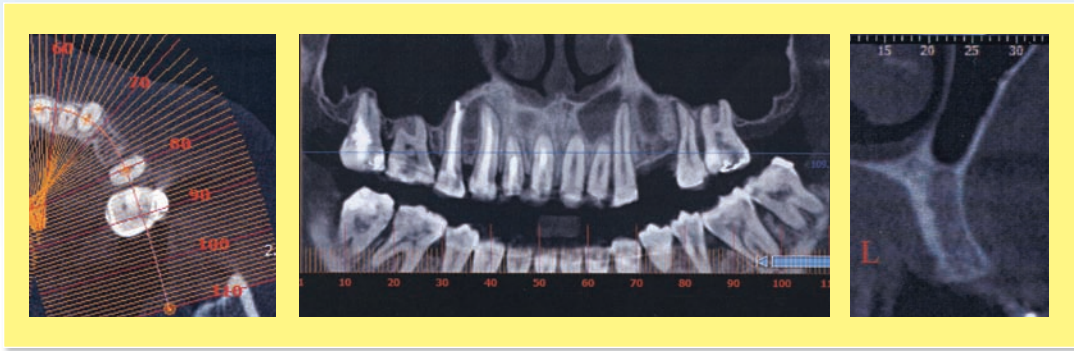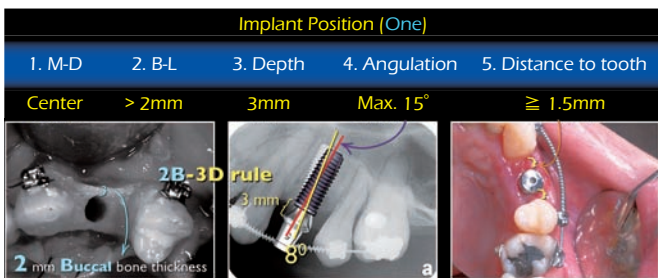
■ 圖 17.
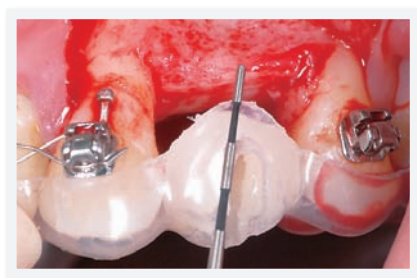拍攝 3D 斷層掃描來評估骨頭的密度與體積 (H:13 mm BL:6 mm, implant size:4x11.5 mm EZ Plus), 以及瞭解其周圍的解剖構造。
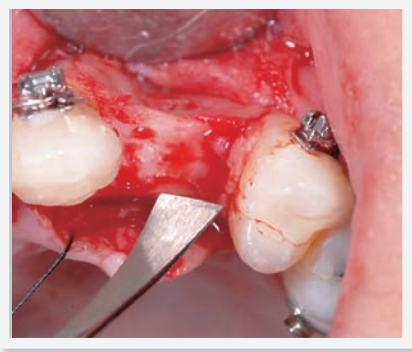

■ 圖 18.
利用手術模板來提供植體的定位

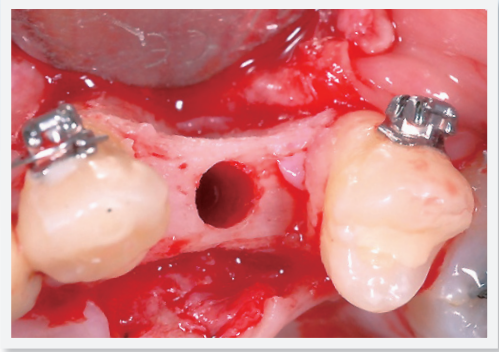

■ 圖 20.
將頰側翻瓣縫在頰側固定，而顎側翻瓣用 needle holder 夾住往顎側拉。

■ 圖 19.
手術模板設計來定位植體的近遠心和頰舌側、植體的高低 (低於未來假牙邊緣 3 mm)、傾斜角度 (少於 15°) 以及與鄰牙的距離 (至少 1.5mm)。
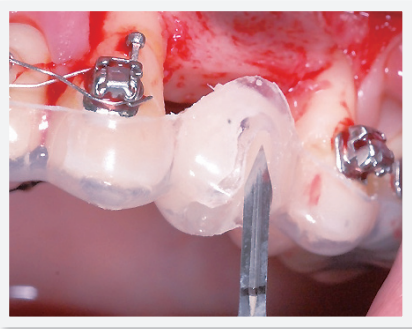

■ 圖 21.
利用手術模板來定位植體 (植體平台放置未來假牙邊緣以下 3 mm)

■ 圖 22. 使用 bone scraper 將缺牙骨堖做修整。

■ 圖 25. 鑽完骨頭後，頰側需保有至少 2mm 骨頭厚度。

■ 圖 23. 第一支鑽骨器械為 lance drill
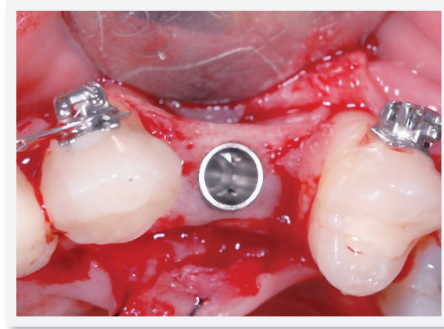
■ 圖 26. 植入 EZ plus implant fixture 4x11.5 mm

■ 圖 24. 用 guide pin 來確認軸向。
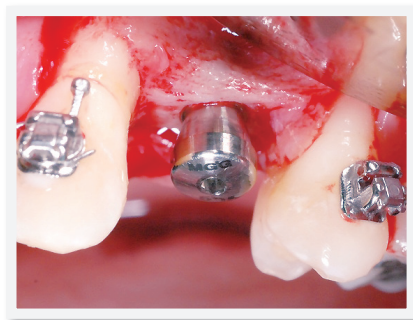
■ 圖 27.
接上 healing abutment。發現頰側有骨凹陷，然而植體並無穿孔現象。

矯正治療結束並安排贗復治療 把 healing abutment 移除，
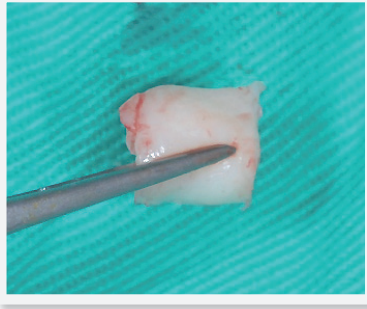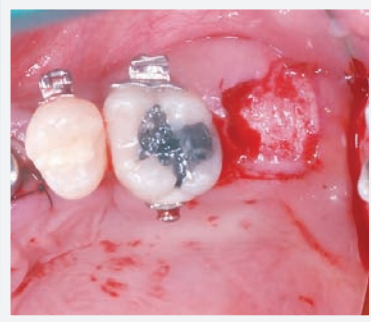
■ 圖 28a,b. 從 tuberosity 取一塊游離牙齦移植
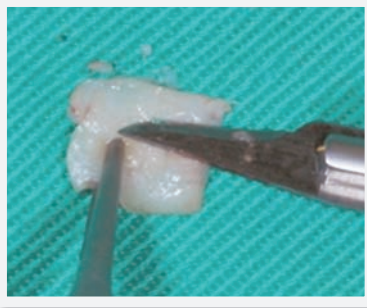
■ 圖 29. 用 15c 刀片將上皮層刮除
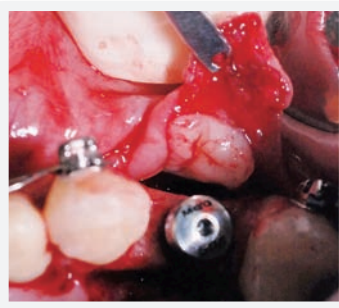
■ 圖 30.
將處理好的結締組織移植置於頰側翻瓣內側，並使用
羊腸線將其縫合固定

■ 圖 31.
用 5-0 尼龍線將翻瓣進行縫合。可看見羊腸線縫合處。

■ 圖 32a,b,c.
一個禮拜後拆線，並拍攝術後觀察的根尖片
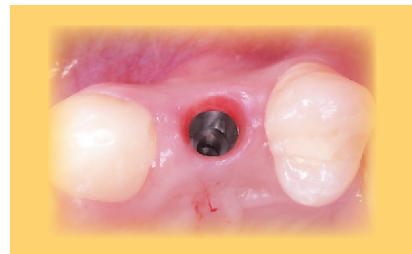
■ 圖 33.
經由 31 個月的治療後 (包含 13 個月的植牙區癒合期)，
矯正治療結束並安排贗復治療 把 healing abutment 移除，
可看見完整健康的牙齦軟組織。

15°   25°

2, 3, 4, 5mm

EZ plus angle abutment,
trilobe orientation with the angulation
of 15° and 25°,
the cuff height: 2, 3, 4, and 5mm.

■ 圖 34.
　a,b angle abutment
　c,d abutment 修磨
　e,f 放置排齦線
　g,h metal coping 試戴及其邊緣密合度的確認

■ 圖 35. 使用牙線來確認與鄰牙接觸面的鬆緊度。為了美觀考量，將假牙咬合面以陶瓷製作。

贋復物的製作

經由 31 個月的治療後（包含 13 個月的植牙區癒合期），將矯正器拆除，並轉介進行贋復治療。把 healing abutment 移除（圖 33），換上 angled abutment（圖
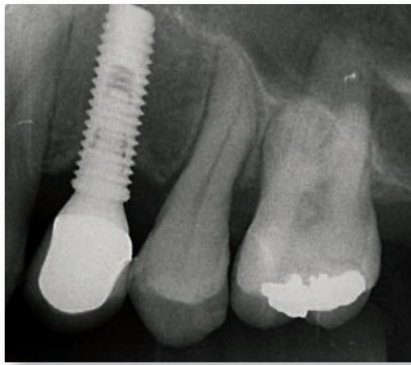
■ 圖 36. 拍攝根尖片來確認邊緣的密合度。

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

■ Table. 1: Cephalometric summary

34a,b）。將 abutment 修磨好後（圖 33c,d），於牙齦溝內放置排齦線（圖 34e,f）。使用 polyvinyl siloxane 進行直接印模，並用 type IV dental stone 灌模，然後取咬合記錄。當 metal coping 製作好進行試戴時，可以用探針去檢查邊緣的密合度（圖 34g,h）。當最終贋復物試戴時，必須使用牙線去確認其與鄰牙連接面之鬆緊度。由於患者美觀的考量，在假牙咬合面是採用陶瓷材料。經由臨床的咬合修整和鬆緊度的確認後，使用暫時黏著劑固定（圖 35-36）。一個禮拜後將假牙舌側的 crown remover 修磨掉。

結果分析

上顎（分三象限而論）：
- 前後關係：維持
- 垂直關係：維持
- 橫向關係：維持

下顎（分三象限而論）：
- 前後關係：維持
- 垂直關係：維持
- 橫向關係：維持

上顎齒列
- 前後關係：門牙稍微外翻約 3 度
- 垂直關係：維持
- 大臼齒或犬齒之間的寬度：維持

下顎齒列
- 前後關係：門牙後縮
- 垂直關係：大臼齒直立
- 大臼齒或犬齒之間的寬度：維持
- 顏面美觀：下嘴唇後縮

維持

在上顎四個門牙和下顎六個前牙黏上固定維持

■ 圖 37. 主要不符合理想的部分為：alignment/rotation, marginal ridges, and root angulation。

器，以及給患者上顎的透明活動維持器，請她前六個月必須全天候戴，之後可改為只有晚上戴。並且教導患者對於維持器的使用與注意事項。

治療結果的最終評估

依據 ABO Cast-Radiograph Evaluation 分數是 19 分。主要不符合理想的部分為：alignment/rotation、marginal ridges、root angulation（圖 37）。[1] 然而，我們改善了導致第三類咬合不正關係的前牙錯咬，也利用將 #12 移位到缺牙區而騰出較適合的植牙位置來簡化了手術的複雜程度。藉由合併矯正、植牙、贗復治療，將這個複雜的病例達到一個令患者滿意的結果。

討論

根據傳統的觀念，當施力在一牙齒上時，壓力側會產生骨吸收，而張力側會有骨頭沈積，並且牙齒只能在有骨頭存在的地方產生移動。但是臨床經驗顯示牙齒是有可能在許多解剖限制構造上移動的，例如：上顎竇底層、縫合線、皮質骨等，似乎觀察到骨頭可以跟著牙齒被移動，所以可以經過這些解剖限制構造。因為新的骨頭會在牙齒移動的前面生

成，所以牙齒的移動仍發生在骨頭內。[3] "施力的大小"和"力矩與力量的比率"決定了矯正力在牙周結構的分佈。從一開始施力在牙齒上時，牙周韌帶會產生 hyalinization，並且在牙齒開始大量移動前會有 necessitating (undermining) resorption。在相反承受張力的另一端的牙周韌帶，會有廣泛的增生反應來促使新的骨頭生成。[4] 利用放射線來觀察矯正中的牙齒移動，發現經過六個月的積極性治療可使牙齒以 bodily movement 經過上顎竇底部，並且沒有造成任何結締組織或附著牙齦的缺損。經由齒列重新分配所騰出的上顎小臼齒空間，提供了植體的放置以及之後其支撐的假牙。藉由此臨床案例驗證了我們可以利用矯正的方式將牙周健康的牙齒在上顎竇底部做移動，同時能保有其牙髓活性、骨頭的支撐，和在壓力及張力兩側的牙周韌帶寬度。[5] 經由矯正移動來創造一個適合植牙的空間條件，如此可省去做鼻竇增高術的複雜步驟。[6]

當移動牙齒時，必須留意其周圍牙齦組織的改變。有可能會導致牙齦溝的分裂，形成紅色的斑塊，並且在牙齒移動的路徑出現上皮的皺摺。[7] 等待手術區域組織癒合及贗復治療完成後，我們可以評估牙
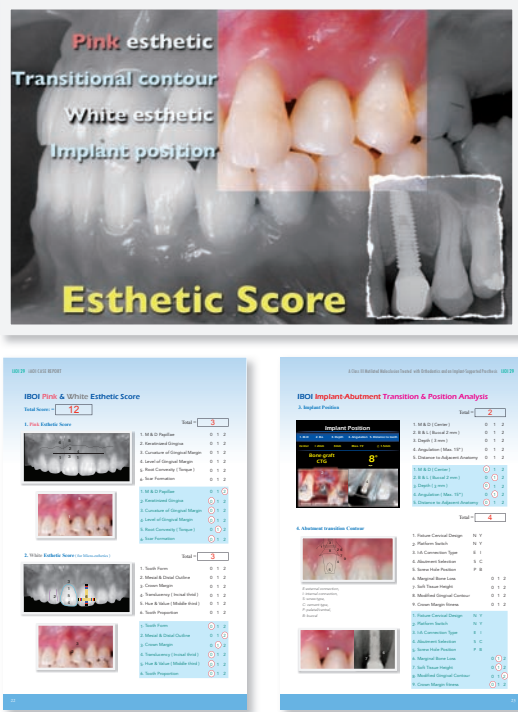
■ 圖 38.
IBOI esthetic score system 來評估植牙或假牙，包含：pink esthetic、white esthetic、implant position 和 transitional contour。

齦美觀的改變來判斷植牙的成功與否 (the IBOI Pink & White Esthetic Score)。[8] 但植體的位置和支台體的選擇是主要影響美學結果的因素。所以我們在 IBOI esthetic score 增列兩個評核的項目，觀察：1. 植體的位置，和 2. 植體支撐的支台體的外形輪廓 (圖 38)。[9]

1. Pink esthetic score

依據 Pink Esthetic Score (PES) 的標準，觀察臨床照片以評估牙齦的變化。[10] 評分由 0→2 來一一分析六項分類，包含：近遠心齒間乳頭、角化牙齦、牙齦邊緣的曲度、牙齦邊緣的高低、牙根的豐隆度、結痂的形成。

近遠心齒間乳頭的部分可區分為：完整 (0 分)、不完整 (1 分)、缺乏齒間乳頭 (2 分)。 角化牙齦的評分為：厚 (0 分)、薄 (1 分)、缺乏角化牙齦 (2 分)。牙齦邊緣的曲度，亦即牙齦邊緣連線的彎曲弧度與牙齒邊緣連線的比較：和諧相同 (0 分)、稍微不同 (1 分)、明顯差異 (2 分)。 牙齦邊緣的高低是評估左右兩側的對稱性：相同高低 (0 分)、差異小於 1 毫米 (1 分)、差異超過 1 毫米 (2 分)。牙根的豐隆度：自然呈現 (0 分)、過度隆凸 (1 分)、過度凹陷 (2 分)。結痂的形成則分為：沒有 (0 分)、中度 (1 分)、嚴重 (2 分)。

2. White esthetic score

依據 White Esthetic Score (WES) 的標準，觀察臨床照片來評估前牙齒列。 評分由 0→2 來一一分析六項分類，包含：中線、切緣弧度、牙齒軸向傾斜、接觸區域、牙齒長寬比例、牙齒與牙齒的比例。若是單顆假牙的評估，則分為此六項：牙齒形態、近遠心輪廓、假牙邊緣、透明度、色調和明度、牙齒比例。

由巨觀前牙齒列來分析:

中線的評估是觀察上下齒列中線的相對關係：對齊 (0 分)、差距不超過 3 毫米 (1 分)、差距大於 3 毫米 (2 分)。切緣弧度分為：平順 (0 分)、不順 (1 分)、缺乏弧度者不論有無伴隨擁擠 (2 分)。前牙牙齒軸向傾斜的標準各為 5°、8°、10°：符合 (0 分)、輕微不同 (1 分)、擁擠或有多餘空間 (2 分)。 接觸區域，意指由正中門牙到犬齒彼此之間接觸區域的比例：符合理想 50% : 40% : 30% 的比例 (0 分)、近遠心不對稱 (1 分)、過長的接觸區域 (2 分)。牙齒長寬比例：1: 0.8 (0 分)、稍微過長 (1 分)、太長 (2 分)。 前牙牙齒與牙齒的理想黃金比例為 1.6:1:0.6，符合者 (0 分)、輕微差異 (1 分)、缺牙或擁擠 (2 分)。

對於單顆假牙的評估:

針對六項分類的評估總得分為0→2。而判定這六項的標準是直接參照對稱牙位的自然牙來做比較,是否相似或是有差異。因此,一個與對稱牙相似自然美觀的植牙或是贗復物不扣分,得分應為0。

在 Pink Esthetic Score 的部分,不適當的軟組織外形和缺損的齒間乳突都會列入計分。而邊緣在牙齦上的瓷牙和假牙狹窄的外形則會在 WES 被計分。

3. Implant position

在植牙手術過程中,有五個重點須留意:近遠心位置、頰舌側位置、深度、角度、與鄰近解剖構造的距離。我們將於以下分項詳細討論:

A. 近遠心位置:植體放置在預計做假牙的位置之正中央 (0分)、偏向一邊 (1分)、接近或碰觸到鄰牙 (2分)。建議應該做手術模板來當導引。

B. 頰舌側位置:植體放置後仍保留2毫米頰側骨頭是很重要 (0分),若頰側骨頭少於2毫米,有幾種做法:(a) 將植體放置較舌側,(b) 選擇較小直徑的植體,或是 (c)做引導骨生成手術來增加頰側骨頭厚度。若頰側骨頭厚度少於2毫米 (1分),沒有頰側骨頭 (2分)。

在這個患者,我們植體種入後頰側有保留2毫米的骨頭。從斷層掃描來看,骨堆的中間部分有凹陷處因此在植體放入後,我們從tuberosity區域取一塊軟組織移植,放到頰側翻瓣內側縫合固定,來增加軟組織的厚度。若再次遇到相同的狀況,建議可以選擇更大的軟組織移植,並考慮是否合併補骨,以得到更和諧的軟組織外觀 (圖 39)。

C. 深度:植體須放在預計未來假牙邊緣的下面3毫米 (0分)、若不足3毫米 (1分)、或超過3毫米 (2分)。[12]

D. 角度:植體的長軸須平行鄰牙 (0分)。在植體放入之前,以guide pin去拍張根尖片來確認軸向是非常重要的。特別是當利用矯正的方式去騰出植牙的空間時,建議務必要請患者去拍X光確認與鄰牙牙根的關係。若太接近鄰牙,在植牙時很難不去傷害到旁邊的牙根。若植體傾斜的角度不足15度 (1分)、超過15度 (2分)。在這個案例中,手術時我們是參考犬齒的軸向來植入植體,但從環景全口X光片看起來,其軸向太偏遠心側約8度。因此,後來選用有角度的支台體來作修正。當利用矯正來騰出空間時,要特別留意牙根軸向的控制,並且在放置植體前要先以 guided pin去拍X光片來確認 (圖 40)。

E. 與鄰近解剖構造的距離:對於單顆植體而言,至少和鄰牙有1.5毫米的距離以保持鄰接側的骨頭高度 (0分)。若不足1.5毫米 (1分)、接觸到鄰牙或重要解剖構造 (2分)。

4. Implant-abutment transitional contour

影響植體頸部最終美觀和諧結果的因素有九項:植體頸部的設計、platform switching、植體與支台體的連結種類、支台體的選擇、螺絲孔的位置、邊緣骨頭的流失、牙齦溝的深度、牙齦外形、假牙邊緣的密合度。而末四項合併為一個評分項目。

植體頸部的設計:我們需註記植體頸部的設計,

例如有沒有 smooth collar，micro-thread，外展或內縮等設計。

　　平台轉移 Platform switching 的有無：指得是植體與支台體的連結往內縮減，讓 Biologic width 往橫向延伸，減少了垂直向所需要的距離。另外，11度的 morse taper 可提供支台體與植體之間達到冷焊效果的 conical seal（圖41）。 Platform switching 和 morse taper 的設計避免支台齒因為承受咬合所產生的微間隙移動，並讓 Biologic width 往橫向延伸以及穩定的建立，藉以維持硬組織的高度。

　　支台體的選擇：對於 cement-retained 的支台體而言，有許多種選擇，包括 one-piece、two-piece、custom milling、a UCLA customized abutment。 在我們這個病例中，選擇了一個有角度的支台體 (15° with cuff height of 4 mm) 來校正植體的軸向 (圖 42)。支台體裝上去之後，直接在口內進行修磨以及後續的印模。

　　螺絲孔的位置：這個案例中，固定假牙的螺絲孔位在支台體的頰側，因此不能選擇 screw-retained 的假牙，需改以 cement-retained restoration。

　　從 X-ray 上，我們可以從植體平台與支台齒，牙冠邊緣與骨頭吸收間相關狀況與變化來分析植體美學上的成功與否，我們在這裡根據下列四項予以評分：

(a.) 邊緣骨頭的流失：在裝戴假牙時，沒有骨頭的流失，則得分為0。根據2007年ICOI共識會議 (圖43)，成功的植牙條件包含：a.咬合時不會感到不適或疼痛，b.沒有搖動度，c. 最初手術後的X光片有少於2毫米的骨頭流失，d.沒有滲出液的記錄。若裝戴假牙第一年追蹤，有少於2毫米的骨頭流失，則得分為1，而2毫米以上則得分為2。在裝上支台體時，本案例的邊緣骨頭流時大約
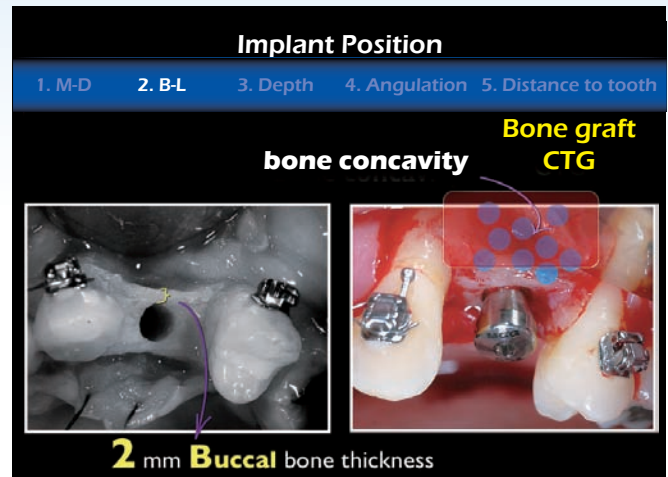

■ 圖 39.
在這個病例，我們保留的 2 毫米的頰側骨頭厚度。從斷層掃描的 slice view 來看，發現在骨堆的中間部分有凹陷處。在植體放入後，我們從 tuberosity 取一塊 CT graft 縫在頰側翻瓣內側來增加軟組織的厚度。如果再次遇到相類似的病例時，我們會建議取更大塊的 CT graft 或是合併補骨以提供更協調的軟組織外觀。
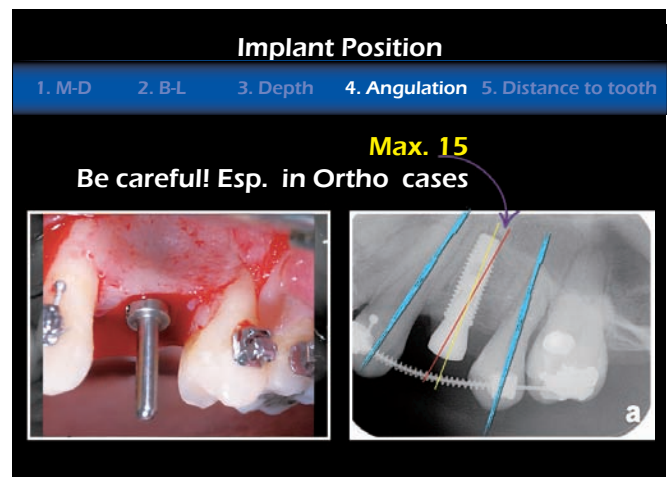
■ 圖 40.
在這個病例，手術當中我們是依循犬齒的軸線來調整植入植體的方向。但從環景全口 x 光片上看，植體的長軸似乎太偏向遠心約 8 度。因此我們選用 angle abutment 來調整其軸向。對於這一類的病例，在藉由矯正移動騰出空間後，建議特別留意牙根軸向的控制。並且應該再植體放入前先以 guided pin 去照 X 光片來做確認。

1.8毫米。因此，長時間的定期術後追蹤來評估值牙的成功與否是必要的。

(b.) 牙齦溝的深度：就生物性寬度而言，植牙周圍的理想 牙齦溝深度約為3毫米 (0分)。若不足3毫米 (1分)，超過3毫米 (2分)。本案例植牙周圍的牙齦溝深度約為3毫米，且假牙邊緣與牙齦邊緣等高。在牙齦邊緣可看到金屬色澤。 以美觀來看，將假牙邊緣放在牙齦之下1毫米或是使用客製化的鋯支台體，可解決這個問題。

(c.) 牙齦外形：倘若因齒間乳突不足而造成有黑三角的出現，可選用CAD/CAM客製化支台體將假牙外型離鄰牙靠近些，來達到較佳的鄰接面接觸。如此設計將可幫助達到齒尖乳突。若植牙牙冠已經有鄰接面接觸，此時需測量接觸區與齒槽骨的距離，在5毫米以內時可達到95%齒間乳突的修復。評估乳突的高度：100% 乳突高度 (0分)、少於100% (1分)、缺乏乳突 (2分) (圖 44)。

(d.) 假牙邊緣的密合度：利用根尖片來確認牙冠與支台體之間的密合度：完全密合 (0分)、微小的間隙 (1分)、不合 (2分)。

結論

遇到第三類不正咬和合併多顆缺牙的患者時，跨科治療包括矯正、手術和贗復等，是必要的。若骨頭高度不足時，植牙位置的準備是需要的。利用矯正移動牙齒來促進骨頭的量，可避免骨頭增生手術。

當評估值牙時，Pink and White esthetic Scores 是重要的一環。藉由調整植牙的位置與支台體連結可改善其結果。
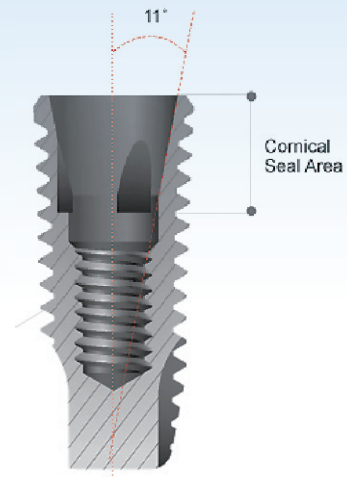
■ 圖 41.
EZ Plus implant 有 platform switching 的設計，可以維持住骨頭高度。此外，它的 11° morse taper 提供了支台體與植體之間冷焊效果的 conical seal。
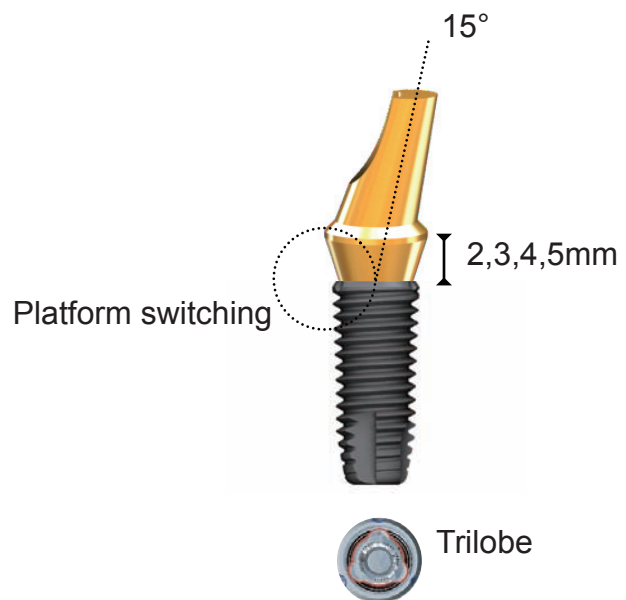
■ 圖 42.
提供軸向校正的有角度的支台體 (15° with cuff height 2,3,4,or 5 mm) 。它 platform switching 和 morse taper 的設計避免了微間隙移動並且使角化組織有美觀性的結果。

Implant Quality Scale Group	Clinical Concitions
I. Success (*optimum health*)	a) No pain or tenderness upon function b) 0 mobility c) < 2mm radiographic bone loss from initial surgery d) No exudates history
II. Satisfactory survival	a) No pain on function b) 0 mobility c) 2-4mm radiographic bone loss d) No exudates history
III. Compromised survival	a) May have sensitivity on function b) No mobility c) Radiographic bone loss > 4mm (*less than 1/2 of implant body*) d) Probing depth > 7mm e) May have exudates history
IV. Failure (*clinical or absolute failure*)	Any of following: a) Pain on function b) Mobility c) Radiographic bone loss > 1/2 length of implant d) Uncontrolled exudate e) No longer in mouth

■ 圖 43. ICOI, Consensus conference meeting, 2007: 評估植牙成功的標準
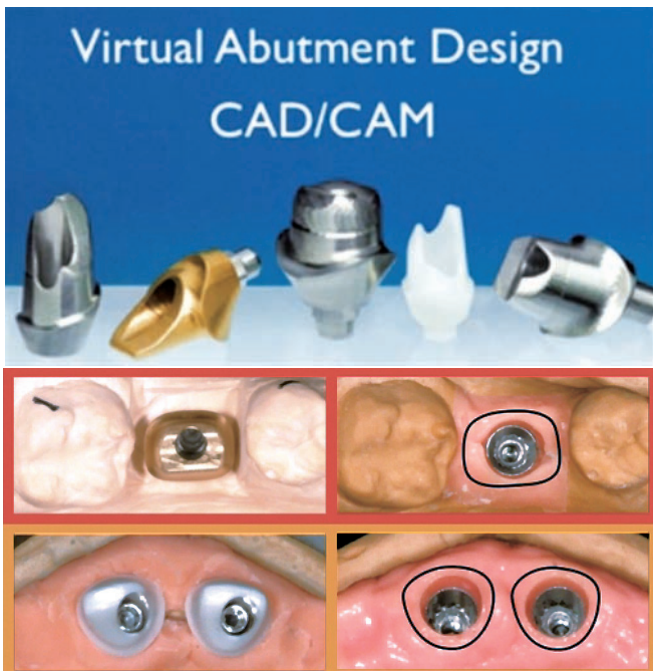
■ 圖 44.
利用客制化 CAD/CAM 支台體可有效地將牙冠的外形邊緣更接近鄰牙，以達到較佳的鄰接面接觸，如此的設計可確保得到齒間乳突。 當鄰接面接觸距離齒槽骨少於 5 毫米時，齒間乳突可重建到約 95%。

Acknowledgment

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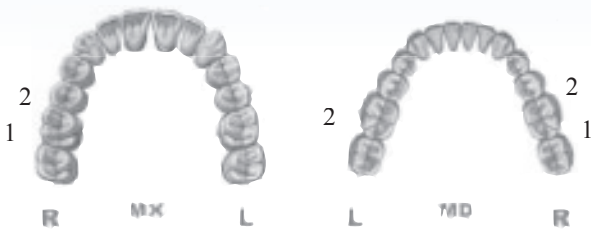12. Chang CH. The 2B-3D rule for implant planning, placement and restoration. Int J Ortho Implantol 2012;27:96-101

Discrepancy Index Worksheet

TOTAL D.I. SCORE   39

OVERJET

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

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

Total   =   **18**

OVERBITE

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

Total   =   **3**

ANTERIOR OPEN BITE

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

Total   =   **0**

LATERAL OPEN BITE

2 pts. per mm. per tooth

Total   =   **0**

CROWDING (only one arch)

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

Total   =   **1**

OCCLUSION

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

Total   =   **4**

LINGUAL POSTERIOR X-BITE

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

BUCCAL POSTERIOR X-BITE

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

CEPHALOMETRICS   (See Instructions)

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

Each degree $< -2°$ _____ x 1 pt. = _____

Each degree $> 6°$ _____ x 1 pt. = _____

SN-MP
    $\geq 38°$ **38°**   =   2 pts.
Each degree $> 38°$ _____ x 2 pts. = _____

    $\leq 26°$ =   1 pt.
Each degree $< 26°$ _____ x 1 pt. = _____

1 to MP $\geq 99°$ =   1 pt.
Each degree $> 99°$ _____ x 1 pt. = _____

Total   =   **2**

OTHER   (See Instructions)

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

Identify:

Total   =   **9**

Cast-Radiograph Evaluation

Occlusal Contacts

| 2 |

Buccal Surface

R   L

Lingual Surface

2

L   R

Case #   1   **Patient**

Total Score: **19**

Alignment/Rotations

| 8 |

2
1   2   2
                            1

R   MX   L   L   MD   R

Marginal Ridges

| 3 |

1   1   1

R   MX   L   L   MD   R
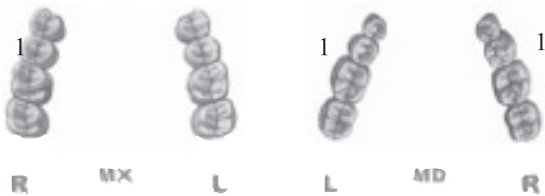
Buccolingual Inclination

| 0 |

R   MX   L   L   MD   R

Overjet

| 1 |

1

R   MX   L
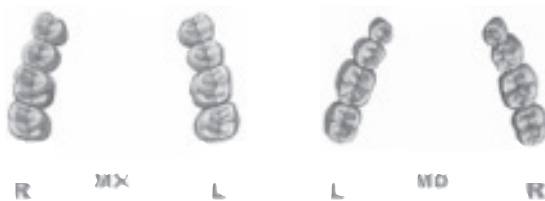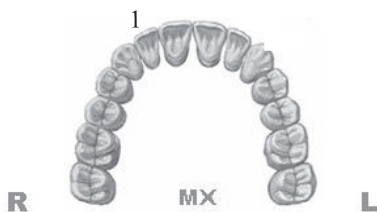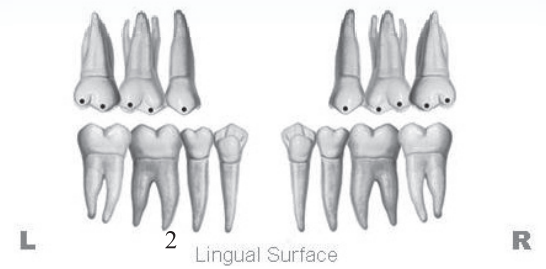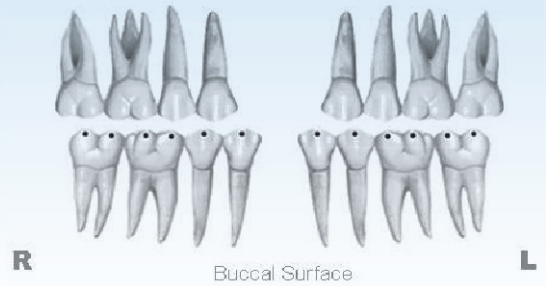
Occlusal Relationships

| 0 |

R   L

Interproximal Contacts

| 0 |

R   L
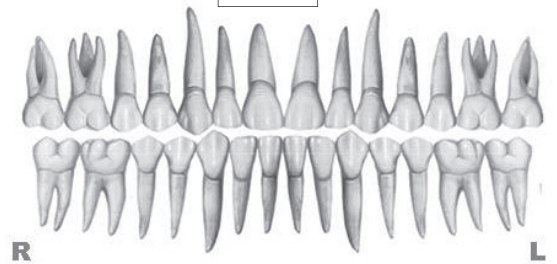
Root Angulation
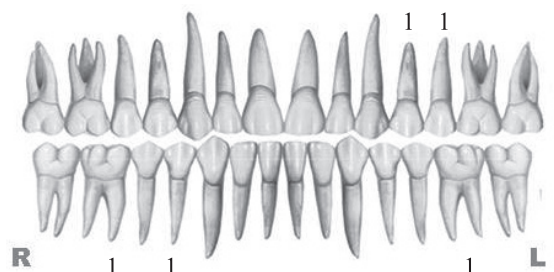
| 5 |

1   1
1   1   1
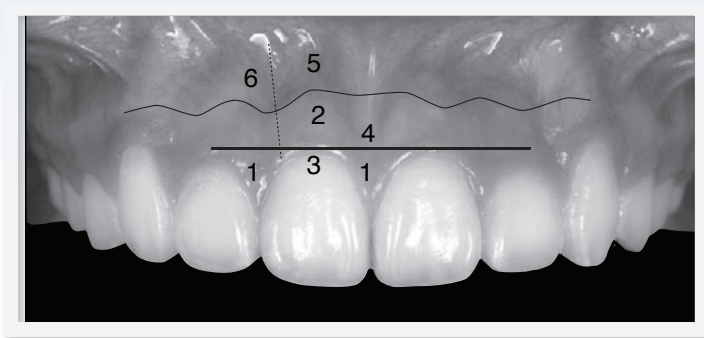   1

R   1   1   1   L

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

IBOI Pink & White Esthetic Score
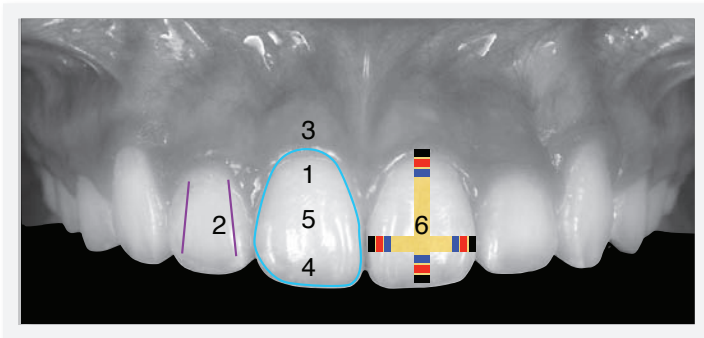
Total Score: =   [12]

1. Pink Esthetic Score

Total = [3]

	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

	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]

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

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

IBOI Implant-Abutment Transition & Position Analysis

3. Implant Position

Total = **2**

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

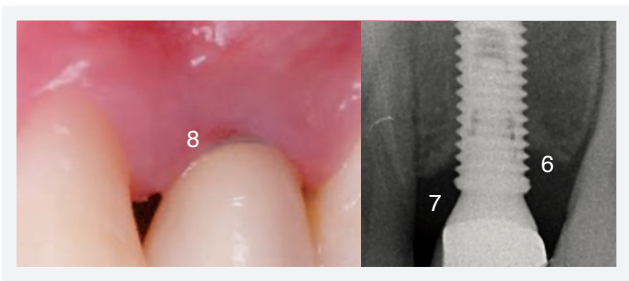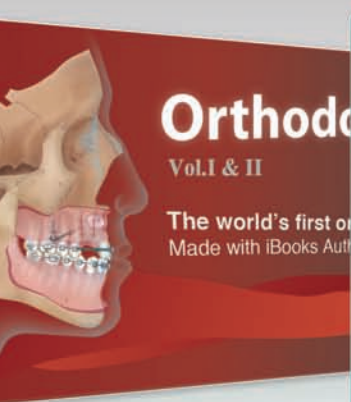| 1. M & D (Center)	(0)	1	2
2. B & L (Buccal 2 mm)	0	(1)	2
3. Depth (3 mm)	(0)	1	2
4. Angulation (Max. 15°)	0	(1)	2
5. Distance to Adjacent Anatomy	(0)	1	2

Total = **4**

4. Abutment transition Contour

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

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

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

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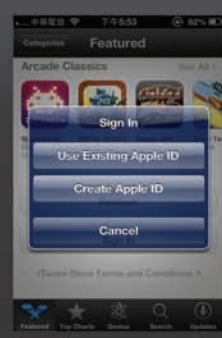
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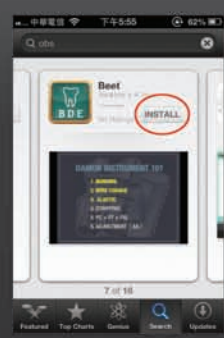App Store

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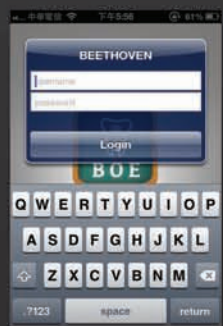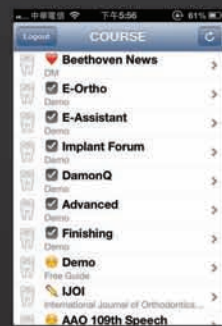2. 「登入」您的 Apple ID。

3. 或是「建立一個新的 Apple ID」。

4. 搜尋關鍵字「OBS」。

5. 點選「免費」並「安裝」。

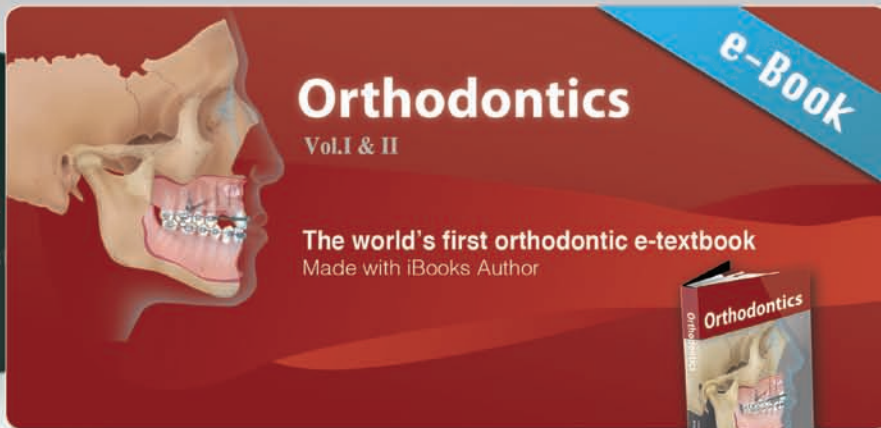6. 下載完成後，點擊以打開該程式。

7. 輸入本 DM 右方提供的帳號、密碼，點選「登入」。

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密碼：**guest**

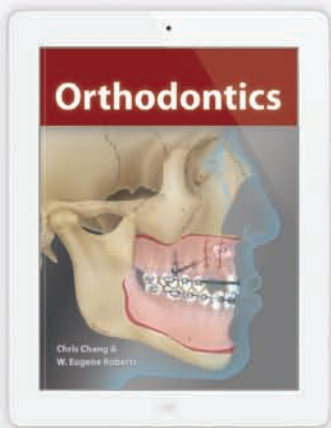**如果** 您對我們的視訊內容、醫療產品有興趣，或對這個應用程式有任何建議，都歡迎寄信到 **app@newtonsa.com.tw**。

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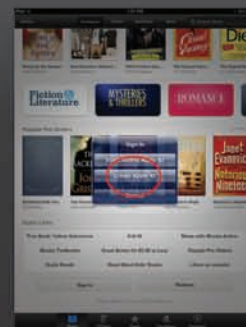
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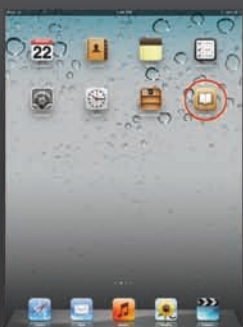
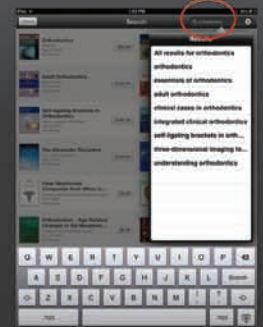1. Launch "iBooks" app on your iPad.

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Newton's A

阻生齒軟組織處理面面觀

Soft Tissue Considerations for The Management of Impactions

治療阻生齒與其它一般的矯正病患治療時間相比，往往需要較長的治療時間，這類病患的治療也涉及牙周手術與矯正科的參與，從術前診斷，正確的治療計劃，阻生齒暴露術式的選擇與矯正的互相配合，有時甚至還需要矯正中以及矯正後的簡單手術參與，才能進一步達到美學的要求。

我們在臨床上遇到阻生齒的機會其實不低，平均約為 1%，其中上下顎比例約為四比一；上顎阻生齒中發生在顎側的比例較高；術式考量也與頰側完全不同。以下為各位醫師介紹我們在臨床上常用的四種術式。
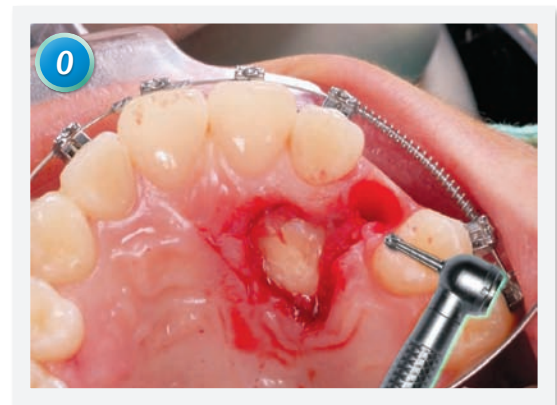
一、Open window technique

對於顎側阻生齒的治療，Dr. Kokich[1] 建議可以在矯正治療開始之前就先進行暴露手術，根據文獻中指出阻生齒在經由其上方軟硬組織去除而露出時會自動萌發；在此同時可利用矯正將需要的空間騰出。

此案例為11歲8個月女生在左上的顎側有一顆阻生犬齒（圖1），我們使用 open window technique 將阻生齒暴露（圖2）。傷口癒合移除敷料後，接下來要讓暴露的阻生齒順利地牽引至理想位置，第一個關鍵就是不要在鄰近牽引路線的牙齒上黏著矯正器，目的是要讓此鄰牙成為一個 free body，如此一來可以避免鄰牙的牙根阻礙往阻生齒萌發的路徑，另外也相對降低鄰牙牙根吸收的機會。

■ 圖.1
此案例在左上顎側有一顆犬齒，從斷層可以清楚的瞭解阻生齒的相關位置。

■ 圖 2
顎側阻生齒我們使用 open window technique，從圖上可看到我們拔除了乳犬齒，同時將阻生齒的牙冠暴露，以及移除將來犬齒往外牽引路徑的皮質骨。之後傷口覆蓋敷料，等待阻生犬齒自己萌發。

由左至右：蘇笙瑋醫師、徐玉玲醫師（貝多芬矯正課程暨植牙論壇講師）
張慧男醫師（貝多芬齒顎矯正中心負責人）、尤金‧羅伯茨醫師（國際矯正植牙學會審查委員）

圖 3
利用骨釘將阻生犬齒先往後移動，再利用 power chain 掛在黏於犬齒頰側的 button 往第一大臼齒拉，造成順時針轉。

圖 4
換回軟線穿過阻生犬齒上的 eyelet，為了避免軟線滑開，我們側齒在的遠心用樹脂做出倒凹讓軟線可以卡住不滑脫。

第二個關鍵就是設計力量系統。在阻生齒牙冠露出後，我們可以依照牙齒的角度方位來給與轉向或移動的力量方向，而力量來源則可以來自主線、其它牙齒，抑或是骨釘（圖 3, 4）。當阻生齒接近牙堵位置時，臨床上我們容易看到軟組織覆蓋住牙冠讓我們無法放置矯正器在牙冠的理想位置上，這時可以使用雷射做簡單的牙齦切除術（圖 5）如此我們就可以馬上黏著矯正器（圖 6），另外要注意一點：從顎側牽引出來的阻生牙儘管牙冠已經到牙弓的位置，但是往往牙根都還在顎側的方向沒有完全擺正 [1]，因此我們會選用 low torque 矯正器或是 tourquing spring，使牙根能夠往頰側移動。這個問題常常造成許多臨床顎側阻生牙拉出後，仍然感覺該區的前庭軟組織相當塌陷的原因。想要得到美觀的成果，就要好好掌握軟組織的處理與牙根的角度（圖 7）。[4]
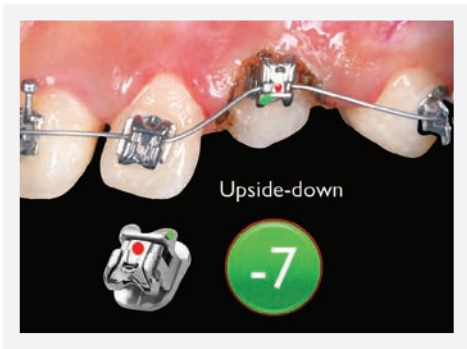
二、Closed eruption technique

在頰側阻生齒處理的術式中，如果阻生齒牙冠位置於 mucogingival junction (MGJ) 附近，則此時多半考量 closed eruption technique 或是 apically positioned flap 來處理。根據 Dr. Kokich [2] 在 2004 年的文章中指出，當阻生齒太高位時以 closed eruption technique 來處理較為適合。

此案例為一 13 歲 7 個月的女性 [3]，在左上顎頰側有一約 14mm 垂直高位的阻生犬齒（圖 8）。矯正騰出空間 4 個月後，我們著手進行阻生齒牽引手術，因

■ 圖 5

當阻生齒漸漸往頰側移動，有時軟組織會覆蓋在阻生齒的牙冠，我們會使用雷射作局部的牙齦切除，方便矯正器的黏著，此圖為術後9.5個月。

■ 圖 6

黏著矯正器時，我們需要考慮到，從顎側往頰側拉的阻生齒，牙根仍然在比較顎側，需要矯正施力將牙根往頰側移動，此時我們會選擇 high torque 矯正器倒黏，以提供更大角度的 low torque。

■ 圖 7

矯正22個月，治療後左側口內照。

為阻生齒比較高位（高於 MGJ），選擇 closed eruption technique（圖 9），由於手術中黏著的矯正器擔心術後脫落，我們通常會黏著兩顆 button 同時附以不同顏色的 power chain 以利區分（圖 10）。

牽引阻生齒的力量來自於置放在左側 infra-zygomatic crest 的骨釘以及延伸出來的 lever arm（17×25 TMA 或 19×25SS wire），如此可保持矯正主線不會受到外力而變形（圖 11）。將 flap primary closure（圖 12），之後只要調整 lever arm 來 activate 牽引的力量（圖 13）。

在 forced eruption 拉出阻生齒的過程中我們觀察到軟組織有三個階段的變化 [4]：

Stage 1. Gingival collar redness,
Stage 2. The red patch,
Stage 3. Keratinization;

Stage 1. Gingival collar redness:

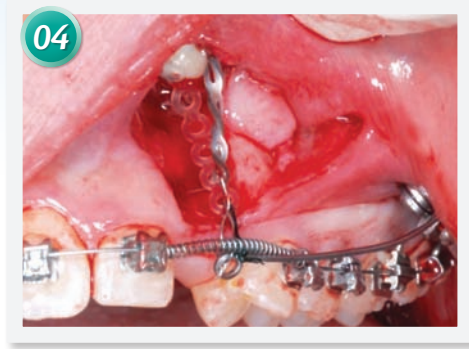在 Forced eruption 的初期，阻生齒 gingival margin 的周圍會看到一圈鮮紅色的牙肉，此處為 pocket 內側 non-keratinized（圖 14），此時會有較深的 probing depth，所以在此階段我們容易誤認為傷口癒合不佳或是牙周組織發炎，如果病人傷口清潔狀況不錯，此階段其實不太會有 bleeding on probing，我們可以告訴病人在這個階段不用擔心，是正常現象。

Stage 2. The red patch:

此時阻生齒仍繼續往下施力 eruption，但是臨床上可以觀察到覆蓋牙冠上的鮮紅色牙肉慢慢回復，此時的 probing depth 從初期的約5mm 上下恢復為較為正常的3mm 上下，但因為仍為 immature 的 erythmatous non-keratinized epithelium tissue，所以色澤仍較泛紅，與周邊的角化牙齦偏粉紅色的色澤仍可

■ 圖 8

　13歲7個月女性，左上顎頰側有一約14mm 垂直高位的阻生犬齒。

■ 圖 9

　沿著阻生齒兩旁作垂直切線將 flap 翻開，暴露出阻生齒後將 CEJ 以上的皮質骨去除。

■ 圖 10

　分別在阻生齒的頰側以及顎側黏上鈕扣，綁上不同顏色的 power chain 做記號。

■ 圖 11

　在左側 infra-zygomatic crest 打上骨釘，連接 lever arm 出來後將 power chain 綁在 lever arm 上，提供阻生齒往下牽引的力量。

■ 圖 12

　將 flap 做 primary closure。
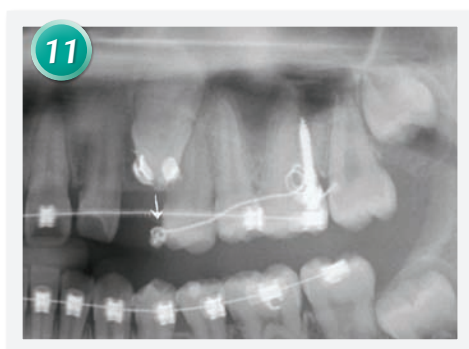
■ 圖 13

　矯正治療第11個月，將 lever arm 往下彎折 activate 提供阻生齒繼續往下的力量。

■ 圖 14

矯正第15個月，Stage 1. Gingival collar reness。阻生齒 gingival margin 的周圍有一圈鮮紅色的牙肉，此處為 pocket 內側因 forced eruption 而外翻出的 non-keratinized eppithelium tissue 的色澤。

■ 圖 15

矯正第19個月，Stage 2. The red patch。覆蓋冠上的鮮紅色牙肉慢慢退縮回正常的 probing depth ，仍為 immature erythmatous non-keratinized eppithelium，色澤較泛紅。

■ 圖 16

矯正第23個月，使用 torquing spring (18x25) 來增加 canine 的 torque。

■ 圖 17

矯正治療共26個月，結束後左側口內照。
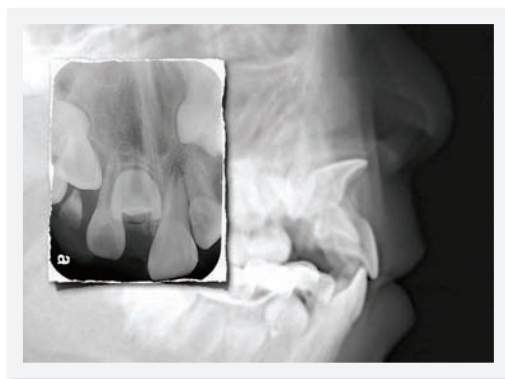
■ 圖 18

9歲5個月女生，右上正中門齒往唇側突出。

■ 圖 19

治療前口內照。

區分（圖 15 ）。

Stage 3. Keratinization:

　　當牙齒萌發到定位不再有向下的施力後，周圍的牙齦組織開始進行 proliferative 與 maturing 的過程，牙齦的角化約需28 ～ 42天。在 finish stage 我們仍然要去注意阻生齒牙根的角度，因為頰側阻生齒的牙根在此階段往往偏向頰側，所以 root convexity 仍然不自然，需要再去調整牙齒的 inclination（ 圖 16, 17 ）。

三、Apically positioned flap

　　有時頰側阻生齒的位置如果在接近或低於 MGJ，Dr. Kokich[2] 建議使用 apically positioned flap 的方式處理，這個 case 中 [5] 的右上正中門齒往唇側突出（ 圖 18, 19 ），為了增加將來角化牙齦的量，手術暴露阻生齒以及黏上鈕扣以及橡皮筋後（ 圖 20, 21 ）在縫合時我們將 flap 往牙根處位移一些再固定（ 圖 22 ）。待矯正治療完成後，我們可以看到術後產生的 scar 比較明顯（ 圖 23, 24 ）。

四、Vertical Incision Subperiosteal Tunnel Access

　　隨著處理阻生齒經驗增加，我們也不斷地思索如何能夠再改進 flap design。從南加大的 Dr. Homa Zadeh 發明的 VISTA 術式中 [6]（Vertical Vestibular Incision Superiosteal Tunnel Access，垂直前庭切線骨膜下遂道法），我們聯想到可以應用在阻生齒的軟組織處理（圖 25 ）。
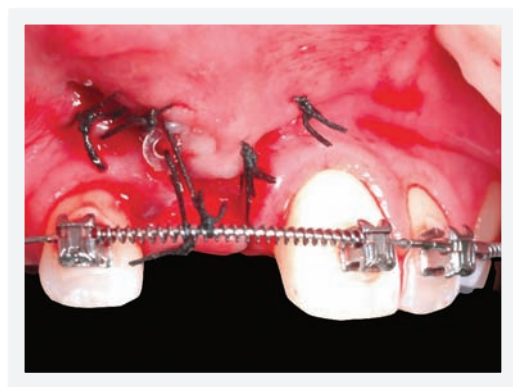
　　這個案例有一顆左上犬齒阻生在正中門齒唇側（ 圖 26, 27 ），我們的計劃是手術暴露出阻生齒後去除牽引路徑上的骨頭，牽引力量的來源是從同側 infra-zygomatic crest 上的骨釘將犬齒拉到定位（ 圖 28 ）。flap design 我們使用 VISTA 術式，首先先從斷層標定
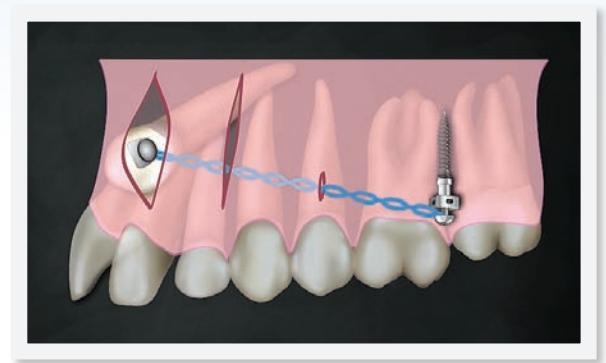

■ 圖 20
矯正撐開正中門齒的空間後，手術暴露正中門牙阻生齒。

■ 圖 21
在阻生齒牙冠唇面鈕扣以及套上 power chain 。

■ 圖 22
將 flap 往牙根位置 (apically positioned) 縫合。

■ 圖 23

矯正 30 個月，治療後口內照。術後產生ㄅ的 scar 明顯。使用 APF，優點是能夠保持前庭深度，增加角化牙齦的寬度，缺點是術後仍會有 scar，flap design 我們建議可作較平行的 vertical incision，flap 往牙根位置的時候較能縫得密合，減少 scar 產生。

■ 圖 24

矯正 30 個月，治療後 PANO，沒有明顯牙根吸收以及牙根彎曲。

■ 圖 25

術前先在照片設計 flap design 以及力量的來源。我們預定使用張慧男醫師改良的 Vertical Incision Subperiosteal Tunnel Access (VISTA) 術式來進行阻生齒牽引的手術，骨釘選擇打在 IZC 以提供適合的力量方向讓阻生齒能夠在高位改變位置。（此為 Dr. Rungsi Thavarungkul 的手繪示意圖）

阻生齒的相對高度，然後沿著左上正中門齒遠心前庭前作垂直切線（圖 29），沒有水平的切線的目的，是希望皮瓣盡量保持良好的血管供應。然後使用骨膜起子從垂直切線進入將皮瓣下骨膜掀開暴露出阻生齒（圖 30）。暴露出後將覆蓋蛀牙冠上面到 CEJ 以上的骨頭移除。接下來在乳犬齒前庭區，位於牙弓轉角處作第二條垂直切線，暴露出組生齒牙冠將來需要往遠心移動路徑中間的骨頭，作 decorticotomy 的動作。

　當牙冠完整暴露後我們在唇側黏上 button 並附著 power chain。此 power chain 的另一端從第二條垂直切線處伸出（圖 31, 32），讓我們可以將 power chain 綁住在位於左側 intra-zygomatic area 的骨釘以提供往遠心牽引的力量。兩道垂直切線使用 Nylon 6-0 縫合（圖 33）。圖 34 的術後照片中我們可看到傷口的癒合狀況順利，power chain 從小的切口中穿出綁在骨釘

■ 圖 26

11歲10個月男生，在左上唇側有一顆阻生犬齒牙冠往近心傾斜到正中門齒牙根區。
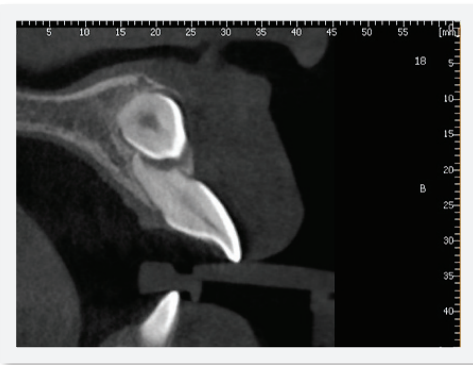
■ 圖 27

正中門牙的牙根因為阻生齒幾乎吸收了約一半。

■ 圖 28

術前先在照片設計 flap design 以及力量的來源。我們預定使用張慧男醫師改良的 Vertical Incision Subperiosteal Tunnel Access (VISTA) 術式配合骨釘來進行阻生齒牽引的手術。

■ 圖 29

在左上正中門齒遠心前庭處做第一道垂直切線，將皮瓣掀開游離暴露出阻生犬齒，將覆蓋在牙冠上皮質骨去除。

■ 圖 30

在犬齒前庭區（牙弓轉角處）作第二到垂直切線，游離皮瓣作隧道通往第一道切線處，並將此處阻生齒需要遠心移動路徑的骨頭作修磨。
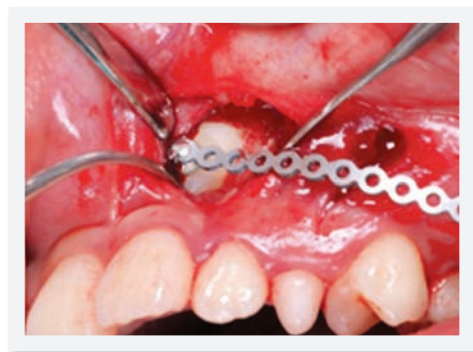
■ 圖 31

在阻生犬齒牙冠上黏著鈕扣及 power chain。

■ 圖 32

將 power chain 的另一頭沿著皮瓣下隧道往第二道切線處拉出。

■ 圖 33

power chain 往遠心套在 infra-zymomatic crest 處的骨釘上提供阻生犬齒往後牽引的力量來源。兩道垂直線切分別以 Nylon 6-0 縫線縫合。

■ 圖 34

VISTA 手術後一個月傷口癒合的狀況。
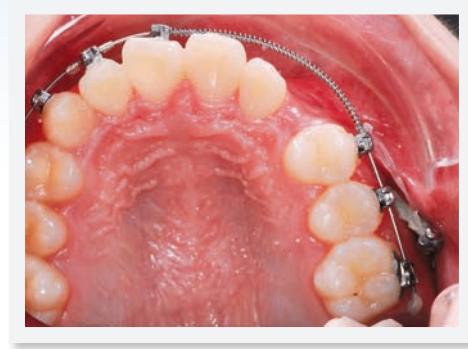
■ 圖 35

矯正器黏著上去時，避開左上正中門齒與側門齒不黏，並在線上放入 open coil spring 以騰開犬齒的空間。

■ 圖 36

矯正第六個月，軟組織仍完整並保持健康，同時將 power chain 綁在骨釘與矯正器上維持騰開的空間。

上提供持續的拉力。VISTA 手術後第五個月我們黏上 Damon 矯正器與 .014 NiTi 的線（圖 35），我們避開不黏正中門牙與側門牙，讓這兩顆牙齒成為 free body，讓阻生齒的移動過程中不會因為這兩顆牙齒被矯正器與矯正線綁住不動而造成牙根進一步的吸收（圖 36）。矯正線放上 open coil spring 撐開空間給阻生齒，並於空間撐開後將 power chain 綁在小臼齒矯正器與骨釘上以維持住空間（圖 36）。經過術後六個月，阻生齒

■ 圖 37

手術當天的 Pano，阻生齒牙冠仍在正中門牙牙根處。

■ 圖 38

術後 3 個月的 Pano，阻生齒牙冠開始往遠心到側門牙牙根處。

■ 圖 39

術後 6 個月的 Pano，阻生齒牙冠已經到理想的位置準備萌發。

逐漸從正中門齒的牙根處往遠心拉到理想萌發的位置（ 圖 37, 38, 39 ）。

五、結論

　　VISTA 是 flapless 的手術技巧，能讓術後的軟組織表現得比 flap 的方式美觀，原因是因為沒有翻瓣的情況下，能夠比翻開整個皮瓣後傷口處的張力影響所產生的疤痕較少得多，以達到較好的傷口癒合以及理想的軟組織美觀，對於處理頰側阻生齒所需的手術術式選擇，我們建議可使用 VISTA 來取代過去的各種翻瓣術式以達到更美觀的結果。

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貝多芬牙科團隊 A Learning Organization

文／陳建綱、徐玉玲、黃思涵、蘇荃瑋

引言

貝多芬，是世界知名的音樂家，但是在台灣，他同時也是一家牙醫診所的名字。在知名的搜尋引擎 Google 中鍵入關鍵字「貝多芬」，在第五個順序就會自動出現"貝多芬牙醫"，點入之後有將近六千筆的結果，可見民眾在網路上想要去了解「貝多芬牙醫」的熱烈程度。

貝多芬牙醫團隊簡介

貝多芬牙科團隊是由張慧男醫師領導，從矯正牙科出發，包含「金牛頓植牙中心」、「貝多芬一般牙科」、「安徒生兒童牙科」牙周病專科、贗復專科等牙醫專科醫師及優秀的牙醫助理團隊所組成。此外，強調以「學習」為核心價值的貝多芬團隊還另外成立「金牛頓藝術科技」，專職負責牙醫資訊科技，醫療器材研發以及牙科教育推廣的工作。

貝多芬矯正中心-環境介紹

一進到貝多芬矯正牙科，櫃台美麗而親切的助理立即起身招呼，眼前寬敞的候診區以及初診病患的諮詢台，周圍不僅有整排的書櫃，有各種張醫師精選的書刊提供候診病患自由選擇，最難能可貴的是大面積的落地窗，讓光線自然而豐富的灑入，舒適而且無壓。

向內進入看診區，同樣的還是一整排的落地窗，這對於整天在診所內工作的牙醫師而言，這真是一個天堂！因為只要自然的一抬頭，就可以看到窗外中庭的綠樹，可以讓工作中的壓力與緊張感自然的舒緩；看診區是開放式的安排，且前方有足夠的陪診空間，方便醫師與家長溝通，或是讓候診病患能standby，這樣的設計方便順暢的處理大量病患。

診療台後方的供應區，主要是擺放看診器械及病歷資料，讓所有的治療過程都能有足夠的後援，供應區台面上的 Apple 桌上型電腦 iMac 也提供醫師在治療時所需要的資訊，而櫃台掛號資訊系統也整合在 iMac 裡面了，病患看診結束，助理也及時的將病歷記錄和照片輸入完成。當然囉，所有的工作站之間都是內部網路連線的，這樣，不管醫師走到哪裡，只要有電腦，配合診療過程，所有的病例資料都可以一覽無遺。

診療區

貝多芬矯正中心- 診療運作系統

貝多芬矯正最值得研究的，應該是它的診療運作系統。診所內的每日看診病患量非常大，而且每天到診所內支援的住院醫師及專科醫師組合都不相同，但是對於病患的處理卻都能依照標準作業流程，按步就班的貫徹張醫師為病人量身訂作的治療計畫，而且效率依然一流！這要歸功於精簡明瞭的病歷設計，

圖像式病歷

不論病患的外觀、口內照片、主訴、基本資料、治療計畫、拔牙位置、特殊發現等，都整合在一張病歷紙上，一目了然！每位住院醫師只要看到病歷上的指示，依照標準操作方式完成每個病例每次的調整，不管是由誰操作，治療的結果都能成就完美。這表示，只要診斷正確，貝多芬矯正牙醫的標準作業流程如果複製到其他牙醫診所，每一位醫師都能如此輕鬆、快樂、有效率的完成矯正治療！

韓國名醫 Dr. Park 與韓國醫師代表團參訪貝多芬。

貝多芬團隊 BEETHOVEN

OBS 繼續教育

印尼國際班醫師認真在模型上練習植入迷你骨釘。

也許大家都會有疑問，住院醫師的訓練不是應該經過4~5年嗎？為什麼大家都能這麼快的進入狀況呢？我想答案應該是「標準訓練流程」。所有的住院醫師都需要經過張醫師的矯正基礎班、進階班的訓練，然後繼續在精修班中逐漸精進成熟。張醫師的教學活潑而且與門診同步，您很難看到萬年不變的教材幻燈片，因為張醫師自己一直在進步。我們會看到就在上個禮拜或是昨天門診中遇到的病例，及時的套入當天的課程主題，而且更令人驚奇的是，當天上完的課程，下午的門診病患裡就有同一類型的病例，真是現學現用零時差！

貝多芬矯正中心-國際化課程

張醫師所設計的課程，不光適合國內醫師，就連國外的醫師也都踴躍報名參加 international workshop，每個梯次的報名都非常踴躍，學員們結業後都說還要再來參加，可見張醫師的課程魅力非常吸引人！張醫師也同時與國際接軌，國際間的演講邀約不斷，漸漸的成為另一個台灣之光！另外，每每只要有國際學者到台灣演講，張醫師有機會都會邀請他們參觀診所，張醫師會為他們簡報介紹診所的運作以及訓練課程，我們會看到這些國際大師他們專注而且驚訝的表情，相信貝多芬牙醫在他們心中都留下了深刻的印象。

貝多芬矯正中心-出版專業刊物
International Journal of Orthodontics & Implantology

貝多芬矯正中心經過張醫師十幾年來的經營，深獲病人的信任與支持，除了提供矯正專業服務外，張醫師也致力於繼續教育的開辦以

及國內外學術活動的交流。為了讓更多牙醫師能有一個實務交流平台，張醫師也出版了一份著重牙科實務經驗分享以及報導國外矯正新知的季刊「International Journal of Orthodontics & Implantology」，邀請國內外知名牙醫師分享他們臨床上的秘訣，並且透過此平台也讓貝多芬矯正的理念能夠透過教育，傳達給認同這份精神的醫師，並且對學習充滿熱忱，不斷精進。

貝多芬醫療團隊

貝多芬醫療團隊，當然不是由張醫師一個人單打獨鬥，我們面對的是廣泛的病人群，年齡從0歲到99歲。沒關係，小的可以送到安徒生兒童牙醫，年長者有贗復專科解決您「無牙」的問題，牙周病及植牙方面有牙周專科醫師，其餘如口腔外科及根管治療、一般牙科都有專人負責，因為都是團隊內轉診，團隊醫師群共同來照顧，對於治療計畫的擬定及溝通較為直接且方便，對於病患的照顧當然是無微不至。

當然，有一群像貝多芬牙醫的全能助理是必要的。助理群也是貝多芬牙醫治療標準流程的重要關鍵！每一位新病人從進入診所開始，就由專業的公關組助理引導填寫基本資料，並介紹環境及諮詢流程，並且拍攝收集病患的口外及口內照片、取模。而在每日的門診治療流程，則由資深的助理組長來指揮，跟診助理引導回診病患就診前刷牙，看診前對病患的關心及詢問，器械準備好了之後由住院醫師先執行治療計畫，之後由張醫師檢查、微調。最後再由助理來指導病患口腔衛教，橡皮筋的佩戴、術後注意事項…等等，然後結束回診流程。助理在病患及醫師之間，扮演重要的關鍵角色，就像鋼筋永遠需要水泥一樣，如果您診所的助理還沒能達到您的理想，請參加貝多芬舉辦的專業助理訓練班吧！

貝多芬醫師團隊。

貝多芬團隊 BEETHOVEN

安徒生兒童牙科 守護孩子口腔的健康

安徒生兒童牙科 · 緣起

　　在貝多芬矯正中心與一般牙科深耕新竹公學新村社區多年後，社區的里長跑來跟貝多芬院長張醫師反應說，社區的孩子牙齒痛都需要跑到市區才能得到專科的照顧，里長伯代表社區的家長們希望貝多芬也能在社區開一個專門為兒童設計的兒童牙科。因為聽到社區民眾的心聲，以及許多在貝多芬做矯正的家長也在反應一樣的需求，2008年元旦我們開設了「安徒生兒童牙科」。安徒生的院長徐玉玲醫師表示，安徒生的理念是希望能塑造一個父母安心，孩子開心的看牙環境，提供永續優質的服務，照護不僅是孩子的口腔生理與心理的健康。

診療台頂上就是繽紛的花朵，讓孩子徜徉在童話的懷抱裡。

金牛頓藝術科技 牙醫科技教育中心

　　成功的牙醫師們經常要面臨的兩難就是，想學的新技術這麼多，永遠抽不出足夠的時間讓我們好好坐下來，完整地聽一場演講或是從頭到尾讀完一本新書。金牛頓藝術科技將貝多芬精湛的臨床技術以及完整的教學系統，透過蘋果科技的硬體 iPad 以及軟體 Podcast，變成隨時隨地可以學習矯正的行動學習工具，已經掀起國際矯正界的一場學習旋風。

金牛頓藝術科技-
　　行動學習 iPad + 視訊課程

　　張慧男醫師率先研發將 Damon 高效矯正、迷你骨釘 OrthoBoneScrew 以及助理訓練這三種屬性完全不同，但是又與牙醫師在職教育密切相關的課程，透過蘋果電腦內建的簡報軟體 Keynote，製作成以照片和影片為主的簡報檔案，再透過軟體本身內建的轉檔功能，將平時授課的電腦簡報內容轉化為視訊影片，並安裝在 iPad 或 iPod touch 裡。不論是已經上過課希望溫故知新，或是沒時間親自來上課的牙醫師，都可以透過反覆觀看這些包含清楚分解動作的視訊影片，來增強高效學習的效果。由於 iPad 視訊課程是完全數位化的內容，也方便日後任何的修改和更新，所以完全不用擔心一旦有新的修正或改變，過去已經購買的珍貴資料就變成明日要被淘汰過期的垃圾。

What is Your Tx. Plan?

安徒生兒童牙科 - 環境介紹

診所以經典童話作家安徒生命名，將耳熟能詳的故事，如國王的新衣、賣火柴的小女孩、拇指姑娘融入診所的場景中，並結合童趣的想像信手塗鴉，留予親子間歡欣共處的童話氛圍。希望在寶貝的成長過程中，看牙不只是為了健康，也能是一件有趣、親子同樂的經驗。從依孩童身高設計不同高度的刷牙檯面，兒童專屬的廁所，到兒童專屬的遊戲區和閱讀區，安徒生從許多細節裡體現一個以兒童為中心的診療環境。

安徒生兒童牙科 - 長期完整保留兒童口腔資料

對兒童牙科而言，安徒生希望能提供的是長期照護，因為生長的過程中，除了在心理上漸漸與小朋友建立關係之外，在口腔顏面發育的部份更希望能透過口內外照片的收集與追蹤，充分掌握整體口腔健康，骨骼生長的情況。所以，為了達成這個目的，每位孩子的資料完整收集，電腦傳輸方式以及大量資訊的統合整理，安徒生都採用最先進的軟硬體技術，高畫質數位單眼相機與即時無線傳輸直接到個人病歷，以及蘋果電腦方便的雙作業系統界面功能，兼顧健保作業及儲存個人影音記錄等作業系統。一點一滴地保存所有小朋友的生長及看牙記錄，藉以提升學術及研究與服務品質。

安徒生兒童牙科 - 兒童衛教

預防勝於治療，尤其是幫年紀尚幼的孩子處理蛀牙更是一項挑戰父母與醫師心臟的浩大工程，有鑑於此，衛生健康教育應向下紮根，所以安徒生兒童牙科除了現在已有幼稚園定期來院檢查塗氟之外，希望還能定期為社區媽媽充實口腔知識以及提供一對一教學，幫助媽媽們從小幫助孩子養成正確的觀念與習慣。另外與孩子口腔健康有切身相關的領域，就是乳牙幹細胞的培養。有鑑於國內外此方面的研究發展已漸臻於成熟，聰明的爸媽除了自寶寶出生後打好口腔健康的基礎，更要懂得保存未來的本錢。

金牛頓藝術科技-
教學利器蘋果電腦+Keynote

金牛頓除了提供牙科專業視訊課程外，也負責設計、規劃、維護貝多芬牙醫團隊的教學資訊環境。舉例來說，日前台大張心涪主任帶著目前仍在美國接受矯正專科訓練，正好回台休假的女婿來參觀貝多芬。診所當天剛好有一個門診手術的個案，訓練有素的助理們有些協助醫師執行臨床上的步驟，有些則進行手術過程的攝影及錄影。待手術過程結束後，助理立刻就將手術的照片放入病人專屬的 Keynote 簡報檔案中，連同病人過去的病例照片，以及剛才的手術錄影畫面，一起整理在這個病人的電子病例檔案中。執刀的醫師則立刻在電腦銀幕上秀出這個病人的治療歷程，向病患及家屬說明治療的進程以及療效，之後則繼續利用這個案例與張醫師進行深度的專業個案討論。討論結束後立刻將這個案例的電子檔燒成光碟，讓張醫師和他的女婿可以帶回去做進一步的研究。

一般醫師可能認為這需要幾個實習醫師花上一個星期才能做出來的病例報告，利用適當的科技工具，這一切在短短的30分鐘內就全部完成了，不論是與病人，家屬溝通，訓練新進醫師、助理或與其他資深醫師進行專業討論，蘋果電腦加上 Keynote 的組合，讓進行個案討論和製作專業訓練教材，變得輕而易舉。再搭配 Keynote 最新加入的即時錄音功能，醫師教學講解的內容可以透過電腦內建的麥克風錄下來，透過影片轉檔的功能，新製作好的教學內容就可以放入 iPad，讓你立刻隨身帶著走。

金牛頓藝術科技-
研發迷你骨釘 OrthoBoneScrew

由貝多芬矯正中心的實務經驗出發，張慧男醫師領導開發矯正用的迷你骨釘，金牛頓的研發團隊包含國內外學界專家如 University of Indiana-Purdue 牙醫所所長 Dr. Eugene Roberts 教授，中央大學林上智教授，以及國內知名矯正醫師林錦榮醫師等。兩年來不斷改進，深受國內醫師的喜愛。透過矯正骨釘的使用，可以大大減少因為矯正需要拔牙的機率，傳統上某些特殊需要接受手術矯正的案例也可以透過骨釘獲得不錯的治療效果。

貝多芬團隊 BEETHOVEN

## 金牛頓植牙中心 毋需再為缺牙遮掩　牙周照護的守護者

過去一般認為成人的牙科治療只需要兩個專科；牙周與補綴，但我們現處於強調 inter-disciplinary 科際間協同治療的時代，其中，矯正與植牙更是扮演了協同治療中最重要的兩個支柱，矯正提供了地基，植牙則是房子的樑柱。因此，金牛頓植牙中心的成立，是為了要提供病人更完善的治療，以及建構更完整的貝多芬醫療專業體系。在各科統和彙整的時代，協同矯正、植牙、牙周、補綴讓治療成果臻於完美是我們不斷追求的目標。

植牙中心承襲著貝多芬體系一貫的明亮且視線延伸的看診空間、自在輕鬆的候診區域，我們更期望植牙中心的成立象徵貝多芬體系邁向科際整合的下一個里程碑，除了配置3D斷層設備，提供矯正關於阻生齒方位的診斷以及植牙時骨質骨量相關資訊等跨科的支援外，也擔任貝多芬體系各專科診所間雲端 e 化的後勤，以蘋果電腦為媒介，將2D X光，3D斷層，電子病歷，跨科治療計畫擬定，患者解說與案例介紹，案例整理，教育課程訓練於雲端整合，跨科分享共同資源，利用科技的運用提高就診效能與促進科際協同。

張醫師曾與我們分享到他人生重要的轉變點，那就是遇見 USC 的 Dr. Homa 與 UCLA 的 Dr. Park！透過矯正與植牙跨科的交流，相互激盪絢麗的火花，並一同思考著整合的未來性。因此決定在今年成立了國際矯正植牙學會 iAOI (International Association of Orthodontists & Implantologists)，也將原先矯正趨勢雜誌 NTO 創新改變成 iJOI (International Journal of Orthodontics & Implantology)。金牛頓植牙中心將繼承貝多芬體系的核心價值:終生學習，更以落實教育當做成立的最高宗旨，透過學會的建立，讓各個醫師擁有相互溝通分享的舞台，張醫師相信，唯有在學會課程中將自己的病歷報告給參與的醫師分享，才會真正的將自己治療心得內化成有系統的 SOP。透過一次次的整理，相互討論，無形中提昇了醫師的專業能力，醫療品質也相對提昇。這亦是張醫師執業多年秉持著的精神「點滴改進，盡心盡力」。期望對學習有相同熱忱的醫師能夠一起加入我們，一起為提昇醫療品質做努力。

ADVANCES IN ENDODONTICS
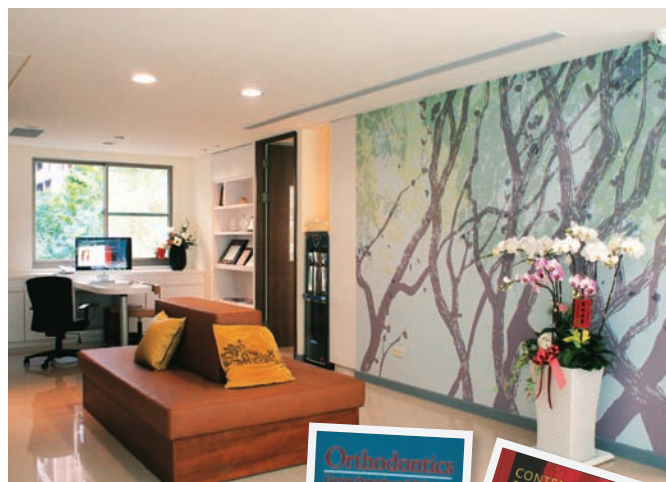
根管治療最新發展和臨床應用

SPEAKER: DR.ALEX W.K.CHAN

2013/08/04 TAIPEI

SPEAKER PROFILE

SPECIALIST IN ENDODONTICS, HONG KONG CLINICAL ASSISTANT PROFESSOR,
FACULTY OF DENTISTRY, THE UNIVERSITY OF HONG KONG

THE BEST

Dr.Alex W.K.Chan

陳維國醫師於1990年獲得香港大學牙醫學士學位，再於1993年以全優成績取得香港大學牙體牙髓病科碩士學位。在1995和1996年分別考獲澳紐皇家牙科醫學院院士和國際口腔植體協會會員資格;其後再取得香港醫學專科學院院士、香港牙科醫學院院士(牙髓治療專科)和牙髓治療科專科醫生資格，並以優異成績完成醫療服務專業管理學碩士課程。

陳醫師現為香港大學牙醫學院臨床助理教授、香港牙科醫學院委員會委員、香港牙髓治療專業委員會和香港牙髓病學會的常委，亦是香港特別行政區牙髓治療科專科醫生，曾應邀在香港、中國和亞洲各地講課和主辦學習班。

根管治療最新發展和臨床應用

INTRODUCTION OF LECTURE

根管治療經過近20年的迅速發展，已發展成為一項獨立，成熟的口腔技術學科。近年來，根管治療器材及技術日新月異，但是怎樣選擇和使用合適的器械和技術，是每一個臨床醫師常面對的問題。

這個課程將會涵蓋當代根管治療理念，包括：牙髓病學的定義和診斷，橡皮障的應用，和了解根管治療成功的生物學理論及根管治療成功具備的條件，亦會包括：機動鎳鈦冠向預備、三維熱牙膠根管充填技術及臨床應用、顯微鏡牙髓治療，和最新的根管充填材料。旋轉動力器械的根管塑形、3D obturation熱擠壓充填、此次演講將帶給您難得的技巧傳授與經驗分享，您絕對不能錯過！

LECTURE INFORMATION

主辦單位：台灣楓城牙醫學會
協辦單位：湧傑企業股份有限公司
時　　間：2013/08/04(Sun.)9:00~17:00
地　　點：集思台大會議中心-蘇格拉底廳
　　　　　(台北市羅斯福路四段85號B1)
費　　用：2013/07/22 前報名2500元・學生1500元
　　　　　2013/07/22 後報名3500元・學生2000元
　　　　　凡報名繳費 贈 ・TF NiTi File Small Pack(一盒)
　　　　　　　　　　　　・前50名報名加贈精美筆記本
報名專線：02-27788315分機#124王小姐　分機#131林小姐
　　　　　請於報名後三日內，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
學　　分：參加者發給繼續教育學分(紙本學分證明100元)
・本文宣品僅供牙科診所及醫師參考，禁止張貼或擺置於公眾可瀏覽及取閱之處

・衛署醫器輸壹字第009148號

SCHEDULE

時間	內容
08:00 AM	- REGISTRATION
09:00~10:30 AM	- 開髓的標準及技巧＆根管預備基本技術
10:30~11:00 AM	- TEA BREAK
11:00~12:30 PM	- 鎳鈦系統的選擇與預備
12:30~13:30 PM	- LUNCH BREAK
13:30~15:00 PM	- 鎳鈦旋轉器械冠向塑形預備技術及臨床應用
15:00~15:30 PM	- TEA BREAK
15:30~17:00 PM	- 3D obturation垂直擠壓充填技術

善用科技以促進與患者溝通
貝多芬矯正中心實例

金牛頓教育公關經理
黃思涵

> **「有好的內容不保證是一場成功的演講」**
>
> ……如何把治療計畫用一種簡單、清楚的方式表達出來，讓不管是病人或是媽媽甚至是阿嬤都可以了解治療的重要性。
>
> 張慧男醫師

成功秘訣：患者溝通

要如何讓病患感覺到他的問題有經過徹底的了解分析，並且可以簡單輕鬆的處理，而且之後不會讓荷包瘦了一大圈，是牙醫師共同的課題。當張慧男醫師十幾年前從美國印第安那普渡大學拿到矯正博士後，選擇在新竹開業時，第一個月他只有兩個病人。當時對張醫師來說，這是一個沈重的提醒：提供好的治療給病人固然重要，但是這並不足以完全滿足病人的需求，也難以在眾多牙醫師中給病人留下深刻印象。他認為，「如果醫師和助理沒有辦法透過有效的溝通讓病人接受治療，再好的治療也沒有用」。

身為貝多芬矯正中心的負責人，張醫師常說他在還沒有成為矯正醫師和專業講師之前，原本想要成為一名傳教士。依他的觀點，與病患的溝通就像是對病人做一場演講。「有好的內容不保證是一場成功的演講」，他說。相反地，重要的是如何把治療計畫用一種簡單、清楚的方式表達出來，讓不管是病人或是媽媽，甚至是阿嬤都可以了解治療的重要性。透過科技的協助，和患者溝通比以往更講求視覺化的呈現，也更容易讓患者了解。

科技輔助的溝通-更視覺化，更貼近人心

大部分的人都同意科技在現代社會已經徹底改變了醫師和病人間的溝通。善用科技可以提昇診所效率，確保一致性，減低成本並因而創造成功。在貝多芬通常一個診次為五個小時，在這段期間醫師要看相當多各類型病例。為此，科技的運用就是一個很重要的工具，確保與病患的溝通時能夠提供充分、簡明的資訊，同時兼顧效率的考量。貝多芬的衛教就是一個很好的例子來說明科技是如何輔助我們與病患進行溝通。

Mac+Keynote
視覺效果最大化

傳統上認為所謂與病人的溝通就是讓醫師和病人

張慧男醫師（圖右）利用 iMac 與 iPad 向來自不同國家的醫師解釋牙科矯正案例

建立一個親近的關係。在貝多芬大部分與病人的溝通都是透過助理，和病人以及家屬作為溝通的橋樑。舉例來說，通常在一個一小時的免費諮詢時段裡，醫師大概會花兩次各五分鐘的時間，第一次檢查病人口腔的情況，第二次透過蘋果電腦上簡報軟體 Keynote 來向病人和家屬詳細解釋病人的治療計畫。剩下的時間就是由助理蒐集病人的個人基本資料，以及臨床所需的資訊，並且回答病人針對療程、治療種類以及費用等等相關問題。助理首先利用 Keynote 以五分鐘的時間介紹接下來一個小時的諮詢所要包含的內容，接著就開始進行照相以及拍攝 X 光片。資料蒐集完後，助理就會開始把剛才蒐集的照片和影像，整理到診所標準的 Keynote 病例格式裡。10-15分鐘後病人就可以馬上在目前最大的27吋蘋果電腦上看到自己的照片。「我們為什麼要用27吋的電腦，而不是小一點的21.5吋，就是因為我們希望病人在高解析度的電腦上看到自己牙齒的問題時，能夠留下一個深刻的印象」，也有助於醫師做更明確診斷說明，張醫師表示。除了讓

病人看到自己的照片之外，張醫師也會立即告訴助理這個病人是屬於哪一種類型，所以助理可以立刻從現有的示範病例類別中挑出類似的病例，並且展示治療前後的改變。張醫師解釋：「除了靜態的照片之外，我們還利用動態的電腦模擬軟體 Morpheus 來為病人展示類似病例治療前後的變化。這些動態影片可以清楚表現牙齒的移動，可以用很簡單、清楚的方式的幫助病人了解矯正醫師是如何把牙齒排整齊，並且關閉多餘的空間」。此外，Keynote 還可以提供的優點是它使解說者可以直接從簡報中無間斷的播放影片，不像 Powerpoint 需要另外點擊超連結，所以助理可以很順暢的展示治療前後的效果，並且清楚的解釋各種不同治療方式的細節以及過程。

張醫師進一步補充，「我們也用很多影片來說明我們的治療過程」。舉例來說，維持口腔的清潔衛生是維護牙齒健康很重要的一環。在我們診所固定會為病患講解該如何正確的刷牙。相對於一般充滿文字，

牙科助理利用 iMac 上的 Keynote 提供病人初診諮詢

病人正在 iPad 上觀看橡皮筋使用的示範影片

病人可以一邊躺在椅子上，一邊觀看自己的矯正檔案

以條列式為呈現方式的簡報，我們在 Keynote 簡報裡使用清楚的標題，高解析度的照片和簡短的影片，來創造一個以影像為主的簡報。張醫師從他多年教授專業演講技巧的背景解釋，「我們不需要使用很複雜的設備才能創造出一個視覺化的簡報。透過視覺化的方式我們希望觀眾可以很清晰、簡單的看到我們所要表達的意思」。

Mac+Keynote
一致性、高效率

除了讓病患更輕鬆、容易了解療程之外，貝多芬開始使用標準化的患者諮詢流程是為了要確認每一個諮詢的內容都能一致，且達到我們所要求的高品質。牙科診所經常要面臨的挑戰是診所助理的流動，以及隨之增加的人員訓練成本。張醫師主張：「病人諮詢應該要像看圖說故事一般，簡單又清楚。我們對病人所講述的這個故事應該是正確且一致地」。為了要達到這個目標，「故事的內容應該可以輕易地由我們修改，但是不管是新進的助理或是資深的助理，講的應該都是一樣的故事」。

行動化科技-更以病患為中心，
創造更有趣的醫療環境

我們一方面持續使用桌上型電腦和 Keynote 來做為我們最主要的病患諮詢工具，我們也開始嘗試使用 iPad 來和我們的病患溝通。因為大家實在太喜歡這個大玩具了！張醫師表示，「貝多芬總是很勇於嘗試新的科技來提昇我們和病人間的溝通。iPad 的廣受歡迎，以及它的輕便，讓我們相信它未來很有可能可以取代那些固定在診療椅旁邊，笨重又佔空間的電腦銀幕」。大部分的診所利用電腦螢幕或是電視螢幕只是被動的播放遠端電腦所傳送的影像，iPad 提供了一個更經濟，更有彈性的選擇，讓我們不僅是可以呈現影像，還可以播放簡報，玩遊戲等等，提供更多元的使用經驗。

「目前我們已經把我們的衛教簡報轉成短片的形式，所以病人可以在等待的時候自行觀賞。病人可以選一個自己有興趣了解的主題，按照自己的速度來觀看學習。這樣的使用方式讓患者和他們的家人可以有更多的自由空間去探索治療相關的資訊，特別是那些有限的諮詢時間裡可能沒有完整解說到的資訊」。透過 iPad 來學習，相較於傳統的宣傳小冊子或是廣告單張，是更有趣也更完整。「如果你對牙科衛教沒有興趣的話，你也可以一邊坐在診療椅上玩玩最新的遊戲或者是一邊在臉書上告訴大家你的看牙經驗」，張醫師笑著強調說：「我們相信提供病人他們想要的，也就是最佳的治療和充分的資訊，並且是用一種有趣且吸引人的方式進行，我們可以創造出病人滿意的笑容」。

> 「我們不需要使用很複雜的設備才能創造出一個視覺化的簡報。透過視覺化的方式我們希望觀眾可以很清晰、簡單的看到我們所要表達的意思。」
>
> 張慧男醫師

未來展望-開發
iPad/iPodtouch/iPhone
應用程式

你知道怎麼使用橡皮筋嗎？最近經常聽到的迷你骨釘究竟是用來作什麼的呢？有很多這類的問題卻不知道該問誰嗎？貝多芬最近在與一組工程師合作，希望能夠在近期開發出一個針對蘋果掌上型的裝置 iPad/iPodtouch/iPhone 上可以使用的應用程式。「iPad 這種讓你可以任何時間、任何地點都可以使用的特性，不僅是很吸引我們的病人，醫師也為之瘋狂」。張醫師補充說：「我們已經累積了很多很好的視覺化教材，幫助病人以及醫師更了解矯正。蘋果所提供的軟體平台，加上它優異的硬體設備，是我們選擇它作為我們未來最主要的溝通工具的兩大主因」。讓我們拭目以待這個新一代的溝通方式，讓看牙醫再也不是想到就害怕的事！

ORTHO-IMPLANT COMBINED TREATMENT

資訊

國人缺牙嚴重，延伸的問題如鄰牙傾斜、對咬牙增長、缺牙區骨吸收，甚至導致上顎竇氣室化，大幅增加了植牙的困難度。以上種種因長期缺牙造成的問題，可適時以矯正改善植牙區的條件。此外，希望能夠讓您幫患者進行假牙或植牙處置前，提供患者多一個選擇的機會，透過連結矯正的治療，讓患者假牙或植牙的治療更加理想。本演講期能以系統性歸納及示範，如何善用矯正治療，改善軟、硬組織，讓植牙更輕鬆。

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，於上午課程由邱上珍及蘇筌瑋醫師闡述如何透過簡易矯正來製造理想的植牙空間，以及植牙治療應該注意的軟組織處理細節。下午課程則由黃瓊嬅、黃登楷、張銘津及陳惠華醫師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。

如果你想對目前的牙醫趨勢進一步了解，九月二十二日這場矯正與植牙合併治療的思考流程，您一定不能錯過！

Cut the crown & RCT + CLP + Crown?
Scissors-bite
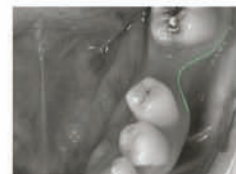
1. Atrophy ridge
2. Change the implant site by coil spring
3. Orthodontic tension force increases bone volume
4. Orthodontic force converts atrophy ridge to ideal ridge

2mm Buccal Bone thickness

陣容

Session I 簡易矯正法製造理想植牙空間

I-1 Soft Tissue Management in Implant
   09:00-10:10 邱上珍/張慧男

I-2 Cross Link between Ortho. & Implant - VISTA
   10:40-12:00 蘇筌瑋/張慧男

Lunch 12:00-13:00

Session II 矯正與植牙合併治療 病例示範

II-1 Implant-Ortho Connection
   13:00-14:00 黃瓊嬅/張慧男

II-2 iAOI Ortho-Implant Case Report (1)
   14:10-15:00 黃登楷/張慧男

II-3 iAOI Ortho-Implant Case Report (2)
   15:10-16:00 張銘津/張慧男

II-4 iAOI Ortho-Implant Case Report (3)
   16:10-17:00 陳惠華/張慧男

資訊

Feedback from the 2013 Damon Forum

Chris,

Just a short note to thank you for your very outstanding presentation at the Forum. As I told you on the airplane, it was the highlight of the meeting. I so much admire your thought process and what you are able to accomplish clinically with your talent. Most of all I so appreciate who you are as an individual. You and your wonderful Shufen are so very special and fun to be around. I love your energy and passion for life. You both are such wonderful examples for others to follow!!!!!

I so hope that you and John Lin will be willing to help move clinicians back to more normal bracket positioning where the "Torquing Couples" were engineered to work. Straight Wire with Three Dimensional Control, I believe, is a significant historical move forward for clinical orthodontics. As shown in my lecture, the less we have to bend archwires to finish cases, the more closely aligned we clinicians can be with BIOLOGICALLY SENSIBLE FORCES IT IS ALSO SUCH A BIG DEAL FOR MAKING MECHANICS EASIER AND SIMPLER. As I mentioned in my lecture, I always have tried to achieve very high quality result with minimal or no archwire bending. I realized when working with the engineers on bracket design that I, at least, was placing far too much force on bone and tissue in my early years as a clinician. Oh how I wish I could go back and treat those patients with what I know and appreciate today!!!!

Again, many thanks for your INCREDIBLE LECTURE AT THE FORUM. I have heard so many wonderful comments from Doctors that heard your lecture.

Please stay connected. I so appreciate all you are doing to improve this very special profession.

Please give Shufen a big, big hug for me. Linda also sends a big hug!!

Warmest regards.

Dwight Damon

Dr. Dwight Damon & Chris Chang ran into each other on the plane on the plane by coincidence.

Feedback on the ebook, Orthodontics

What a breakthrough! Chris, you have singlehandedly revolutionized teaching methods and forever impacted the traditional text book industry with your electronic text books. The chapters are logically laid out with main points lucidly illustrated and supported with text, x-rays, photos and video. If we subscribe to the Chinese proverb, " *A picture is worth a thousand words*", then surely a video is worth at least ten thousand words. The technology has circumvented the bulk and inaccessibility of traditional books and brought everything to your finger tips. Nothing is more than an intuitive swipe away. You have made learning fun again by eliminating the tedium associated with reading a text book. These are by far the best text books and learning tools I have ever come across. I am sure all the best textbook in the future will use this blueprint. Thank you Chris! I am forever in your debt.

Jerry H. Watanabe

DDS, MS
Diplomate of the American Board of Orthodontics
California, USA

Here is a photo with my star student that I would like to share.

W. Gene Roberts

Consultant, International Journal of Orthodontics & Implantology

Feedback from the International Damon & OBS Workshop

Dear Dr. Chris:

I'm now back in my country Colombia, after a long journey. I will try to put into words what this experience has meant to me.

Firstly, I want to say that you're the kind of person that goes through the lives of others generating big changes. That is exactly what you did to me, by the inspiring passion you live with your life, your practice, and I would say, everything you do in your life.

The dedication, discipline and organization reflected in your Clinics and in Newton's A, are qualities that for sure I will put into practice for my professional development.

Thanks to you and your ability of transmitting knowledge through your workshop, now I am equipped with more tools to solve my cases.

I will continue to learn by reviewing your ibooks and Journal.

I cannot express enough my most sincere thanks to your wonderful wife for her hospitality and generosity. I am very grateful to all of your staff for their willingness and dedication to the course.

For my part, I will pass on the knowledge I acquired in your workshop and serve as a great motivator for many of my colleagues to encourage them to attend this course.

I hope someday I can repay all the hospitality you gave to both my wife and my self, and go back as soon as possible to continue learning from you.

With my sincerest gratitude,

David Jimenez
Orthodontist,
Colombia

My experience at the Beethoven workshop was mind-blowing.

My world of Orthodontics has been opened wider with tons of cases which, I can confidently say, I wouldn't dare to treat without surgery. The word, beautiful, is just not sufficient to describe all of the cases I saw at the clinic, because they are all finished with such excellence. I believe that my experience here would benefit my patients more. I am proud of my work but I would say that if my work from now on happens to be better than before, I would give this credit to Dr. Chris Chang and the Damon course with Dr. Rungsi earlier. We received a very warm welcome like we are part of the team family. Thank you very much indeed.

Dr. Kanyarat Inntarakaew
Orthodontist,
Thailand

Dear Dr. Chris Chang,

I'm very grateful to you for all things I've taken from your International Damond & OBS Workshop in 2012. I have applied many things I learned from your lectures to my practice and it is the Vietnamese Children who are enjoying the benefits of my growth, shorter treatment time, more comfortable treatment and better results.

In particular, I want to thank you for a special impacted canine case. Before attending your lectures I had spent 3 months in treatment without success. So I made the decision to put the treatment on hold until I came back. After completing the workshop, I restarted the treatment armed with many things learned from you, removing the plate and placing the screw higher up for pulling. Finally, a miracle happened! The impacted canine has descended into the right position.

I will send you some pictures of this case to share my happiness and gratitude.

Best regards

Dr. Vu Hai Anh
Diamond Orthodontic Clinic, Hochiminh City,
Vietnam

K1 簡報聖經　　　　　　　　　　　　　　　　　　2012/12/27

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

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

K2 Dr.Kokich 令人屏息的十大演講秘訣　　　　　　2013/1/17

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

學習重點：1.Dr.Kokich 十大演講秘訣　2.準備演講的九個步驟　3.多媒體影片剪輯
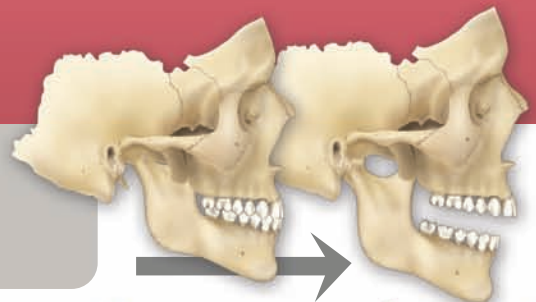
K3 賈伯斯令人目眩神迷的五項演講技巧　　　　　　2013/3/14

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

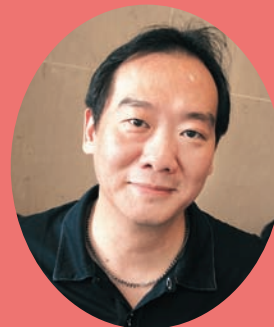學習重點：1.Steve Jobs 的五項演講技巧　2.幻燈片的設計概念　3.幻燈片修改應用

K456

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矯正植體課程

OBS In-office Workshop

講解矯正植體操作的時機、方法診所臨床跟診及實例示範

牙醫師不敢或是不知如何植入 miniscrews，大抵有兩個原因：一是無法突破心理障礙；另一則是認為操作困難。然而，張醫師透過高效率的課程講授，直接切入重點，使您輕鬆掌握；簡潔的步驟，讓您不再求助牙周或口外醫師。百聞不如一「做」，相信短短一天的課程，您將親身見證！

● 購買OBS超值組贈 2000元課程折價券，可折抵本課程費用。

全方位牙醫診所
王肖龍醫師

助理訓練課程

1. 高效矯正助理訓練	4. Keynote 製作
2. 新病人流程	5. 矯正期間衛教
3. 照相技巧	6. Morph 製作

針對矯正助理的臨床技巧、電腦操作，包含照相、X光拍攝、Damon 系統相關知識介紹，以及牙科電腦應用，例如衛教檔案製作、Morph 病例以及 Keynote 病例製作教學。結合課堂講解與診間實習雙重方式，幫助您快速培養出得力矯正助理。此外，本期課程新增 iPad 在診間的應用，讓您的助理可以善用科技，為病人創造理想就診經驗。

● 三人以上團報享9折 優惠。

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International

Association for

Orthodontists &

Implantologists

國際矯正植牙學會

歡迎至 http://iaoi.pro 獲得更多 iAOI 會員權益與專科認證等最新消息。

加入 *iAOI*，
共創牙科的未來！

如何加入 iAOI？

欲取得國際矯正植牙學會會員資格，需完成下列階段：

1. Member

醫師可以在網站 http://iaoi.pro/ 直接申請加入會員資格，申請完成的醫師將具有資格索取線上考題題庫或是考題題庫紙本，得用以準備入會考試。

2. Board eligible

所有申請加入會員資格的

醫師始可參加入會考試，參加考試的醫師將從四百題題庫選出的一百道題目作答，以 70 分（含）為通過標準，通過的醫師即可獲得 Board eligible 資格。考試的時間為一個小時。下次考試的時間為2013/12/15（日）於台灣台北金融研訓院。

3. Diplomate

已獲得會員資格者，需要提出三篇案例報告，其中一篇案例需要再做口頭報告，通

過審查後，始可獲得 iAOI 的 Diplomate 資格。三篇案例中，至少須有一篇案例，同時涵蓋 矯正與植牙領域。此為單一案例的個案報告。報告人和評論人需在規定的時間內完成報告及講評。每個報告人需在 12 分鐘內報告單一個案。大會會在第十分鐘時響第一次鈴，第十二分鐘到時會直接將麥克風關閉。每個個案報告結束後，全體評論人共有八分鐘可以講評。 大會會在第六分鐘時響第一次鈴，第十分鐘到時會直接將麥克風關閉。評論人如果

有額外的意見可以以書面方式提供給報告人。

4. Ambassador

獲得院士資格的醫師，將有機會受邀在 iAOI 年度大會中提出六篇矯正與植牙結合的案例報告。完成報告的醫師，始取得 iAOI Ambassador 的資格，並且獲頒紀念獎牌，以表揚醫師對學會的特別貢獻。

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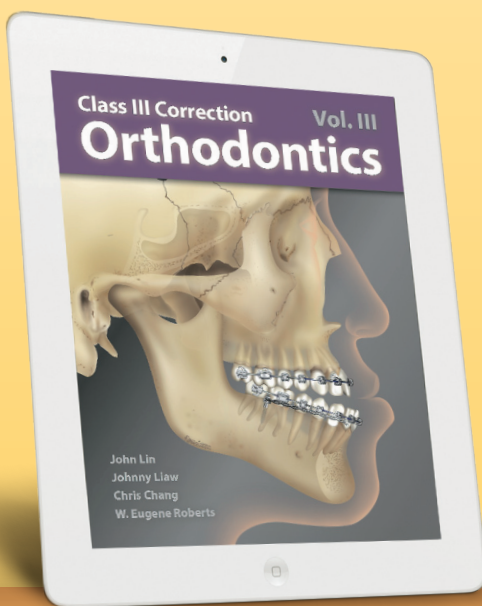
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Drs. Eugene Roberts, Chris Chang, Tom Mulligan, John Lin and Larry White (from left to right) at the 2013 AAO meeting.