中華民國齒顎矯正學會
Taiwan Association of Orthodontists

第五屆受訓醫師大會手冊

The 5th Resident Meeting of Taiwan Association of Orthodontists

時間 DATE

2016 / 12 / 2 五

Dec. 2nd, 2016 (Friday)

地點 VENUE

台北萬豪酒店 5樓 宜華廳

5F, Junior Ballroom, Marriott Hotel

目錄
Contents

教育主委的話

甫自承接學會教育主委職責以來，除了承辦相關業務，也從許多前輩學習到許多，無論為人處事、臨床科學以及學術教育。帶隊前往日本與韓國，見識許多不同文化發展下的科學教育，啟發了許多關於教育的新思維。每次帶隊出去與我們矯正界優秀的新生代談話中，其實我無法給予太多，倒是我學習了更多，最重要的就是重溫那種充滿學習的衝動！讓我再次深刻的瞭解教育的動能，以及其重要性！

關於“教育”，在接任教育主委期間，我思考數回教育的意義，與擔任此職務的職責。乃至於近年來常與同好分享牙科美學的經驗，每一次的分享都讓我自己有不同的體認。關於“美學教育”，我所分享的談不上教育，僅止於分享，美學是很難用教育的形式去傳達的，因為“美學”整合了太多觀念。“教育美學”，因為教學本身就是一門藝術，讓聽者真實感受其授予內容的溫度，獲取真正想要傳達的聲音，進而啟發個體學習的動能，這就是學術發展之所以能持續推動的主因。

去年的受訓醫師大會，結合了國際學術，舉辦第一屆APOS Resident Forum，讓許多國家的醫師見到台灣的矯正學術能量，獲得許多讚揚，背後倚靠的是台中籌備團隊的努力，以及全體齒顎矯正界前輩與後進的共同支持。今年我們即將進入第五屆受訓醫師大會，投稿人數也再次突破以往創下新高。本屆依然邀請了日本與韓國頂尖優秀的受訓醫師一同在學術發表上較勁，令人期待本次各位受訓醫師精彩的學術發表。

最後，非常感謝 劉人文理事長與全體理監事，本屆年會籌備會 鄭信忠會長團隊的支持，與長庚 柯雯青主任團隊的協助，籌備規劃第五屆TAO受訓醫師大會。期待看見新生代在大會學術發表發光發熱的同時，齒顎矯正教育更上一層樓！

陳易駿

教育委員會主委

受訓醫師大會主辦機構感言

齒顎矯正專科醫師訓練，在前輩的努力之下，建立完善良好的制度，讓國內訓練機構能有所依循，學生們能在專業的規範與引導之下，完訓後有能力取得衛福部定專科醫師資格。

受訓醫師大會今年邁入第五年。學會將此學生報告的平台，納入年度會員大會的重要一環，是重視未來人才培育，維持訓練機構品質的動能。此大會歷屆由各訓練機構輪流承辦，內容包括學生的論文報告與競賽，和受訓醫師大會晚宴。由於經費有限，第一屆是台大承辦，在校園內舉行，溫馨簡約氣氛歡樂，才有接下來高雄長庚〔第二屆〕，萬芳〔第三屆〕，中山〔第四屆〕的承接。也感謝學會把活動經費投資在此教育活動上，場地與規格年年提升，讓受訓醫師有個模擬國際會議報告的場域，並且觀摩其他訓練機構的研究與病例特性的機會，是一個相當優質的交流平台。

受訓醫師晚宴，是學生們展現才藝勇敢秀自己的時刻，從中發現不少特殊人才，也認識不一樣的學生，年輕人真是潛力無窮。尤其是近年國際學生會員的參與，讓整個大會與晚宴有新的元素注入，為之亮眼。

今年由長庚體系〔台北、林口，桃園〕承辦第五屆受訓醫師大會，感謝學會的資源投入與教育主委陳易駿醫師的經驗傳授。這次論文投稿踴躍，無法安排所有論文至口頭論文競賽，是最大的遺憾；而研究型的論文不足，這是訓練機構未來應努力的目標。無論是口頭或電子貼示報告，都是受訓醫師用心準備的心血結晶，懇請與會醫師到場給予年輕的一代支持與鼓勵。

敬祝大會順利成功！

柯雯青 醫師
長庚醫院顱顏齒顎矯正科
長庚大學顱顏口腔醫學研究所

受訓醫師大會時間表

2016年12月02日（五） DEC. 02, 2016 (FRI.)		
時間 Time	主題 Topic (English Presentation)	
演講地點 Venue	5F 宜華廳 萬豪酒店 / 5F, Junior Ballroom, Marriott Hotel	
08:00-08:25	報到 Registration	
08:25-08:30	Opening Remarks (宜華廳II) **理事長 劉人文 Eric Liou / 教育主委 陳易駿 Kevin YJ Chen** President of TAO / Chairman of Education Committee, TAO	
08:30-09:15	Special Lecture: Myths and Facts in Japanese Ni-Ti Archwire **小野卓史 Takashi Ono**	
TAO Residents' Oral Presentations Competition in Researches & Case Reports (15 minutes each, including 12 minutes of presentation and 3 minutes of Q&A)		
演講地點 Venue	宜華廳 I / Junior Ballroom I	宜華廳 II / Junior Ballroom II
09:30-09:45	Rutapakon Insawak	高巧宜
09:45-10:00	張嘉予	陳泱錚
10:00-10:15	Hyun-Hee Choo	Seowoo Park
10:15-10:30	Mariko Goto	Song-I Han
10:30-10:45	Misa Ito	Takuya Asami
10:45-11:00	Coffee Break	
11:00-11:15	羅書賢	廖大銘
11:15-11:30	王若懷	楊潔
11:30-11:45	Nuttapong Udomlarptham	錢怡雯
11:45-12:00	Chatuthat Wannalerkngam	尹鉦雅
12:00-13:15	Lunch	
13:15-13:30	蔡騏駿	謝昀庭
13:30-13:45	Piyanan Keardkhong	劉立晨
13:45-14:00	Worraruthai Titiroongruang	Nisa Phothapaeree
14:00-14:15	Sitawan Navasumrit	蘇育瑩
14:15-14:30	Wariya Laothong	張皓文
14:30-14:45	劉姜麟	吳佩儒
14:45-15:00	Coffee Break	
15:00-15:15	張瑋庭	林芷玲
15:15-15:30	Siripatra Patchanee	Supawadee Hasprayoon
15:30-15:45	葉儷人	洪賢晴
15:45-16:00	林詩穎	傅偉誠
16:00-16:30	Special Lecture (宜華廳II) Advices After Venturing Out of Your Orthodontic Training Program 跨出矯正訓練機構的第一步 **顧問 林錦榮 John Jin-Jong Lin** Advisor of TAO	
16:30-17:00	大合照 Group Photo	
18:00-21:00	大直典華5F日出廳 / 5F, Sunrise Ballroom, Denwell Hotel 第五屆受訓醫師大會晚宴 / 5th TAO Residents' Night	

演講者簡介

小野卓史 *Takashi Ono*

Takashi Ono has been Professor and Chairman of the Department of Orthodontic Science, Graduate School Tokyo Medical and Dental University (TMDU), Tokyo, Japan since 2010. He is also Deputy Director of the International Student Exchange, TMDU. From 1991 to 1994, he was a Research Fellow of the Japan Society for the Promotion of Science, and also served as a Visiting Clinical Assistant Professor and Postdoctoral Fellow at the University of British Columbia, Vancouver, Canada. From 2000 to 2001, he studied at the University of Copenhagen, Denmark as a Short-term Fellowship Scholar of Japanese Ministry of Education, Culture, Science & Technology (MEXT) in Japan.

Prof. Takashi Ono works as a Visiting Professor at 3 universities in Japan as well as at an international university. He also serves as an editorial board member for 6 international peer-reviewed journals. Prof. Ono has published 6 book chapters and more than 180 articles related to orthodontics, craniofacial function/dysfunction, sleep-related respiratory disorders, and brain activity. He has been invited for lectures in Korea, China, Vietnam, Thailand, Malaysia, Myanmar, Taiwan, Saudi Arabia, Austria, Denmark, Switzerland, UK, USA, Canada, Brazil, and Australia. He is currently a member of the Executive Committee of the World Federation of Orthodontists (WFO), and has been appointed as Chairman of the 9th International Orthodontic Congress (IOC) 2020 in Yokohama, Japan.

林錦榮 *John Jin-Jong Lin*

- 林錦榮齒列矯正中心
- 美國馬楷大學矯正碩士
- 中華民國齒顎矯正學會理事長（2000~2002）
- 台北醫學大學矯正科臨床教授

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- 中華民國齒顎矯正專科醫師學常務監事
- 前國軍桃園總醫院牙科部主任
- 新竹九歌牙醫診所負責醫師

受訓醫師（研究生）口頭論文競賽Schedule
Oral Presentation (A- RESEARCH & CASE REPORT)

Place: 宜華廳 I / Junior Ballroom I
Chairperson (AM): Dr. 姚宗珍

No.	Time	Name	Topic
A1	09:30-09:45	Rutapakon Insawak	Comparison of Post-Operative Dental Movement in Class III Surgical Correction With and Without Pre-surgical Orthodontic Treatment
A2	09:45-10:00	張嘉予	Effects of Sustained Release of RANKL on the Rate of Orthodontic Tooth Movement
A3	10:00-10:15	Hyun-Hee Choo	The Clinical Application of the Composite Tooth Model Composed of Intra-Oral Scanned Crown and Cone-Beam Computed Tomography Root
A4	10:15-10:30	Mariko Goto	Mechanical Effects of Attachments in Mouthpiece Type of Orthodontic Appliance: Three-Dimensional Finite Element Analysis
A5	10:30-10:45	Misa Ito	TRPV1- and TRPA1-Mediated Spontaneous Pain and TRPV4-Mediated Mechanical Pain in Orthodontic Wire-Induced Oral Mucositis
	10:45-11:00		COFFEE BREAK
A6	11:00-11:15	羅書賢	Surgical Occlusion in Bimaxillary Orthognathic Surgery for Skeletal Class III Deformity
A7	11:15-11:30	王若懷	Three-Dimensional Cephalometric Analysis of Adult Taiwanese with Skeletal Class I Pattern and Balanced Facial Profile
A8	11:30-11:45	Nuttapong Udomlarptham	Comparison of Surgical Outcome in Skeletal Class III Asymmetry Correction: 3D Simulation vs. 2D Traditional Planning
A9	11:45-12:00	Chatuthat Wannalerkngam	Changes of Soft Tissue after Bimaxillary Surgery in Patient with Skeletal Class III Malocclusion: A Systematic Review
	12:00-13:15		LUNCH

Chairperson (PM): Dr. 高嘉澤

No.	Time	Name	Topic
A10	13:15-13:30	蔡騏駿	Treatment for Impacted Canine in a Case of Canine Incisor Overlapping
A11	13:30-13:45	Piyanan Keardkhong	Three-Dimensional Evaluation of Soft Tissue Changes in the Maxillofacial Region after Bimaxillary Orthognathic Surgery in Skeletal Class III Deformity
A12	13:45-14:00	Worraruthai Titiroongruang	Displacement of Proximal Segment after Sagittal Split Osteotomy for Asymmetric Class III Deformity
A13	14:00-14:15	Sitawan Navasumrit	Skeletal Stability of Maxillomandibular Advancement for Treatment of Obstructive Sleep Apnea
A14	14:15-14:30	Wariya Laothong	Cross-Cultural Comparison of the Orthodontics Patients' Treatment Motivation in Two Countries: A Pilot Study
	14:30-14:45		COFFEE BREAK
A15	14:45-15:00	劉姜麟	The Impact of Occlusal Loads on Orthodontic Tooth Movement: A Case Report
A16	15:00-15:15	張瑋庭	Treatment of Class III Malocclusion with Missing Teeth by Orthognathic Surgery
A17	15:15-15:30	Siripatra Patchanee	Definitive Surgical-Orthodontic Treatment to Correct the Problems Subsequent to Early Skeletal Class III Camouflage: A Case Report
A18	15:30-15:45	葉儷人	Orthodontic-Surgical Treatment of Class III Malocclusion with Facial Asymmetry: A Case Report
A19	15:45-16:00	林詩穎	Virtual Surgical Planning for Skeletal Class III with Facial Asymmetry

Oral Presentation (B- CASE REPORT)

Place: 宜華廳 II / Junior Ballroom II
Chairperson (AM): Dr. 曾于娟

No.	Time	Name	Topic
B1	09:30-09:45	高巧宜	A Case Report: Orthodontic Treatment of Post-Traumatic Area by Tooth Replacement for Esthetic Area Rehabilitation
B2	09:45-10:00	陳泱錚	Bilateral Impacted Canine Caused Severe Roots Resorption on Central Incisors
B3	10:00-10:15	Seowoo Park	Orthodontic Aid for Successful Tooth Autotransplantation in Adult Patients
B4	10:15-10:30	Song-I Han	Autotransplantation of Palatally Impacted Maxillary Canines
B5	10:30-10:45	Takuya Asami	Surgical Orthodontic Treatment of High-Angle Class II Malocclusion
	10:45-11:00		COFFEE BREAK
B6	11:00-11:15	廖大銘	Correction of Canine-Premolar Transposition: A Case Report
B7	11:15-11:30	楊潔	Orthodontic Treatment of Class I Malocclusion with Severe Crowding and Canine Transposition
B8	11:30-11:45	錢怡雯	Orthodontic Treatment of Class I Bimaxillary Dentoalveolar Protrusion: A Case Report
B9	11:45-12:00	尹鉦雅	Class I Malocclusion High Angle Anterior Openbite with Condylar Head Resorption: A Case Report
	12:00-13:15		LUNCH

Chairperson (PM): Dr. 王郁智

No.	Time	Name	Topic
B10	13:45-14:00	謝昀庭	Modify Intrusive Arch Wire Mechanism for Class II Division 2 Malocclusion Patient-- A Long-Term Follow-up Case Report
B11	13:30-13:45	劉立晨	Surgical-Orthodontic Correction of Skeletal Class II Anterior Open Bite Malocclusion in Patient with Temporomandibular Joint Disorders: A Case Report
B12	13:45-14:00	Nisa Phothapaeree	A Class III Anterior Open-Bite Adult Patient Treated with Anterior Teeth Extrusion and Platelet Rich Plasma
B13	14:00-14:15	蘇育瑩	Adult Class III Malocclusion Combined Bilateral Mandibular First Molars Missing Treated with Maxillary Temporary Anchorage Devices (TADs)
B14	14:15-14:30	張皓文	Upper Molar Intrusion and Lower Third Molar Uprighting - A Case Report
	14:30-14:45		COFFEE BREAK
B15	14:45-15:00	吳佩儒	Using Distraction Osteogenesis to Correct Maxilla Retrognathism in Cleft Palate Patient with Multiple Missing Teeth
B16	15:00-15:15	林芷玲	Residual Asymmetry after Unilateral Reconstruction of the Temporomandibular Joint and Bimaxillary Orthognathic Surgery in a Nongrowing Patient with Hemifacial Microsomia
B17	15:15-15:30	Supawadee Hasprayoon	Orthodontic Treatment Combined with Orthognathic Surgery Correction in Skeletal Class I Hypodivergent Type with Dental Class II Division 2 Malocclusion: A Case Report
B18	15:30-15:45	洪賢晴	Orthodontic Treatment with Forsus Devices to Correct a Class II Division 2 Malocclusion with Missing Four Premolars
B19	15:45-16:00	傅偉誠	Comprehensive Treatment of a Patient with Deep Bite, Occlusal Plane Canting and Bilateral Posterior Buccal Cross Bite

NO. 01

Comparison of Post-Operative Dental Movement in Class III Surgical Correction with and without Pre-Surgical Orthodontic Treatment

Rutapakon Insawak[1,2*], Ellen Wen-Ching Ko[1,2]
[1]Graduate Institute of Craniofacial and Oral Science, Chang Gung University, Taoyuan, Taiwan
[2]Department of Craniofacial Orthodontics, Chang Gung Memorial Hospital, Taipei, Taiwan

Purpose: To investigate dental movement in postoperative orthodontic phase between orthodontic first approach and surgery first approach.

Patients and Methods: The study includes 40 Taiwanese adult patients with skeletal Class III who had 2-jaw orthognathic surgeries (OGS) to skeletal Class III malocclusion correction in CGMH. 20 patients with presurgical orthodontics were in the orthodontics-first group (OF) and 20 patients without presurgical orthodontics were in surgery-first group (SF). 3D regional superimposition and measurements of dental change in maxilla and mandible segment were acquired at 3 timing; before OGS (T1), 1 month after OGS (T2), and at completion of treatment (T3).

Result: In post-operative and overall treatment, there were no between-group significant difference of dental change except vertical change in upper right maxillary first molar (U6R), lower first and mandibular molar (L6R , L6L, L7L, L7R) to FH. However, the dental parameters demonstrated a similar trend in both group. In SF group, upper and lower molar showed mild extrusion after surgery (T2) and further extrusion until T3. Lower incisor (L1R, L1L) to COP showed mild protraction due to proclination after surgery. In OF group, the molar showed mild extrusion at T3. Lower incisor showed protraction after surgery but returned to normal within limit at T3. In transverse plane, intercanine and intermolar distance showed larger in OF group than SF group after surgery, but no significant difference at complete treatment.

Conclusion: The surgery-first approach had significant effect on vertical change in posterior teeth. However, the magnitude and trend of post-operative dental change were similar whether receiving presurgical orthodontics or not.

NO. 02

Effects of Sustained Release of RANKL on the Rate of Orthodontic Tooth Movement

Joy Chang*, Sumit Yadav, Sangamesh Kumbar, Ravindra Nanda
University of Connecticut

Objectives: Orthodontic tooth movement (OTM) typically requires 18-36 months of treatment, which may lead to detrimental outcomes like white spot lesions, caries, root resorption, or patient burnout. Current methods to accelerate treatment include minimally invasive techniques, which are not shown to be effective, and invasive techniques, which only have transient effects. OTM is a biological process dependent on bone modeling, and RANKL regulates osteoclast differentiation and activation. Previous studies have shown that increased levels of RANKL resulted in increased OTM. We hypothesize a sustained and optimal dose of exogenous RANKL through injectable particulate formulations will continuously accelerate bone modeling and OTM as compared to control.

Materials and Methods: Polylactic acid-co-glycolic acid (PLGA) is used to prepare 250-425μm-sized porous microparticles, on which RANKL is adsorbed. Microparticles will be characterized for morphology with scanning electron microscopy, and for release behavior in phosphate buffer saline (pH 7.4). RANKL activity will be tested with tartrate-resistant acid phosphatase staining after incubating microparticle releasates with mice osteoclast precursor cells (RAW 264.7). The efficacy *in vivo* will be evaluated in Wistar rats for 14 days. The microparticles are injected in an osteoperforation on the mesial of both maxillary first molars in the experimental group, and placebo microparticles would be injected in the control. OTM is accomplished with a NiTi closed coil spring applying 10 g of force. The outcome measure, or distance of tooth movement determined by microCT, will allow us to quantify if an exogenous source of RANKL results in accelerated OTM.

Results and Discussion: PLGA microparticles show a porous surface morphology and are 250-425μm in diameter. They show a burst release of 60% within the first hour, a subsequent linear release of 10-30μg/mL over 14-28 days. The incubation of the RANKL releasates with RAW 264.7 osteoclast precursor cells shows an increase in the number of TRAP-positive osteoclast cells in vitro, corresponding to an increase in the rate of tooth movement *in vivo*.

NO. 03

The Clinical Application of the Composite Tooth Model Composed of Intra-Oral Scanned Crown and Cone-Beam Computed Tomography Root

Hyun-Hee Choo*, Min-Hee Oh, Kyung-Min Lee, Jin-Hyoung Cho
Chonnam National University
Korean Association of Orthodontics

Objective: Orthodontists want to know accurate tooth position, especially root position, in many situation before, during, or after orthodontic treatment. Usually, evaluation of the root position has been performed using panoramic radiographs. Many studies, however, have shown that panoramic radiographs contain distortions because of non-orthogonal beams directed at the target teeth. Therefore, a demand for developing a new and accurate method for visualizing the position and angulation of roots has been raised.

Case: Cone-beam computed tomography (CBCT) can depict the root position and angulation in real and 3-dimensionally. So, clinician can evaluate roots position accurately whenever they obtain the CBCT scan. However, there are some limitation for CBCT scan such as hazardous effect of radiation, costs, and ethics. A new method has been proposed that evaluates a 3-dimensional tooth movement without CBCT scans during orthodontic treatment. The technique uses the *Composite Tooth Model* fabricated from the initial CBCT scan and intra-oral scanned crown. When an evaluation of root position during orthodontic treatment is needed, patient's dentition is scanned using an intra-oral scanner. And then, composite tooth models are registered individually using a 3D image program, one by one, to the intra-oral scanned dentition image. If clinicians use the fabricated *Composite Tooth Model*, they can visualize root position 3-dimensionally anytime with intra-oral scanning only, without any radiographic burden to the patient.

Discussion and summary: This presentation will show that the Composite Tooth Model is simple, accurate, and reliable method for evaluating root position during orthodontic treatment.

NO. 04

Mechanical Effects of Attachments in Mouthpiece Type of Orthodontic Appliance: Three-Dimensional Finite Element Analysis

Mariko Goto[1*], Wakana Yanagisawa[1], Norio Inou[2], Kotaro Maki[1]

[1]Department of Orthodontics, School of Dentistry, Showa University, 2-1-1 Kitasenzoku, Outa-ku, Tokyo 145-8515, Japan.

[2]Department of Mechanical Engineering School of Engineering, Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Tokyo 152-8552, Japan

Objective: Thermoplastic aligner appliances such as Invisalign® (Align Technology, Santa Clara, Calif.) have recently become widely used. However, the aligner treatment occasionally causes unexpected tooth movement called “bowing effect”. In extraction cases, molars tend to tip towards the extracted area. To cope with this problem, the use of small supplementary attachments is recommended although the effects have not yet been elucidated. In this study, we evaluated the mechanical effects of the attachments by finite element analysis.

Materials and Methods: To perform the computational analysis, we constructed a two-teeth finite element model, canine and second premolar including periodontal ligament (PDL). Vertical rectangular attachments (length, width, height is 4×1×1mm) were added to the center of the crown labial surfaces. We also provided an aligner appliances with both ends had connecting parts to neighbor teeth. Four materials were considered in this study including, teeth, attachments, aligner and PDL. We simulated the mechanical behavior of the model as follows. Firstly, we provided an aligner appliance of the same size for the two-teeth model, and then fit the aligner to the model. Then, compulsory displacement was applied to the outer surface of PDL at the second premolar side by 0.25mm distal movement, which causes an attracting force between the teeth. We performed stress analysis including contact state of the model by non-linear finite elements analysis software, Marc®. The orthodontic force and the created moment under the stable condition were also calculated from the analytical result.

Results and Discussion: The computational results showed that the attachment changed the effect of orthodontic force and the created moment by about -10 to 30% depending on the attachment conditions on each tooth. We also evaluated the ratio of tipping moment to tensile force, which is supposed to be an indication of the controllability of orthodontic force. The ratio decreased by about 4~20%, which is smaller than that of the non-attachment model.

Conclusion: We investigated the effect of supplementary attachments in aligner treatments by finite element analysis considering the contact state of the aligner to the teeth. The existence of attachments contributes to regulate effectiveness of the applied orthodontic force.

NO. 05

TRPV1- and TRPA1-Mediated Spontaneous Pain and TRPV4-Mediated Mechanical Pain in Orthodontic Wire-Induced Oral Mucositis

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Objective: In orthodontic patients, oral mucosal injury is frequently induced by metal apparatus and associated pain leads to poor quality of life and decreases cooperation for the therapy. To reveal pain mechanism of the orthodontic mucosal injury, we investigated patho-physiological status and nociceptive behaviors in a newly-developed orthodontic wire-induced oral mucositis model of rats.

Materials and Methods: Under pentobarbital anesthesia, 8 week-old Wistar rats were installed with an arched orthodontic thick wire of 10 mm length between inferior incisors, soldered to a ligature wire. The sharp tip of the thick wire directly touched the labial fornix region of the oral mucosa. As control, a shorter thick wire (4 mm) was installed similarly without any contacts of the tip on the oral mucosa. Next day (day 1), the wire was removed. Using our recently-developed assay system for intraoral pain in conscious rats, spontaneous pain and mechanical pain were evaluated from spontaneous mouth rubbing time and head-withdrawal threshold to mechanical stimulation to the mucosal area, respectively.

Results and Discussion: The orthodontic wire-touched area demonstrated severe ulcerative mucositis with an abscess. After removing the wire on day 1, ulceration was quickly cured on day 2 while abscess was remained over day 3. Prostaglandin E2 was up-regulated in the mucositis area on only day 1, together with cyclooxygenase-2. In the newly-developed model, spontaneous and mechanical pain were caused on day 1 only and until day 3, respectively, and not suppressed by pretreatment of antibacterial drugs. Spontaneous pain was sensitive to the cyclooxygenase inhibitor indomethacin, the TRPV1 and TRPA1 antagonists SB-366791 and HC-030031, respectively. In contrast, mechanical pain was resistant to these drugs, but sensitive to the TRPV4 antagonist RN1734.

Conclusions: These results demonstrate TRPV1/TRPA1-mediated spontaneous pain and TRPV4-mediated mechanical pain in wire-induced oral mucositis, largely differed from those of previously-reported oral mucositis models using acetic acid. The patho-physiological pain mechanism suggests effective analgesic approaches for orthodontic patients.

NO. 06

Surgical Occlusion in Bimaxillary Orthognathic Surgery for Skeletal Class III Deformity

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Objective: Surgical occlusion is the postoperative occlusion which is set up before orthognathic surgery. This study was to identify the difference of surgical occlusion between orthodontics-first approach and surgery-first approach in bimaxillary orthognathic surgery for skeletal Class III deformity.

Materials and Methods: Sixty skeletal Class III patients who were consecutively corrected by Le Fort I osteotomy and bilateral sagittal split osteotomy were included and categorized into two groups depending on different surgical approaches, orthodontics-first approach and surgery-first approach. Study models before orthognathic surgery were set up, scanned and measured to evaluate the surgical occlusion in three-dimensional images including contact distribution and contact amount. The relation between surgical occlusion and overbite was also evaluated.

Results and Discussion: There were no significant differences in surgical occlusion between orthodontics-first approach and surgery-first approach. Majority of surgical occlusion had contact on 3 segments in both groups. In average, there was occlusal contact on 6 teeth (2 on anterior teeth, 2 on premolars, and 2 on molars). The more the segment contact or tooth contact, the larger the contact area. There was also no difference in surgical occlusion between open bite and overbite cases.

Conclusion: The surgical occlusion was similar between orthodontics-first approach and surgery-first approach in bimaxillay orthognathic surgery for skeletal Class III deformity.

NO. 07

Three-Dimensional Cephalometric Analysis of Adult Taiwanese with Skeletal Class I Pattern and Balanced Facial Profile

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Objective: The objectives of this study were to create a normative database of 3D cephalometric measurements for adult Taiwanese to understand the specific features of Taiwanese face, as well as to apply the data for 3-dimentional orthognathic surgical planning for patients with maxillofacial deformity.

Materials and Methods: A cross-sectional study was conducted on 30 male and 30 female adults (27.23±4.86 years old) with balanced facial profile, skeletal class I pattern, and normal occlusion. Cone-beam computed tomography was performed on all subjects. After standard orienta-tion of the 3D virtual models were done, forty landmarks were digitized on the 3D-rendered views, and 18 angular and 33 linear commonly used measurements were rec-orded for skeletal analysis.

Results: The 3D cephalometric norms showed significant differences between males and females in the maxilla and midface width, the mandibular length and transverse dimension, and some overall facial height measurements ($p<.01$). The angular and ratio measurements of 3D norms can be the reference value when planning the 3D orthognathic surgical simulation. The 3D cephalometric norms generated in this study were comparable with those reported in the literature for different ethnic groups.

Conclusions: This is the first database of 3D cephalometric norms based on the CBCT of adult Tai-wanese. This can be a useful reference for assessment of facial deformity and orthog-nathic surgical planning in 3 dimensions.

NO. 08

Comparison of Surgical Outcome in Skeletal Class III Asymmetry Correction: 3D Simulation vs. 2D Traditional Planning

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Objective: To assess the dento-skeletal changes and achievement of symmetry of 2-jaw surgery in patients with skeletal Class III facial asymmetry, compare the outcomes between 2D traditional planning and 3D simulation.

Materials and Methods: Thirty-seven Taiwanese adult patients with skeletal Class III and mandibular deviation greater than 4 mm who had 2-jaw orthognathic surgeries in CGMH were included in the present study. 3D cephalometric and 2D cephalometric measurements of postero-anterior and lateral cephalogram were obtained at 2 timing (before and after surgery) to evaluate symmetrical achievement and surgical result between each group.

Results: No significant difference of surgical outcome between 3D planning group and 2D planning group except gonion in the non-deviated side to midsagittal plane (MSP), upper first molar in the non-deviated side to FH plane, roll and yaw angle. In the 2D planning group, both the 3D cephalometric and 2D PA cephalometric analysis show significant difference in bilateral gonion position between deviated side and non-deviated side. However, no significant difference in bilateral gonion position between deviated side and non-deviated side in the 3D planning group.

Conclusions: With digital planning all necessary records are provided all the patient's data into a 3D image and can be used as a reliable tool to correct facial asymmetry. 3D simulation planning has the potential to improve the surgical outcome and increase predictability of the surgical result especially the symmetry in bilateral gonion position.

NO. 09

Changes of Soft Tissue after Bimaxillary Surgery in Patient with Skeletal Class III Malocclusion: A Systematic Review

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Objective: Systematic review was carried out to evaluate the soft tissue change after orthognathic correction of skeletal Class III malocclusion.

Materials and Methods: A survey of Scopus, PubMed, Web of Science and Science-direct databases was performed from January 1990 to August 2016. The search identified 16 articles. Studies were included if they involved patients with skeletal Class III who received bimaxillary surgery, measure on soft tissue at least 6 months after surgery, retrospective study or above, and published in English. Exclusion criteria included orthognathic studies with facial asymmetry, facial syndromic patients, cases with complementary segmental osteotomies and distraction osteogenesis. This systematic review excluded articles without adequate literature reviews, or inclusion of data from animal, cadaveric, and experimental studies or case report.

Results: The quality of 11 articles were determined medium, and 5 articles were determined low. From this review could be revealed that nasolabial angle increased with 3.39° in average from 4 articles and decrease with -1.41° in average from 2 articles, upper lip length (Sn-Stms) increased 0.86 – 2.27 mm (1.57 mm in average) from 5 articles, lower lip length (Stmi-Me') decreased 2.14 – 5.46 mm (3.8 mm in average) from 2 articles, upper lip (UL–Nv) moved forward 1.71 – 3.1 mm (2.41 mm in average) from 3 articles, and lower lip (LL-Nv) moved backward 2.8 – 4.16 mm (3.48 mm in average) from 2 articles. The point movements showed Stomion Superius (Stms), left Chelion (Ch-L), and right Chelion (Ch-R) moved backward and downward. There are horizontal movement of the soft tissue and hard tissue correlation between UL-U1 (71%), LL-L1 (79%) from 2 articles and Pog'-Pog (80%) from 3 articles. In vertical movement show correlated between LL-L1 (71%), and Pog'-Pog (84%) from 2 articles.

Conclusions: Soft tissue change varied greatly in literature according to difference between human races and references line. In general, upper lip length is increased and lower lip length is decreased after orthognathic surgery. The ration of soft tissue and hard tissue varied from 71% at U1, 79% at L1 and 80% at Pog.

NO. 10

Treatment for Impacted Canine in a Case of Canine Incisor Overlapping

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Objective: Canine impaction is a common chief complaint in orthodontic treatment. Many adolescents, especially in Asian, have narrow dental arch with crowded teeth, and there is no room for normal eruption of canine. The 13-year-old boy, in this case report, has a protrusive profile and an impacted canine with incisor overlapping. The etiology of canine impaction and prognostic factors are discussed in this article along with different methods in treating such impacted canine.

Case: A 13-year-old boy with impacted left maxillary permanent canine, Angle class I molar relationship with bimaxillary protrusion and protrusive profile was found in clinical evaluation. Intra-orally, retained left maxillary primary canine and proclined left permanent lateral incisor were noted. Under cone beam computer tomography examination, the left permanent maxillary canine was impacted and lying over the buccal root surface of left permanent lateral incisor under the gingiva. Therefore, the treatment objectives are profile improvement through extraction of four permanent first premolars, and regain of adequate space for traction of the impacted canine. When considering to bring impacted permanent canine into the occlusion, there must be no ankylosis on the impacted canine. An opened-eruption method was used in this case, followed by a segmented approach with cantilever arm to bring the impacted canine into the occlusion. The out-coming result is satisfied with a good canine guidance, nevertheless, we could achieve a better volume of keratinized gingiva if a closed-eruption method is used at the beginning of canine traction.

Discussion and summary: Second to lower third molar, permanent maxillary canine is the most frequently impacted tooth. Since maxillary canine acts as a corner stone of the dental arch and provides canine guidance and lip support, it plays an important role in orthodontic treatment. The etiology of the ectopic canine is multifactorial. Because of the long path of eruption (22 mm with a late buccal movement) before emergence of maxillary permanent canine, most of the impacted canines were palatally located (85%). Only 15% of impacted canine located labially, and most of the impacted reasons are tooth size-arch length discrepancy. In Taiwan, lots of children have narrow dental arch with crowded teeth, there is no room for normal eruption of canine. In the consequence, the canine is usually impacted due to its late eruption time.

According to McSherry and Pitt, there are four prognostic factors that act as an index to estimate treatment difficulty, in order to determinate the suitable management of canine impaction. These prognostic factors include: 1) overlap of incisor; 2) vertical height of canine; 3) angulation of canine; and 4) position of canine apex. There are several management of labially impacted canine, including: 1) Extraction of the deciduous teeth and follow up for the emergency of permanent canine; 2) Surgical removal of the impacted canine with poor prognosis; 3) Surgical exposure by opened-eruption method and orthodontic alignment; 4) Surgical exposure by closed-eruption method and orthodontic alignment. In opened-eruption method, we should consider the impacted canine position and the volume of covering keratinized gingiva before choosing the proper ways to open, either apically positioned flap or gingivectomy. If the impacted canine was located apically, a closed-eruption method is then indicated. Furthermore, besides exposing methods, we need to consider the direction of traction and proper anchorage consideration in managing canine impaction.

NO. 11

Three-Dimensional Evaluation of Soft Tissue Changes in the Maxillofacial Region after Bimaxillary Orthognathic Surgery in Skeletal Class III Deformity

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Objective: This study aimed to three-dimensionally assess soft tissue changes in the maxillofacial region following bimaxillary orthognathic surgery for skeletal Class III deformity.

Materials and Methods: This cohort study included 50 skeletally mature patients with skeletal Class III deformity who consecutively underwent Le Fort I osteotomy and bilateral sagittal split osteotomy. Cone beam computed tomography (CBCT) scans and 3-dimensional (3D) facial photographs were acquired before treatment and after orthodontic debonding. 3D models were constructed from combined CBCT and 3D photographic data and superimposed using voxel-based matching. Landmarks and distance maps between the superimposed 3D models were computed to evaluate the degree of skeletal and soft tissue changes in the maxillofacial region.

Results: Landmarks and distance maps showed significant posterior displacement of the lower lip and soft tissue chin. Correlation was found between the movement of the skeletal and soft tissue chin.

Conclusions: After bimaxillary orthognathic surgery for skeletal Class III deformity, the most obvious changes to the maxillofacial soft tissue were at the lower lip and chin.

NO. 12

Displacement of Proximal Segment after Sagittal Split Osteotomy for Asymmetric Class III Deformity

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Objective: Facial asymmetry is common in skeletal Cass III deformity. The purpose of this study was to quantify the displacement of the proximal segment after bilateral sagittal split osteotomy (BSSO) in patients with asymmetric Class III deformity and to evaluate if the amount of displacement was different between asymmetric types.

Materials and Methods: Seventy-five patients with asymmetric Class III deformity who consecutively underwent Le Fort I osteotomy and BSSO were recruited and categorized into three groups according to different types of mandibular asymmetry. Displacement was assessed by comparing the position and rotation of the proximal segment before and one week after surgery. Cone beam computed tomography with image reconstruction was used.

Results: The proximal segment displaced significantly after asymmetric BSSO setback. There were significant differences in roll and yaw rotation of the proximal segment between the groups.

Conclusions: In patients with asymmetric Class III deformity, there was significant displacement of the proximal segment after BSSO and the displacement was influenced by different types of mandibular asymmetry.

NO. 13

Skeletal Stability of Maxillomandibular Advancement for Treatment of Obstructive Sleep Apnea

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Objective: Maxillomandibular advancement (MMA) is effective in the treatment of obstructive sleep apnea (OSA). The purpose of this study was to determine the long-term stability of MMA in patients with obstructive sleep apnea.

Materials and Methods: Twenty-five adults with OSA who consecutively underwent primary MMA were included. Polysomnography and cone beam computed tomography of the head and neck were done preoperatively, one week after surgery, and at least one year after surgery. The caliber of the upper airway and the facial skeleton were measured with image analysis software.

Results: The MMA positioned the maxilla and mandible upward and forward, and enlarged the volume and minimum cross sectional area of the velopharynx and oropharynx. From one week to more than one year after surgery, the mandible moved backward and the volume and minimum cross sectional area of the velopharynx and oropharynx decreased. At follow-up, patients had a significant reduction in their apnea-hypopnea index.

Conclusions: The study showed that at the follow-up period after MMA there was significant relapse in the mandible and upper airway.

NO. 14

Cross-Cultural Comparison of the Orthodontics Patients' Treatment Motivation in Two Countries: A Pilot Study

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Objective: To compare the orthodontic treatment motivation of Thai and Taiwan orthodontic patients, and explore the affecting factors towards patients motivation for decision to receive treatment.

Materials and Methods: The samples comprised 500 orthodontic patients by a cross sectional sampling method. 250 was randomly collected from Sunpasitthiprasong Hospital in Thai, and 250 from Taipei Medical University Hospital in Taiwan, respectively. The age distributed 20 to 59 years old. The questionnaire with 9 demographic and 24 motivation questions were completed by all subjects without name records. VAS was used to the motivation questions. Statistical analysis was undertaken using t-test, Chi-square and ANOVA.

Results and Discussion: Most of twenty-four motivation variables was significant difference between Thai and Taiwan orthodontic patients groups, while only seven motivation variables were non-significant difference between both groups. "Desire to straighten their teeth" was the main motivational factor for seeking orthodontic treatment in Thai orthodontic patients group (8.08±1.49) and were significantly ($p < 0.001$) from Taiwan patients group (6.18±2.41). Meanwhile, "improve the appearance of smile" was the key motivating factor for Taiwan orthodontic patients group (6.76±2.54) but it was no significant difference from Thai patients group ($p>0.5$).

"A long-term treatment" was the important factor affects to the patient motivation to receive in Thai patients group (6.20±2.52). No significant difference was found between both group ($p > 0.5$). In Taiwan patients group rated the high treatment cost was the most key factor affects to their decision (6.25±2.60). Significant difference was found between both group ($p <0.01$).

Conclusions: The affecting factors toward treatment motivation for orthodontic patients between Thai and Taiwan patients' group are significantly different and multiple. However, esthetic is always the important factor that motivated patients to seek orthodontic treatment. We need to further investigate the related research and factors.

NO. 15

The Impact of Occlusal Loads on Orthodontic Tooth Movement: A Case Report

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Objective: It has been a clinical observation that the occlusal loads might play a role in orthodontic tooth movement, and the rate of a bilateral closure of extraction space could be relatively faster on the habitual chewing side. However, only experimental but no clinical studies or reports have been revealed to illustrate the possible effects of occlusal loads on the rate of closure of extraction space.

Case: A case of 39-year-old male with repaired cleft lip and palate and anterior cross bite treated by extraction of #15, 23, 34, and 44 and will be presented. The extraction space closure in the upper dentition was to protract the buccal teeth and to establish a Class I buccal occlusion. The extraction space in the upper and lower dentitions was closed in 18 months, except a 3.0 mm of extraction space remained at #14-16. At this point, patient complained biting pain on #46 and avoided chewing on his right since then. The space at #14-16 was closed further to 1 mm in another 14 months before #46 was diagnosed a cracked tooth and extracted. The #16 and #17 were then without occlusal load from #46, and the 1 mm extraction space at #14-16 remained without any significant change for another 12 months until resin bite blocks were added to occlude #16 and #17 with the mandibular dentition. The 1 mm space at #14-16 was then suddenly closed in a month after having occlusal loads from the mandibular dentition.

Discussion and Summary: The treatment progress and results of this case report supports that occlusal loads might play an important role on the rate of orthodontic tooth movement.

NO. 16

Treatment of Class III Malocclusion with Missing Teeth by Orthognathic Surgery

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Objective: The etiologies of skeletal Class III malocclusion include excessive growth of mandible, deficient growth of maxilla, or the combination of both. Orthognathic surgery is often required to correct the skeletal relationship.

When facing full-mouth rehabilitation case with multiple congenital missing teeth, the prosthetic plan is important to redistribute the spaces properly for final prosthesis fabrication.

The aim of this case report is to demonstrate the transdisciplinary treatment of an adult Class III patient with mandibular prognathism, deficient maxillary dentoalveolar growth, and multiple congenital missing teeth.

Case: A 18 year-old female complained about mandible prognathism and insufficient chewing function. Extraoral examination revealed a concave lateral profile. Intraoral examination showed teeth #15#14#24#25#27 missing and retained deciduous teeth #55#53#63#65 in the upper arch, and teeth #35#36#37#41#45#46#47 missing in the lower arch. She was treated by two-jaw orthognathic surgery: maxillary LeFort I 2-piece, advancement and posterior impaction, and mandibular setback with bilateral sagittal split osteotomies. Teeth #53#63 was extracted to reposition #13#23. Teeth #14#24#25 spaces was regained and edentulous area will be reconstruct by removable partial denture in both arches. At the end of treatment, the facial esthetics was significantly improved and stable occlusion was established.

Discussion and Summary: For surgical correction of mandibular prognathism with Class III malocclusion, one main goal of pre-surgical orthodontic treatment is to decompensate the teeth alignment and to create sufficient negative overjet. In this case, we did controlled tipping at upper incisors to establish more ideal torque but maintain incisal tip position, while we did little decompensation at lower incisors due to the patient's thin tissue type of gingivae.

Analysis of final records indicated that all treatment objectives were achieved. The teeth were placed in good alignment, anterior cross bite was relieved and good occlusion was maintained. A satisfactory esthetic result had been achieved. The patient's psychological satisfaction was also achieved.

NO. 17

Definitive Surgical-Orthodontic Treatment to Correct the Problems Subsequent to Early Skeletal Class III Camouflage: A Case Report

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Objective: To illustrate the concept of surgery-first approach and the treatment alternatives and treatment outcome for deep overbite and prominent chin correction after early camouflage treatment of skeletal Class III malocclusion.

Case: The case report describes the treatment of a 21-year-old female patient who was disappointed with the outcome of a previous orthodontic treatment and complained about her chin prominent. She had skeletal Class III malocclusion with concave facial profile, hypodivergent facial pattern with deep overbite. The previous Class III camouflage orthodontic treatment was done by teeth 34, 44 extraction since she was 12 years old. With the concept of surgery-first approach, the surgical treatment plan included LeFort I osteotomy clockwise rotation of maxilla and bilateral sagittal split ramus osteotomy backward rotation of mandible with genioplasty and angle reduction in order to increase lower facial height. With non-extraction therapy, the molars were finished in full Class III relation. The 3D surgical simulation showed overall Pogonion movement was backward 8.3mm and downward 5.2mm which corresponded to post- operative clinical result. As post-surgical orthodontic phase treatment done, the results showed that deep overbite was corrected and facial esthetics greatly improved after about one year of treatment.

Discussion and Summary: In conclusion, we report the successful facial esthetic case resulting in motivated patient comfort and psychosocial satisfaction. This clinical case report could be beneficial to demonstrate the corrective treatment of choice in patient who required to improve facial esthetic and function.

NO. 18

Orthodontic-Surgical Treatment of Class III Malocclusion with Facial Asymmetry: A Case Report

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Class III skeletal malocclusion may have an unfavorable impact on esthetics, which is frequently aggravated by the presence of accentuated facial asymmetries. Common features of facial asymmetry include a mandibular deviation to the right or left.This type of malocclusion is usually treated with association of Orthodontics and orthognathic surgery for correction of occlusion and facial esthetics. This report presents the treatment of a patient aged 21 years with Class III skeletal malocclusion, having anterior crossbite, a cant of the maxilla and the maxillary occlusal plane, and maxillary and mandibular midline shift. Clinical examination also revealed increased lower one third of the face, concave bone and facial profiles and facial asymmetry with mandibular deviation to the left side. The treatment was performed in three phases: presurgical orthodontic preparation, orthognathic surgery with a combination of LeFort I osteotomy and Wassmund's procedure of maxilla and bilateral sagittal split ramus osteotomy of mandible and orthodontic finishing. The surgical-orthodontic combination therapy has resulted in near-normal skeletal, dental and soft tissue relationship. In reviewing the patient's final records, the major goals set at the beginning of treatment were successfully achieved, providing the patient with adequate masticatory function and pleasant facial esthetics.

NO. 19

Virtual Surgical Planning for Skeletal Class III with Facial Asymmetry

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Objective: To achieve ideal occlusion and esthetic, surgical- orthodontic correction is usually required for the cases with severe skeletal discrepancy. Conventional surgical treatment planning based on 2D radiographic images and dental models. 3D computer-assisted surgical simulation provides a more accurate treatment plan, especially for patients with complex dentofacial deformities. Herein, we report the virtual surgical planning in the treatment of a patient with skeletal Class III malocclusion and facial asymmetry.

Case: A 29-year-old female presented with a concaved profile, mandible prognathism, and facial asymmetry with chin deviation to right side and larger left hemiface. She exhibited a Class III malocclusion with crowding in both arches (space deficiency 18/ 4 mm). The tooth #15 was missing and #25 palatally lock-in. The overjet was -1 mm and the overbite was 2 mm. Cephalometric analysis showed retrognathic maxilla and prognathic mandible with obvious dental compensation to Class III skeletal pattern (ANB: -4.5˚, MPA: 43˚, SN-FH: 11˚, U1-SN: 106.5˚, L1-MP: 69.5˚). The treatment plan included extraction of #25, and two- jaw surgery of Lefort I 1-piece for maxilla advancement and bilateral sagittal split osteotomy for mandible setback with yaw rotation and clockwise rotation of maxillomandibular complex. The virtual surgical planning was done by using Dolphin Imaging software and a 3D reconstruction of the CBCT with integrated digital dental models. The operation was conducted and rigid fixation was performed with CAD/CAM surgical splints to achieve skeletal harmony. The total treatment duration was 2 year and 2 months. Harmonious facial profile with facial symmetry and stable occlusion were established after treatment.

Discussion and Summary: This case demonstrated that the virtual surgical planning in orthognathic surgery provides the benefit of optimal treatment results, patient satisfaction, precise translation of treatment plan, and facilitating intraoperative manipulation in severe skeletal discrepancy cases.

NO. 01

A Case Report: Orthodontic Treatment of Post-Traumatic Area by Tooth Replacement for Esthetic Area Rehabilitation

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Objective: Dental trauma occurred over anterior area is common in the accidents. To rehabilitate the esthetic zone, we can offer several treatment options for the patients according to the severity of the traumatic teeth. For example, restorative treatment, prosthesis, implantation, combined with orthodontic treatment and/or periodontal treatment. Nowadays, with the evolution of dental digital technology, we could predict the result of our treatment. Besides, we can also learn about the variance of treatment result between reality and simulation.

Case: The case was a 19-year-old male who had a car accident. During this accident, the tooth 11 was missing due to avulsion and the crown of tooth 22 was fractured. His chief complaint was to restored the anterior esthetic area, so he asked for the orthodontic treatment. Angle's Class II malocclusion with 3.0 mm overbite and 3.0 mm overjet was noted. Cephalometric analysis showed skeletal Class II jaw relation with maxillary protrusion and orthodivergent facial pattern. The treatment plan involved tooth 24 extraction and replacement of tooth 11, 12, 13 with tooth 12, 13, 14. Furthermore, tooth 22 need the forced eruption for prosthesis fabrication. By use of full mouth fixed appliance, that we can achieve the better result.

Discussion and Summary: The total treatment time was 37 months. The changes included anterior missing tooth replacement and harmony alignment in upper and lower arch. Proper overbite and overjet were established. The tooth 12 was restored as central incisor with veneer or crown to establish anterior esthetic area.

This case showed that under the correct diagnosis, careful treatment and well prosthesis fabrication. The treatment of post-traumatic unaesthetic area can also achieve a satisfactory outcome.

NO. 02

Bilateral Impacted Canine Caused Severe Roots Resorption on Central Incisors

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Objective: To discuss the treatment and outcome of bilateral impacted canine and substituted for central incisors.

Case: This is an 11 y/o girl with bilateral maxillary canine impactions with previous phase I orthodontic treatment at the age of eight for anterior cross bite at an orthodontic office. A 2x4 appliances combined with inclined plane was used. Lingual fixed retainer was installed then. However, patient did not come for regular follow up. Later panoramic radiograph showed ectopic eruption of bilateral upper canines resulting severe root resorption on centrals. She was referred to our hospital for further evaluation. CBCT images showed that the impacted canines overlaid on the facial sides of four incisors, severe roots resorptions of centrals, and cystic changes around canine crowns.

Due to her bimaxillary protrusion, treatment plan was to extract lower first premolars and severely damaged upper centrals. Canines were forced erupted to substitute centrals with composite built up and shaping.

Discussion and Summary: Impactions are not uncommon in our practice, and the etiology comes from some systemic or local causes. The local factors contributed to impacted teeth include mechanical obstruction such as supernumerary teeth, cysts, odontoma, tumors, eruption sequestrum, mucosal barriers, scar tissue, or lack of eruption space, and ectopic eruption path.

In this case, the ectopic canines damaged roots of centrals which were bonded with fixed retainer. Fixation of incisal positions prohibited displacement of clinical crown when surrounding eruption approached roots. Therefore, using fixed retainers on children should be exercised carefully. Guiding the ectopic tooth to its original position was considered yet the severe damaged incisors swung our plan to extract upper centrals and lower premolars. Substitution central incisors with canines may compromise in esthetic appearance. However, we preserved teeth with better support for long term stability.

NO. 03

Orthodontic Aid for Successful Tooth Autotransplantation in Adult Patients

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Introduction: As the healthy teeth are occasionally removed due to orthodontic treatment, they can be used as donor teeth to restore the missing region. However, the transplanted teeth can encounter the periodontal and/or endodontic problems, and therefore some orthodontic tips are required to reduce the complications. In this presentation, we attempted to apply orthodontic remedies for successful autotransplantation in adult patients.

Case Summary: The patient was a 30-year-old female with absence of upper right second premolar and root rest of lower right first molar. Upper left first premolar was planned to be extracted for orthodontic purposes and transplanted to the region of the lower root rest. Orthodontic force was applied on the donor tooth from the start of treatment. The tooth was transplanted after endodontic treatment, and light force was loaded on the transplanted tooth from postoperative 6th week. Brackets were removed after 23 months of active treatment. The transplanted tooth has not shown any abnormal signs and symptoms on clinical examination and serial radiographs.

Discussion: It is recommended that the donor teeth are included in the leveling and alignment process and light force is applied after the end of 4~6 weeks of fixation period after transplantation to prevent tooth ankylosis. And in case of donor teeth with root development completed, endodontic treatment before surgery is advised when they are accessible.

Conclusion: Autotransplantation with orthodontic treatment is worth consideration in case of imbalances in the number of teeth and space. In cases that orthodontic force is applied at the appropriate time and well-timed endodontic treatment is done on donor teeth, transplanted teeth will survive with better prognosis.

NO. 04

Autotransplantation of Palatally Impacted Maxillary Canines

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Maxillary canines are the second most frequently impacted teeth after third molars. The incidence of maxillary canine impaction is from 0.9% to 2.0% according to the studies on various populations. Several etiological factors for ectopic canine impaction have been proposed; which may be either generalized or localized. If untreated, the following sequelae include external root resorption of the impacted teeth as well as the adjacent teeth, loss of arch length, dentigerous cyst formation. Clinician's should consider various treatment options such as autotransplantation, orthodontic traction, interceptive treatment, and extraction according to patient's cooperation, age, general oral health, developmental stage and shape of the tooth and location.

Among the options, autotransplantation is indicated when the degree of malocclusion is too severe to achieve orthodontic traction and tooth can be extracted atraumatically. The advantages of autotransplantation are relatively short treatment duration, small number of visits, and low tendency to develop post treatment relapse such as rotation and spacing. According to several studies, survival rate is up to 86.4% and major causes of failure are root resorption and periodontal failure. To prevent failure, it is important to preserve healthy periodontal ligament (PDL) cells on the donor tooth surface and achieve optimal contact with the recipient site. CT data is useful for copious examination of the shape of donor tooth and of the anatomic structure of the recipient site so that they fit each other. Furthermore, life-sized resin model of the donor tooth can be fabricated using CT data. The model contributes to reduce extra-oral time and prevent PDL damage. Fixation method and duration, time for endodontic treatment and orthodontic force application should be determined adequately in response to the adaptation to the recipient site, mobility of the donor tooth, and developmental stage of the root.

Especially, autotransplanted teeth with closed apices have to be treated as avulsed teeth. Therefore, endodontic treatment should be done after transplantation to prevent inflammatory root resorption, mobility increase, alveolar bone loss, and ankylosis.

Through the autotransplantation case of impacted maxillary canines with closed apices, clinical considerations for successful prognosis will be demonstrated.

NO. 05

Surgical Orthodontic Treatment of High-Angle Class II Malocclusion

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Objective: Long-term stability in surgical orthodontic treatment may be difficult to achieve for patients with Class II malocclusion because of the associated mandibular condyle deformation. Herein, we report the correction of a high-angle Class II malocclusion with condylar deformation using anterior segmental maxillary osteotomy (ASMO) combined with bilateral sagittal split ramus osteotomy (SSRO).

Case: A 22-year-old female patient presented with protrusion of the anterior teeth. Her facial profile was retrognathic with an overjet exceeding 9.0 mm and an overbite of 4.0 mm. The angular measurements in the cephalometric analysis of the hard tissue showed large ANB angle and FMA, small SNB angle and FMIA, and an average U1-FH plane. These measurements implied severe mandibular retrusion, high-angle, and labial tipping of the mandibular incisors. The linear measurements in the cephalometric analysis of the soft tissue showed severe upper and lower lip protrusion. Condylar deformation was observed on cone-beam computed tomography (CBCT), and a discrepancy was observed between the centric occlusion and centric relation. During preoperative orthodontic treatment, the mandibular second premolars and third molars were extracted; additionally, a pre-adjusted edgewise appliance was placed to relieve the crowding and labial tipping of the mandibular incisors. After 23 months of active treatment, orthognathic surgery was performed by combining ASMO and SSRO. After 42 months of active treatment, an acceptable occlusion was attained, and her facial profile improved. A subsequent cephalometric analysis revealed improvement in ANB angle and reduced upper and lower lip protrusion. Noticeable condylar deformation was not detected in the CBCT images obtained after the surgical orthodontic treatment. However, a certain extent of mandibular relapse at the Pogonion was observed 1 year post-operatively when compared with the immediate post-operation period.

Discussion and Summary: Surgical orthodontic treatment of high-angle Class II malocclusion by ASMO combined with SSRO provided an acceptable occlusion and resulted in improved facial profile. However, long-term observation may be necessary because a certain extent of mandibular relapse was observed 1 year post-operatively.

NO. 06

Correction of Canine-Premolar Transposition: A Case Report

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Objective: Transposition is a rare anomaly of tooth order and eruptive position. It has been reported that maxillary canine is most frequently involved. Treatment modalities include extraction, orthodontic correction, or leaving the teeth in the transposed position. This case report presents successful orthodontic correction of transposed left maxillary canine to its original position.

Case: A girl aged 10 years 9 months complained of painful gums over left upper quadrant. Intraoral examination showed that the left maxillary canine was bulging buccally between first premolar and second premolar and the deciduous canine was retained. Bilaterally molar class I relationship and right canine class II relationship were noted. The panoramic film revealed that the left maxillary canine was completely transposed with the first premolar. Treatment goals were to correct the transposed canine to establish the natural tooth order by orthodontic treatment. A spring made by .017 x .025 inches β-Titanium was used to intrude and mesialize the transposed canine after surgical exposure. After the transposed canine was moved mesially, then, it was tractioned occlusally. The active treatment lasted for 40 months. At the end of the treatment, the transposition was successfully corrected.

Discussion and summary: Maxillary canine-premolar transposition is considered to be the most common type. The incidence of maxillary canine-premolar transposition is reported to be 0.135-0.510%. The etiology of tooth transposition is still controversial. Heredity, variation in embryologic development, early loss of deciduous teeth, prolonged retention of deciduous teeth, and dentofacial trauma are suggested causes. Because of the complexity of definite treatment, detection of the developing transposition is important. Early clinical and radiographic examinations at the age of 6 to 8 are suggested. If transposition has occurred at later stage, thorough orthodontic evaluation must be done to decide whether to be corrected, to leave them transposed or to be extracted. In this case, orthodontic correction of maxillary canine-premolar transposition demonstrated the meticulous control of the position of the teeth and careful monitoring of the adverse effects are keys to success.

NO. 07

Orthodontic Treatment of Class I Malocclusion with Severe Crowding and Canine Transposition

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Objective: This case presentation was in purpose of dealing Class I malocclusion with severe crowding and transposition of upper right side canine and premolar with orthodontic treatment, pleasing and satisfied outcome was achieved after treatment.

Case: The patient was a 23 years old female with dental Class I malocclusion combined severe crowding and transposition of upper right canine (# 13 was on the buccal side of #15 and totally transposition of #13. #14). Skeletal Class I malocclusion with Class III tendency, hyper-divergent facial pattern, upper and lower anterior teeth retroclination and retrusion were noted from lateral cephalometric radiographic. The treatment plan was to extract # 13, 25, 34, 44, 18, 28, 38, 48, and then full mouth edgewise brackets system were bonded. After about the treatment of three years, all extraction spaces were closed, severe crowdings were relieved and all teeth were well positioned. Perfect dental relationship, cusp interdigitation, overbite and overjet were achieved. Patient was satisfied with the facial profile and dental occlusion.

Discussion and summary: Transposition was an interchange in the position of two permanent teeth within the same quadrant, and it is often accompanied with missing, small or peg-shaped maxillary lateral incisors, retained deciduous teeth or impaction. The maxillary permanent canine is the tooth most frequently involved in transposition, and it shows the highest incidence of transposition with the first premolar. When transposition is complete, repositioning the teeth to their normal position is complex and may be damaging to the adjacent teeth and supporting structures. The treatment of such condition must to take the crown and root position of transpositioned teeth, adjacent periodontal conditions, dental relationships all into considerations. In this case, the upper right canine is totally transpositioned with the 1st premolar, due to thin buccal cortical bone, gingival recession and over-eruption of transpositioned upper right canine, so such tooth was extracted for orthodontic treatment. The procedure was efficient and achieved acceptable outcome and function.

NO. 08

Orthodontic Treatment of Class I Bimaxillary Dentoalveolar Protrusion: A Case Report

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Objective: Bimaxillary protrusion is a condition characterized by protrusive and proclined upper and lower incisors and an increased procumbency of the lips. The goals of orthodontic treatment of bimaxillary protrusion include the retraction and retroclination of maxillary and mandibular incisors with a resultant decrease in soft tissue procumbency and convexity. This is most commonly achieved by the extraction of four first premolars followed by the retraction of anterior teeth using maximum anchor- age mechanics.

Case: The patient was a 19 years old female with Class I malocclusion combined biamxillary dentoalveolar protrusion, orthodivergent facial pattern, convex facial profile and lip incompetence. The treatment plan was designed to extract of four first premolars with maximum to absolute anchorage. Besides, the possibility of further extraction of bilateral upper third molars and application of miniscrews over maxillary bilateral infrazygomatic crest was informed to patient. Transpalatal arch was also used to reinforce vertical control and assist to avoid upper first molar extrusion. After near 2 year of treatment without any bone screws, protrusive and proclined upper and lower incisors and the convex profile was improved as well. Perfect dental relationship, cusp interdigitation, overbite and overjet were achieved. Patient was satisfied with the facial profile and dental occlusion.

Discussion and summary: The results of this case showed that the extraction of four premolars can be successful in reducing the dental and soft tissue procumbency seen in patients with bimaxillary protrusion. Anchorage preparation in this kind of case was important, we could reinforce the maxillary posterior anchorage by adding the second premolar and molar to the posterior unit, transpalatal arch or even miniscrews for absolute anchorage provision. As a general rule, the lips will move 2/3 of the distance that the incisors are retracted, but only until lip competence is reached. In this case, anchorage reinforce and torque control of anterior teeth during retraction were key points to achieve satisfactory and pleasing treatment outcomes.

NO. 09

Class I Malocclusion High Angle Anterior Openbite with Condylar Head Resorption: A Case Report

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Objective: To correct Angle Class I malocclusion high angle anterior openbite with condylar head resorption with extraction orthodontic treatment and TADs.

Case: This case report describes the orthodontic treatment of a 23-year-old female, who presented an Angle Class I malocclusion, with anterior openbite, retroclined upper incisors, gummy smile and high mandibular plane angle. The patient was treated with extraction method. Two TADs were inserted at bilateral infrazygomatic crests for upper posterior segment intrusion, and an upper anterior TAD was used for reduction of gummy smile and anterior teeth torque control. The result showed improved facial profile, inter-incisal angle and normal overjet and overbite. The lateral cephalometric superimposition showed controlled root torque of upper incisor.

Discussion and summary: An anterior open bite is often caused by downward rotation of the mandible and sometimes is caused by condylar head resorption. In adults who have anterior openbite, the recommended treatment is oral surgery or nonsurgical treatment.

In this case, the patient had a high angle with weak chin due to the rotated downward mandible. Therefore, we considered absolute anchorage with TADs on bilateral IZCs for various tooth movements, upper molars intrusion and anterior tooth retraction. We also had a TAD on upper anterior labial region for gummy smile correction. As a result of intrusion of the upper molars, the mandible rotated counterclockwise, and the anterior open bite was improved. Rotation of the mandible caused advancement of the chin and improved the retrognathic appearance of the facial profile. By preventing the anterior extrusion, an esthetic smile was achieved.

NO. 10

Modify Intrusive Arch Wire Mechanism for Class II Division 2 Malocclusion Patient: A Long-Term Follow-up Case Report

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This case report is an atypical case of a 22-year-old adult patient, who presented a Angle Class II Division 2 malocclusion,100% deep overbite, severe curve of Spee and left maxillary lateral incisor proclined. Lateral profile showed straight. The patient was treated with extraction of the upper first premolars and anchorage control with transpalatal arch. Combined bonding with Tip-edge Plus bracket and modified intrusive arch wire, which can help us unlock the bite easily. Finally, great improvement of deep overbite and nice facial profile were achieved. And the occlusion remained stable over 10 years follow up.

Class II Division 2 is one sort of very challenging case that requires proper clinical, radiological, and biomechanical evaluation. Traditionally, Dr. Burstone use segmented base archwire, which use bilateral posterior teeth as anchorage units to intrude anterior teeth unit by bending intrusive archwire. The archwire provide upper anterior unit direct intrusion force and bite opening. Nowadays, orthodontics might combine TADs at upper anterior for treating deep overbite. Which is useful but invasive treatment, likely to cause uncomfortable and may cause reverse smile arc.

Instead of the complicated way, we use the modified intrusive arch wire with one continuous archwire and combined with Tip-edge Plus bracket. Because the bracket slot is designed cutting edge. While engaging the anterior segment, the brackets showed point contact with individual tooth movement. We can use bending anchor bend to generally intrude anterior segment. And we can achieve the same result easily and efficiently without TADs or complicated wire bending!

NO. 11

Surgical-Orthodontic Correction of Skeletal Class II Anterior Open Bite Malocclusion in Patient with Temporomandibular Joint Disorders: A Case Report

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Objective: To describe the surgical-orthodontic correction of skeletal Class II relationship with anterior open bite related to bite plate treatment for temporomandibular disorder.

Case: A case of 28-year-old female with skeletal and dental Class II relationship, high mandibular plane angle with anterior open bite seeking orthodontic treatment because of protrusion and crowding. Just right before the orthodontic treatment started, she suffered from acute temporomandibular joint (TMJ) pain. Referral was made to the TMJ specialist. After receiving Michigan bite plate treatment, the patient came back to continue the treatment three years later. The symptoms and signs of temporomandibular disorder (TMD) were relieved. However, the anterior open bite became more severe from molar to molar. Surgical-orthodontic treatment was then suggested to correct protrusion and severe open bite. Bone scintigraphy with Technetium-99 (Tc-99) was arranged before treatment. The bone activity of TMJ showed stable. The pre-surgical orthodontic treatment started with full-mouth fixed appliance therapy for teeth leveling, alignment, and dental decompensation with teeth extraction. Two-jaw surgery with LeFort I, bilateral sagittal split osteotomy, and genioplasty were performed. The treatment was complete after 21 months without recurring of TMJ arthritis. Satisfactory appearance and function were achieved for this patient.

Discussion and summary: Before starting a surgical-orthodontic treatment in patient with TMD history, it is necessary to consult with patient's TMD doctor. The progression of Condyle head resorption or remodeling can be assessed by images or bone scan. Monitoring the symptoms and signs of TMJ during and after surgical-orthodontic treatment is important as well. In conclusion, surgical-orthodontic correction of skeletal class II open bite in patient with TMJ arthritis history can provide ideal treatment result after splint therapy.

NO. 12

A Class III Anterior Open-Bite Adult Patient Treated with Anterior Teeth Extrusion and Platelet Rich Plasma

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Objective: In adults, class III malocclusion associated with anterior open bite is considered as one of the challenging in orthodontic treatment, especially for the nonsurgical intervention. This case report presented the effectiveness of extruding anterior teeth in correcting class III anterior open bite patient without worsening the patient's facial profile.

Case: A 28 year-old female patient had 4 mm anterior open bite with mandibular prognathism and #36, 46 were missing resulting in mesial tilting of #37, 47. The treatment plan was using upper extrusive lever arms and anterior vertical elastics to correct anterior open bite and temporary anchorage devices (TADs) were used to protract lower molars. The platelet rich plasma (PRP) was injected submucosally at the labial and palatal mucosa of the anterior teeth aiming for increasing the stability of anterior teeth extrusion. CBCT was taken before and after the treatment. After active treatment of 24 months, the 3D superimposition showed the overall extrusion of anterior teeth was 6 mm and the mandible had a backward rotation.

Discussion and summary: In conclusion, anterior teeth extrusion is an effective method in treating class III anterior open-bite non-surgical patients without worsening the facial profile.

NO. 13

Adult Class III Malocclusion Combined Bilateral Mandibular First Molars Missing Treated with Maxillary Temporary Anchorage Devices (TADs)

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Objective: Most of the cases that had lower anterior tooth proclined or crowding usually were treated by retraction as the anchorages came from mandibular molars or screws, but there are some conditions that mandibular molars are missing and mandibular screws are failed or non-available. When in this situation, using maxillary temporary anchorage devices (TADs) and class III elastic as mechanisms to retract mandibular teeth is an alternative treatment option.

Case: This case report is a 25-year-old male with skeletal class III relationship and anterior crowding, his lower first molars and upper secondary premolars were extracted at local dental clinic in many years ago, the missing teeth space were almost all lost due to posterior teeth were mesial tilting. Owning to his systemic and clinical problems, his mandibular TADs failed twice, so the alternative treatment plan was that only using the maxillary TADs and class III elastic as mechanisms to retract lower anterior teeth and close space. The treatment outcome was very good and patient was satisfied with it.

Discussion and summary: When there are some conditions that screw is no available in one arch of patients, screws application in the other arch combined with elastic devices as the indirect anchorage is a good alternative treatment option, and it can provide a good treatment result for patients.

NO. 14

Upper Molar Intrusion and Lower Third Molar Uprighting: A Case Report

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Objective: Vertical occlusal space reconstruction is now a very common chief complaint for or-thodontic patients. Elongated teeth opposite the residual ridge can be intruded back into the alveolar bone with the assist of temporary anchorage devises, especially in the maxillary dentition. On the other hand, lower third molar uprighting is now a common need from the patients who lost their lower first or second molars. With the help of temporary anchorage devises, it can be carried out to reach this goal and min-imize the negative effect on the other teeth. This case presents both situations men-tioned above. It is also an interdisciplinary cooperation case receiving dental implant after orthodontic treatment.

Case: A 44-year-old female, with teeth 26, 36, 46, 47 missing, 16, 17 elongation and ante-rior deepbite, was referred by the prosthodontic specialist, requesting to regain the vertical occlusal space for dental implants insertion. After discussed with the patient, it was decided to close the spaces in the second and third quadrants, intrude the teeth in the first quadrant by mini-screws, and to try to upright third molar in the fourth quadrant. The total treatment time took three years and eight months, the right upper molar was intruded about 5.5 mm and the lower right third molar was uprighted with occlusion, no obvious tooth mobility was found after treatment. Spaces in other quadrants were all closed, anterior overbite decreased to 1 mm. One dental implant was inserted between teeth 45 and 48 five months after orthodontic treatment.

Discussion and summary: Adult treatment of intrusion, uprighting and space closure is achievable by the tech-nics and appliances nowadays. Good oral hygiene is a necessity for a good outcome, which should be improved in this case.

NO. 15

Using Distraction Osteogenesis to Correct Maxilla Retrognathism in Cleft Palate Patient with Multiple Missing Teeth

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Objective: Early repair of the palate and the resulting scar tissue may have an effect on the growth and development of the maxilla which easily cause underdevelopment of maxilla and anterior crossbite. There are different ways to correct maxilla deficiency and missing teeth. This case will be presented using distraction osteogenesis for correcting maxilla retrognathism and autotransplantation for missing tooth.

Case: This patient was diagnosed cleft palate and received several times of repairing plastic surgery before 2 years old. The patient came with chief complaint of aesthetic profile when he was 20 years old. After cephalometric analysis, skeletal class III due to maxilla retrognathism was diagnosed. Overjet was -9mm and overbite was 5mm. Also, missing of #13, #22, #24, #25, #44 were noted. After paper surgery and model surgery planning, the treatment plan was using distraction osteogenesis for correcting maxillary deficiency. Furthermore, autotransplantation of #34 to #25 position for correcting unequal tooth number in second and third quadrants. After initial alignment, distraction osteogenesis with intraoral device was performed. Then, #34 was autotransplanted to #25 position and post-surgical orthodontic treatment was done. Prosthesis for missing #22 was also reconstructed.

Discussion and summary: The distraction osteogensis and autotransplantation were carefully carried out. After 6 years of treatment, distraction ostetogenesis successfully correct maxilla anterior-posterior deficiency. Autotransplantation also conquer the 3 missing teeth in second quadrant. The outcome was satisfied and the profile was greatly improved.

NO. 16

Residual Asymmetry after Unilateral Reconstruction of the Temporomandibular Joint and Bimaxillary Orthognathic Surgery in a Nongrowing Patient with Hemifacial Microsomia

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Objective: Hemifacial microsomia (HFM) is the most common craniofacial anomaly after cleft lip and cleft palate. This deformity primarily involves the facial skeleton and ear, with either underdevelopment or absence of both components. In nongrowing patients with HFM and significant ipsilateral hypoplasia or absence of the condyle and ramus, temporomandibular joint reconstruction in conjunction with orthognathic surgery are often required to provide stable and predictable functional and esthetic outcomes.

Case: In this case report, a 22-year-old female with HFM Pruzansky type IIB was presented. Residual face asymmetry was found after concomitant reconstruction of the ipsilateral temporomandibular joint and advancement of the mandible with costochondral graft, a contralateral mandibular ramus sagittal split osteotomy, genioplasty, and maxillary osteotomies using surgery first approach and single splint technique. To correct the asymmetry, another bimaxillary surgery was sequentially performed in eight months with the use of computer-assisted surgical planning and printing of the intermediate splint. At the end of surgical-orthodontic treatment, a functional occlusion, a harmonious profile, a normal symmetry, and patient satisfaction were achieved.

Discussion and summary: For severe form of HFM, computer-assisted surgical planning and intermediate splint shows its great value in restoring face symmetry. Additional orthognathic surgery sometimes is needed to achieve satisfactory outcomes.

NO. 17

Orthodontic Treatment Combined with Orthognathic Surgery Correction in Skeletal Class I Hypodivergent Type with Dental Class II Division 2 Malocclusion: A Case Report

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Objective: The choice between orthognathic surgery or orthodontics as a treatment option usually be confusing to the orthodontist in borderline cases. Consideration of surgical correction should be based on many factors, the patient's goal; envelope of discrepancy; esthetics; cost-benefits. This case-report describes a patient with Angle Classification II division 2 with borderline skeletal Class I, be treated with a combination of orthodontic therapy and orthognathic surgery.

Case: A 31-year-old female presented with the chief complaint of her gummy smile and backward position of anterior teeth. Clinical examination revealed skeletal Class I relation, but come up with asymmetry, hypodivergent facial type with a strong chin and deep labiomental fold. She has a short upper lip with lip incompetence and mentalis muscle strain. Angle's Classification II division 2 malocclusion presented with severe deep bite, the retroclined incisors, and deep curve of spee. The 1.5 years of conventional orthodontic treatment, focused on the intrusion and proclination of incisors, has clarified the problems in dento-alveolar relationship and also facial esthetics. Then the orthognathic surgery has been added to the treatment plan. The surgical plan included LeFort I 2 pieces to torque upper anterior teeth further, bilateral sagittal split osteotomy, and genioplasty. The facial asymmetry, facial appearance, and dental problems were almost corrected. The post-operative orthodontic treatment was continued later in order to solve the remaining deep bite and close all spaces.

Discussion and summary: The 3D superimposition and other records demonstrated the correction of dental problems, improvements in skeletal dimension and also facial esthetics. In conclusion, the re-evaluation of treatment outcome status might have the advantages of the treatment outcome, particularly in the dental Class II division 2 with severe deep bite combined with borderline skeletal relationship.

NO. 18

Orthodontic Treatment with Forsus Devices to Correct a Class II Division 2 Malocclusion with Missing Four Premolars

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The prevalence of Angle Class II Division 2 malocclusion is relatively low in comparison with other malocclusions. This malocclusion is generally characterized by retroclination of the maxillary incisors, a deepbite, and an obtuse interincisal angle. In the treatment of a Class II Division 2 malocclusion, the improvement of a deepbite with missing teeth is a challenging treatment objective.

This case report presents a 31-year-old woman who complained of ugly anterior teeth. She had several other orthodontic problems, including retroclination of the maxillary and mandibular incisors, a deep overbite, spacing between mandibular canines and second premolars, mesial tilting of mandibular secondary premolars and molars, Class II dental relationships, and a Class I profile.

After placing a preadjusted bracketed system, nickel-titanium archwires were engaged for leveling and aligning followed by stainless archwires. Distalization and intrusion of the maxillary molars, mesialization and intrusion of the mandibular incisors, and closure of the mandibular edentulous spaces were simultaneously started with bilateral forsus devices and mandibular closing loop. A 0.032-in transpalatal arch was placed to prevent buccal flaring of the molars during intrusion of the maxillary molars. Following the treatment, the patient's orthodontic problems improved. A functional occlusion, a balanced profile, and an ideal smile were achieved. The total treatment period was approximately 24 months.

NO. 19

Comprehensive Treatment of a Patient with Deep Bite, Occlusal Plane Canting and Bilateral Posterior Buccal Cross Bite

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Teamwork orthodontic center

Objective: A nonsurgical orthodontic approach to resolve three dimensional dental problems in a Class II division 2 malocclusion case with the aid of temporary anchorage devices.

Case: A 20 years old female who suffered from Class II division 2 malocclusion with deep bite, excessive overjet, gummy smile, occlusal plane canting, low mandibular plane angle and bilateral posterior buccal cross bite. Selective bonding of upper anterior teeth and molars to level occlusal plane, gingiva display and consonant smile arc in the initial phase were performed. Disocclusion is necessary by using glass ionomer and composite resin bite augmentation. Upper second premolars and molars, lower third molars were extracted at both sides. The aim is to intrude the elongated molars and unroll lower molars. Four titanium bone screws were then inserted at upper and lower posterior regions. After 35 months of treatment, a harmonized smile and stable occlusion were accomplished.

Discussion and summary: This is a non-growing adult case with Class II division 2 malocclusion accentuated by bilateral posterior buccal cross bite. It was treated with the help of miniscrews as absolute skeletal anchorage which can successfully enhance the treatment efficiency to correct dental problems associated with deep bite and posterior buccal cross bite.

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