News & Trends in Orthodontics

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Treatment of Severe Class III with Buccal Shelf Miniscrews
Dr. John Lin

ABO Case Report : Correction of Bimaxillary Protrusion with Closing of Premolar & Molar Extraction Spaces
Dr. W. Eugene Roberts

ABO Case Report : High Maxillary Canine Impaction with Mesial and Labial Displacement
Dr. W. Eugene Roberts

Dr. Andrew Haas was reading the NTO 17 in the 2010 Angle Midwest Annual Meeting in Chicago

2010 熱愛學矯正

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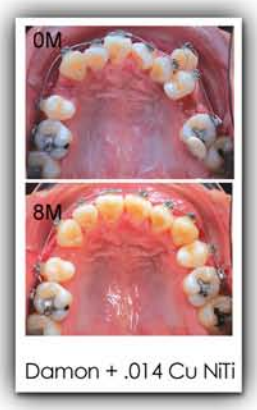
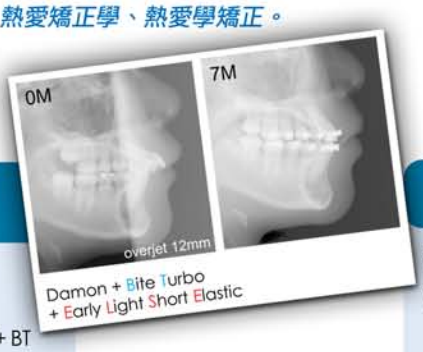
學會開始做矯正需多久?

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



Damon + .014 Cu NiTi



Damon + Bite Turbo
+ Early Light Short Elastic

Damon矯正課程

將使用最新一代矯正器 Damon Q 進行課程，歡迎舊生報名參加。

	台北 (二)	台中 (四)	高雄 (四)	LECTURE	LAB
1	05/25/10'	04/29/10'	09/23/10'	理想入門病例 + Damon Q 黏著	Bonding (Damon Q) + BT
2	06/01	05/13	10/07	快速矯正療程四部曲	Ceph + Photo
3	06/15	05/27	10/21	簡捷有效的錨定系統	Damon + OrthoBoneScrew I
4	06/29	06/03	11/04	不拔牙與拔牙分析	Damon + OrthoBoneScrew II
5	07/06	06/24	11/25	Damon 診斷流程及微調	Finish Bending
6	07/20	07/08	12/02	完工檢測及報告示範	Fixed Retainer (FR)
7	07/27	07/15	12/30	維持及復發；病例示範	Presentation Demo
8	08/10	07/22	01/06/11'	矯正力學及診斷分析 (1)	DDX + Case Reports I
9	08/24	08/12	01/20	軟硬組織及診斷分析 (2)	DDX + Case Reports II
10	08/31	08/19	02/10	兒童矯正及診斷分析 (3)	DDX + Case Reports III
11	09/07	09/02	02/17	成人矯正及診斷分析 (4)	DDX + Case Reports IV

矯正植體課程

矯正植體的操作時機、植法與實習、個案討論、臨床跟診及實作示範。

新竹(五) 9/17/10'

International workshop

Keynote & managment
OrthoBoneScrew
& Damon

5/18~20/10'

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。

新竹(五) 10/8、15/10'

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 (二)	Paper reviews	Topics & Case Demo
1	09/30/10'	Bracket placement & workshop	Crowding: Ext. vs. Non-ext.
2	10/14	Impacted canines	(U) Impacted Teeth: Ant. vs. Post.
3	10/28	Canine Substitution	(L) Impacted Teeth: Ant. vs. Post.
4	11/11	Anterior Esthetics	Missing: Ant. vs. Post.
5	12/23	Excellence in Finishing (occlusion)	Crossbite: Ant. vs. Post.
6	02/24/11'	Excellence in Finishing (esthetics & perio)	Deep Bite vs. Open Bite
7	03/03	Ortho-Perio-Restore connection	Low vs. High Angle & Gummy Smile
8	03/17	Adjunct to perio	Root Resorption & Relapse
9	03/24	Unhappy patient	Perio-Ortho
10	04/07	DI & CRE Workshop (1)	Implant-Ortho
11	04/14	DI & CRE Workshop (2)	IDT

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。

精修II (二) 05/11/10' 06/22 07/13 08/17 09/14 10/12 11/16 12/14 01/18/11' 02/15 03/22

課 程 資 訊

課程項目	時段
Damon矯正	台北/台中/高雄
	【課程】09:00 - 12:00
	【實習】另外安排
矯正進階	【新竹】09:00 - 12:00
	【高雄】14:00 - 17:00
矯正精修	【課程】09:00 - 12:00
矯正植體 (含中、晚餐)	【課程】09:00 - 12:00
	【實習】13:30 - 20:00
助理訓練班 (含中、晚餐)	【課程】10:00 - 14:30
	【實習】15:00 - 20:00

上課地點

【台北】
恆逸資訊中心畢卡索廳
/ 台北市復興北路99號12F
(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2F

【台中】
文化大學台中教育推廣部
/ 台中市西屯區中港路二段128之2號3樓 (317教室)

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科學工藝博物館S107教室
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Trends in Orthodontics

What are the latest trends in Orthodontics? As the publisher of News & Trends in Orthodontics, I always try my best to answer this frequently asked questions. However, by definition that answer has always been changing with time.

Ever since I started learning orthodontics 25 years ago, orthodontic history has been one of my major interests. The reason why I love studying history is because I hope and believe with a better understanding of the past, I'll be able to predict the future. Based on this simple thought, I have devoted most of my time to study self-ligation and mini-screws anchorage for the past six years. I found the time was well spent for the differences we have been seeing in patient care in terms of efficiency and quality control. This fact has been proven true in my own practice and in the 2nd edition of Dr. John Lin's new book, *Creative Orthodontics: Blending the Damon System & TADs to manage difficult malocclusions*. This is a book that you definitely don't want to miss if you wish to enhance efficiency and quality control in your own practice.

So the answers seem to be self-ligation and mini-screws. Not until I met with three implant giants, Dr. Homa Zadeh, director of USC Implant Symposium, Dr. Kwang Bum Park, president of Korea MIR Dental Hospital, and Dr. Micheal Cohen, founder of the Seattle Study Club, did I truly observe the significant benefits of using orthodontic treatment to set up a solid foundation for implant and restoration construction in those complicated cases requiring interdisciplinary treatment (IDT). These benefits of adjunt orthodontic treatment are particularly pronounced for elder patients who are in the process of transitioning the 2nd mixed dentition from natural teeth to full mouth implants. Today, my answers to the question of trends in orthodontics are self-ligation, mini-screws and IDT. The era of IDT has arrived and I hope our readers can all be a part of it.

To better prepare ourselves to meet the challenges in this new era of IDT, since this year NTO has begun to report trends in other dental specialties, namely, implantology, periodontology, prosthodontics and so on, from an orthodontic perspective. Our goal for this year is to transform into a journal of interdisciplinary treatment for orthodontists. I hope you will find this new issue useful and informative.

Chris HN Chang, DDS, PhD, Publisher

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Treatment of Severe Class III with Buccal Shelf Mini-Screws

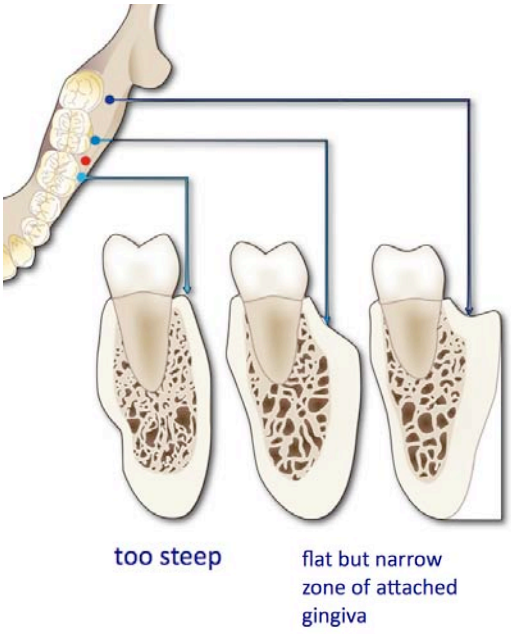

Fig 1. *From 1st molar toward 3rd molar, the buccal shelf gets flatter and the zone of attached gingiva becomes more narrow.*

(1) Anatomy

The buccal shelf is the buccal bone area over the mandibular molars. It is very dense cortical bone, which makes it ideal for mini-screw placement.

The slope of the buccal shelf around the mandibular 1st molar is quite steep while the one around the mandibular 2nd molar is flatter, which makes it easier for direct mini-screw placement. The slope around the 3rd molar has the flattest buccal shelf, but usually very limited zone of attached gingiva (Fig 1, 2). Chen's study[1], confirms the above anatomy. The attached gingiva region is wider around the mandibular 1st molar. For flatter surface to place mini-screws one should get close to the mandibular 2nd molar.

Even in the same buccal shelf of mandibular 2nd molar area, the slope of the buccal shelf varies with individuals (Fig 3). Of course the flatter the slope is, the easier it is for direct self-drilling of mini-screws. Clinically the slope of the buccal shelf can be diagnosed by pulpation. Cone Beam Computerized Tomography (CBCT) can also be used for confirmation (Fig 4). In most cases the mandibular canal is located in the lingual side of mandibular molars. It means the chance of hitting the mandibular canal, when placing the buccal shelf mini-screw, is close to zero (Fig 5, 6). Anatomically buccal shelf is a very safe place for mini-screw placement. Also due to dense cortical bone structure, it's an excellent area for skeletal anchorage.

(2) Placement of mini-screws

In cases of flatter buccal shelf, with enough attached gingiva, direct self-drilling is possible. The author's clinical experience and Chen's study confirmed that steeper shelf is more common than flatter buccal shelf (Fig 7). For cases of steeper buccal shelf, due to a narrow zone of attached gingiva and steeper cortical bone surface, flap surgery is often needed. There are two types of flap surgeries for placing buccal shelf mini-screws.

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

One is full thickness flap. After incision through the attached gingiva, the full thickness flap is elevated. Use the pilot drill to make a hole below mucosa followed by mini-screw placement. After the placement, leave the denuded bone area exposed[2]. The denuded bone area will be healed with attached gingiva (Fig 8, 9). The advantage of full thickness flap is that it is an easy and simple procedure without suture. The disadvantage is the denuded bone area is usually in a lot of pain.

The other type of surgery is partial thickness flap. It starts with incision from mucosa and vertically up to the attached gingiva to make partial thickness flap (Fig 10). Then use pilot drill to make a pilot hole through the exposed periosteum. After placing the screw, suture the partial thickness flap to wrap mini-screws with Coe-pack covering. The advantage of partial thickness flap is that there's less pain over the periosteum. The disadvantage is that it takes more skills to perform the procedure (Fig 10, 11).

(3) Materials and sIze of mini-screws

Osseointegration is not required when applying TADs (Temporary Anchorage Devices).If major osseointegration does happen with TADs, it, in fact, will create problems when removing the screw at the end of the treatment. Fortunately it seldomly occurs with TADs system. Hence, the author prefers stainless steel mini-screws. Stainless steel is a much stronger, more ductile type of material which can be made sharper and of less chance of fracture when compared with titanium alloy screws.

Generally 2 mm x 12 mm stainless steel screws are good for buccal shelf placement. Sometimes when the site of insertion is too low due to steep slope, one can try 2 mm x 14 mm mini-screws.

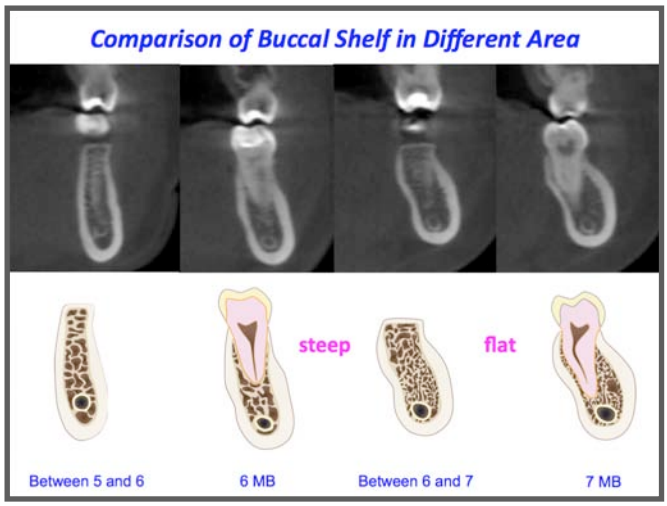

***Fig 2**. From 2nd molar toward 1st molar, the buccal shelf gets steeper and the zone of attached gingiva become wider.*

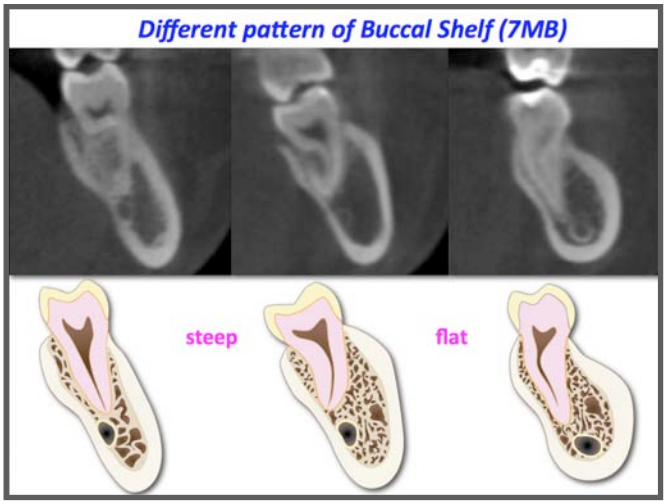

***Fig 3.** Even in the buccal shelf of mesiobuccal region of mandibular 2nd molar, different patients have different slopes; some are flatter and some are steeper.*

(4) Failure rate

Park et al's study[3] contribute a high failure rate of mandibular screw placement to overheating of the bone during drilling and irritation during chewing. The author suspected 1.2 mm titanium alloy mini-screws were used in this study. A small diameter makes mini-screws very fragile during insertion in the dense cortical bone of buccal shelf area. Instead, the author used stainless steel mini-screws of 2 mm in diameter in the buccal shelf area. There was no failure except one screw due to placement over mucosa which induced severe peri-implantitis and was later removed (Fig 12).

Therefore, it's not appropriate to contribute overheating and irritation during chewing to buccal shelf screw failures. The main cause is screws of smaller diameter sizes and made by titanium alloy.

(5) Application force

When first switching to 2 mm diameter stainless steel screws, compared to much smaller 1.2 mm diameter titanium alloy screws, the author felt the stainless steel mini-screws can tolerate heavy force. After using heavy force a while, the author felt the failure rate seemed to have increased.

Hsieh et al[4] applied force to move two osseointegrated dental implants, using 100 gm and 200 gm for up to 6 months. The dental implants did not move at all as expected. When using 500 gm of force for 3 months, the dental implants started to move. The movement was more significant after 6 months. This study surprised the author because even osseointegrated dental implants tend to move when applying force over 500 gm. Now the author never uses force more than 1 pound (454 gm) to avoid undesired movement. The author uses about 12 - 16 oz (340 - 454 gm) of foce when placing buccal shelf mini-screws. Mostly the author uses crimpable hook on the main archwire,

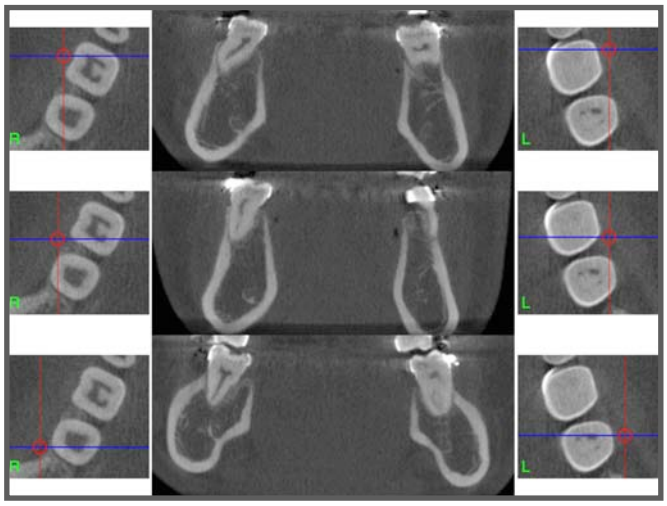

Fig 4. *The CBCT revealed the flatter buccal shelves are located over the distobuccal site of the lower right 2nd molar, and the buccal site of the lower left 2nd molar.*

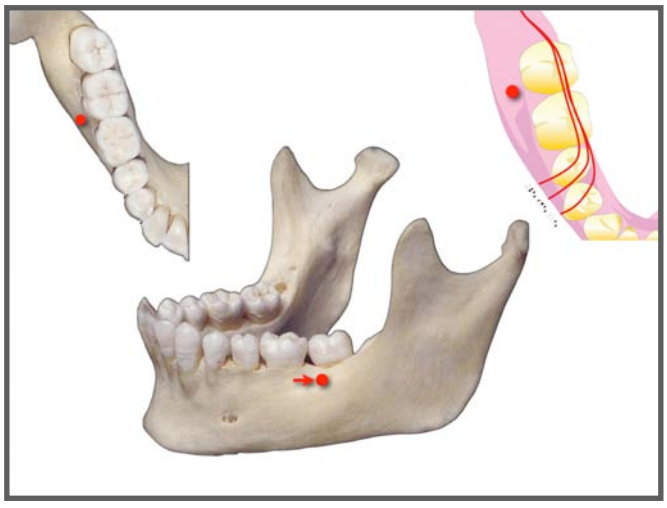

Fig 5*. The most common buccal shelf area is around the mesiobuccal region of the mandibular 2nd molar. Most of the time, the distribution of mandibular canal is on the lingual of mandibular molars.*

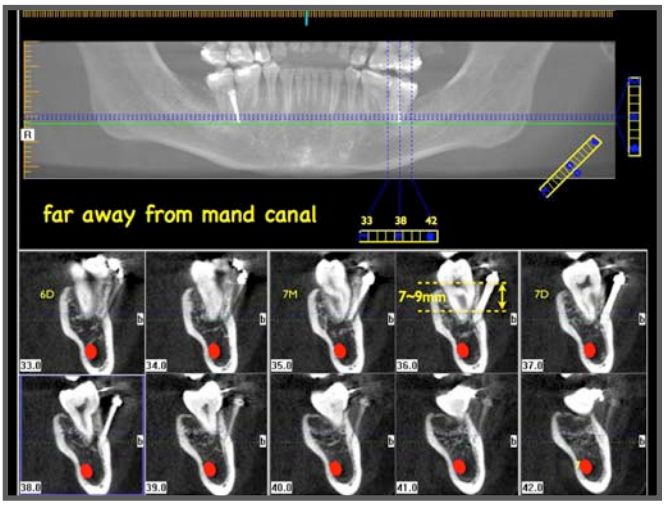

Fig 6. *From the CBCT, clearly showed the position of the buccal shelf mini-screw is outside the molar root region, it makes the distalization of the whole mandibular dentition possible. The screw is far away from the lingually positioned mandibular canal.*

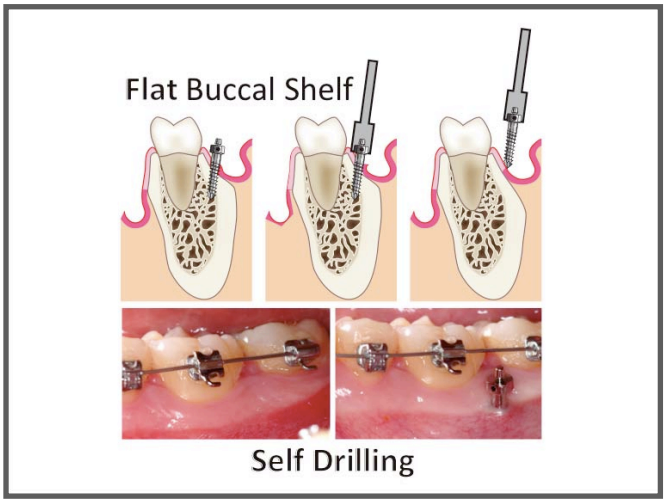

Fig 7. *If the buccal shelf area is flat and has enough zone of attached gingiva, the 2 mm x 12 mm stainless steel mini-screw can be placed with self-drilling.*

between mandibular lateral incisor and canine. For better force control, always use a tension gauge to measure the amount of force application.

(6) Main archwire size

It's possible to retract the entire lower arch through the use of light rectangular wire like .016 x .025 CuNiTi. The main advantage of this method is retraction can be achieved very easily by mostly tipping back of the lower molars but relapse tends to occur soon. Nowadays, the author always uses .019 x .025 stainless steel wires because they create less tipping of the molars and more bodily movement instead. Post treatment occlusion will be more stable.

(7) Bracket selection

Most Class III patients have dental compensation. This is when the upper incisor labially proclined and the lower incisor lingually retroclined, which makes the reverse overjet smaller.

In Damon 3MX series, the author adopts Pitts' method[5] by turning the standard four upper incisor brackets upside down to get super low torque. On the lower arch the author places low torque brackets upside down to get a high torque effect which prevents dumping lower incisors while retracting the whole lower dentition. Except extraction of the 3rd molar, it's a nonextraction treatment. Even in severe Class III cases we can distalize the whole lower dentition. The post treatment periodontal health and axial inclination of lower incisors are in good conditions.

This wonderful treatment option provides the author a new thinking on young Class III patients. It is not advised to begin early extraction treatment on young Class III patients unless in

cases of extremely severe crowding. It is more desirable to wait and re-evaluate the patient after the growth period is completed.

(8) Axis of the mini-screws

Mini-screws should be placed away from the molar roots. Sometimes due to narrow zone of attached gingiva and steep buccal shelf, clinicians will try to place buccal shelf mini-screws without flap surgery. Therefore, they have to angulate the placement axis. Otherwise, mini-screws will slide through the steep bone surface. This will cause the screw fall between mandibular molar roots. It's acceptable for maximal anchorage application, but not ideal for whole arch distalization. The effect of distalization is quite limited as a result (Fig 13).

(9) Mechanics of buccal shelf mini-screws

The center of rotation of the whole mandibular arch is located approximately between the mandibular 1st premolar and the 2nd premolar root region, which is far below the force direction from the screw head to the main archwire hook. Eventually it'll create extrusion and lingual movement of lower incisors and distal tipping of mandibular 2nd molars[6,7]. The overall result is the whole mandibular dentition will distalize with counterclockwise and rotate the mandibular occlusal plane (Fig 14).

This mechanics is very useful for correcting severe Class III patients with shallow overbite or open bite. Traditionally treating Class III open bite cases is a nightmare for orthodontist. Nowadays using buccal shelf mini-screws can solve this problem easily.

(10) Retraction device

The retraction of the whole mandibular dentition can be achieved by using either closed coil spring or power chains.

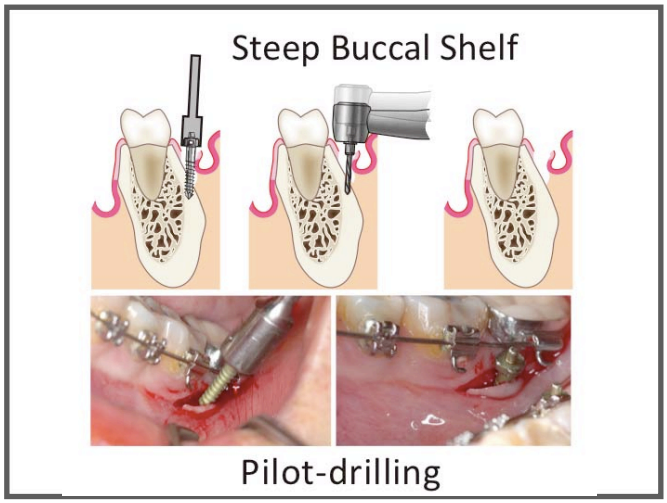

Fig 8. *If the buccal shelf area is steep and has not enough zone of attached gingiva, the mini-screw can be placed with flap surgery and pilot drilling.*

Fig 9. *Full thickness flap, let the denuded bone area exposed, it healed with attached gingiva surrounding the mini-screw. The PA cephalogram, shows the buccal shelf mini-screw is outside the mandibular molar roots, it makes the distalization of the whole mandibular dentition possible.*

Fig 10. *Partial thickness flap.*

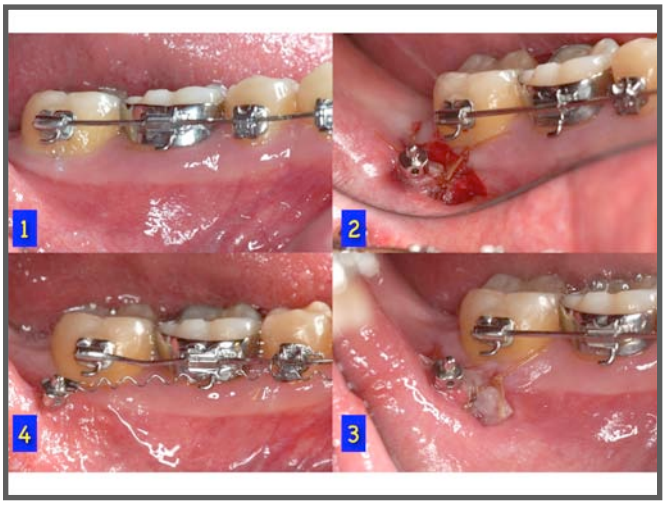

Fig 11. *Partial thickness flap healed with attached gingiva surrounding the mini-screw.*

Power chain is easy to attach, but one should choose the miniscrews whose head design can easily fit power chain (Fig 15). The main advantage of using power chain is its ease of use; the disadvantages are that the force decreases over time, and powr chain tends to catch food easily. Overall it provides very good retraction force.

The author prefers to use NiTi closed coil spring. There are six varying combinations of length and force levels, that are 8 mm, 13 mm and light, medium, heavy, can be selected. It's more time consuming to push the eyelet of closed coil spring into the mushroom head of the miniscrews. Whenever it's hooked on, it's difficult and time-consuming to remove. However, it provides a more consistent force level and more hygienic. When removing the closed coil spring, it is suggested to use the Weingart to hold the margin of the eyelet of the spring and use heavy duty cutter to cut off the eyelet.

The whole mandibular arch distalization takes about 6-9 months to achieve the treatment goal. We can see the patient in every 2-3 months. For such a long visiting interval the author thinks that closed coil spring is a more hygienic option that provides a consistent force. When the span of coil spring gets too long, the author routinely uses ligature wire to tie the middle of the spring on the bicuspid bracket to prevent dislodging and soft tissue impingemant (Fig 11, 16B).

(11) Lingual holding arch vs. Molar intrusion

Crossbite cases usually can be corrected during early alignment stage by cross elastics (Fig 20A). If the patient has a recessive chin and open bite, then clinicians should avoid creating clockwise rotation of the mandible. A counterclockwise rotation of the mandible will not only

improve the facial profile but also help correct the open bite (Fig 16B).

Pure buccal shelf mini-screw retraction of the whole mandibular arch only creates distal tipping of mandibular molars, instead of true intrusion (Fig 19C, 20C).026 x .026 Rocky Mountain rectangular elastics thread can be used to intrude the mandibular molar region by tying it to the .019 x .025 stainless steel main archwire. As such, the mandibular molars can be intruded (Fig 16 A,B,C). Mandibular molars intrusion can not only solve open bite quickly but also help improve a retrognathic profile (Fig 16).

(12) Notice the molar tube hook and screw-head relation

After the whole arch distalization, not only will the dentition be distalized, so will the mini-screw be moved forward and occlusally 8. When the distance of distalization is significantly increased, the hook of the molar tube may be in close contact with the head of the mini-screw. This makes further distalization of the whole lower arch impossible. The solution is grind off the hook of the molar tube so the distalization can continue (Fig 17).

(13) Mini-screw vs. Mini-plate

Sugawara et al[9] found out by using mini-plates lower 1st molars can be distalized 3.5 mm over crown, and 1.8 mm over the root region. Liaw[10] and author found out the lower 1st molars can be distalized 4.3 mm over crown, and 1.0 mm over root region by applying mini-screws. Though the amount of crown tipping is more significant when creating en-masse distalization with mini-screw anchorage while there is more root movement with mini-plate anchorage, clinically mini-

Fig 12. *Peri-implantitis happend 3 months after placing the mini-screw directly on movable mucosa.*

Fig 13. *On the upper figure, the buccal shelf mini-screw was placed between the roots of 1st and 2nd molars. It will be difficult to retract the lower dentition with this screw. On the lower figure, the buccal shelf mini-screw was placed outside the roots of mandibular molars. It makes distalization of the whole lower dentition possible*

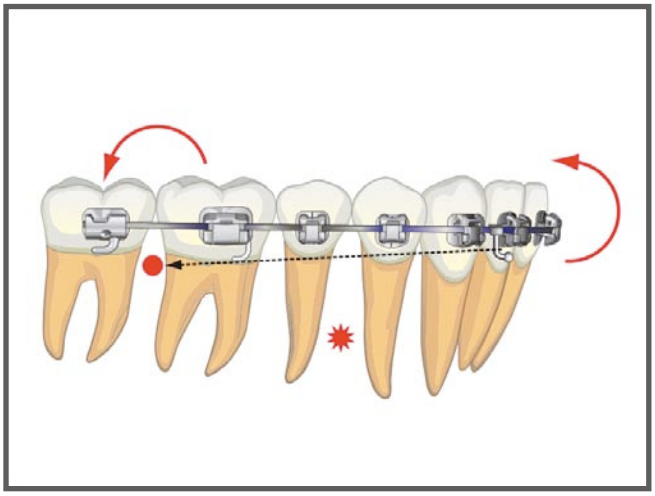

Fig 14. *The mechanism of buccal shelf mini-screw distalization of the whole lower dentition.*

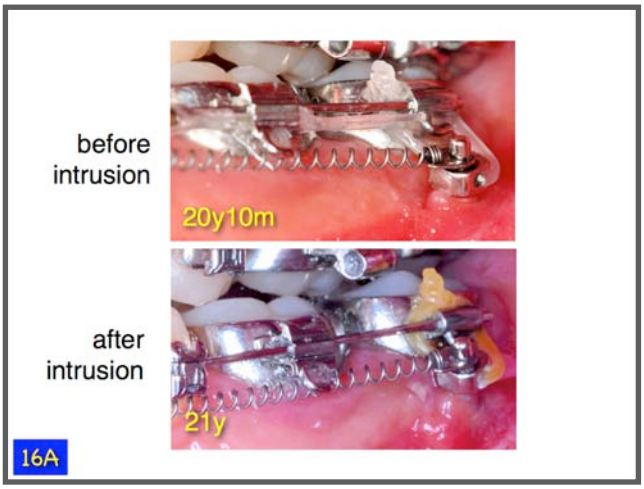

Fig 16A. *.026 x .026 square elastic thread was used to intrude the lower molars. Watch power chain was used to prevent space opening before 2nd molars, put elastic thread through the hole of the mini-screw and tie directly to the 2nd molar tube. After 2 months, the molars were intruded, notice the distance between screw head and tube hook get much closer.*

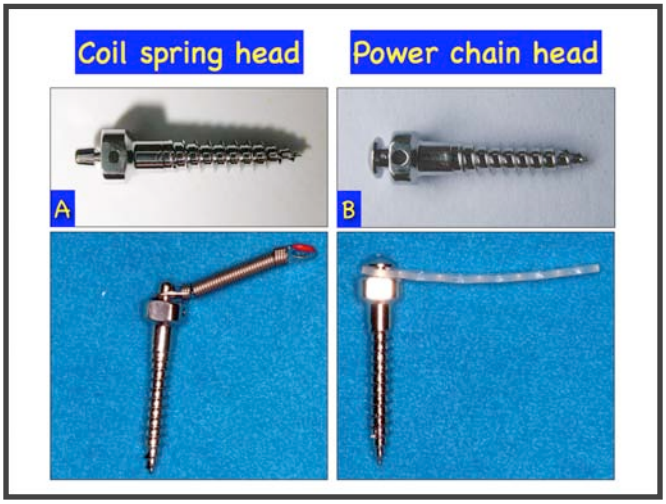

Fig 15A. *The author prefer using simple coil spring head mini-screw and NiTi closed coil spring to distalize the whole lower dentition.*
Fig 15B. *Power chain can be used to do the distalization either, but special head design is needed.*

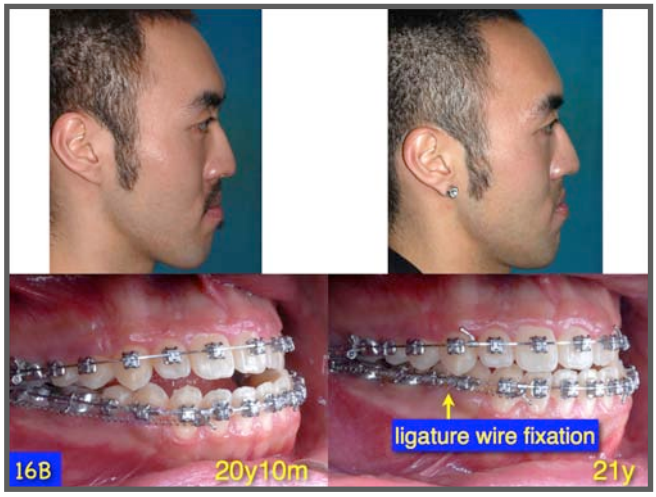

Fig 16B. *After just 2 months intrusion and retraction of the whole lower dentition, the open bite almost closed, and mandibular rotated counterclockwise. The lower facial height shorter and chin more forward after 2 months buccal shelf mini-screw intrusion of mandibular molars and retraction of the whole mandibular dentition.*

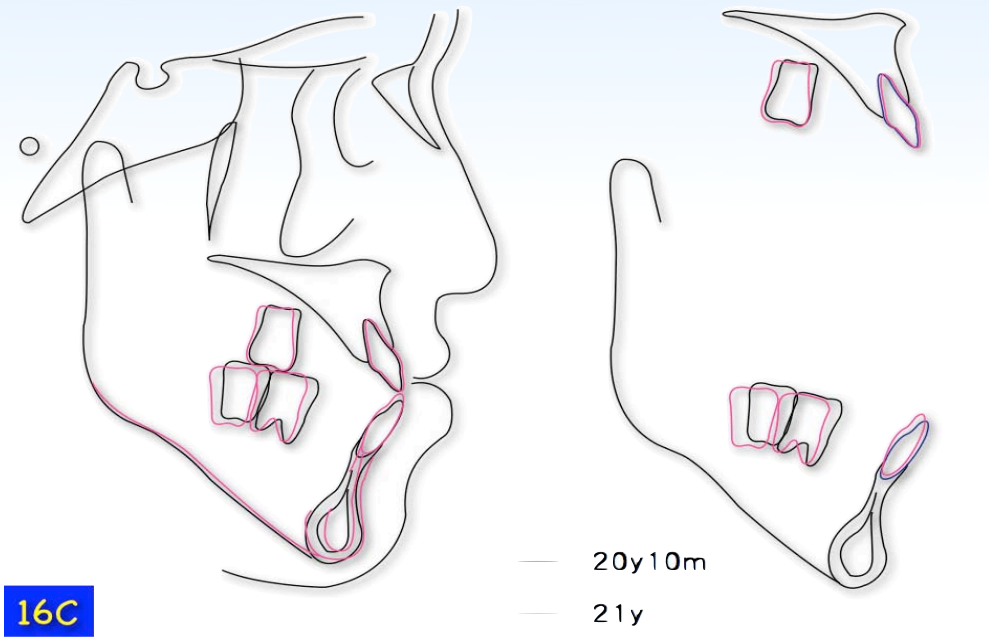

Fig 16C. *After 2 months treatment, the cephalometric superimposition showed intrusion of lower molars and counterclockwise rotation of the occlusal plane and autorotation of the mandible.*

screws can distalize the whole lower dentition as efficiently as mini-plates.

On one hand, placing mini-plates is an expensive and comprehensive surgical procedure and patients suffer pain and swelling at the placement and removal. On the other hand, placing buccal shelf mini-screws, if the area is flat enough, can be a self-drilling procedure performed by orthodontists. If the area is steep and the case has to be refered to periodontists or oral surgeons. It's a much simpler surgery, compared to mini-plate surgery. Also, removal is an easier procedure and can be perfomed by orthodontists.

(14) What is the limitation?

The author has treated many difficult severe Class III cases with buccal shelf mini-screws combined with the Damon system. However, there are also several limitations for this treatment method. One severe asymmetric Class III case can clearly illutrated such limitations. On the left side the distance between the mesial site of the upper 1st molar to the one of the lower 1st molar is greater than the width of the lower 1st molar (Fig 18). During treatment peri-coronitis was found on distal of 2nd molar. The patient was refered for periodontal treatment. Now the author's criteria for buccal shelf mini-screw are as follows:

1) The distance between the mesial site of the upper 1st molar to the one of the lower 1st molar should be within one lower molar width.
2) An orthognathic or retrognathic CR (Centric Relation) profile at the beginning of treatment.
3) The patient has a little prognathic profile and prefers nonsurgical treatment.

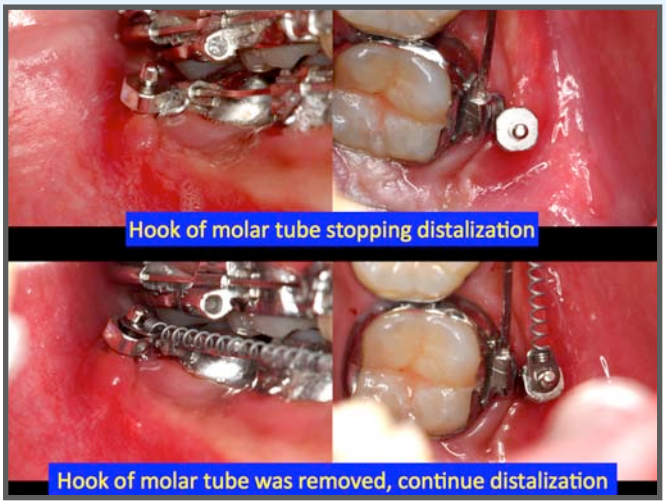

Fig 17. *During distalization, sometimes the hook of molar tubes will be right in front of the mini-screw, for continuing distalization, the hook should be ground off.*

Fig 18. *A severe Class III molar relationship, the distance between mesial of upper and lower 1st molar larger than the width of the lower 1st molar. Too much distalization caused peri-coronitis on distal of lower 2nd molar.*

Thanks to:

1. Dr. Nancy Nie-Shiuh Chang for performing partial thickness flap surgery for the cases of buccal shelf mini-screw placement described in this article.
2. Dr. Yi-Hao Huang for performing full thickness flap surgery for the cases of buccal shelf mini-screw placement described in this article.
3. Miss Tzu-Han Huang for English editing of this article.
4. Dr. Yu-Cheng Liaw for the cephalometric study of distalization by buccal shelf miniscrew placement.
5. Dr. Po-Jung Chen for the cone beam CT study of distalization by buccal shelf miniscrew placement.

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Case 1 (Fig 19 A,B,C,D)

A female severe Class III malocclusion with prognathic profile. Her main concern was ugly looking dentition, she didn't care about the prognathic profile. So compromised treatment without orthognathic surgery was planned. Notice the original edge to edge bite, after alignment and relief of lower crowding, it became big Class III open bite case. Due to deeper vestibular depth, two 2 mm x 14 mm stainless steel mini-screws were placed over buccal shelf after alignment of the dentitions. At 23 years old, the closed coil spring were used to distalize the whole lower dentition, by using 13 oz force on both sides, on the .016 x .025 CuNiTi wire.

It took only 3 months to distalized the lower dentition on the soft rectangular .016 x .025 CuNiTi wire. For more stable result, the .019 x .025 stainless steel main archwire was used to maintain the treatment result. Even with 13 oz heavy distalization force for whole lower arch distalization, the post treatment panorex showed healthy dentition. After 1 year and 5 months follow up, though the occlusion change to shallower overbite but still stable.

Fig 19A.

Fig 19B.

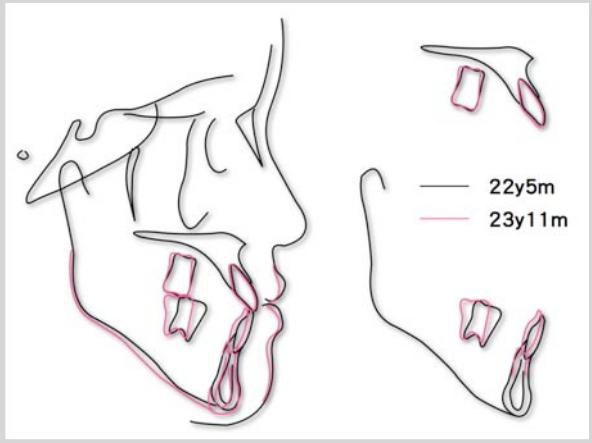


Fig 19C.

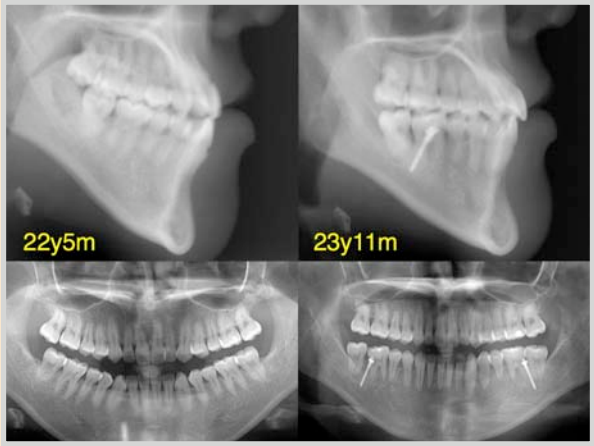


Fig 19D.

Case 2 (Fig 20 A,B,C,D)

A female Class III sub asymmetry patient with chin point deviate to the left and anterior open bite. Her main concern was she couldn't chew with her anterior teeth. She was not concerned with facial asymmetry and protruded dentition. Orthognathic surgery was proposed and rejected. The patient requested a compromised orthodontic treatment only. After both upper and lower dentitions were well aligned with .019 x .025 stainless steel main archwire, two 2 mm x 12 mm stainless steel mini-screws were placed on both sides.

The author applied about 12 oz of force of coil spring on the right side and 10 oz force on the left size for not only retracting the whole lower dentition but also correcting the lower dental midline. After 6 months of retraction, the open bite almost closed, and the right side of buccal occlusion was close to Class I. After 2 years and 4 months of treatment the patient reached Class I occlusion with lower dental midline overcorrected to the right side to prevent relapse. After 5 months in retention, the lower midline deviated to the left side again. Besides this small relapse of dental midline, the occlusion and profile are quite acceptable.

Even though heavy force was used for the whole lower arch distalization, the post treatment dentition showed healthy roots and periodontal tissues. No lingual dumping or gingival recession of lower incisors was found. From the cephalometric tracing, the lower molars were tipped back distally, and the lower incisors moved lingually and incisally which creates a counterclockwise rotation of the whole occlusal plane, and the open bite was closed.

Fig 20A.

Fig 20B.

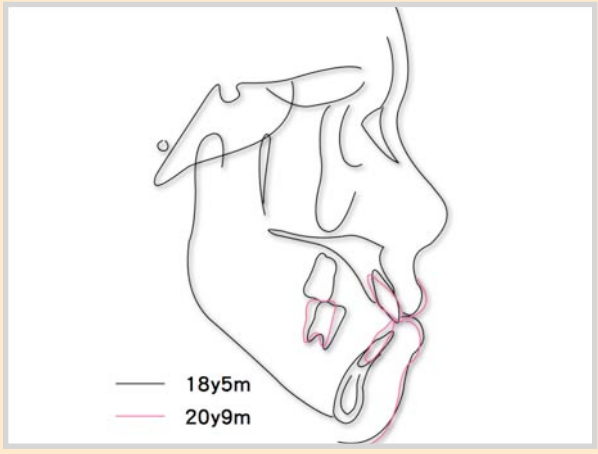


Fig 20C.

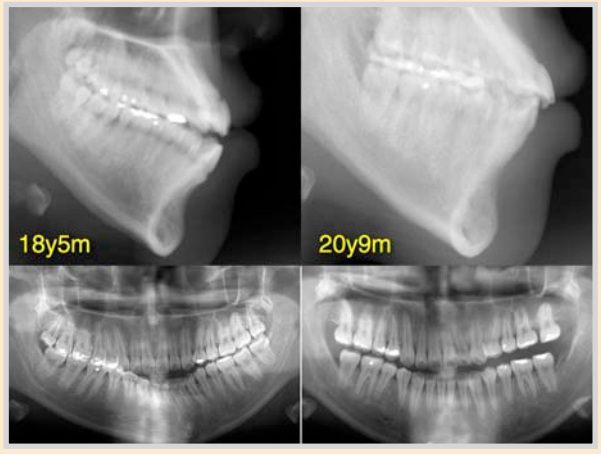
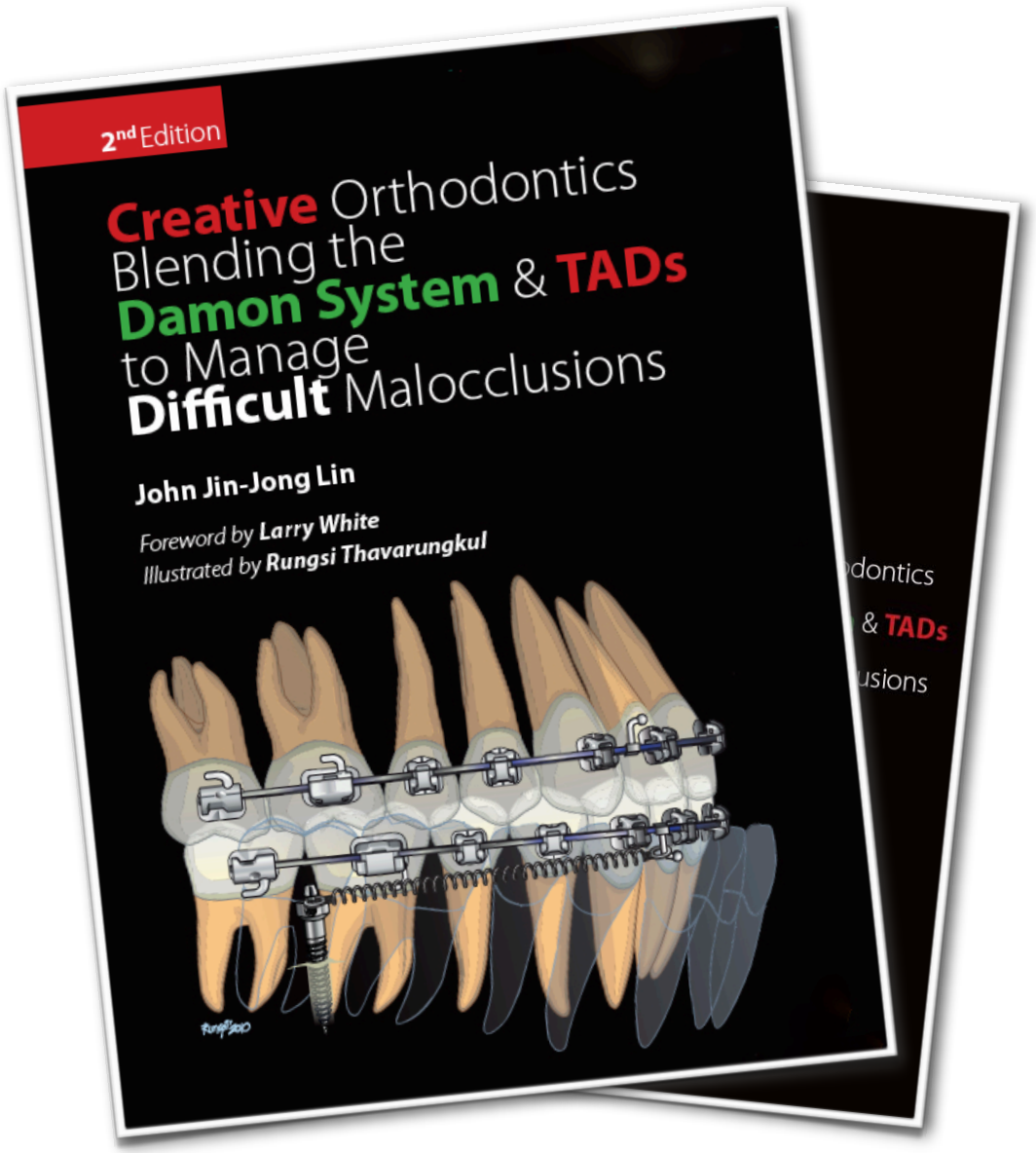
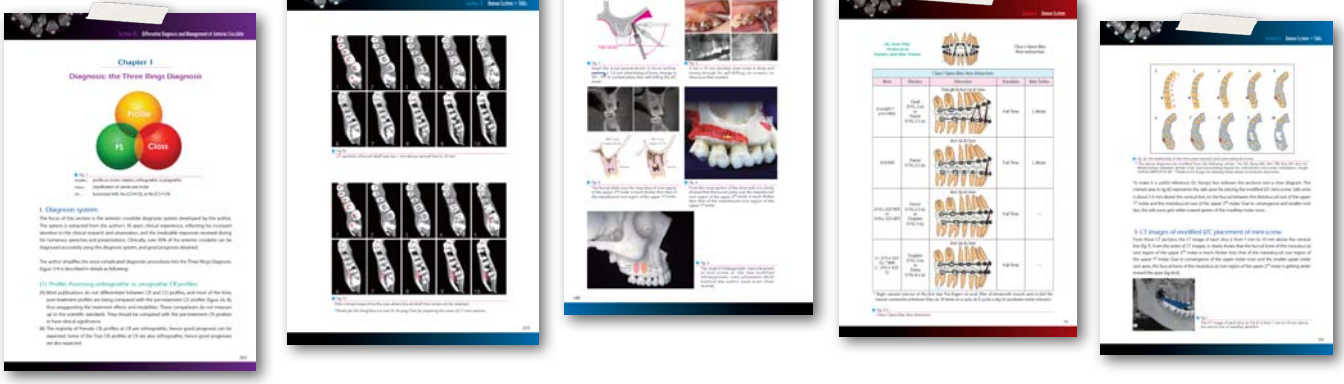


Fig 20D.

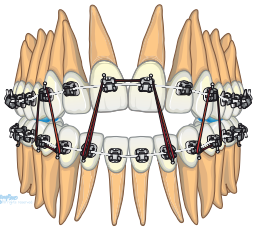
Upcoming New Book !



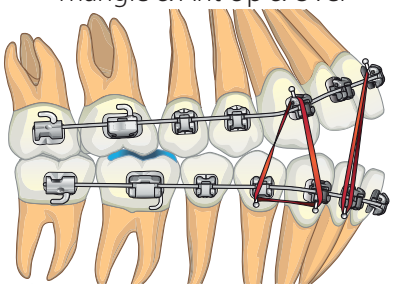
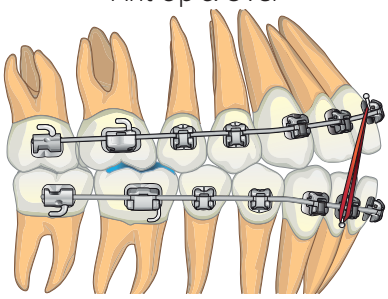
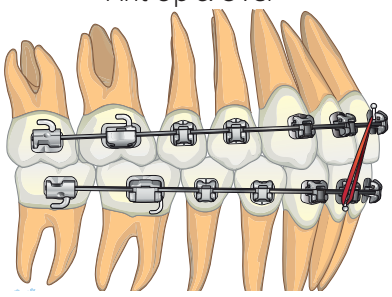
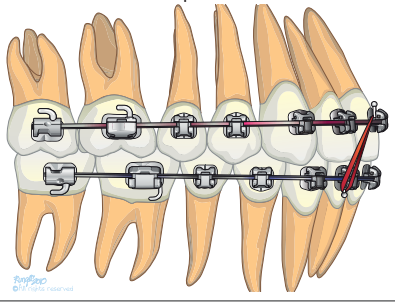
The highly anticipated new edition of Dr. John Lin's book, Creative Orthodontics will be available in May, 2010. This new edition includes many more incredibly complex cases of renowned orthodontists worldwide and particularly, a complete reference table of Damon's Early Light Short Elastics, created by Dr. Tom Pitts. It contains clear and detailed anatomy graphics of minicrew placement sites, including IZC and buccal shelf created by Dr. Rungsi. In addition, Dr. Lin proposes a revolutionary non-extraction method for CIII diagnosis and treatment by using miniscrews. This edition also contains the most up-to-date information on the Damon Q. system. It's a must read for all the old and new Damon users.



Dr. Tom Pitts' Protocol of Elastics and Bite Turbos



Class I Open Bite
Non-extraction

Class I Open Bite, Non-Extraction				
Wire	**Elastics**	**Direction**	**Duration**	**Bite Turbo**
.014 NiTi * (*.013 PRN*)	Quail 3/16, 2 oz. or Parrot 5/16, 2.5 oz.	Triangle & Ant Up & Over 	Full Time	L Molar
.018 NiTi	Parrot 5/16, 2.5 oz.	Ant Up & Over 	Full Time	L Molar
.014 x .025 NiTi or .018 x .025 NiTi	Parrot 5/16, 2.5 oz. or Dolphin 5/16, 3 oz.	Ant Up & Over 	Full Time	--
U : .019 x .025 SS / TMA L : .016 x .025 SS	Dolphin 5/16, 3 oz. or Zebra 5/16, 4.5 oz.	Ant Up & Over 	Full Time	--

* *Begin squeeze exercise at the first day. Put fingers on post. fiber of temporalis muscle area to feel the muscle contraction whenever bites on. 50 times as a cycle, do 6 cycles a day to accelerate molar intrusion.*

Fig. 31C:
Class I Open Bite, Non-Extraction

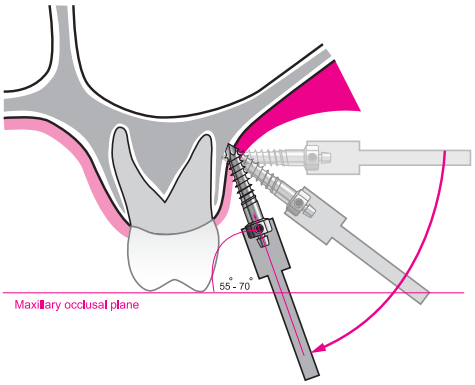


Fig. 1:

Insert the screw perpendicular to bone surface, perfomr a 1-2 mm initial biting of bone, change to 55° - 70° to occlusal plane then self-drilling the IZC screw.

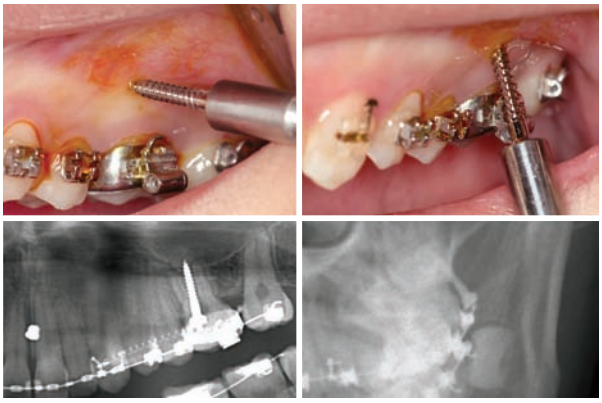


Fig. 2:

2 mm x 12 mm stainless steel screw is sharp and strong enough for self-drilling, no incision, no tissue punches needed.

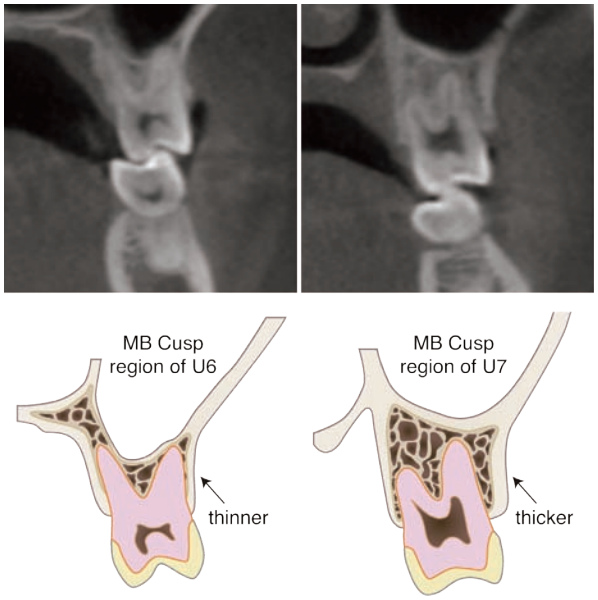


Fig. 3:

The buccal plate over the mesiobuccal root region of the upper 2nd molar is much thicker than that of the mesiobuccal root region of the upper 1st molar.

Fig. 4:

From this cross-section of the sinus wall, it is clearly showed that the buccal plate over the mesiobuccal root region of the upper 2nd molar is much thicker than that of the mesiobuccal root region of the upper 1st molar.

Fig. 5:

The original Infrazygomatic crest placement of mini-screw vs. the new modified Infrazygomatic crest placement which method the author used most often recently.

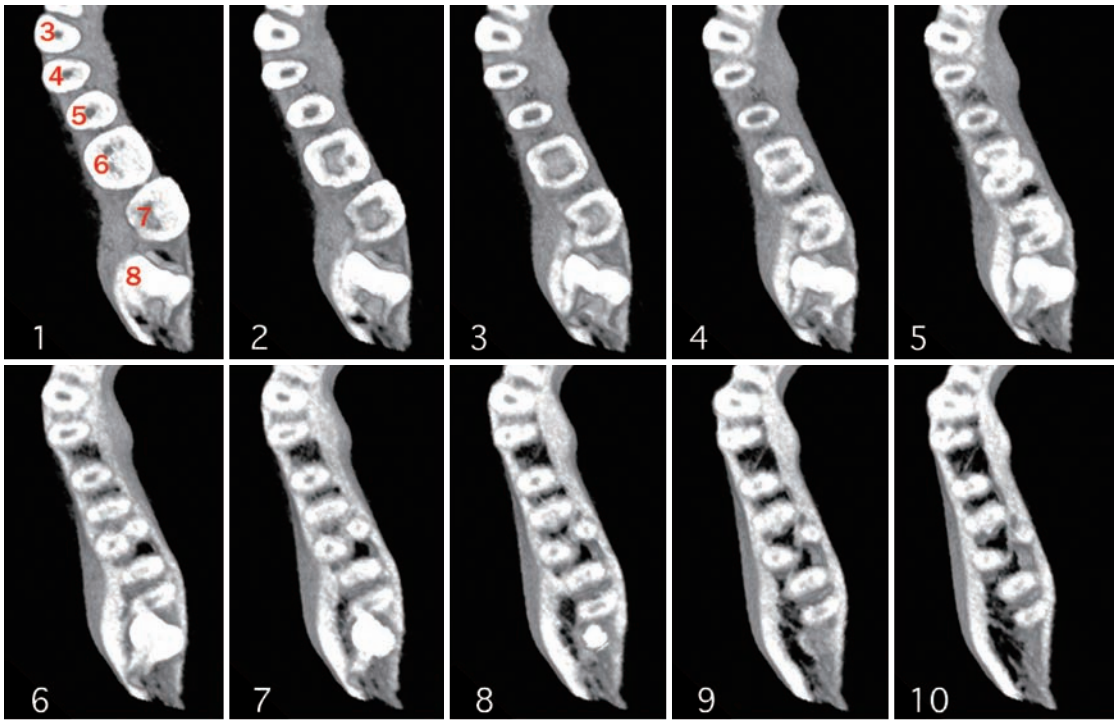


Fig 7B:

CT sections of buccal shelf area are 1 mm above cervical line to 10 mm.

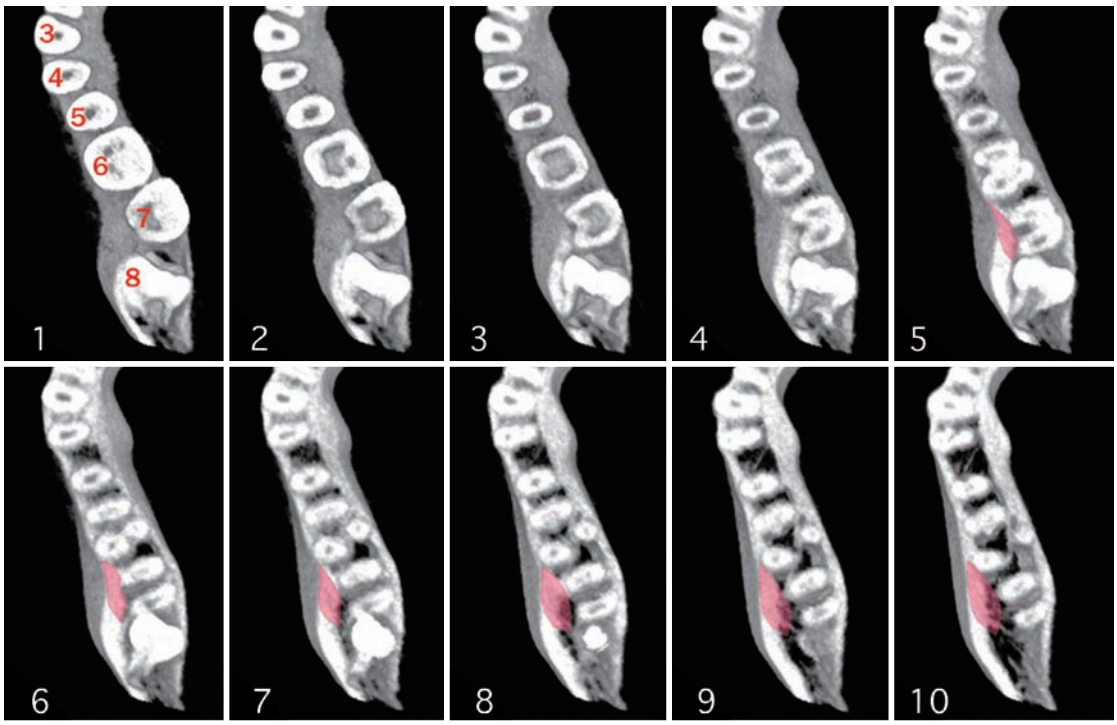


Fig 7C:

Pink-colored areas show the area where buccal shelf mini-screw can be inserted.

**Thanks for Mr. Ming-Shun Lin and Dr. Po-Jung Chen for preparing this series of CT cross-sections.*

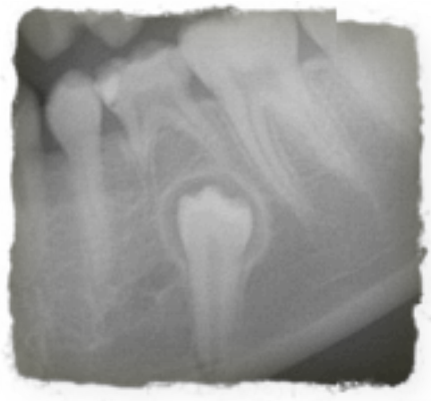
OrthoBoneScrew

Beethoven Orthodontic Center, Taiwan

OrthoBoneScrew (OBS) has a double-crossed rectangular slot on its neck. This 0.019" x 0.025" rectangular slot provides a versatile use of orthodontic mechanics. A 0.018" x 0.025" wire can be secured in the slot firmly.

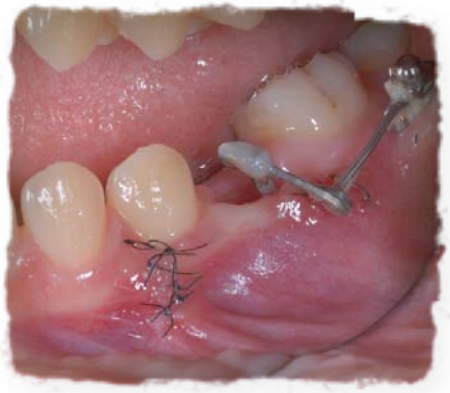
A Case Report Demonstrating OBS Application on Impacted 2nd Premolar.

Yu-Lin Hsu, Chris HN Chang, W. Eugene Roberts



A 13-year old female had a lower impacted 2nd premolar, approximately 10 mm deep on the left side. The treatment plan was to extract the 2nd primary molar and pull out the 2nd premolar.

During the treatment, the 2nd primary molar was first extracted, followed by bonding an eyelet bracket on the surgically exposed 2nd premolar. Meanwhile, the bone surrounding the crown of the second premolar was reduced until reaching CEJ and a lateral window was made for bracket bonding. An eyelet bracket was bonded on the buccal surface of the deeply impacted second premolar. The OrthoBoneScrew was inserted on the left buccal shelf area. A power-chain was attached between a 3D lever arm and the eyelet bracket to extrude the second premolar. This 0.017 x 0.025-inch TMA lever arm was consisted of a helical coil in the middle and one attached on one end. When this lever arm was inserted in the square hole of the OrthoBoneScrew and activated, it would form a force system which extruded the second premolar directly. Without this direct force design, it would have taken at least 6 months before one could use the last wire sequence of the 0.016" x 0.025" SS arch wire to extrude the premolar.



SURGICAL PROCEDURE

1. Extract the primary molar, remove dental follicle and the bone above the impacted tooth. (Fig. 1)

It's very difficult for enamel to resorb the surrounding bone because there is no osteoclast cells. After the 2nd primary molar extracted, we removed the bone above the 2nd premolar by high speed hand piece to facilitate extrusion.

2. Open a lateral window for bonding and keep the marginal bone. (Fig. 2, 3)

The traditional way is to bone the bracket on the buccal surface of the 2nd premolar. It is a very difficult procedure due to the 10 mm depth and bleeding. We have found a new method by opening a lateral window for bonding. It becomes easy and clear for bracket bonding from a buccal view. Keep the marginal bone for flap adaptation.

OrthoBoneScrew

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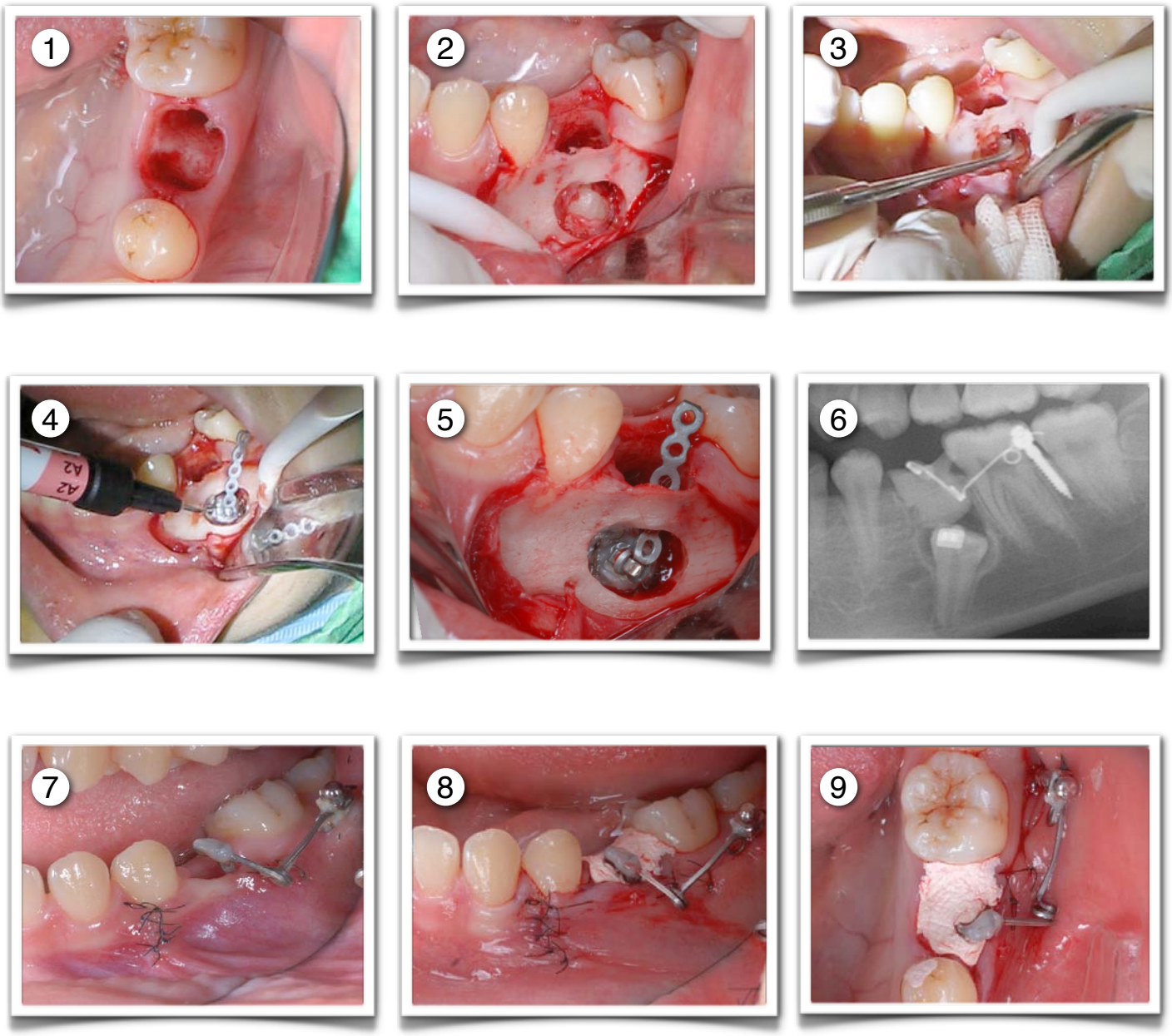


3. Bond an eyelet on the buccal surface of L5, seal the margin with flowable resin. (Fig. 4)
The key point of bonding is to keep it dry and tie a power chain first. Reinforce the bonding by sealing the margin of the hole in the bracket.

4. Identify the mental nerve. (Fig. 5) Identify the mental nerve carefully to avoid trauma.

5. Attach a 3D lever arm to OBS. (Fig. 6)
Insert an OBS on the buccal shelf area. Connect the lever arm to the OBS on one end and attach the power chain on the other end.

6. Use 6-0 Nylon for minimal trauma. (Fig. 7)
Make a releasing incision of periosteum (partial thickness) apical to the flap to release tension and to facilitate coronal position.

7. Compression and cover with Coe Pak. (Fig. 8, 9) Compress the flap with rinsed normal saline gauze.

A Letter from the Member of the Damon Progressive Study Club about the Treatment of the Impacted Bicuspid.

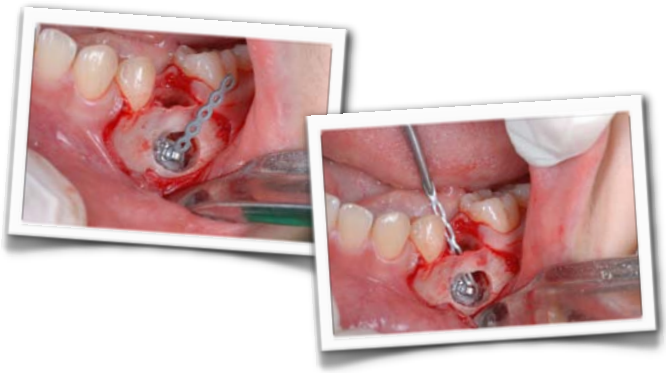
Dear Shu-Fen & Chris,

Sue and I had such a good time in Hawaii. The meeting was most interesting and the extra-curricular activities lots of fun, but the Progressive People are the real draw for us. Thank you for including us in your lives and letting us know more about you and your lives. The world becomes a better place when we listen and learn for those who are not next door. Thank you.

I shared your Keynote presentation on impacted bicuspids with my local Oral Surgeon this last week. He was impressed with the simple elegance of the technique and wanted me to say thank you as well. He uses a very similar exposure but does not do the side window for bonding. Often the simple things are the best.

I made a presentation to the local Dental Hygienist group in my small town last Thursday. I used some of the Keynote techniques you exposed us to in my presentation and used the Remote Controller that you so graciously provided. I almost felt like Chris Chang up in front of all those lovely ladies! Thank you.

We look forward to seeing you the next time we are able. Hopefully it will be soon and if not, then next year in Palm Springs. If you are skiers and would like to follow us home to the snow for some skiing we would love to show you where we live. Until the next opportunity.



Very best regards to you both.

John & Susie

John Coombs, D.D.S.
Coombs & Beglin Orthodnitcs
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ABO Case Report

Correction of Bimaxillary Protrusion with Closing of Premolar & Molar Extraction Spaces

HISTORY AND ETIOLOGY

A young adult female, aged 24 years 2 months, was referred by her family dentist for a second opinion (Figure 1). Her chief complaints were crooked front teeth and irregular lower incisal edges (Figures 2 and 3). The patient desired resolution of the crowding without orthognathic surgery or the use of miniscrews. There was no contributory medical problems but she did have dental history of a missing lower left second premolar and compromised endodontic treatment of both left first molars. Clinical examination revealed a Class I molar relationship on the right, but the left first molars were Class III. The mandibular dental midline was 2 mm to the left of the facial and maxillary midlines. Her maxillary lateral incisors were palatally displaced bilaterally.

The patient had a thumb sucking habit until age 10 which apparently contributed to the relatively narrow arches. A portion of her lower lip was habitually positioned lingual to the maxillary incisors, resulting in a "lip trap" that contributed to maxillary incisor flaring and overjet. The etiology for the malocclusion appears to be predominately environmental factors because the thumb sucking history and aberrant tongue posture.

Although the patient's restorative problems and the desire to avoid miniscrews presented a substantial challenge, treatment was accomplished to her satisfaction (Figures 4-6). This report will review the diagnosis, treatment planning and specific mechanics to accomplish the pleasing result for the patient's challenging problem.

Fig 1. *Pretreatment facial photographs*

Fig 2. *Pretreatment intraoral photographs*

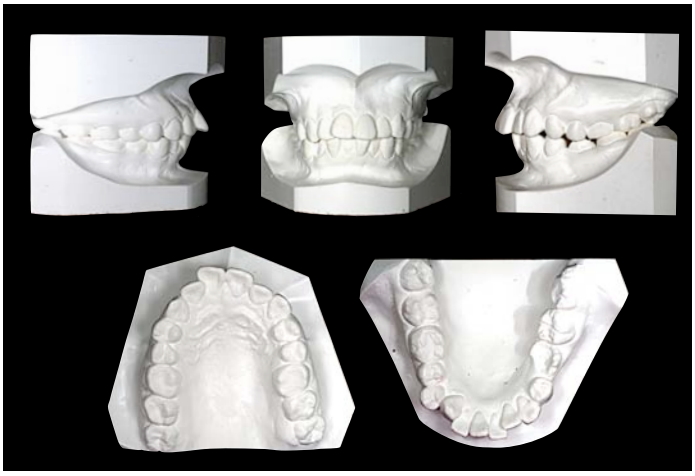
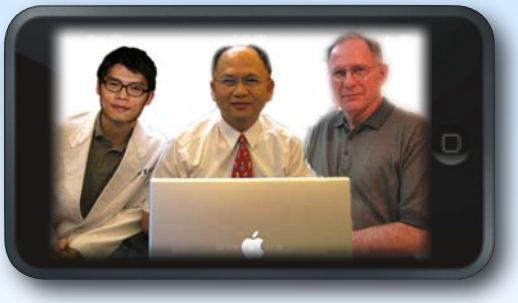


Fig 3. *Pretreatment study models*



Dr. Jia Yuan Liang, Lecturer, Beethoven Orthodontic Course (left)
Dr. Chris HN Chang, Director, Beethoven Orthodontic Center (middle)
Dr. Eugene W. Roberts, Consultant, *News and Trends in Orthodontics* (right)

Fig 4. *Posttreatment facial photographs show considerable improvement in the facial profile*

Fig 5. *Posttreatment intraoral photographs*

Fig 6. *Posttreatment study models*

DIAGNOSIS

Skeletal: Skeletal class I (SNA 91° , SNB 86° , ANB 5°), high mandibular plane angle (SN-MP 41°)

Facial: Bimaxillary protrusion with lip strain.

Dental: Right side class I molar relationship and left side class III molar relationship were noted. Lower dental midline was 2 mm to the left of the facial midline, and the lower incisor to mandibular plane angle was 900 with severe mandibular crowding (space deficient more than 7 mm), and the anterior overjet was 7 mm. #20 was missing and #19 was hopeless. The cephalometric values are summarized in the Table 1. The total score of ABO Discrepancy Index was 25, as seen in the DI worksheet.

SPECIFIC OBJECTIVES OF TREATMENT

The principal objectives of treatment were to attain Class I canines, and an asymmetric Angle Class I/III molar relationship, while achieving ideal overjet and overbite, consistent with retracting the lips. Specific treatment objectives were to:

1. Maintain the skeletal position of the maxilla and the mandible.

2. Avoid extrusion of the molars and clockwise rotation of the mandible during treatment.

3. Intrude mandibular incisors and retract maxillary incisors.

4. Achieve proper overjet & overbite in a mutually protected, Class I canine occlusion.

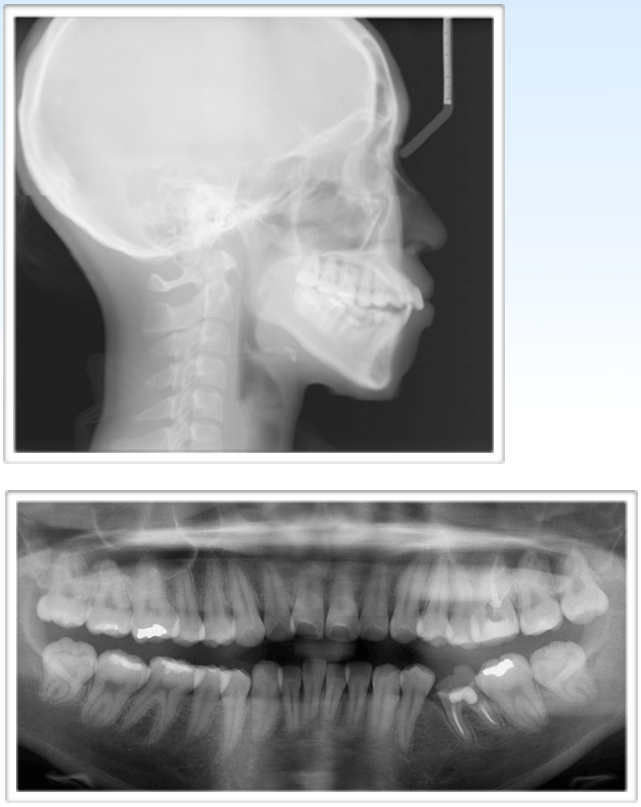


Fig. 7. *Pretreatment pano and ceph radiographs show lip strain , #20 lost and #19 holpless*

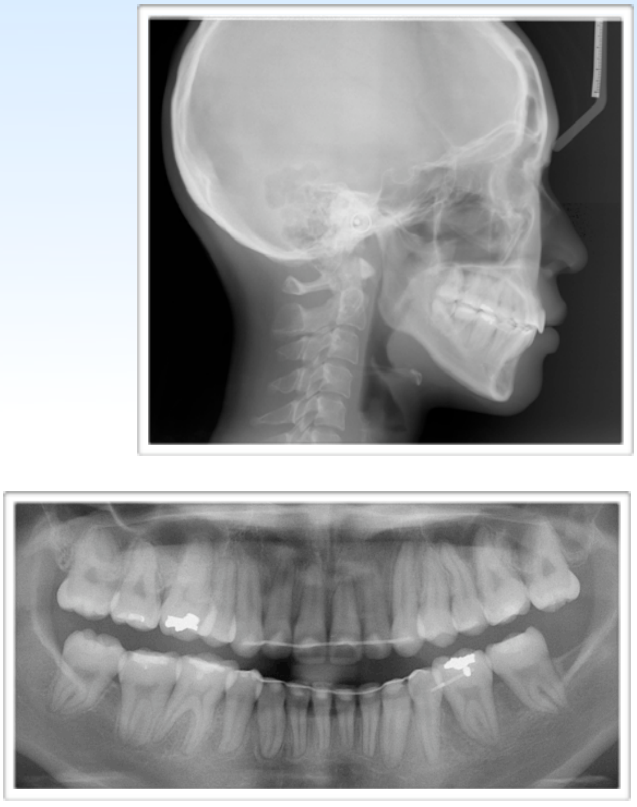


Fig. 8. *Posttreatment pano and ceph radiographs show balancing lip profile, the root angulation are not parallel on #21 and #30*

5. Retract upper and lower lips to enhance facial esthetics and achieve lip competence.

TREATMENT ALTERNATIVES

The main issues involved in developing an appropriate treatment plan were the missing tooth #20 and hopeless tooth #19 which left a large lower left posterior space to be closed. Therefore three treatment options were presented to the patient.

Option ❶

Extract upper first premolars, left lower first molar, and right lower first molar. Maximally retract the upper six anterior teeth, align the lower anterior teeth and protract the lower left second and third molars. OrhoBoneScrewsTM might be needed for anchorage to retract the maxillary anterior segment and protract the lower left 2nd and 3rd molars.

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-TX	POST-TX	DIFF.
SNA°	85°	84°	1°
SNB°	80°	78°	2°
ANB°	5°	6°	-1°
SN-MP°	41°	41°	0°
FMA°	32°	32°	0°
DENTAL ANALYSIS			
U1 TO NA mm	9 mm	4 mm	5 mm
U1 TO SN°	119°	99°	20°
L1 TO NB mm	10 mm	9 mm	1 mm
L1 TO MP°	91°	91°	0°
FACIAL ANALYSIS			
E-LINE	1 mm	0 mm	1 mm

Table 1 . *Cephalometric summary*

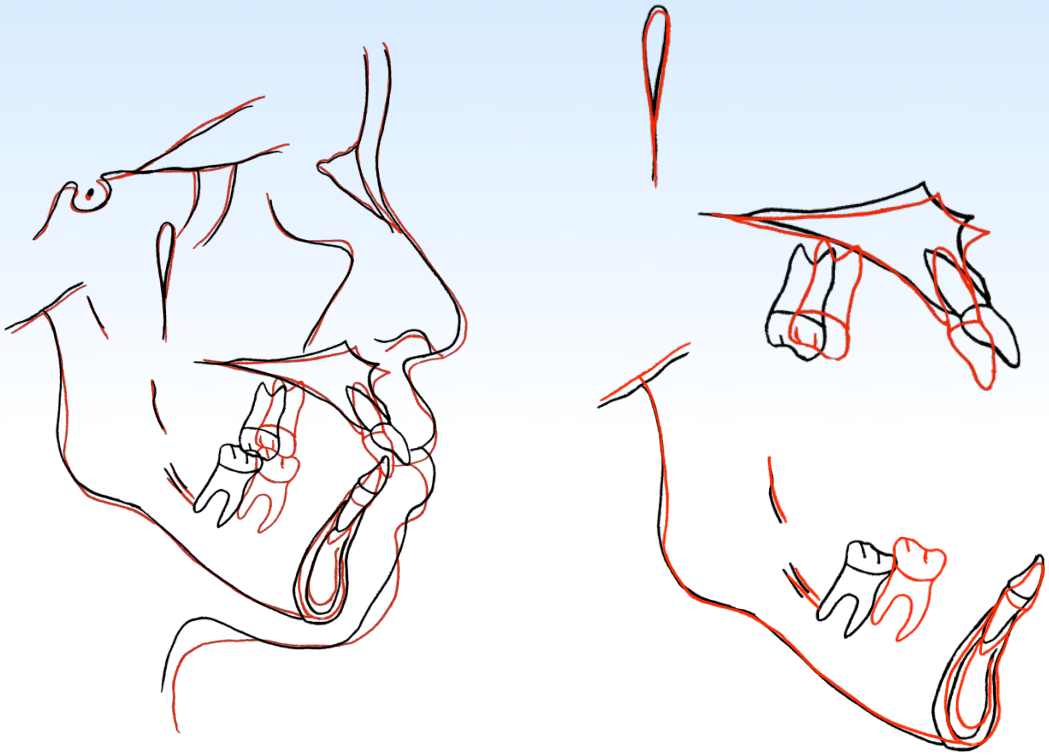


Fig. 9. *Superimposed tracings show a posterior uprighting of maxillary anterior teeth and a a protraction of mandibular posterior teeth*

Option ❷

Extract upper first premolars, left lower first molar, and right lower first premolar. Restore the remaining space of the left lower molar with an implant-supported prosthesis.

Option ❸

Considering the costs of prosthetics to replace the left lower first molars, and the difficulty of endodontic retreatment of the upper left first molar, the 3rd option was extraction of upper left and lower first molars, as well as the upper right and lower right first premolars. Maximal retraction of the upper anterior teeth was planned to resolve the lip protrusion. Correction of the lower anterior crowding and protraction of the lower left 2nd & 3rd molars was to be achieved without the use of miniscrews. It was explained that this option was very challenging technically, would result in a Class III molar relationship on the left, and would probably increase treatment time. Despite these limitations, option 3 was selected by the patient.

APPLIANCES AND TREATMENT PROGRESS

Extraction of teeth #5, #14, #19, and #28 was accomplished before orthodontic treatment started. To achieve a Class I left molar relation, the additional extraction of #12 was suggested, but the patient declined. Damon D3MX .022" Brackets (Ormco) were used. Both arches were bonded with occlusal bite turbos constructed with Fuji II Glass Ionomer cement on teeth #18 & #31 at the first appointment. Lingual buttons were bonded on teeth #17 & #18, and full time cross elastics (4.5 oz) were applied to correct lingual tipping of #17 & #18. After three months of treatment, the posterior bite turbos were removed. The wire sequence was as follows: .014 copper NiTi, .014 x .025 copper NiTi, .017x .025 TMA, .019x .025 SS and finally went back to .017x .025 TMA for detailed adjustment. Class II elastics were upgraded gradually from 3.5 oz to 4.5 oz. After twenty-two-month of treatment, diagnostic models and a panoramic radiograph were taken to determine 2nd order correction for root parallelism. After twenty-four months of active treatment, the

appliances were removed and the retainers were delivered just one week earlier before she embarked for Australia.

TREATMENT RESULTS

The patient's facial appearance improved dramatically. There were significant reductions of dentoalveolar protrusion which resulted in relief of mentalis strain to achieve competent lips. These changes improved the chin and nose projection, which substantially improved the patient's profile. If miniscrew skeletal anchorage had been used, more dentoalveolar retraction would have been possible and it would have been easier to accomplish the 13mm of asymmetric mandibular space closure. However, treatment goals were achieved to the patient's satisfaction without using any skeletal anchorage, but the final root paralleling was rushed because of the impending trip to Australia. Post-treatment intraoral photographs and study casts revealed class I molar and canine relationship on the right side, and a class III molar relationship and class I canine relationship on the left side. The lower dental midline was shifted 1 mm left to the upper dental midline .

Final results revealed the following deviations from ideal:

- Minor rotations were noted for teeth #2, 12, 15 and 18.
- Marginal ridge discrepancies were seen adjacent to teeth #18, 20 and 31.
- Tooth #2 exhibited excessive palatal crown torque.
- Residual Class II occlusion: teeth #2, 4, 6, 11 and 12 were shifted mesially about 1.5 mm relative to the interproximal embrasures of the mandibular posterior teeth.
- Residual Class III occlusion: teeth #13 and 15 were shifted distally more than 2 mm relative to the desired embrasures of the lower left dentition.

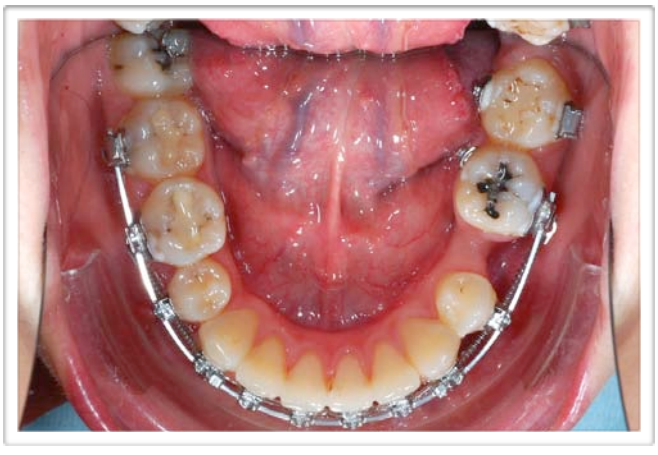


***Fig 10**. wire cutting between #17 and #18*

***Fig 11**. 6 oz Moose (11th month)*

• Root movement: Tooth #6 needed slightly more mesial root movement, while teeth #30, 21 and 13 needed slightly more distal root movement.

The total score for the ABO cast and panoramic radiograph grading system was 26. This score is just within the maximal desirable score of 26.

RETENTION

After the completion of active treatment, an upper clear overlay retainer was delivered and a lower anterior fixed retainer was constructed on the lingual. Stepovich[1] concluded that spaces of 10 mm or more can be closed in adults, but retaining the closed spaces was difficult. For this reason, a fixed buccal retainer was placed from the left molar to premolar (teeth #18-20) in the mandibular arch to prevent the space from reopening during retention.

DISCUSSION

Roberts[2] described the bone physiology of 2nd and 3rd mandibular molar protraction into a missing 1st molar space. The relatively flat roots of the molars move through the center of the alveolar process by resorbing primarily trabecular bone on the mesial surface and forming cortical bone on the distal surface of each root. For the first few mm of tooth movement, the molars move rapidly, but when the trailing root engages the cortical bone formed by the leading root, the rate of molar protraction decreases until space closure is accomplished. Radiographic images suggest that rate of tooth movement is related to the ability of the body to remodel the relatively dense, cortical bone formed by the leading root. As the molars moved mesially through the denser alveolar bone, radiolucent foci were noted in the cortical bone mesial to the alveolar bone/PDL interface. This radiographic picture conforms to the combined modeling and remodeling mechanism of tooth

***Fig 12**. power chain at lingual side (16th month)*

***Fig 13**. Right buccal view (16th month)*

movement. Initialing remodeling events (resorption cavities) in the path of a moving tooth appears to be an important mechanism for decreasing the mass of cortical bone resisting tooth movement.

Vanarsdall and Swartz[3] described the common sequelae for a missing mandibular first molar as (1) mesially inclined second and/or third molars, (2) distal drift of the premolars, (3) extrusion of the maxillary molars, (4) altered gingival form with constriction of the edentulous ridge, (5) infrabony defect mesial to the inclined molar, (6) stepped marginal ridges, (7) food impaction, and (8) posterior collapse. However, these negative results in the maxillary arch are usually not as severe as those in the mandibular arch[3]. Although fixed prostheses are often used for replacement of two adjacent, mandibular missing teeth in the buccal segment, the present case demonstrates that is possible to close such a space.[1] However, many clinicians still believe that when the buccolingual width of the alveolar ridge is constricted, the second molar will not move mesially.[4] Moreover, there might be an incomplete space closure. For the present patient, the spaces of 10 mm or more were closed in the posterior region of the mandible.1 If the edentulous ridge is at least half the width of the tooth being moved into the ridge, then the remodeling process would probably be successful.[5] However, if the edentulous ridge is less than half the width of the tooth root, then a dehiscence in the bone is likely to form over the labial or lingual surfaces of the root.[6] When closing first molar spaces in the mandible, young adults generated more alveolar bone in the edentulous space and lose less crestal bone than older adult patients.[1] Furthermore, retention of space closure is more difficult for older adult patients than for younger adults.1 Hatasaka[7] observed that the best second order postretention results were in cases which roots and crowns were positioned in normal, upright parallel positions. Edwards[8] suggested that excess gingival tissue could be a factor associated with residual spaces and advocated the surgical removal of any tissue that accumulates interproximmally during

Fig 14. *Lingual view (19th month)*

Fig 15. *Fixed retainer on #18 and #21*

treatment. As originally described by Casko et al.[9] the ABO Objective Grading deducts many points for failing to achieve Class I buccal segments. Although good interdental contacts were achieved, nine points were lost in the occlusion section of the ABO cast score. One of the principle objectives of orthodontic treatment is to establish maximun intercuspation of opposing teeth even if intermaxillary intercuspation is not ideal. Although the left occlusal relationship is class III, the cusp to fossa relationships are optimal between the mandibular and maxillary dentition. Considering the complexity of the problem, and the imposed biomechanics restrictions, the authors and the patient are pleased with the results.

ACKNOWLEDGEMENT

The authours would like to acknowledge our editors, Tzu Han Huang, Dr. Billy Su, Dr. Chen Jin Lung and Dr. Sabrina Huang for English revision.

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DISCREPANCY INDEX WORKSHEET

CASE # _____ **PATIENT** HUNG YU-FANG

TOTAL D.I. SCORE 25

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 = 3

OVERBITE

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

Total = 0

ANTERIOR OPEN BITE

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

Total = 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. additional	_____ pts.

Total = 4

LINGUAL POSTERIOR X-BITE

1 pt. per tooth Total = 0

BUCCAL POSTERIOR X-BITE

2 pts. per tooth Total = 0

CEPHALOMETRICS (See Instructions)

ANB ≥ 6° or ≤ -2° = 4 pts.

SN-MP
≥ 38° = 2 pts.

Each degree > 38° **3** x 2 pts. = 6

≤ 26° = 1 pt.

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

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

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

1 to MP ≥ 99° = 1 pt.

Each degree > 99° _____ x 1 pt. = _____

Total = 8

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. =	_____
Missing teeth (except 3rd molars)	**1**	x 1 pts. =	1
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. =	_____
Addl. treatment complexities	**1**	x 2 pts. =	**2**

Identify:

Total = 3

Exam Year
ABO ID# 96112***

Examiners will verify measurements in each parameter.

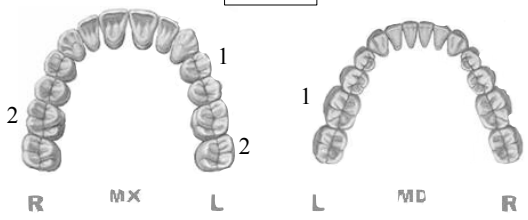
ABO Cast-Radiograph Evaluation (Rev.6-1-08)

Case # 26 **Patient** Huang Yu-Fang

Total Score:

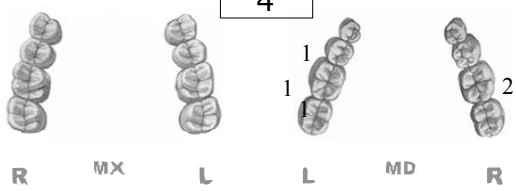
Alignment/Rotations

7



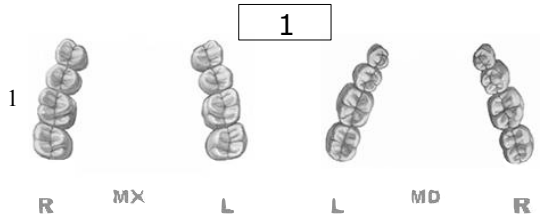
Marginal Ridges

4



Buccolingual Inclination

1

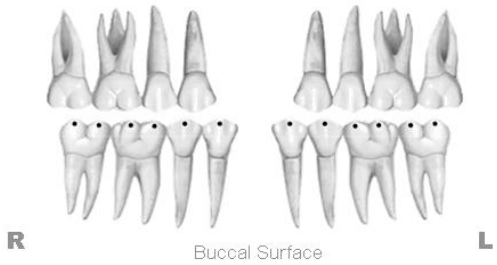


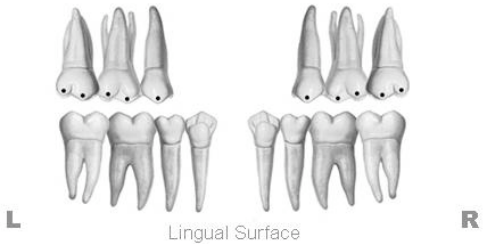
Overjet

0

Occlusal Contacts

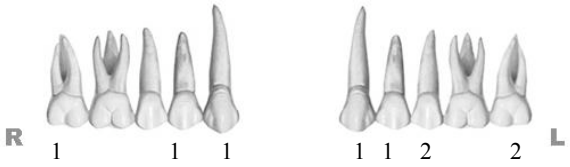
0





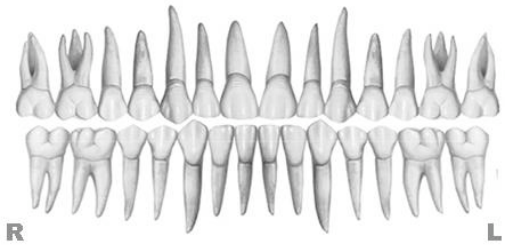
Occlusal Relationships

9



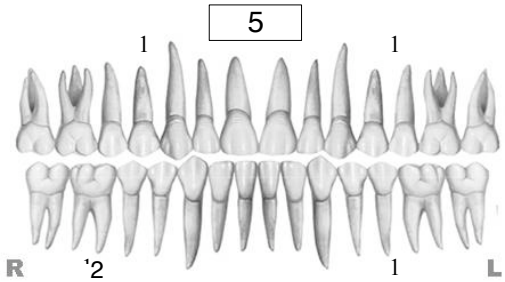
Interproximal Contacts

0



Root Angulation

5



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

ABO Case Report

High Maxillary Canine Impaction with Mesial and Labial Displacement

HISTORY AND ETIOLOGY

A 12 year 3 month female was referred by her general dentist to evaluate a chief complaint of unerupted maxillary canine (Figure 1). The patient was in good general health and the dentition was developing normally except for a high impaction of the maxillary left canine (Figures 2 and 3). The apparent etiology was an aberrant path of eruption.

The patient was successfully treated to a near ideal result as documented by Figures 4-8. Three dimensional radiographic imaging (Figure 10) revealed that the crown of the impacted canine was lodged between the adjacent lateral incisor and first premolar roots. A specific surgical plan[1-2] was devised to uncover the impacted canine (Figure 11). Orthodontics mechanics tipped the tooth distally, so that it could be extruded and properly aligned (Figure 12). Figure 9 is pre- and post-treatment cephalometric documentation. The diagnosis and treatment details will be discussed below.

DIAGNOSIS

Skeletal:

Skeletal Class I (SNA 84°, SNB 81°, ANB 3°)

Normal mandibular plane angle (SN-MP 31°, FMA 22°)

Dental:

Bilaterally Class I molar relationship

Asymmetric right Class II canine relationship

3 mm overjet, 30% overbite, and all mid-lines coincide

Mesially and labially impacted upper left canine high in the alveolar process

2 mm crowding of the lower anterior dentition

Facial:

Slightly protrusive maxillary lip

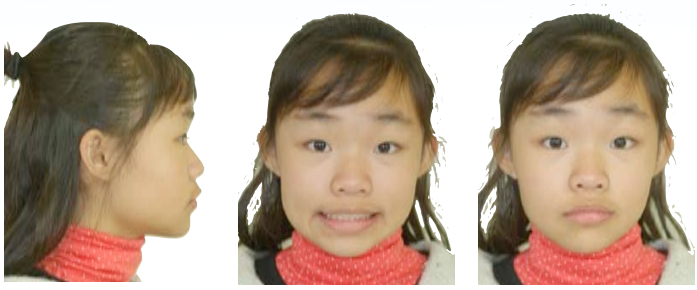


Fig 1. *Pretreatment facial photographs*

Fig 2. *Pretreatment intraoral photographs*

Fig 3. *Pretreatment study models*

Dr. Tseng Shu Ping, Lecturer, Beethoven Orthodontic Center (Left)
Dr. Chris HN Chang, Director, Beethoven Orthodontic Center (middle)
Dr. W. Eugene Roberts, Consultant, *News and Trends in Orthodontics* (right)

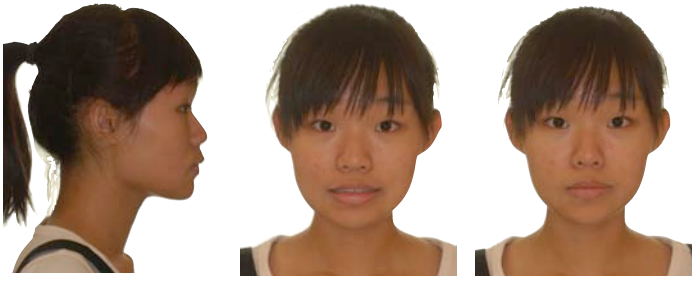


Fig 4. *Posttreatment facial photographs*

Fig 5. *Posttreatment intraoral photographs*

Fig 6. *Posttreatment study models*

SPECIFIC OBJECTIVES OF TREATMENT

Maxilla (all three planes):

A - P: Maintain

Vertical: Maintain

Transverse: Maintain

Mandible (all three planes):

A - P: Maintain

Vertical: Maintain

Transverse: Maintain

Maxillary Dentition

A - P: Maintain

Vertical: Recover high impacted canine on the left side

Inter-molar Width: Maintain

Mandibular Dentition

A - P: Maintain Class I molar relationship; align anterior segment

Vertical: Maintain

Inter-molar / Inter-canine Width: Maintain

Facial Esthetics:

E-line: Maintain a normal growth pattern; slight retraction of the upper lip.

TREATMENT PLAN

Both arches were bonded with fixed appliances and an open coil spring was used to prepare pathway for the impacted canine, which was subsequently exposed and bonded with a labial approach. Closed eruption technique was chosen to bond canine (Figure 11), which was brought into occlusion with an orthodontic light force from a power chain and a continuous maxillary archwire (Figure 12).

Treatment included Class II elastics to maintain a favorable occlusion and profile. Detailing bends produced the final occlusion. Fixed appliances were removed and the corrected dentition was retained with fixed retainers from 3-3 in both arches.

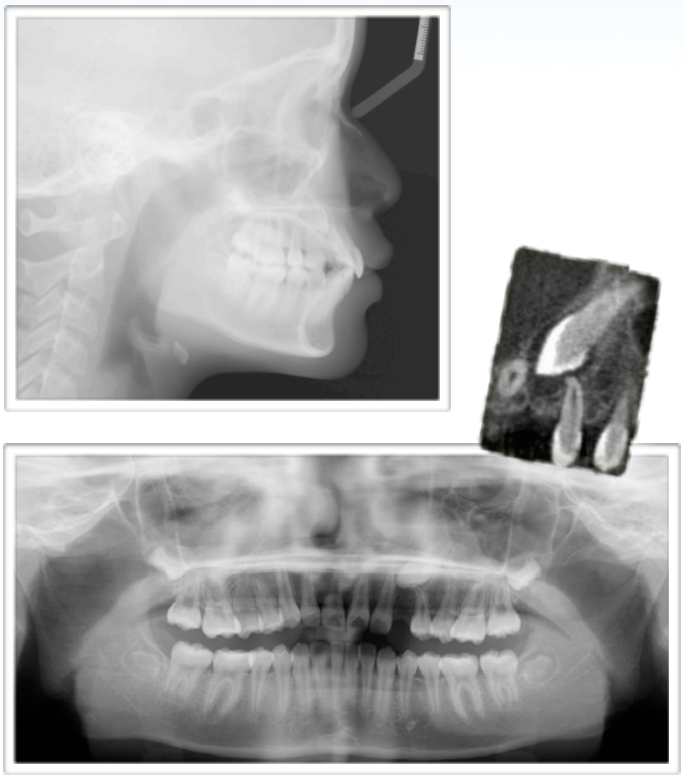


Fig. 7. *Pretreatment ceph. and pano. radiographs*

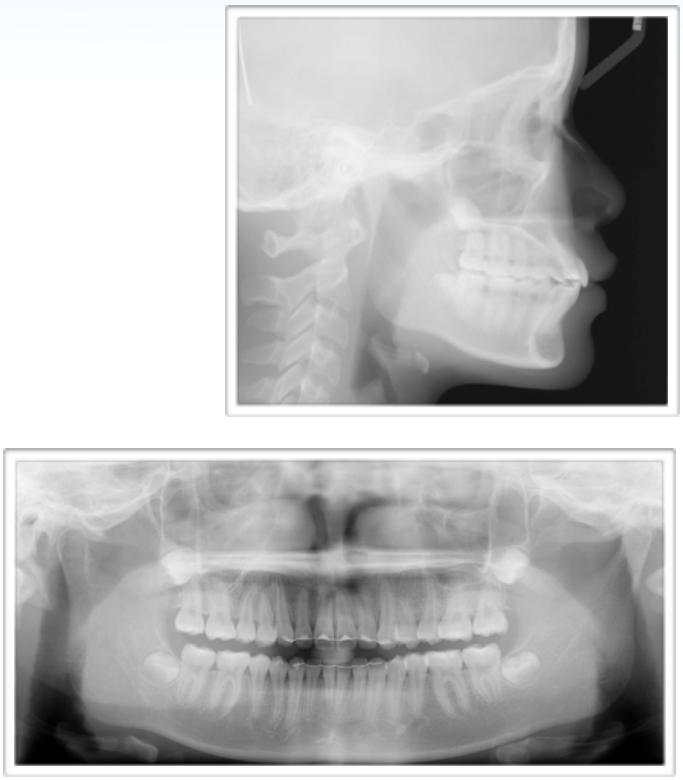


Fig. 8. *Posttreatment ceph. and pano. and radiographs*

APPLIANCES AND TREATMENT PROGRESS

Damon D3MX brackets 0.022" (Ormco) were used. Both arches were bonded and occlusal bite turbos, made with glass ionomer cement, were placed on both lower first molars. An open coil spring was placed between teeth #10 and 12 to open a pathway for the extrusion of the impacted canine. Five months later, #11 was surgically exposed and a button was bonded on the labial surface to tip and extrude it with a closed eruption technique (Figure 11). Following 5 months of traction, with the power chain and .014 Copper-Ni-Ti archwire, the crown of #11 was exposed and the button was replaced with a Damon bracket. After 8 months of traction and alignment, #11 was optimally positioned in the arch. Once the impacted canine reached the occlusal plane, Class II elastics were used to achieve proper interdigitation and close the

CEPHALOMETRIC			
SKELETAL ANALYSIS			
	PRE-TX	POST-TX	DIFF.
SNA°	84°	83°	-1°
SNB°	81°	81°	0°
ANB°	3°	2°	-1°
SN-MP°	31°	32°	+1°
FMA°	22°	24°	+2°
DENTAL ANALYSIS			
U1 TO NA mm	4 mm	6 mm	+2 mm
U1 TO SN°	107°	107°	0°
L1 TO NB mm	5 mm	4 mm	-1 mm
L1 TO MP°	99°	99°	0°
FACIAL ANALYSIS			
E-LINE	1.5 mm	1 mm	-0.5 mm

Table 1 . *Cephalometric summary*

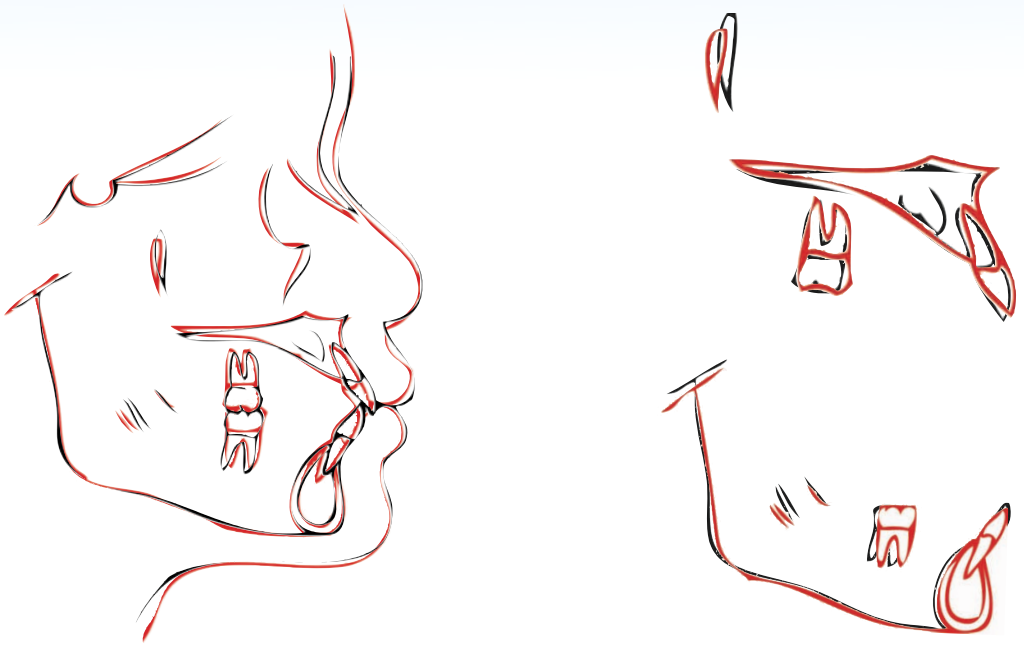


Fig. 9. *Superimposed tracings*

remaining space between teeth #11 and 12. Moreover, lip tension exercises were prescribed to obtain a better soft tissue profile.

One month before removing the fixed appliances, the upper archwire was sectioned distal to the cuspids. Light up and down elastics (2 oz) were further used for final detailing. After 25 months of active treatment, appliances were removed and 3-3 fixed retainers were delivered at the same appointment. The wire sequences for the treatment were as follows: .014 Copper Ni-Ti, .014x .025 Copper Ni-Ti and .017x .025 TMA.

Shortly after bonding the brackets and towards the completion of canine traction, panoramic radiographs were taken to examine the bracket positions for all teeth.

TREATMENT RESULTS

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: Maintained Class I molar relationship

Vertical: Impacted left canine recovered and optimally aligned

Inter-molar Width: Maintained

Mandibular Dentition:

A - P: Maintained Class I molar relationship; slightly flared and well aligned

Vertical: Maintained

Inter-molar / Inter-canine Width: Maintained

Facial Esthetics:

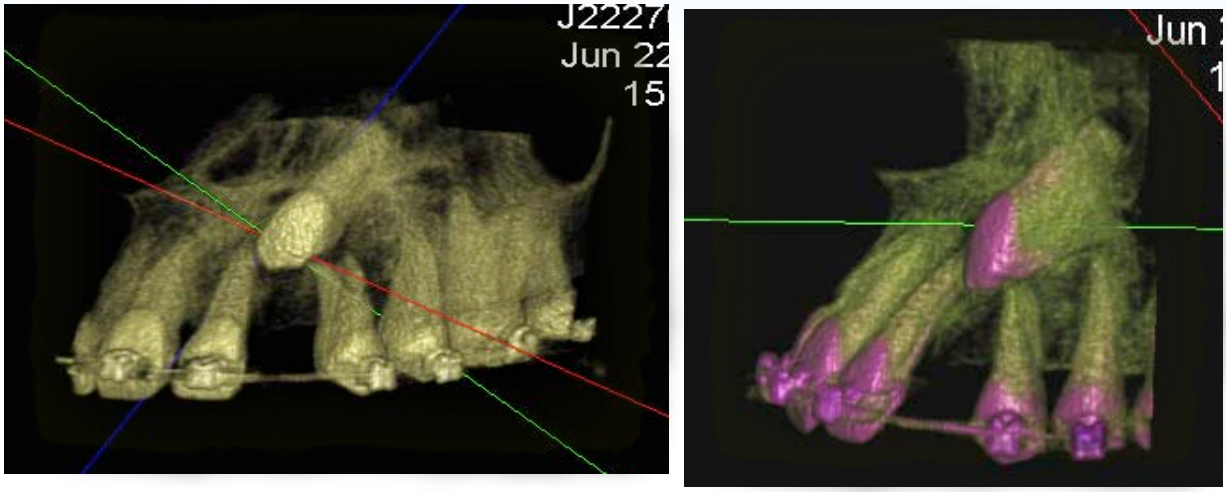


***Fig. 10**. 3D images show 11 in good morphology without any pathological change. The crown of 11 is just palatal to the root apex of 10 and palatal root tip of 12 is just fitting in the lingual fossa of 11.*

E-line: Maintained a normal growth pattern and slightly retracted the upper lip

RETENTION

The upper and lower fixed 3-3 retainers were bonded on every tooth. The patient was instructed in home care and maintenance of the retainers.

FINAL EVALUATION OF TREATMENT

Three dimensional radiographic imaging (Figure 10) was important diagnostic information for selecting the appropriate surgical uncovering procedure (Figure 11) to compliment the specific orthodontic traction to recover and align the impacted canine (Figure 12). For the present patient, this potentially difficult canine impaction was corrected in about 8 months. The treatment resulted in pleasing crown length and gingival contour on tooth #11. The relatively symmetrical maxillary labial gingival form is expected to improve after treatment and crown exposure of the lateral incisors equalizes.

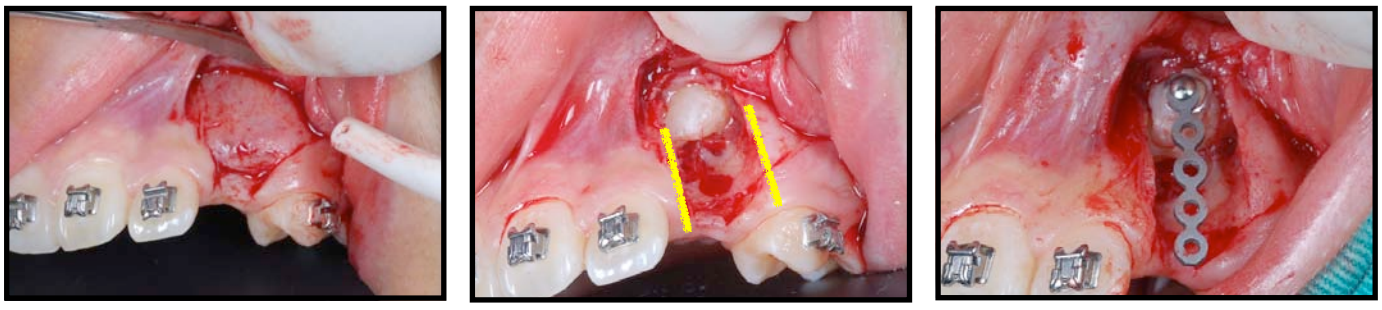


Fig. 11 Operation procedures show as illustrated. Especially noted that the bone covering crown and the pathway for erupting cuspid are removed.

DISCUSSION

For impacted canines, extraction should be limited to ankylosis, uncontrollable infection, internal or external root resorption, severe root dilacerations and/or pathology that may compromise adjacent teeth during or after orthodontics treatment.[1-4] 3D radiographic imaging revealed a relatively normal tooth that unfavorably displaced from the normal path of eruption. An effective treatment plan was devised to recover and align the high impacted canine that was displaced mesially and labially. Without properly diagnosing the unfavorable position for the impaction, it may have been difficult to recover it without damaging the roots of adjacent teeth.

The classic treatment protocols for impacted maxillary canines are opening space, performing surgical exposure, and applying light traction forces in an appropriate direction. In this case, an open coil spring was used to increase the space between the lateral incisor and the first premolar to create a pathway for eruption of the impacted canine.[1-5] The approach of further increasing the width of the space between the adjacent teeth was necessary because the 3D imaging revealed that the root tip of the adjacent lateral incisor (#10) was just anterior to the superior portion of the crown of the canine, and the inferior portion of the crown (#11) was lodged between the roots of the premolar (#12). If orthodontic traction had been applied to the impacted canine, without opening a pathway for eruption, extrusion would have been inhibited and root resorption of the adjacent teeth was likely. The side effect was a more anterior position of the canine once it was aligned. This problem was easily corrected with Class II elastics after the impacted canine was extruded into position.

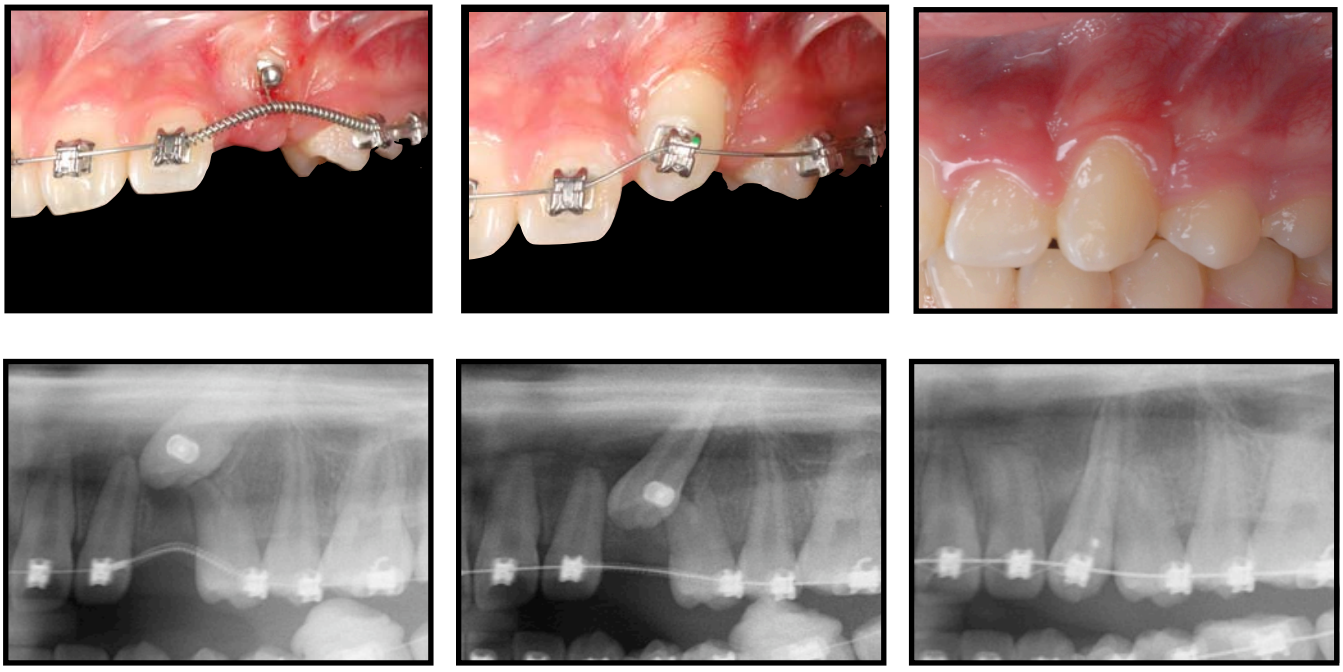


Fig. 12 Radiographies show first day, two months later and 8M later since traction began.

Fig. 13 Post-Tx photo.

For a high labially-impacted canine, an excisional surgical technique would probably result in compromised attached gingival, apical to the crown of canine after it had erupted.[2] On the other hand, an apically positioned flap (APF) would result in instability of the crown and possible reintrusion of the tooth after treatment. Closed eruption technique was the most appropriate method for uncovering the canine because its position was significantly apical to the mucogingival junction. Besides, removing the bone covering the crown and along the pathway of eruption at the time of surgical uncovering is suggested to shorten the traction time.[2]

In assessing the final result for the present patient, the canine position, angulation, bone level, and crown length are all satisfactory. The disharmony of the gingival line of upper anterior teeth can easily be solved with gingivoplasty in the future if it does not spontaneously correct with age. However, the canine eminence on the affected side is relatively more prominent. This modest problem could have been prevented with a higher torque bracket, a torqued archwire, or a torquing spring. In addition, a Ballista loop or a traction force from the mini-screw in the palate[5] may have improved the direction of canine traction. Moreover, the occlusion of tooth #11 should be carefully monitored and adjusted, if needed to achieve better occlusion.

The high impaction of a maxillary canine is a difficult problem in orthodontics. Once the impacted tooth is recovered, there may be a discrepancy in occlusion, root resorption and/or gingival compromise. The force design and control is a very important aspect of the treatment sequence. For the present patient, the DI score was only 5 points. However, the clinical effort and skill to treat this patient is not adequately reflected by the DI. Although the DI has proven to be an effective indicator of treatment complexity (severity) for most patients, it underestimates the difficulty of high canine impactions. A revision of the DI to more appropriately weight difficult impactions is indicated.

CONCLUSION

A thorough diagnosis, a well planned surgical strategy, and an efficient, force system design are essential components for successful management of unfavorably positioned, high maxillary canine impactions. 3D radiographic imaging is important for precisely determining the relative position of the impacted canine to its adjacent teeth. This information is necessary for designing a treatment approach to consistently achieve optimal outcomes for these difficult clinical problems.

References

1. Heloisio de Rezende Leite et al: Labially displaced ectopically erupting maxillary permanent canine: interceptive treatment and long-term results. Am J Orthod Dentofacial Orthop 2005;128:241-51
2. Vincent G. Kokich: Surgical and orthodontic management of impacted maxillary canine. Am J Orthod Dentofacial Orthop 2004;126:278-83
3. K. Niagara et al: Impacted maxillary central incisor, canine, and second molar with 2 supernumerary teeth and an odontoma. Am J Orthod Dentofacial Orthop 2009;135:390-9
4. Demetrios J. Halazonetis: Horizontally impacted maxillary premolar and bilateral canine transposition. Am J Orthod Dentofacial Orthop 2009;135:380-9
5. Stella Cherish et al: Lingual orthodontic treatment and absolute anchorage to correct an impacted maxillary canine in an adult. Am J Orthod Dentofacial Orthop 2008;134:811-9

DISCREPANCY INDEX WORKSHEET

CASE # 1199 **PATIENT** CHOU-YU YANG

TOTAL D.I. SCORE 5

EXAM YEAR 2007
ID# A831202

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 = 0

OVERBITE

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

Total = 0

ANTERIOR OPEN BITE

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

Total = 0

LATERAL OPEN BITE

2 pts. per mm. per tooth

Total = 0

CROWDING (only one arch)

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

Total = 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. additional _____ pts.

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 ≥ 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)	**1**	x 2 pts. =	**2**
Midline discrepancy (≥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 ≥ 2mm)		@ 2 pts. =	_____
Tooth transposition	_____	x 2 pts. =	_____
Skeletal asymmetry (nonsurgical tx)		@ 3 pts. =	_____
Addl. treatment complexities	**1**	x 2 pts. =	**2**

Identify:

Total = 4

Exam Year	2009
ABO ID#	A831202

Examiners will verify measurements in each parameter.

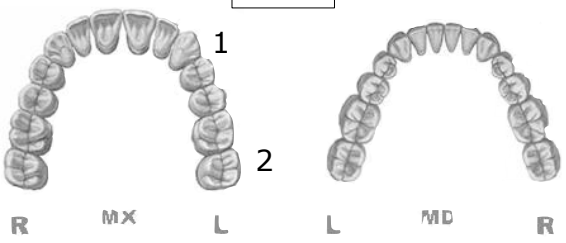
ABO Cast-Radiograph Evaluation (Rev.6-1-08)

Case # 1199 **Patient:** **Chou-you Yang**

Total Score: **16**

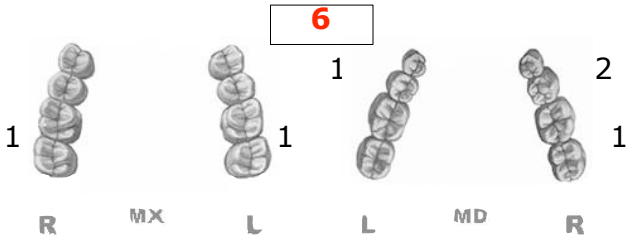
Alignment/Rotations

3



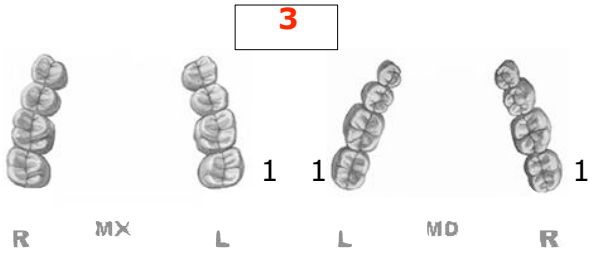
Marginal Ridges

6



Buccolingual Inclination

3

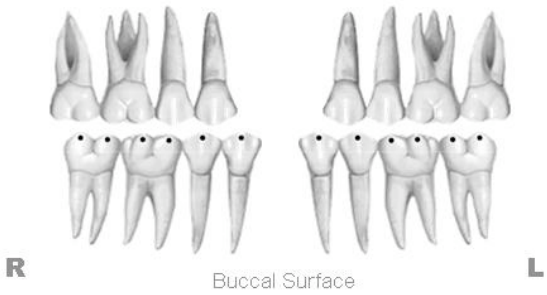


Overjet

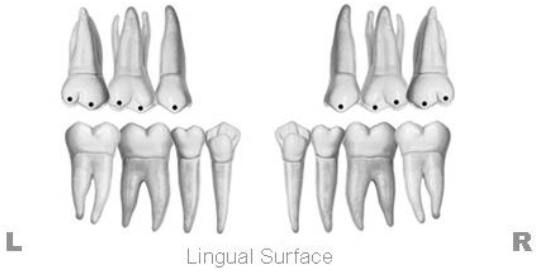
0

Occlusal Contacts

0



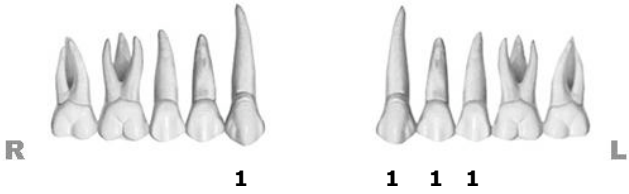
Buccal Surface



Lingual Surface

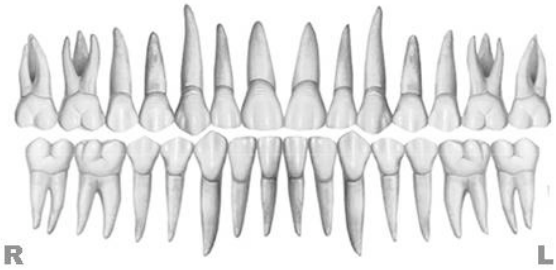
Occlusal Relationships

4



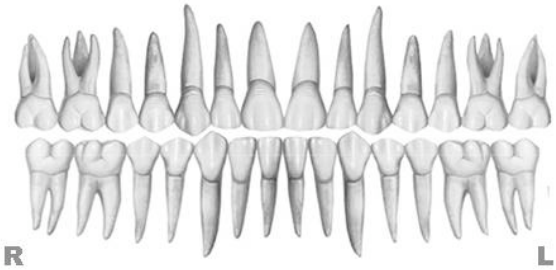
Interproximal Contacts

0



Root Angulation

0



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.

Upcoming International OBS Workshop

8/14-16, 2010

LECTURER: Dr. John Lin

President of the Jin-Jong Lin Orthodontic Clinic, Dr. Lin received his MS. from Marquette University and is an internationally renowned lecturer. He's also the author of *Creative Orthodontics and* consultant to *News and Trends in Orthodontics* .

LECTURER: Dr. Chris Chang

ABO certified orthodontist and president of the Beethoven Orthodontic Center, Dr. Chang received his PhD in bone physiology and Certificate in Orthodontics from Indiana University in 1996. As publisher of News & Trends in Orthodontics, he has been actively involved in the design and application of bone screws.

The visit to Beethoven and Newton's A center of this time was really an eye-opening experience for me in many ways. Among others, what impressed me the most was the confidence of staff members at work. Of course. it must be the consequence of a superb office management system. A lot of time and effort must have been poured in to establish the current status, which is well rewarded. Being inspired by the visit to Hsinchu, I have come back to my office with several new ideas to improve my own office system.

Dr. Tomio Ikegami, Japan (middle)
President of the Japan MEAW Technique and Research Foundation

It was also a fun to get acquainted with some new friends from Thailand, Malaysia and Vietnam. Thank you very much for the wonderful and refreshing 2 days. I want to return some day with my staff members to show them how efficient an orthodontic office can be.

OrthoBoneScrew and Damon workshop includes two half-day lectures, two half-day chair-side observation sessions, one model practice and one case discussion session. **Cost: USD 1,200**

Next dates:

August 14-16; December 7-9

Keynote Presentation workshop includes a total of 6.5-hours of lecture and hands-on practice, focusing on improving your professional communication skills. The workshop will use Macintosh computers and its native presentation software, Keynote 09. **Cost: USD 300**

Contact: Ms. Huang
thhuang@newtonsa.com.tw

Modern Orthodontic Office Design ~ Part III

Consultation table

諮詢桌的設計傳統為L型桌子搭配兩台螢幕，一個螢幕給助理使用記錄醫師的諮詢內容，另一個螢幕為醫師向家長或病患解說用，我們改良為簡潔一字型圓弧造型搭配大螢幕電腦，簡單又可以滿足需求（圖一）。家長或病患正對電腦螢幕，醫師和助理坐在電腦左右側，方便同時解說與記錄。診療區或櫃台附近可利用小小空間也設置諮詢桌，對於衛教或注意事項說明都相當方便。

Fig. 1 諮詢桌

Labortory

矯正診所中技工房的設置是相當必要的（圖二），因為大量模型的製作需求，第一考量是隔音，不要讓機器運作的聲響干擾看診；另外技工室若與消毒室合併，則要考量不要離主要的診療區太遠，因為助理需要常打包器械消毒，動線應注意不宜太長，以提高效率。

Fig. 2 技工房

Reception desk

櫃台位置的決定有三點考量 : 1. 決定工作人員的主要動線。2. 影響病患動線為圓形或直線。3. 好的設置可形成診療區的視覺屏障。櫃台設計除了功能性之外，最主要就是決定了病患的動線，以及作為診療區的屏障（圖三、四）。

Fig. 3 圓弧式櫃台

Fig. 4 直線式櫃台

徐玉玲 醫師
安徒生兒童牙醫診所負責人
貝多芬矯正課程講師

Reception room

等候區的重要性在整個平面規劃順序上應該是敬陪末座的，大多是利用散置的空間，並不侷限一個區域，最好是多個小空間（圖五～七），如此可以分散等待的患者或家長，在特別忙碌的時段比較不會讓病患有一進到診所就看到滿室的等待者。

E-office

在電腦科技如此發達的時代，許多傳統牙科不易長久妥善保存的資料，例如X光片等都可以透過數位e化的方式呈現及保存。除此之外，舉凡口內口外照片，手術過程等都可整理至病患個人的病歷資料中，使醫師對於病程更能通盤掌握。此外，對於助理用於衛教以及注意事項的解說，也能透過清楚的影像呈現讓病患更能簡單了解。除了資料收集外，電腦在行政工作的幫忙更不僅止於預約掛號，追蹤未就診病患等，更能進一步在忙碌的門診工作進行中分辨治療中及等待中的病人甚至等候時間的長短。在順暢的動線硬體設計之上再加入電腦軟體的管控，資料收集與管理，大大地為整體運作加分。

Tailer-made office

談了這麼多診所設計的原則，目的都是為了要一手打造符合心中理想又能兼具效率的工作環境；牙醫師在診所活動的時間其實超過在自己家裡的活動時間 (睡覺不算)，所以好好地花心思在這個空間設計絕對是值得的。而要建立量身訂做適合自己的診所，除了多聽多看多學之外，筆者認為最重要的還是要回歸 “需求”，了解自己的工作模式及看診需要，如此方能打造真正量身訂做的診所。

Fig. 5-7 等候區

Fig. 8 安徒生兒童牙科平面圖

貝多芬團隊 BEETHOVEN

貝多芬創辦人：
張慧男醫師

- 中華民國齒顎矯正專科醫師
- 美國齒顎矯正專科醫師學院院士（ABO）
- News & Trends in Orthodontics 發行人
- 美國印地安納普渡大學齒顎矯正研究所博士
- 國防牙醫系畢

貝多芬負責人張慧男醫師（後排中）及全體助理合影。

貝多芬牙科團隊
A Learning Organization

文 / 陳建綱、徐玉玲、黃思涵、蘇筌瑋

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「貝多芬一般牙科」、「安徒生兒童牙科」牙周病專科、贋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。為了能提供更完整的牙科照顧，我們也預計在明年成立一植牙中心，希望能讓有缺牙困擾的民眾更全面的治療環境。

診療區

開闊的空間設計，面對的是窗外中庭的一整片綠意，舒緩病患看診時等待的緊張心情。

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真是令人感到驚艷，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，平行的放置八張診療椅，並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，舉凡術前、術中的照片記錄，治療過程的病患獨立 Keynote 檔案，特殊檢查的X光片或是 3D 立體電腦斷層掃描資料，都能毫無遺漏的完整呈現，還有還有，櫃台掛號資訊系統也整合在 iMac 裡面了，包括病患報到，等候時間，收費以及預約項目都清清楚楚，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。

病患候診區

陪同的家長可以清楚的看到醫師進行的步驟，醫師也可以直接和家長溝通，創造出一個讓病人安心、家長放心的看診環境。

刷牙區

診所內設置多處刷牙區和鏡子，一方面增加診所明淨之感，更重要的是方便助理隨時可以檢查病患是否已經把牙齒刷乾淨。需要時則立刻可以清潔，毋須等待。

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，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！

圖像式病歷

病歷第一頁是病患初診的圖像資料，病人的相關問題一目了然，亦方便醫師與病人間的溝通。

貝多芬矯正中心-牙科繼續教育

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

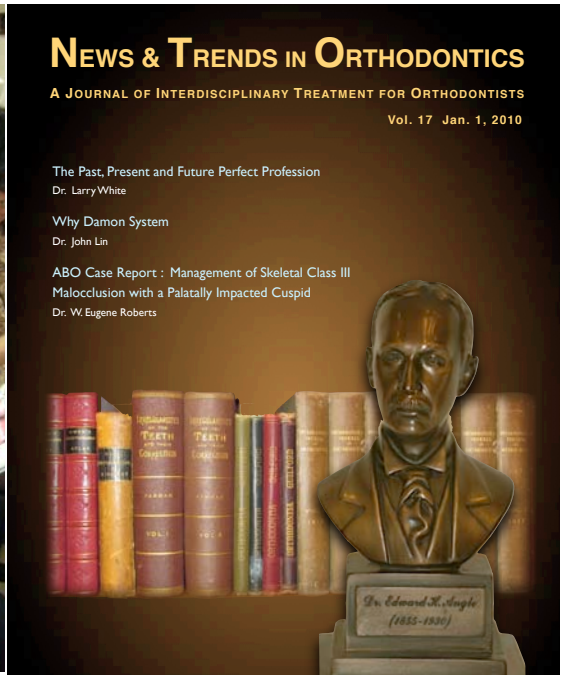
張醫師所設計的課程，不光適合國內醫師，就連國外的醫師也都踴躍報名參加 international workshop，每個梯次的報名都非常踴躍，學員們結業後都說還要再來參加，可見張醫師的課程魅力非常吸引人！張醫師也同時與國際接軌，國際間的演講邀約不斷，漸漸的成為另一個台灣之光！另外，每每只要有國際學者到台灣演講，張醫師有機會都會邀請他們參觀診所，張醫師會為他們簡報介紹診所的運作以及訓練課程，我們看到這些國際大師他們專注而且驚訝的表情，相信貝多芬牙醫在他們心中都留下了深刻的印象。

貝多芬矯正中心-出版專業刊物 News & Trends in Orthodontics

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「News & Trends in Orthodontics」，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。

（左）印尼國際班醫師認真在模型上練習植入迷你骨釘。

（右）最新一期雜誌News & Trends in Orthodontics，封面為張醫師所設計矯正之父Dr. Angle之塑像。



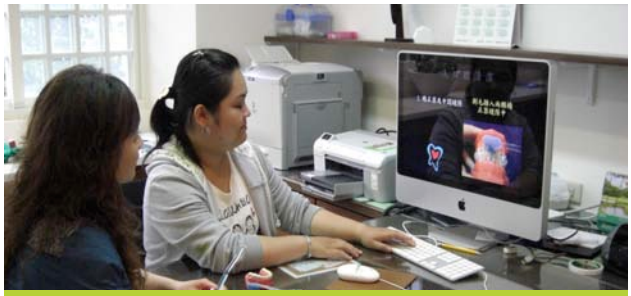
(左圖)資深助理正在電腦上進行新進助理訓練。

(右下圖)貝多芬醫師團隊。

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，因為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，年長者有贋復專科解決您「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！



助理正在蘋果電腦上對病人進行初診諮詢。

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。

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。

（左）依兒童身高所設計的高低刷牙台（右）診療台頂上就是繽紛的花朵，讓孩子徜徉在童話的懷泡裡。

金牛頓藝術科技 牙醫科技教育中心

透過三階段的Keynote高效簡報課程，醫師學習製作一流的Keynote幻燈片簡報，並加強自身的簡報魅力與技巧。

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 iPod touch 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iPod touch + 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 iPod touch 或 iPad 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 iPod 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。

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。

金牛頓藝術科技 牙科醫療器材研發

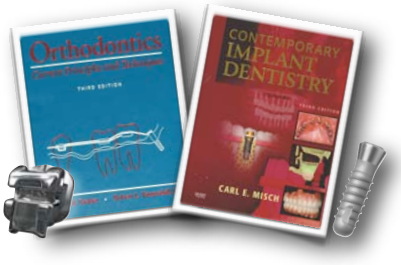
一般醫師可能認為這需要幾個實習醫師花上一個星期才能做出來的病例報告，利用適當的科技工具，這一切在短短的30分鐘內就全部完成了，不論是與病人，家屬溝通，訓練新進醫師、助理或與其他資深醫師進行專業討論，蘋果電腦加上 Keynote 的組合，讓進行個案討論和製作專業訓練教材，變得輕而易舉。再搭配 Keynote 最新加入的即時錄音功能，醫師教學講解的內容可以透過電腦內建的麥克風錄下來，透過影片轉檔的功能，新製作好的教學內容就可以放入 iPod，讓你立刻隨身帶著走。

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。

張慧男醫師與研發人員討論迷你螺絲的製造細節

貝多芬未來展望-植牙中心



近年來，貝多芬病人結構逐漸由兒童青少年轉型趨向成人的比例越來越多，這意味著成人對美感的要求也愈發強烈，但這也是貝多芬的全新挑戰，因為面對成人的治療時，往往除了牙齒排列的問題需要矯治外，牙周病，大範圍的缺牙，舊有假牙補綴物汰舊以及矯正後的植牙或假牙補綴評估，重建。因此貝多芬有義務，也必須為成人提供矯正前中後完整的全面專業的治療建議與治療。

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，植牙則是蓋房子的支柱，因此，貝多芬植牙中心的成立，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。

貝多芬體系的核心價值在於教育兩字，植牙中心也將落實教育當作成立的最高宗旨，透過課程的建立，會讓貝多芬各個專科的駐診醫師擁有相互溝通的舞台，張醫師相信，唯有在課程中出來報告給參與的學員分享，才會真正的認真整理自己的病例或是將自己的治療心得內化成有系統的 SOP。透過一次次的整理，相互討論，無形中能提升醫師的專業能力，醫療品質也相對提升。

貝多芬植牙中心即將於 2011 年成立，在今年，我們成立了植牙論壇，預先替矯正及植牙科際協同整合治療作暖身，也希望對學習有相同熱忱的醫師能夠加入我們，一起為提升醫療品質作努力。

News & Trends in Orthodontics will be available on the iPod / iPad soon !

NEWS & TRENDS IN ORTHODONTICS

A JOURNAL OF INTERDISCIPLINARY TREATMENT FOR ORTHODONTISTS

現今的牙科治療是各科統合彙整的時代，協同矯正、植體、牙周、補綴讓治療成果臻於完美是我們追求的目標。此期摘錄 DR. SAMUEL LEE 的 CRESTAL SINUS LIFT PROCEDURE 與邱上珍醫師在金牛頓植牙論壇與大家分享關於 BIOLOGIC WIDTH 的內容。

Crestal Sinus Lift:

A Minimally Invasive and Systematic Approach to Sinus Grafting

Samuel Lee, DDS

Introduction

Due to pneumatization of the maxillary sinus, poor bone quality and quantity, treatment of posterior edentulism has been and continues to remain a challenge for dental physicians. Traditionally, these obstacles are overcome by bone condensing and grafting into the maxillary sinus beneath the Schneiderian membrane.[1-18] Bone grafting into the sinus has produced predictable results enabling clinicians to place longer implants for more stable prostheses and better long term outcomes.[3] Although final outcomes have proved satisfactory, sinus augmentation via lateral window grafting procedures produces substantial patient morbidity.[5-7, 15, 17, 18] Because this technique involves flap elevation beyond the mucogingival junction, bruising, swelling, and pain are common postoperative complications.[5-7, 15, 17, 18] An additional intraoperative complication associated with this procedure may arise from the laceration of the intraosseous branch of posterior superior artery (branch of maxillary artery).[15] Finally, the technique sensitive nature of the lateral window approach carries a risk of Schneiderian membrane perforation during window preparation and membrane elevation. In an attempt to forgo the risks and complications of lateral window sinus augmentation, a number of internal (crestal) approaches to have been introduced such as osteotome[5-7], reamers[17], tapping drills[18], piezoelectric, ISM[17], and HSC.[15] With most of these internal techniques for sinus augmentation, poor visibility during manipulation of the Schneiderian membrane remains a problem. While a great solution for the premolar region, use of standard diameter implants (4.0mm) in the molar region has limitations such as poor emergence profile, implant fracture, and crestal bone strain.[19-21] Large platform diameter implants may overcome poor bone quality by increasing bone to implant surface contact in addition to producing superior emergence profile.[21] Use of such implants in molar areas may also decrease fracture risk, crestal bone stress, and allows fabrication of a natural occlusal table.[20] The purpose of this paper is to describe an innovative surgical technique that combines a crestal internal sinus lift with use of wide diameter implants.

Description of Surgical Technique

Flap Elevation

Incision design that is at least 2 mm palatal to desired implant position and flap elevation that does not extend beyond the mucogingival junction is recommended (figure 1). This incision design allows for minimal pain, unilateral flap retraction, the option of doing one or two stage implant placement without losing keratinized tissue, and the ability to treat oral antral communications in case of excessive Schneiderian membrane perforation.

Location of Crestal Window

When performing this technique, the lowest point of the maxillary sinus should be located by means of radiographic or cone-beam/ct options (see arrow in figure 2). It is most favorable when this position coincides with implant position. If implant placement at sites #17, 16, and 15 are anticipated with site #16 being the lowest point in the maxillary sinus floor, site #16 should be used to lift the sinus membrane.

Crestal Window Preparation and Membrane Lift

To perform the crestal internal sinus lift, a round window is made on the crestal bone with a set of specially designed trephine burs that have a diameter 1 mm less than the final implant size. For example, if a 6mm implant is anticipated, a 4.0mm (inner diameter) x 5.0mm (outer

Samuel Lee, DDS (left)

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Figure 1: Palatal incision design.

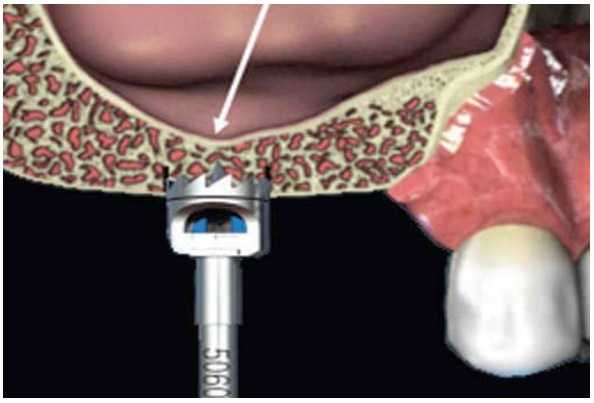

Figure 2: Crestal sinus lift initiated from lowest point of maxillary sinus (arrow).

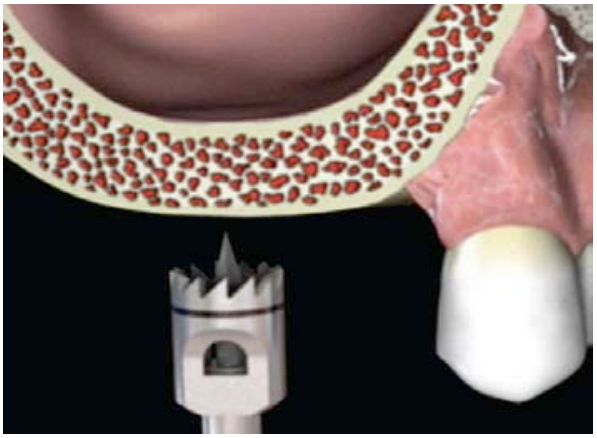

Figure 3: Pointed trephine used to mark precise location of crestal window position.

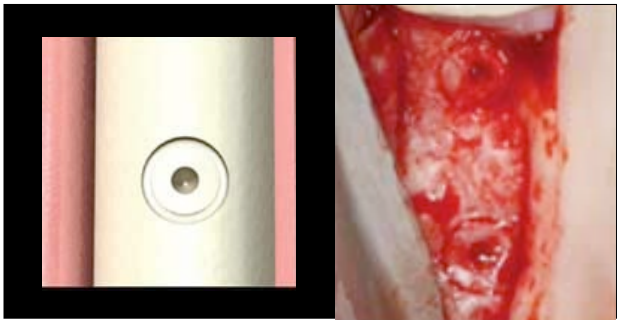

Figure 4: Crestal marking after use of pointed trephine.

diameter) trephine is used. Unlike the conventional trephine techniques that require 700-1000 rpm with ample irrigation, this technique utilizes lower speeds of 40-50 rpm without irrigation and is referred to as a "Waterless technique." The waterless technique has the advantage of not washing away autogenous bone filings during bone manipulation, thus allowing the surgeon to collect an increased amount of autogenous bone.[18] Conventional trephining with precision is often challenging due to skipping or drifting of the trephine during initial bone cutting. To minimize this complication and maximize visualization and precision of the trephine bur, a "pointed trephine" is used at a speed of 50 rpm without irrigation (figure 3). The pointed trephine is used to mark the location of the intended crestal window and only penetrates the cortical crest (figure 4). The second step in this technique utilizes a trephine with an internal adjustable stopper (ASBEtrephine). Radiograph or cone-beam/CT is used to measure the width of residual native bone from the ridge crest to the floor of the sinus and 1 millimeter is subtracted from this distance. The adjustable stopper within the ASBE trephine is then set to such a length to prevent perforation of the maxillary sinus floor. For example, if 6mm of native residual bone remains from the ridge crest to the floor of the maxillary sinus, the ASBE trephine adjustable stopper is set to 5 mm. At a speed of 50

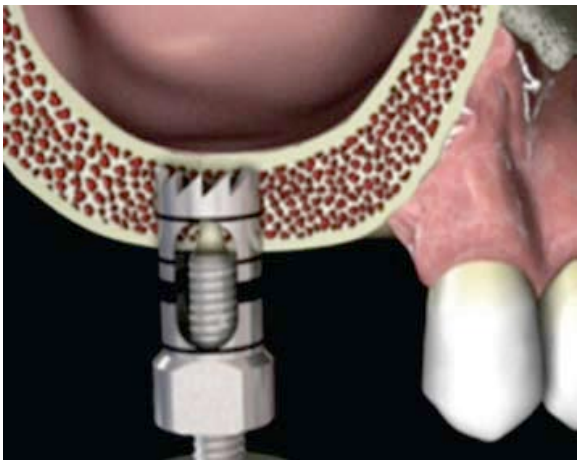

Figure 5: Adjustable stopper and bone ejector (ASBE) trephine used at 50 RPM to a point 1mm short of the

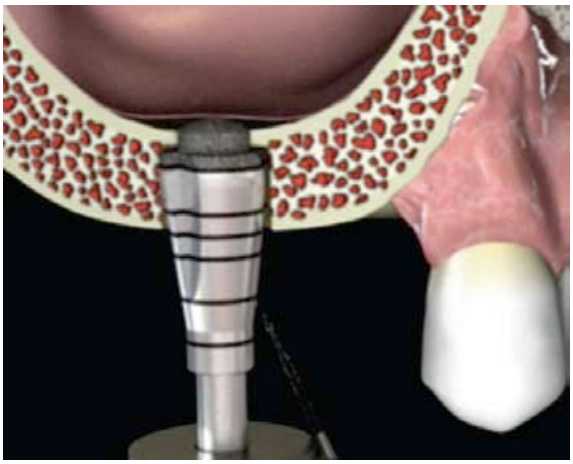

Figure 7: Specialized self-limiting diamond bur may be used to remove residual bone on sinus floor.

Figure 6: Sinus floor removed with trephine exposing Schneiderian membrane.

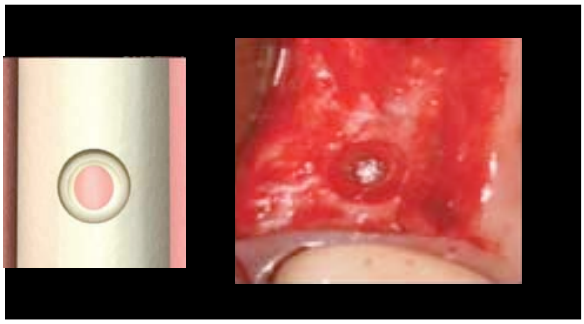

Figure 8: Crestal window after use of specialized self-limiting diamond bur.

rpm, the ASBE trephine is used to penetrate the ridge crest and remove a bone core (figure 5). Although the ASBE trephine is set to a length 1mm short of the sinus floor, bone core removal will often expose the Schneiderian membrane (figure 6). In cases where the sinus floor is extremely dense or on an inclined plane, 1mm of cortical bone may remain at the floor of the maxillary sinus. In the event that 1mm of residual bone remains at the sinus floor following use of the ASBE trephine, a specialized wide diameter "sinus diamond bur" is used to expose the Schneiderian membrane. The specialized sinus diamond bur contains a shoulder stop that prevents drilling into the Schneiderian membrane. Additionally, as the sinus diamond bur grinds the residual cortical bone, resultant fine bone particles act as a buffer between sinus membrane and diamond bur (figure 7).

With the third step in this technique, elevation of the maxillary sinus Schneiderian membrane is accomplished. Following preparation of the crestal window, a "mushroom

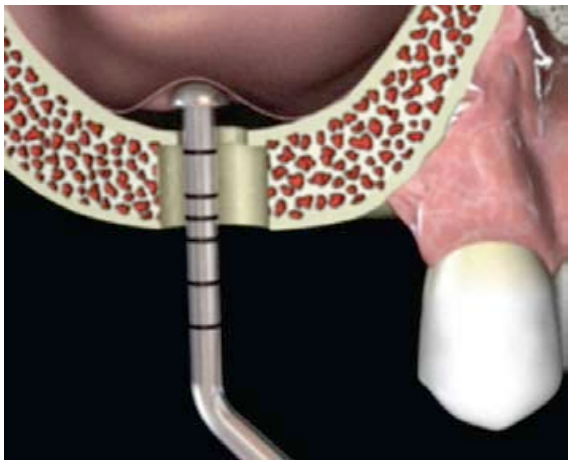

Figure 9: Mushroom elevator used to initiate Schneiderian membrane elevation.

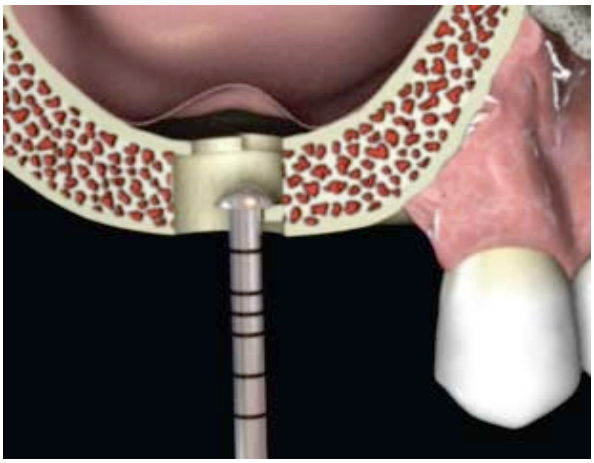

Figure 10: Mushroom elevator may be used to remove residual bony ledges at crestal window.

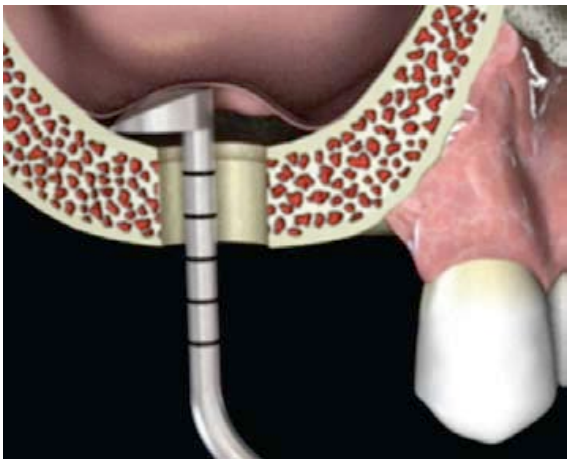

Figure 11: Cobra elevator used to elevate Schneiderian membrane mesially and distally.

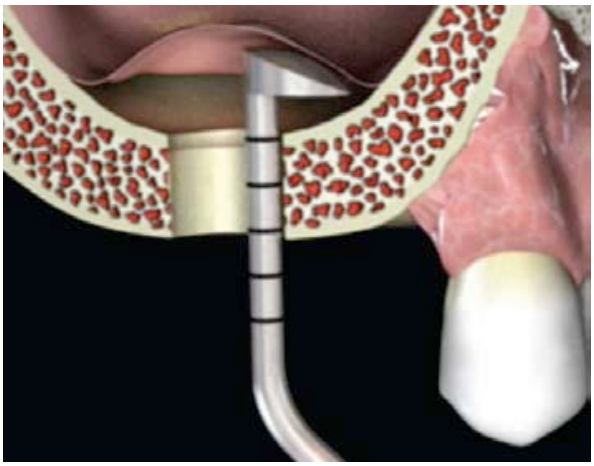

Figure 12: Cobra elevator further elevates Schneiderian membrane and may be used to scrape sinus !oor to induce bleeding.

elevator" is used as a probe for tactile feel of the sinus floor and detection of membrane exposure. The maxillary sinus floor is rarely perfectly flat, so it is common to find initial sinus membrane exposure at the corner of the osteotomy rather than at the center (figure 8). Once the mushroom elevator slightly drops into the maxillary sinus and the Schneiderian membrane is felt, membrane elevation is initiated (figure 9). This same elevator is also used to break away any remaining ledges of bone in the osteotomy site that interfere with sinus membrane elevation (figure 10). After initial Schneiderian membrane elevation, the "Cobra sinus elevator" is used to further elevate the sinus

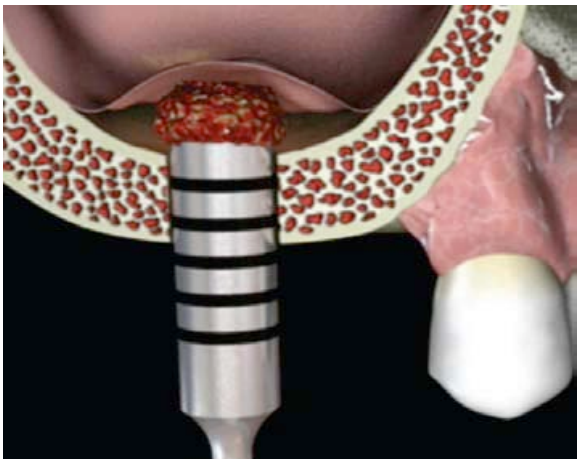

Figure 13: Bone graft added to prepared maxillary

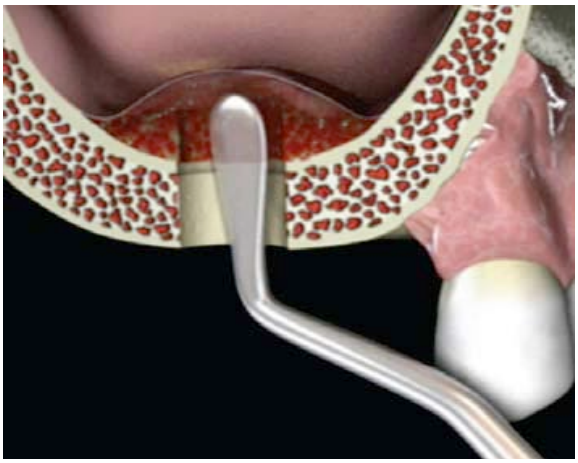

Figure 14: Lateral condensation of bone graft into

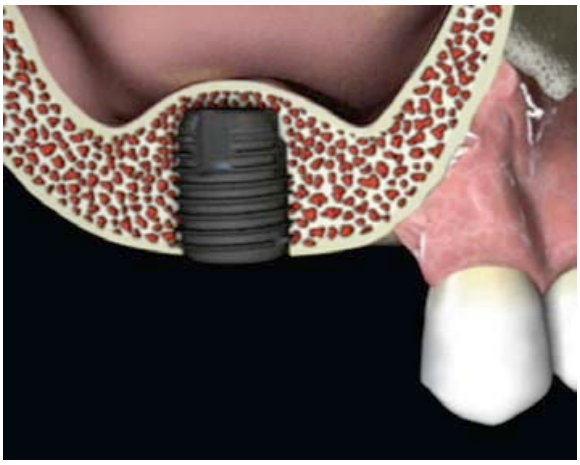

Figure 15: Implant insertion into prepared maxillary sinus.

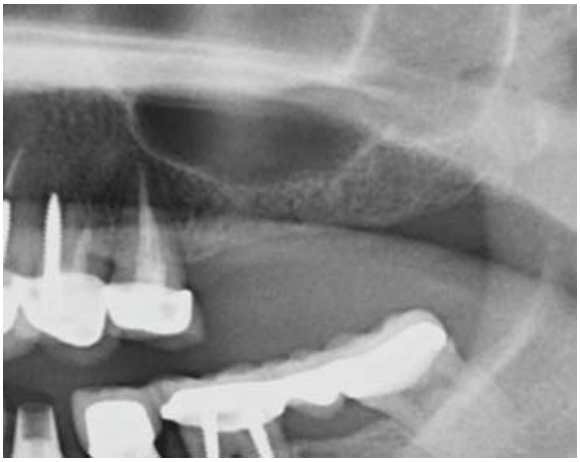

Figure 16: Case 1 presurgical radiograph of left maxillary sinus.

membrane and scrape the bony sinus floor to promote bleeding in the sinus cavity (figures 11 and 12).

Bone Condensing and Implant Insertion

To accommodate a wide diameter implant of sufficient length, bone graft is added to the maxillary sinus. A combination of lateral and vertical condensation of particulate bone is used to augment the sinus and produce additional lift of the Schneiderian membrane (figures 13 and 14). Lateral bone graft condensation is critical to reducing pressure on the Schneiderian membrane and, thus, reducing the risk of perforation. This method facilitates

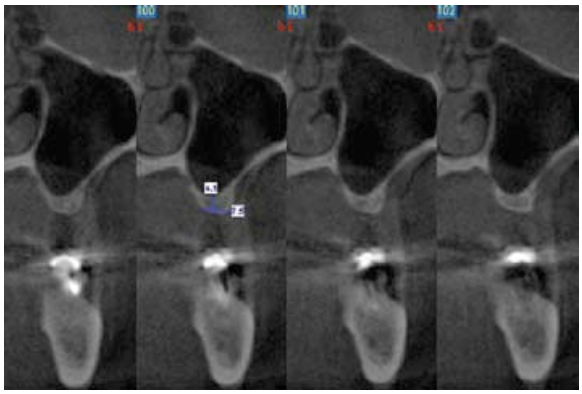

Figure 17: Case 1 cross sectional CT images.

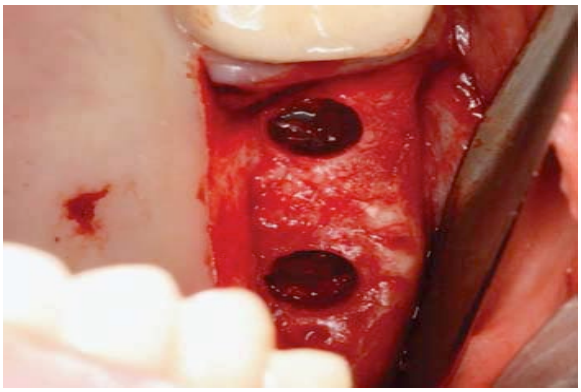

Figure 18: Case 1 left maxillary ridge following use of ASBE trephine. Note exposure of intact Schneiderian membrane.

healing by increasing blood supply from the lateral and medial wall. Underpreparing the diameter of the osteotomy in relation to the implant is recommended to achieve bone compaction and improve initial fixture stabilization (figure 15).

Case ▶ ❶

A 29 year old non-smoking Asian female with a noncontributory medical history had extraction of tooth #14 three months prior to implant surgery and site #15 edentulism for 5 years. Preoperative radiographs showed 4-6 mm of residual bone height between the ridge crest and the maxillary sinus floor (figure 16). Cross sectional CT revealed no signs of sinusitis, ostium patency, and a thin Schneiderian membrane (figure 17). Coincidentally, the patient also had a very thin gingival biotype. There is no known study correlating gingival biotype with Schneiderian membrane thickness, but through the author's clinical experience it has been observed that patients with a thin gingival biotype tend to have thinner sinus membranes (unless he/she is a smoker). The patient's sinus floor was relatively flat, thus it was expected that the sinus floor could be removed with the bone core after use of ASBE trephine

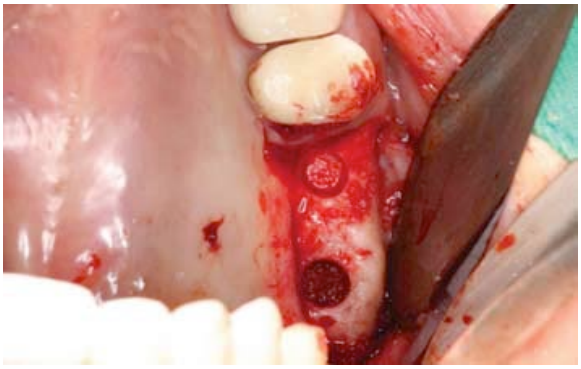

Figure 19: Case 1 vertical condensation of bone into maxillary sinus.

Figure 20: Case 1 lateral condensation of bone into maxillary sinus.

Figure 21: Case 1 closure. Note preservation of buccal keratinized gingiva due to palatal incision design.

(figure 18). Trephine with the Waterless technique was used to remove the crestal bone core. Rotation of the bone core within the trephine is an indication that the sinus floor is broken and no further apical pressure of the trephine is recommended to avoid cutting sinus membrane. Autogenous bone collected from the trephine was made into particulate graft and condensed into the maxillary sinus. After initial elevation of the Schneiderian membrane with the mushroom and cobra elevators, slow bone compaction was accomplished by inserting the condenser no more than initial height of residual bone (figure 19). Next, lateral condensation was achieved by the use of a "sinus spreader" instrument (figure 20). To allow for single stage implant surgery, the Figure 15: Implant insertion into prepared

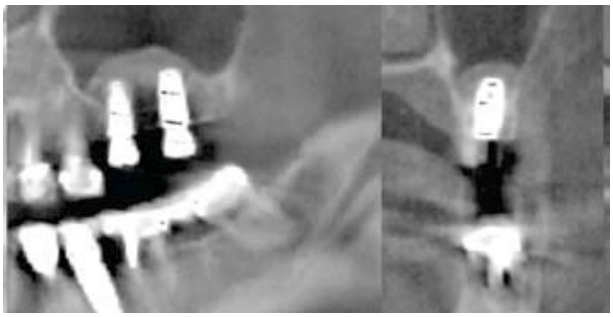

Figure 22: Case 1 postsurgical radiograph and CT image.

maxillary sinus. Figure 16: Case 1 presurgical radiograph of left maxillary sinus. Figure 12: Cobra elevator further elevates Schneiderian membrane and may be used to scrape sinus foor to induce bleeding. Figure 13: Bone graft added to prepared maxillary sinus. Figure 14: Lateral condensation of bone graft into prepared maxillary sinus. Figure 17: Case 1 cross sectional CT images. implant osteotomy was under-prepared in diameter to achieve good initial stability through compaction of porous quality bone during implant placement. A palatal incision design allowed for preservation of keratinized tissue following placement of the healing abutments. (figure 21). Panoramic and CT scans were accomplished after surgery to verify proper grafting of the maxillary sinus without perforation and to note horizontal compaction of bone graft touching the medial and lateral walls (figure 22).

Case ▶ ❷

A 53 year old non-smoking Asian male with a noncontributory medical history presented for implant placement. Preoperative radiographic and CT scan evaluation revealed a patent ostium and no signs of sinusitis. The lowest point of the maxillary sinus floor was located at site #3 with residual bone height of 6.5mm. In

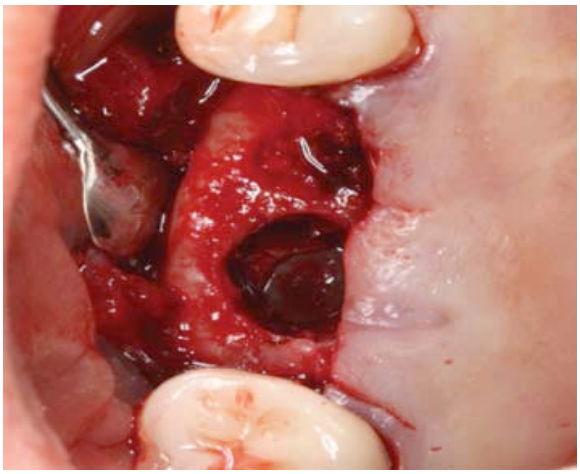

Figure 23: Case 2 maxillary ridge following use of ASBE trephine. Note exposure of intact Schneiderian membrane

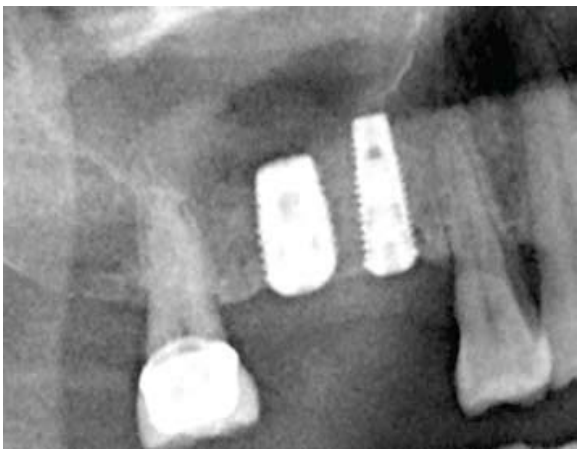

Figure 24: Case 2 postsurgical radiograph.

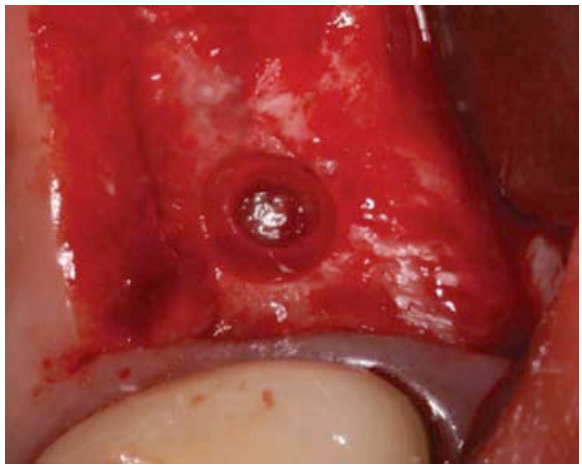

Figure 25: Case 3 maxillary ridge following preparation with specialized self-limiting diamond bur. Note sinus membrane at center of preparation.

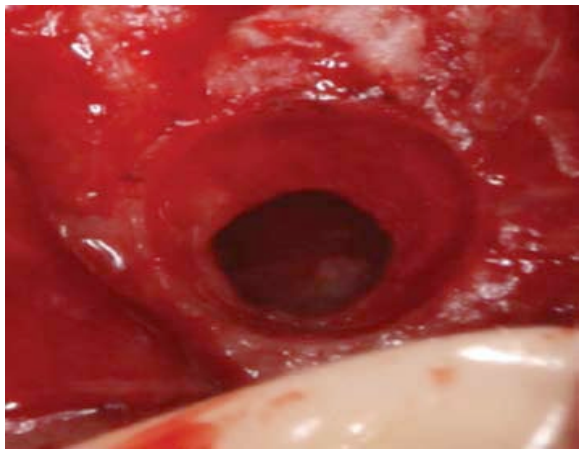

Figure 26: Case 3 membrane elevation with mushroom elevator.

this case, due to the high density of the sinus floor, removal of the trephine core left approximately 1mm of residual bone on the sinus floor. The self-limiting sinus diamond bur was used to safely expose the Schneiderian membrane (figure 23). Next, the Schneiderian membrane was elevated with the aforementioned elevators and bone grafting was achieved using demineralized freeze dried bone allograft (DFDBA) mixed with autogenous bone graft (figure 24).

Case ▶ ❸

A 60 year old Asian patient with a noncontributory medical history and current smoking status presented for

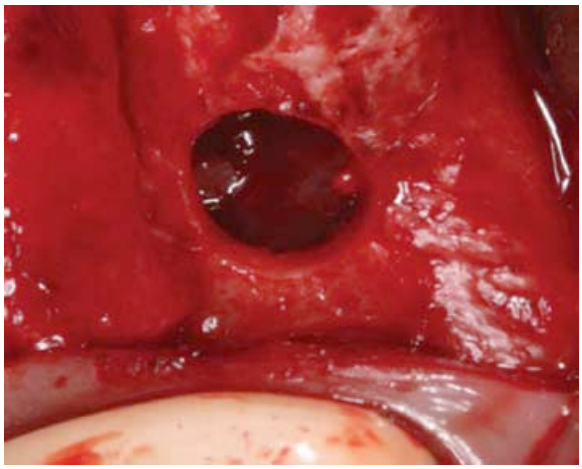

Figure 27: Case 3 crestal osteotomy following ledge removal.

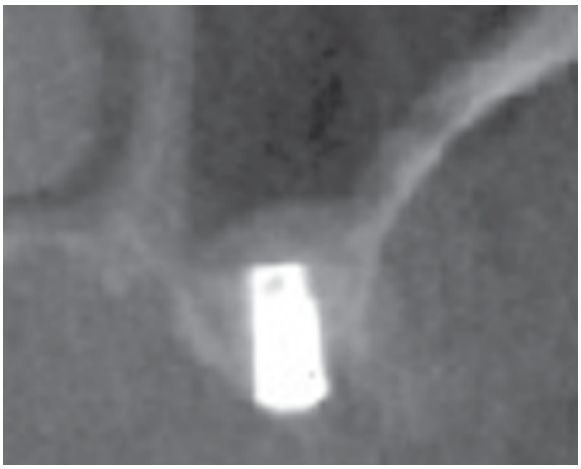

Figure 29: Case 3 cross sectional CT image. Note excellent lateral condensation.

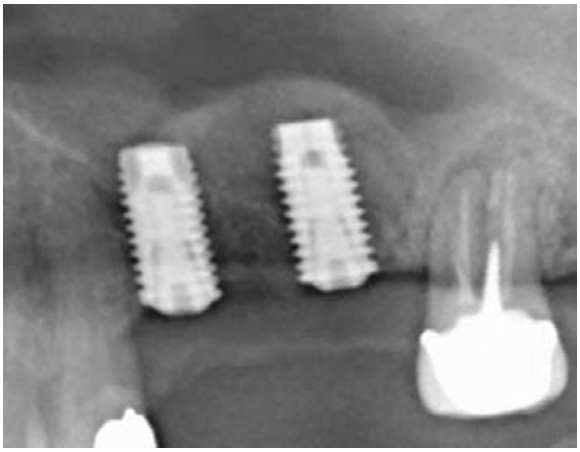

Figure 28: Case 3 post surgical radiograph. Note 12mm elevation at site #14.

Figure 30: Case 4 presurgical radiographic image of left maxillary sinus.

implant treatment. Radiographic and CT scan evaluation revealed residual bone height of only 1.5mm at site #14. As this site was the lowest point of the maxillary sinus in relation to the residual ridge, site #14 was used to lift the Schneiderian membrane and an implant was placed at sites #13 and #14 after grafting. The sinus diamond bur was used to penetrate to the bone directly instead of using trephine bur because the residual bone height was only 1.5mm (figure 25). After visual confirmation of sinus membrane exposure, membrane elevation was accomplished with the Figure 25: Case 3 maxillary ridge following preparation with specialized self-limiting diamond bur. Note sinus

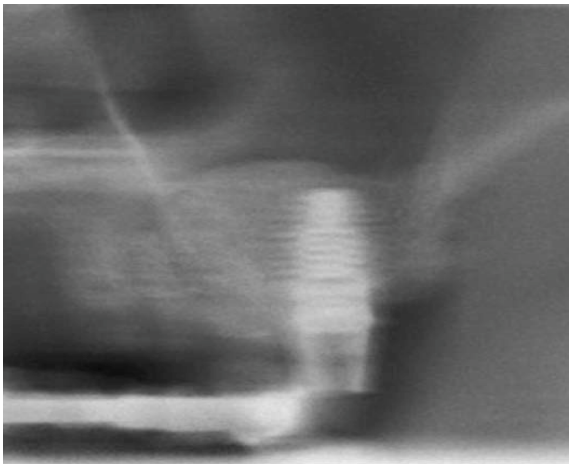

Figure 31: Case 4 cross sectional CT image of initial bone condensation.

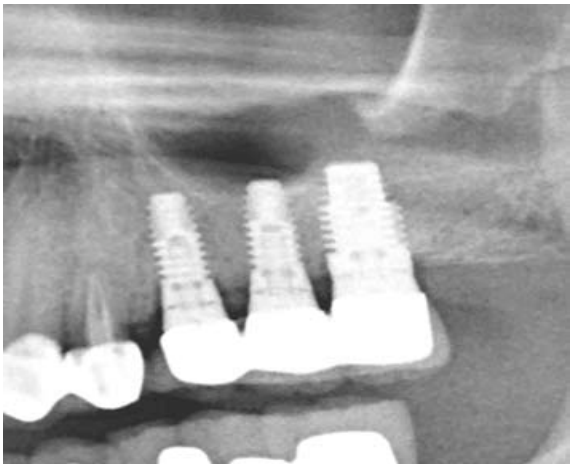

Figure 33: Case 4 two year postsurgical radiograph.

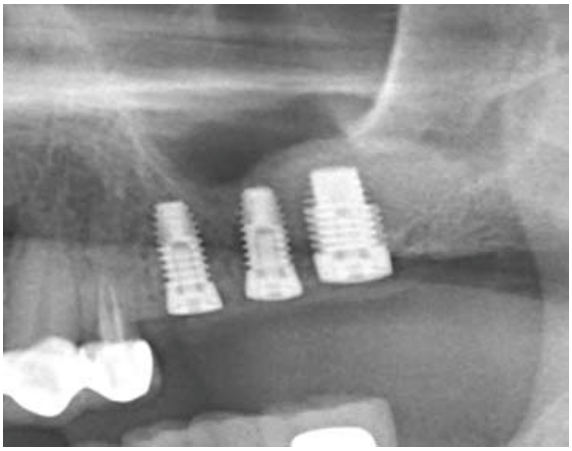

Figure 32: Case 4 radiographic image following additional implant placement.

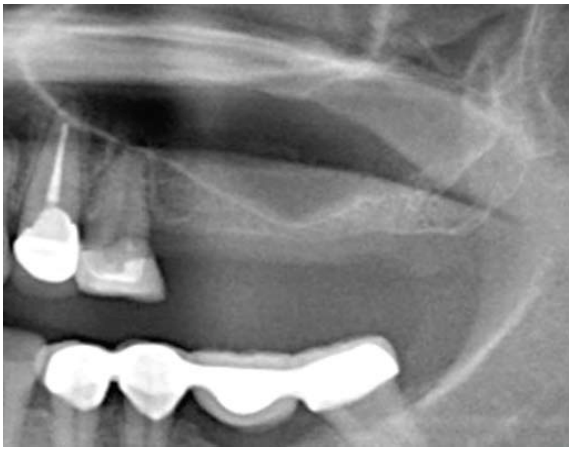

Figure 34: Case 5 presurgical radiographic image of left maxillary sinus.

membrane at center of preparation. mushroom elevator (figure 26). A remaining ledge of bone in the osteotomy was removed with an implant osteotomy drill at low speed using the waterless technique (figure 27). After bony ledge removal, introduction of "cobra elevator" was possible to further elevate the sinus membrane in all directions. Bone was then condensed into the sinus and the implant was inserted, skipping the last drill sequence (4.3 mm diameter drill instead of 4.6 mm drill for 5.1 mm implant). Good primary stabilization of the implant was achieved and a postoperative radiograph revealed adequate sinus augmentation (figure 28). Cross section from a CT scan

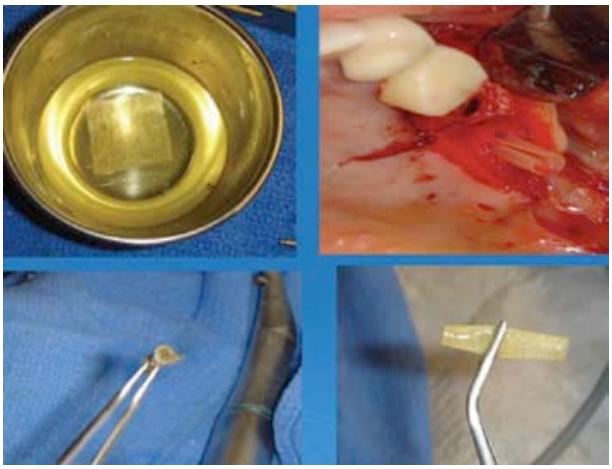

Figure 35: Case 5 membrane insertion into prepared maxillary sinus.

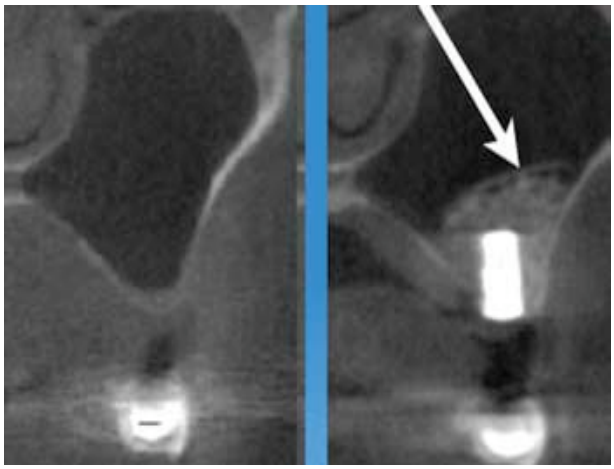

Figure 36: Case 5 postsurgical CT image. Note excellent lateral bone condensation and resorbable membrane (arrow).

showed the medial and lateralwall fully elevated to maximize blood supply to the graft (figure 29). Note the thickness of the Schneiderian membrane on the unelevated lateral and medial walls. Because this patient was a smoker, the membrane is exceptionally thick.

Case ▶ ❹

A 53 year old patient with a non-contributory medical history and current heavy smoking status presented for implant treatment. As was the case with the patient in Case 3 of this series, the patient's smoking history resulted in a Schneiderian membrane that was very thick. Radiographic and CT scans revealed a patent ostium, no signs of sinusitis, and 2mm of residual bone height at site #15 (figure 30). The lowest point of the maxillary sinus (site #15) was used to elevate the Schneiderian membrane. Sinus augmentation was achieved with DFDBA using mostly with lateral condensation rather than vertical condensation (figure 31). Implants were placed at sites #13, #14, and #15 (figure 32).

One mistake that the author made was not overgrafting with DFDBA. It is the author's experience that DFDBA tends to resorb faster and have more shrinkage than other bone graft materials. However, one advantage is that it is not too radiopaque. Therefore, when DFDBA is replaced by host bone, the clinician can have visual confirmation by observing radiopacity from new bone as well and new cortical bone formation on the new sinus floor (figure 33).

Case ▶ ❺

A 39 year old non-smoking Asian patient presented for implant treatment. Radiographic and CT scans revealed a patent ostium, no signs of sinusitis, and a residual bone height only about 2mm at sites #14 and #15 (figure 34). Under preparing the implant osteotomy is crucial in this case to make initial stabilization successful. As discussed above, the crestal window approach is easier if residual bone height is thin as in this case. To avoid bone shrinkage as observed in case 4, the author used a long lasting

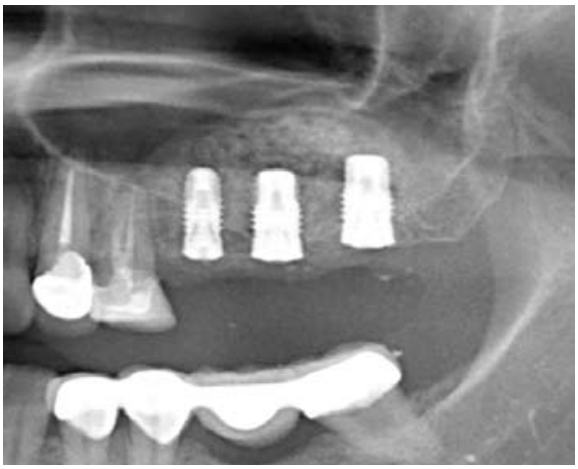

Figure 37: Case 5 post surgical radiograph.

resorbable membrane under the Schneiderian membrane. The crestal window in this case was only 4mm in diameter. Therefore, insertion of the resorbable membrane was achieved by rolling the membrane after soaking in saline with tetracycline (figure 35). Lambone has excellent plasticity, so once inserted into sinus cavity via crestal window it will open and return to its original shape (see arrow in figure 36). Postoperative radiograph evaluation revealed an adequate sinus augmentation housing implants at sites #13-15 (figure 37).

Discussion

The morbidity associated with lateral window sinus augmentation and the "blind" nature of closed sinus lifts necessitated the need for an alternative to these techniques. As shown in the many clinical cases of this series, the "Crestal Window Technique" predictably allows for elevation of the Schneiderian membrane without the morbidity associated with lateral window technique. With proper sinus instrumentation (mushroom, cobra, bone carrier, vertical condenser, lateral condenser) and bony cutting tools (pointed trephine, ASBE trephine, sinusdiamond bur), the crestal window approach is predictable and results in similar outcomes to lateral window techniques in terms of membrane elevation and bone condensing. Indications for the crestal window technique are an edentulous maxillary posterior site with residual native bone height of 1-7mm. It isthe author's experience that elevation of the Schneiderian membrane with the cobra elevator is easiest when there is less residual bone height as this reduces interference of bone on the instrument during membrane elevation. In cases of extremely thin residual bone, the author recommends that the sinus diamond bur be used to penetrate to the bone directly instead of using the trephine. This will reduce the likelihood of Schneiderian membrane laceration. Finally, as a terminal step prior to bone grafting, the author recommends the cobra elevator be used to induce bleeding inside the sinus by scraping the bony floor.

Conclusion

The crestal window technique is an alternative to conventional lateral window and closed maxillary sinus augmentation techniques. This technique requires the use of specialized instrumentation that is unique to the procedure.

Disclosure

* Dr. Samuel Lee is the inventor of, and has a financial interest in, the instrumentation kit described in this article.
** All instrumentation used in this article manufactured by MegaGen Co., LTD

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Let's talk about "Biologic width"

What is biologic width?

Biologic width is a physiologic dimension of soft tissue around natural teeth and implant. It plays an important role as a protective barrier for the underlying bone from being insulted by the oral bacteria. In 1961, Gargiulo [1] did a study to measure the vertical dimension of dentogingival junction around natural teeth. He found that the healthy gingival sulcus is about 0.69 mm, the junctional epithelium is about 0.97 mm and the connective tissue attachment is about 1.07 mm. The combination of junctional epithelium and connective tissue attachment are subsequently called the "biologic width", which is about 2 mm. (Fig 1)

Clinical application

In clinical perspective, biologic width is an unique transition zone and should be respected to ensure the long term health of gingiva tissue. Violation of biologic width can cause the gingival inflammation, pocket formation and possible bone loss. It often seen at the area of restoration or crown margin placed at 2 mm or less to the alveolar bone. Surgical crown lengthening can help to re-build up the biologic width and regain the health of gingiva tissue.

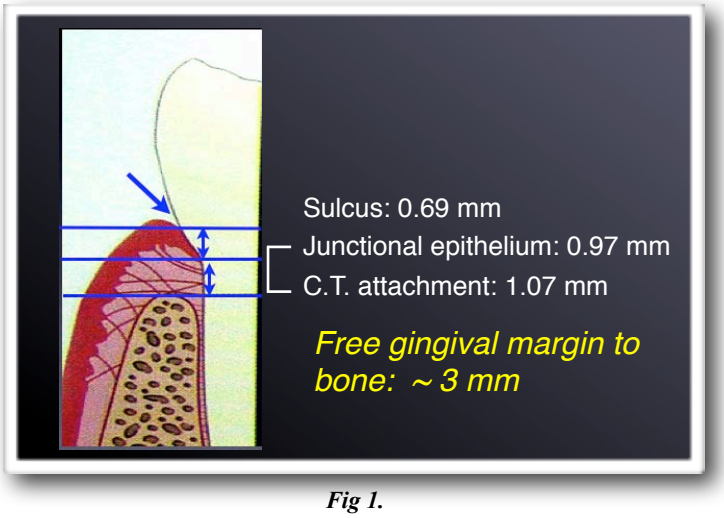

Fig 1.

In orthodontic treatment, we often encounter a situation of short clinical crown and which may need to do some correction for better esthetic outcome. Fig.2 is an upper anterior view of a 22 y/o male patient who just finished orthodontic treatment 2 months before. This patient presented with a congenital missing right lateral incisor, a secondary caris on left lateral incisor, a mild gingival overgrowth between two central incisors and short clinical crown on both canine. The treatment plans include (1) crown lengthening on both canine, (2) gingivoplasty on the papilla between two central incisors (3) implant placement at right lateral incisor, and (4) veneer on the left lateral incisor.

The patient's treatment sequences were as followings: We first made a diagnostic wax-up to determine the final position of the free gingival margin and made a surgical stent accordingly (Fig 3). By using the surgical stent we can outline the final free gingival margin and remove excess tissue (Fig 4). However, after above procedure,we found out that the free gingival margin to the bone is only 2 mm (Fig 5). As we know the biologic width is about 2 mm and by adding the additional 0.69 to 1 mm for the sulcus depth, we need about 3 mm from free gingival margin to alveolar bone to ensue the long term stability of

Dr. Shang-Chen (Grace) Chiu

Beethoven Orthodontic Clinic
Diplomate, American Board of Periodontology

gingiva margin. Therefore, we further removed 1 mm bone (Fig.6). In Fig.6 we can see after ostectomy, the free gingival margin (surgical stent as reference) to alveolar bone is 3 mm. There is one thing important: When we performed the ostectomy, we only removed the bone on the buccal side and half of proximal area. We kept the bone on the palatal side to provide support, more importantly, we kept half of proximal bone to avoid the black triangle.After above procedure, we know the free gingiva margin will stay in the final position. We can have the esthetic outcome and can keep the result for the long term.

In some occasion, even though we kept the 3 mm distance from the free gingival margin to bone, the result of crown lengthening is not satisfying. This is maybe caused by the individual variation of biologic width. In 1994, Vacek et al [2] did a similar study of biologic width as Garguilo. He found that even though the biologic width showed average of 2 mm dimension as Garguilo found, the individual variation could be from 0.75 mm to 4.3 mm. Therefore, to get the specific individual biologic width, we can perform the " bone sounding" (Probing from free gingival margin to bone under anesthesia). After subtracting the sulcus depth, we can get the biologic width for that specific area. When performing this procedure on a couple different healthy gingiva of that person, by average those numbers we can get the specific biologic width for the person and can get more precise treatment.

How is the biologic width of implant?

Implant also has the biologic width, which is similar to the natural tooth (Fig.7) and is composed of junctional epithelium and connective tissue attachment.[3] Abrahamsson et al[4] examined the soft tissue dimension around three different

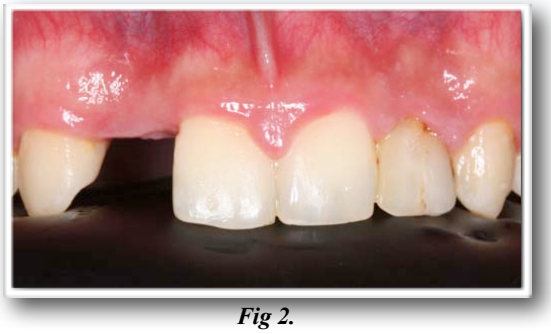

Fig 2.

Fig 3.

Fig 4.

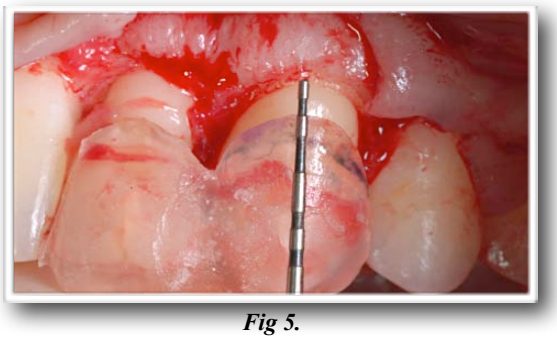

Fig 5.

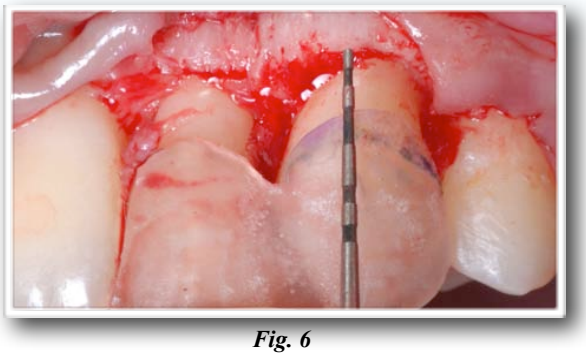

Fig. 6

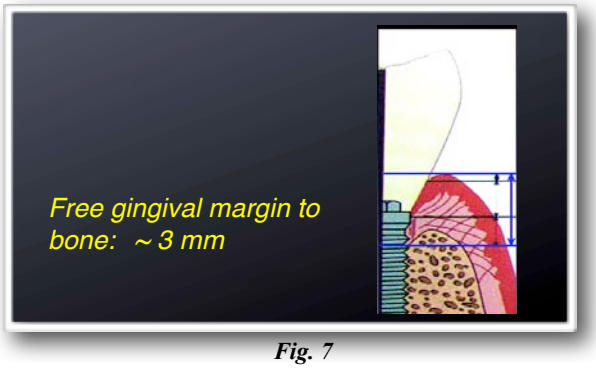

Fig. 7

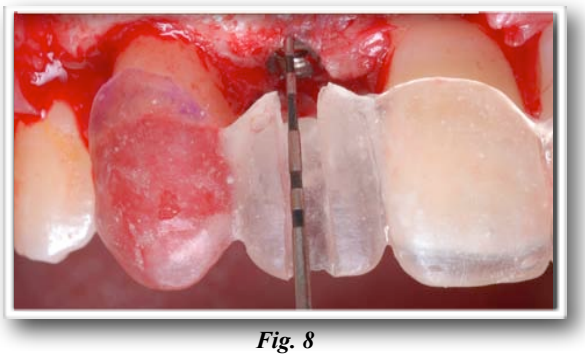

Fig. 8

Fig. 9

implant system. He found that even though there is some variation between the implant system with regards to the soft tissue composition of biologic width, the distance from free gingiva margin to bone is constantly around 3 mm. Berglundh and Lindhe[5] also found that peri-implant mucosa required 3 mm dimension to prevent bone resorption. Applying these concepts, the position of implant platform to the free gingiva margin should be around 3 mm. In Fig.8, we can see by using the surgical stent, we can easily identify the "pre-determined free gingival margin" and place the implant 3 mm from that. Fig.9 is the 2 weeks post-operative view. The healing was uneventful. Now, we are waiting for gingiva becoming stable (about 3 to 6 months) and osseointegration of the implant. Then we will make an veneer for left lateral incisor and finish the crown on right lateral incisor.

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USC UNIVERSITY OF SOUTHERN CALIFORNIA

USC Comprehensive Surgical and Restorative Implant Training Program in Taiwan

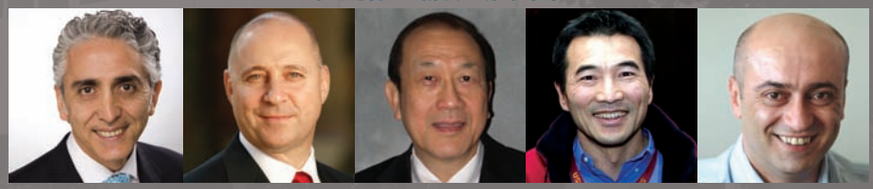
南加大植牙繼續教育訓練課程

2010

時間: 7/10~11, 2010 (六，日 - 演講與實作workshop) • 8/22, 2010 (日 - 視訊教學) • 9/4~5, 2010 (六，日 - 演講與實作workshop) • 10/17, 2010 (日 - 視訊教學) • 11/13~14, 2010 (六，日 - 演講與實作workshop) • 12/19, 2010 (日 - 視訊教學) • 1/25~1/26, 2011 (二，三 - 美國演講) • 1/27, 2011 (四 - 美國可選修的 cadaver workshop) • 1/28~29, 2011 (五，六 - 美國演講，畢業典禮) • 1/30, 2011 (日 - 美國可選修的 cadaver workshop) • 9:00am - 6:00pm

地點: 福華國際文教會館. 台北市新生南路三段30號.
Wilshire Grand Hotel. 930 Wilshire Blvd., Los Angeles, CA 90017.

南加大講員陣容



Homa Zadeh　Avishai Sadan　Baldwin Marchack　Casey Chen　Domenico Cascione

Ilan Rotstein　Yang Chai　Songtao Shi　Parish Sedghizadeh　Ramin Mahallati

演講嘉賓: Stephen Wallace ★ Lyndon Cooper ★ Fernando Rojas-Vizcaya ★ Clark Stanford

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2010 Newton's A Implant Forum

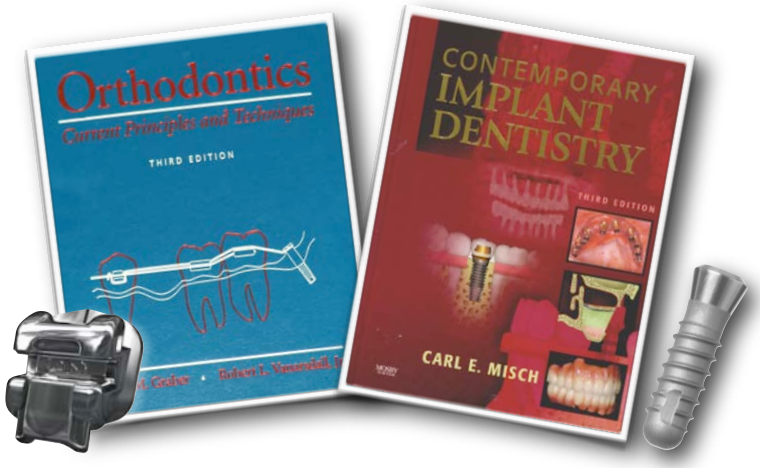
金牛頓植牙論壇

Implant Technique + DDx + Basic Knowledge

- 時間：2010年每月底週五
  早上9:00-12:00
- 地點：金牛頓教育中心
  新竹市建中一路25號2樓
- 費用：18000（一月底前匯款完成）
  20000（原價）
  單次2500元
  費用包含講義、視訊 (iPod or iPhone)
- 匯款帳號：109-25203060-000
  戶名：金牛頓藝術科技股份有限公司
- 報名專線：03-573-5676
  黃思涵小姐

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

金牛頓植牙論壇邀請您一起迎接「協同性整合」的新牙科時代，讓我們從植體與矯正的對話出發，透過整合各科精華，締造集美觀、功能於一身的全方位治療。



透過精讀八篇結合矯正與植牙觀點的經典文章，並運用深入的個案分析討論，讓醫師們能快速掌握植牙與矯正，以達成完美治療的目標。

2010 Implant Forum

	日期 (W5)	Implant Forum 9:00 ~ 10:30				Interdisciplinary Treatment Planning 10:45 ~ 12:00
		臨床導論 主講者 張慧男	臨床祕訣	病例分析	講師	精選文章分析
1	02/26	臨床導論	無菌觀念，手術基本觀念 植體設計與贋復組件介紹		邱上珍	Inter-relationship of Ortho, Perio, Restorative Dentistry
2	03/26	臨床導論	引導骨再生及齒槽骨保存		王肖龍	Fundamental Treatment Planning
3	04/30	特別演講 講師 黃怡豪醫師 / 主持人 張慧男				
4	05/28	臨床導論	植體的矯正考量		黃瓊嫻	Forced Eruption
5	06/25	微創手術操作	植體的軟組織處理		歐亦焜	Ant. Esthetic 1
6	07/23	特別演講 講師 謝尚廷醫師 王國華醫師 / 主持人 張慧男				
7	08/27	臨床導論	前牙美觀區的植體考量		王肖龍	Ant. Esthetic 2
8	09/24	臨床導論	上顎竇升高術		邱上珍	Inter-implant Papilla Consideration Peri-implant Architecture Preservation
9	10/29	特別演講 講師 吳碧礽醫師 / 主持人 張慧男				特別演講 講師 楊家華醫師 / 主持人 張慧男
10	11/26	臨床導論	3DCT應用與手術模板製作		歐亦焜	Save Tooth ! or Ext ?
11	12/31	臨床導論	六個植牙補綴物常見的盲點		方景亮	Establish Occlusal Scheme

實作課程 : 1. 植牙模型操作 2. 微創手術操作 (依學員需求另行安排時段， 費用另計)

植牙論壇主要講師群

歐亦焜，王肖龍，黃瓊嫻，邱上珍 醫師
補綴顧問 : 方景亮 主任

參考書籍

Interdisciplinary Treatment Planning
Contemporary Implant Dentistry 3rd, Misch

特別外賓


吳碧礽醫師


王國華醫師


謝尚廷醫師


楊家華醫師


黃怡豪醫師

Letters from the Damon Progressive Study Club

Dear Sabrina

Just wanted to tell you how much I enjoyed Chris Chang's presentations at the Damon Forum in Scottsdale Arizona and Progressive Study Club in Hawaii. At the Forum he presented to over 1000 orthodontists and their staffs. He was invited to speak on Impacted Cuspids and did a brilliant job. **It was one of the finest presentations I have ever seen.** His manner of teaching should be a format for orthodontic teachers around the world. It was **very clear and precise and amazingly he performs the necessary surgical procedures** himself. **Showing short video clips in his slides made the learning experience so easy**. He focused on maxillary canines in Arizona.

In Hawaii, he spoke to very progressive orthodontists and he focused his lecture on the Mandibular impacted teeth. Again in his wonderful presentation style, he showed video clips and showed precisely how it is done. Wonderful learning experience to say the least. **Impacted teeth are so often mishandled around the world and now we have an exacting formula for treatment**. I appreciate the dedication of the Taiwanese orthodontic teachers and particularly Chris Chang. I hope that Chris can continue to teach worldwide.

Very Sincerely,

Tom

Dr. Chang's creative use of **OrthoBoneScrews** is truly remarkable. Deemed impossible by well published and respected "experts" in our specialty, **his case demonstration of uprighting and recovering a severe horizontally impacted mandibular cuspid was nothing short of miraculous!** We all have much to learn from Dr. Chang, and I eagerly look forward to his future presentations!

Ron Bellohusen DMD, MS

Bellohusen Orthodontics, NY, USA

A Letter from the Visit of the Beethoven Orthodontic Center

給我心中理想牙醫的一封信:

張醫師您好，參觀完你的診所之後，我就準備給你寫一封感謝信，因為我受到很大的啓發。你的矯正課程實在太精彩了！回美之後，每天晚上我都沈醉其中。你的演說深深的吸引著我，同時，我也對您產生了許多的尊敬，一種從心底發出來的佩服，我不善於奉承別人，但是我認為我必須讓你知道你是多麼地值得令人喝彩。

從我進入Dental School的那一天起，我就立志做一位好醫生，“Do No Harm”是我們學校教我的第一件事情，但是有多少的醫師，為了本身的利益或尊嚴，而不顧病人的利益。我一直認為病人找我看病，是因為他們相信我，所以我必須做到值得讓他們信任。在你的診所，聽你對病人做 TREATMENT PLAN 的時候，我就知道你與很多很多的醫師不一樣，你的學術知識和專業理念都是世界一流，很少人可以和你相比，但是，最令我佩服你的，不僅僅是你的知識和專業；而是你完全以病人的利益為出發點去為病人考慮，即使你會因此而浪費很多時間或是損失一些利益，你都願意堅持你的理念，為病人提供最好的治療。醫者仁也，本因該如此，可是現在的社會，又有多少人願意為了別人而犧牲自己的利益呢？你是一位非常稱職的醫師。

當我聆聽你講課的同時，另一股敬佩由衷而生，你生動精彩的演說，非常能夠捉住聽眾的注意力，同時，我也為你喝采，因為你那種不願屈服，而又勇於挑戰”學術權威”的個性，如今有多少人敢說真話？有多少人不怕得罪人？尤其是那種有權威的人，而且又有多少人？可以就理論理，而不是糢糊觀念，任意批評。當然，沒有實力的人，很難做到，可是有能力又肯說真話的人，實在太少。另外，你敏銳的觀察力和不斷求進步的動力，都是你成功的原因，也是值得我們學習的地方。你已經是世界一流的大師了，也有相當的成就，你還願意不斷地創新，學習新的觀念和技術--好還要更好，更是你與一般大師不同的地方。

太多太多的尊敬和佩服，都是出自於我的內心深處，您在AAO的演講，相信已經給你許多的肯定。我雖然是矯正的門外漢，但是，我深信你發表的技術課程和臨床操作的一致性。很感謝您不藏所私，願意把你的經驗和技術分享給大家，台灣太需要像你一樣的大師，一個願意為教育付出，帶領大家進步的耕耘者，再一次的謝謝您！

Johnathon Lee D.D.S.

Cum Laude Art of Dentistry, General Dentistry, LA, USA

A Letter from the Keynote Workshop

Dear. Dr. Chang:

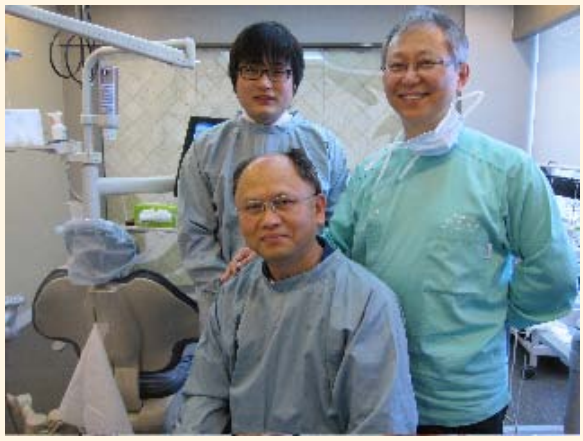
First of all, I was much pleased to spend some time with you during your stay in KOREA. Your lecture gave me a great inspiration to be a leading person in the implant industry. As I mentioned before, I was taught by Dr. Park and he wants me to be a best implant sales person in the world. Of course, my dream is the same as Dr. Park's plan and I hope that I will be a person who contribute enormously to the MegaGen.

For this reason, your seminar for using Mac is very helpful for me because I have lots of chance to do presentations and I have recently recognized that there is a limitation to express my opinion by Power point during a presentation. I heard about that Dr. Park is going to buy a Mac, and after that I'm going to buy a Mac and begin to use Keynote.

Once again, thank you for giving me the great inspiration and remote controller, it was very nice to meet you. I can definitely say that you are my Mentor for Mac. Is it OK to ask you if I have questions during the use of Mac?

Thank you
Best regards,

Jun, Heo



Jun Heo, Dr. Chris Chang, Dr. Park (from left to right)

貝多芬矯正中心見習獎學金辦法

目的：

為促進國內牙科學術教育與牙科實務工作間的學習交流，並鼓勵國內牙醫系所學生在學期間能認識牙科實務操作環境，貝多芬齒顎矯正中心與安徒生兒童牙科特聯合提供本獎學金以及四天觀摩見習的機會。

實習目標：

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

★ 甄選對象：全台灣牙醫系四升五年級學生

★ 名額：每校3-5名

★ 獎助內容：四天三夜五星級飯店住宿以及見習期間餐飲費補助。

★ 遴選方式：學期成績在全班前30%或成績平均在75分以上，且對牙科實務展現積極學習的態度。

★ 見習時間：99年7月29日-8月1日

★ 申請截止日期：99年6月30日

★ 檢覆文件：該學年成績單影本（一份），自傳（請簡述學習經歷及申請目的）。

聯絡人：黃思涵

聯絡方式：03-573-5676
電子郵件：thhuang@newtonsa.com.tw

這是我參加過最不一樣的見習活動。

高醫　吳尚恆

第一次看到這樣一位享譽國內、登上國際舞台的矯正醫師，願意花時間教導我們、提攜我們晚輩；第一次看到一個牙醫診所，沒有刺眼的頭燈、狹小的隔間，而且每位助理都可以一直保持笑容，還稱呼我們「醫師」，甚至願意停下手邊工作，只因為要聆聽我們的問題，讓我備受禮遇、深受感動。這幾天，不管是在金牛頓、安徒生、或貝多芬，我都可以感受到一致的風氣，那就是熱心、開朗、禮節、服務精神。我覺得張醫師以及所有的工作團隊，儼然成為一個大家庭，每個人都帶著貝多芬「集團」特有的氣質與魅力，或許有其老闆，必有其員工吧。

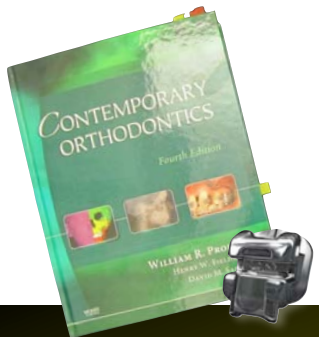
北醫　羅士傑

在整個見習的課程設計上分別安排了臨床見習與高效能簡報兩部分，在見習與簡報課程交錯的進行下使整個課程設計上不會令人感到枯燥乏味，因此也使我們的學習鬥志激昂。在牙醫臨床見習的過程中，經由張醫師活潑的解說方式帶領下，矯正治療變得生動有趣，同時也使我們觀察到一位好的牙醫師是如何與患者進行互動。其中在本次的見習活動中有幸聽到張醫師在AAO的演講原音重現，真是使我感到獲益良多，在簡潔活潑的簡報下很快就吸收了如何將阻生犬齒拉出的機制與方法光是這點就值回票價。還有就是如何利用OBS迷你骨釘當作一個strong　anchor，使矯正治療的時間縮短，同樣也令我感到驚奇。

最後，再一次的感謝張慧男醫師能夠提供這樣的機會使我們獲益良多，並且在此我也鼓勵學弟妹們未來若有機會一定要來參加貝多芬獎學金所舉辦臨床見習活動，相信一定不會讓你們失望的！

2010 貝多芬矯正精修班 Part II

	日期 (W2)	精緻完工技巧 09:00~09:50	精選文章分析 10:00 ~ 10:50	精緻完工病例分析 11:00~11:50
1	05/11 10′	Saturation Training Tip 1	Contemporary Treatment Planning (p.274 ~ 284)	Class I Case
2	06/22 10′	Saturation Training Tip 2	Treatment Planning for Skeletal Problems (p.284 ~ 302)	Class II Case
3	07/13 10′	Saturation Training Tip 3	Skeletal Problems in Older Patients (p.302 ~ 327)	Class III Case
4	08/17 10′	Saturation Training Tip 4	Biologic Basis of Orthodontic Therapy (p.329 ~ 343)	Deep Bite Case
5	09/14 10′	Saturation Training Tip 5	Anchorage and Its Control (p.343 ~ 358)	Open Bite Case
6	10/12 10′	Saturation Training Tip 6	Production of Orthodontic Force (p.359 ~ 372)	Low Angle Case
7	11/16 10′	Saturation Training Tip 7	Design Factors in Orthodontic Appliance (p.373 ~ 382)	High Angle Case
8	12/14 10′	Saturation Training Tip 8	Force Systems (p.383 ~ 394)	Gummy Smile Case
9	01/08 11′	Saturation Training Tip 9	Removable Appliance (p.395 ~ 407)	Impacted Case
10	02/15 11′	Saturation Training Tip 10	Fixed Appliance (I) (p.407 ~ 418)	Adult Complex Case
11	03/22 11′	Saturation Training Tip 11	Fixed Appliance (II) (p.418 ~ 430)	Implant-Ortho Case



課程目標：

協助每位學員了解古典到現代之文獻，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。

- 時間：2010年每月中週二 早上9:00-12:00
- 地點：金牛頓教育中心 新竹市建中一路25號2樓
- 報名專線：02-2778-8315*123 湧傑 劉品囷小姐

創新矯正方程式

隨著牙醫學之專科分工愈精細，牙醫專科醫師愈來愈專精於自己的專長之分科，專精雖可以使病人得到最佳之專科治療，但對於有多重複雜全口復形問題之病患，若光由單一專科醫師之治療又嫌不足，因此近年來逐漸學界發現統合性之各專科互相合作 interdisciplinary treatment 之重要性。針對此類全口性復形之病患，矯正治療又扮演極為重要之角色，為得到最佳之齒列復形，往往空間之分配，病人齒列所引起之外觀變化，為能得到齒列整齊美麗的笑容，往往非配合矯正治療無法盡善盡美。

早期傳統矯正受限於矯正托槽之設計，技術上較困難且難學，目前由於直接式托槽 (straight wire appliances) 及最近蓬勃發展出來的自鎖矯正器之問市，使得齒列矯正之門檻大為降低，但診斷及治療計劃仍是不可忽略之最重要基礎。早期矯正治療中，最困擾的支抗喪失 (anchorage loss) 亦因為近年來矯正植體 (Temporary Anchorage Devices, TADs) 之應用，使得矯正治療比傳統的容易掌控。家庭牙醫師在近代的各科整合治療中扮演核心位置，若能熟知最新矯正兩大利器之應用，可自行做矯正治療，則將是病人之福。

此次演講，筆者除強調基本的齒列矯正之診斷與治療之外，將分享近幾年來享受到器材進步所發展出之自鎖矯正及矯正植體系統上所帶來治療之方便，及如何充份應用這兩大利器於日常所遇到之困難症例。

CREAtive ORTHOdontic FORmula

林錦榮 醫師

林錦榮齒列矯正中心院長
美國馬楷大學齒顎矯正碩士
國防醫學院牙醫學系臨床教授
中華民國齒顎矯正學會第七屆理事長
台北醫學大學齒顎矯正研究所臨床教授

講師 | 內容簡介
Speaker & Lecture Introduction

張慧男 醫師

新竹貝多芬齒顎矯正中心負責人
美國印第安那普渡大學齒顎矯正研究所博士
美國齒顎矯正專科醫師國家考試認證(ABO)

如何發揮 Damon Q 的療效

DamonQ 為矯正史上投入最多研發經費，也是市面上最昂貴的矯正器，如此昂貴，為何還造成上市後供不應求呢？原因可能是：非但最貴，也可能是史上最舒適，且最有效率的矯正系統。如何有效率的使用新的矯正利器 DamonQ 呢？DamonQ 除了外型的舒適設計能讓病患更舒適外，對矯正醫師的臨床操作也更為輕鬆方便。但最大的特色是內建的 Torque，做了大幅度的增與減，原因是為了配合黏著的位置。經三年的討論，Damon System 決定採取 Tom Pitts 的黏著位置：即較接近牙齦部，較接近 Center of Resistance，此位置可大大的增加牙齒移動的控制，及更易達成精緻完工 (Excellent Finishing)。本次演講的目的主要是分析 Torque 的簡易選擇及精確的黏著位置，以達成 Damon Q 的極致效率與高品質的矯正治療過程。

CREAtive ORTHOdontic FORmula

林錦榮 | 張慧男

享譽國際二位重量級矯正宗師 2010年代表作

June 27 2010

演講資訊 Lecture Information

Organizer	高雄醫學大學附設中和紀念醫院牙科部齒顎矯正科
Co-Organizer	湧傑企業股份有限公司
Host	張宏博 醫師
Speaker	林錦榮 | 張慧男 醫師
Topic	Creative Orthodontic Formula
Time	2010.6.27 周日 9:00 - 17:00
Venue	高醫啟川大樓 6F 第一講堂．高雄市三民區自由一路 100 號
Lecture Fee	2010.6.15 前 會員1000元，非會員1500元，學生500元 2010.6.15 後 會員1800元，非會員2500元，學生900元
Certification	參加者給予繼續教育學分
Registration	請先電話報名 (07)5361701 Ms王、(02)27788315 #122 Ms楊 三日內完成劃撥費用，郵政劃撥帳號17471807
Remark	戶名：湧傑企業(股)公司，備註欄註明「2010.6.27 演講」 活動備茶點及午餐，報名未出席者，恕不退還既收款項

演講時刻表 Schedule

0830 - 0900	Registration
0900 - 1030	Why Damon System
1030 - 1100	Coffee break
1100 - 1230	Torque Selection and Excellent Finishing
1230 - 1330	Lunch
1330 - 1500	Class II Treatment
1500 - 1530	Coffee break
1530 - 1630	Class III Treatment
1630 - 1700	Panel Discussion

Summer 10' 課程

類型	課程名稱	內容	開課日期	上課對象
入門推廣	iPhone 3GS 新手上路	iPhone+iTunes	5/8, 6/5（六） 15:00～16:00	樂於嘗試生活科技應用者
入門推廣	iLife系列： 輕鬆剪輯精彩生活影片	iMovie+IDVD	5/15, 6/12（六） 15:00～16:00	樂於嘗試生活科技應用者
入門推廣	認識蘋果世界裡的超好用小軟體	影音轉檔軟體	5/22, 6/19（六） 15:00～16:00	樂於嘗試生活科技應用者
入門推廣	iLife系列： 管理美好生活影像	iPhoto	5/29, 6/26（六） 15:00～16:00	樂於嘗試生活科技應用者
入門推廣	Mac OS X 蘋果電腦新手入門	Mac OS X	5/9, 6/6（日） 15:00～16:00	樂於嘗試生活科技應用者
入門推廣	iWork系列： 簡單上手的多媒體簡報	Keynote	5/16, 6/13（日） 15:00～16:00	樂於嘗試生活科技應用者
入門推廣	iWork系列： 整理表格數據的好幫手	Numbers	5/23, 6/20（日） 15:00～16:00	樂於嘗試生活科技應用者
入門推廣	iWork系列： 製作個人化的印刷品	Pages	5/30, 6/27（日） 15:00～16:00	樂於嘗試生活科技應用者
專業簡報	Keynote簡報法 series 1 簡報聖經	1. 常見簡報謬誤 2. Keynote 入門	7 月 1 日（四） 09:00～17:00	科技人、醫師、 教師、學生
專業簡報	Keynote簡報法 series 2 Kokich的10大演講秘訣	1. 多媒體影像處理 2. 簡報設計	7 月 29 日（四） 09:00～17:00	科技人、醫師、 教師、學生
專業簡報	Keynote簡報法 series 3 How to Wow'em like Steve Jobs?	1. 賈伯斯演講秘訣 2. 簡報設計進階應用	8 月 26 日（四） 09:00～17:00	科技人、醫師、 教師、學生
International	Damon and OBS workshop	1.Damon System 2. OrthoBoneScrew	8/14-16, 12/7-9	International Orthodontists
OBS	OrthoBoneScrew Workshop	OBS lecture Hands-on Workshop	9/17 (五)	矯正醫師

注意事項：上課期間欲租借教學用電腦，酌收維護費200元，可抵用店內消費。
上課地點：金牛頓藝術科技教育中心（交大華廈2樓）新竹市建中一路25號（巴士馬偕醫院下車步行5分鐘）
報名專線：03-5735676 黃小姐　　金牛頓網頁： www.newtonsa.com.tw

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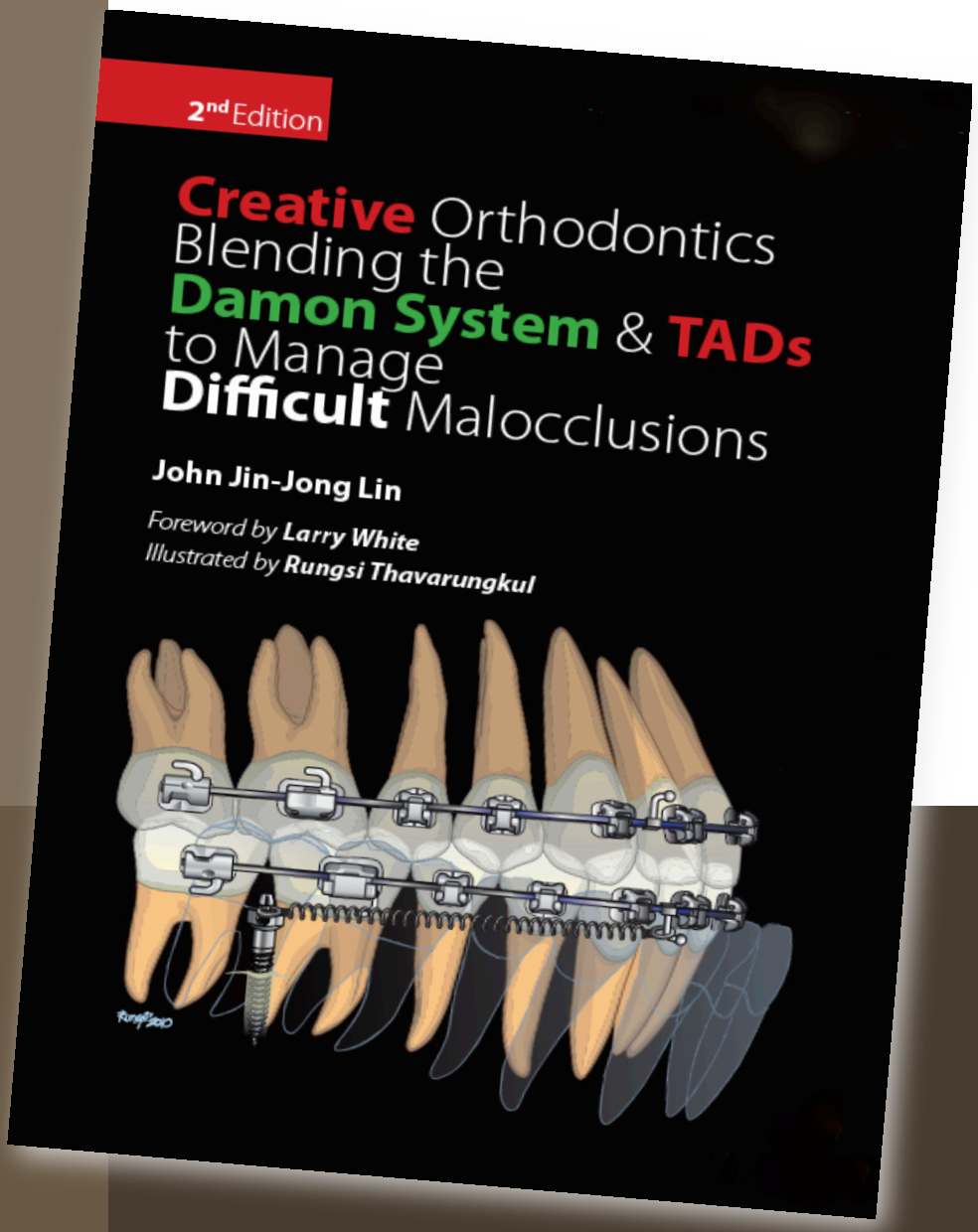
For more information visit http://orthobonescrew.com

“An excellent instructive and reference text for postdoctoral orthodontic students and specialist clinical orthodontists. Definitely recommended reading!”

—Alex Jacobson, associate editor of *AJODO*



Dr. Samuel Lee attended Beethoven Advanced Course on 12.29.2009