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Orthodontics

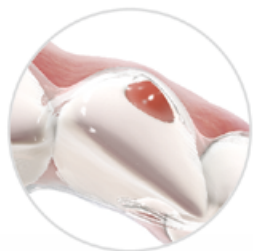




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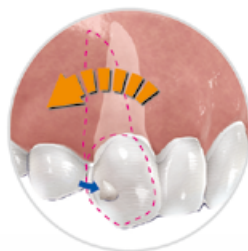
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The Cover Shot



Wax typodont with metal teeth, brackets and orthodontic wires

Orthodontic specialist training always includes practical exercises with Wax typodont and the study of biomechanics in tooth movements. When orthodontic wires are skillfully bent and strategically placed on the bracket slots, they will move the teeth to planned and desired positions. By placing the wax typodont into hot water, the wax will soften and the teeth will move to certain positions based on applied forces. This typodont illustrates that a statically determined force system, i.e. cantilever, is used to extrude the upper right canine and upright the mesially tilted lower right second molar.



Dr Wilson LEE

FCDSHK (Orthodontics),
FHKAM (Dental Surgery),
MOrthRCS (Edin), MOrth (HK),
AdvDipOrtho (HK), MRACDS (Ortho),
BDS (HK), BSc (Toronto)
*Specialist in Orthodontics,
Private Practice;
Part-time Clinical Lecturer, Faculty of
Dentistry, University of Hong Kong;
Executive Committee Member (HKSO),
Asian Pacific Orthodontic Society*



New Year Message from the President - 知，不知 know the unknown



Dr Mario Wai-kwong CHAK

*President
The Federation of Medical Societies of Hong Kong*

Dr Mario Wai-kwong CHAK

It is my great honour and privilege to be elected and to serve the Federation in the past one year.

To begin the New Year, I would like to share with you all a proverb from the famous ancient Chinese philosopher Laozi, written as "Limitation" in Tao De Ching chapter seventy one (道德經第七十一章:不病) 「知，不知，上；不知，知，病。聖人不病，以其病病，是以不病。」

Who recognises his/her limitation is healthy; who ignores his/her limitation is sick. The saint recognises his/her limitation as sickness, so becomes immune.

In the present era, I have found proverbs/quotes with similar meaning from an American politician Donald Rumsfeld as follows:

There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

In regards to the attitude to knowledge, both of these famous proverbs/quotes of Chinese and Western wisdom remind us not only do we need to know the things which we don't know, but more importantly is to realise that there are things we think we know, but actually we don't know or do not fully understand. By recognising and admitting to one's own limitation in knowledge is not a weakness; on the contrary, this is the way to motivate oneself to improve and to ask for the truth, updated knowledge and technology. If we put it into practice, this is to have life-long continuing medical education. Although written many years ago, this proverb continues to convey words of great wisdom and a moral message today.

With recent rapid development of medical knowledge and technology, we have breakthroughs in understanding how our body system, for instance, human genome, gut microbiota, immune system, brain functional network, body metabolism, chemical and receptor work and function. Some old concepts which we previously thought as true, has now become untrue and we have a new understanding. All these have brought breakthroughs in terms of clinical diagnosis and treatment. For example, many previous unknown diseases now could be diagnosed by genetic and molecular tests, hence giving more information on disease prognosis and guide more specific treatment; many previous incurable malignancies now could have a more effective and specific target therapy with much less side effects.

In the past one year, the whole world's health system including that of Hong Kong has faced a lot of new challenges and emerging health problems including an ageing population, rising trends of malignancy and obesity related disorders, epidemics of flu and threat of Zika virus infection, health problems related to environmental pollution and climate change etc. Although we have found the solution to some of these health problems, many of them still have no identifiable solution and rely on health care professionals to find an effective solution.

At the same time, over the past one year, we appreciate the many health professionals and medical societies who have made an effort to try to find out what they need to know but not yet know, by updating themselves with the latest medical knowledge and technology in their respective professional field and specialties/subspecialties either through self-learning or by attending overseas training course or through peer group reviews by organising local or international scientific meetings, conferences and workshops with invited overseas expert speakers.

The Federation of Medical Societies of Hong Kong as an umbrella society of at present 140 medical, dental, nursing and allied health societies will continue our mission to take up the role of exploring and promoting advancement of knowledge and high quality medical and health care, as well as by providing various continuing educational activities and materials.

For example, the certificate courses held jointly with members societies have proved popular, and covered diverse topics and areas. Our publication, the Medical Diary, is of professional interests with different monthly topic reviews and update knowledge. Annual scientific meetings with theme of "Holistic care in the era of specialty-based medicine" have addressed important areas of medicine with talks delivered by various local experts. Public and Professionals' opinion survey in palliative care and advanced directive, as well as symposium and round table discussion of "Care for Advanced Diseases" have been held, for discussions on key health or policy issues, followed by document feedback to the government.

Apart from offering continuing education, the Federation also provides lots of other support to our member societies. For example, our Federation premises are a popular venue and open for rental by our member societies for meetings, seminars, and conferences. Furthermore, we offer administrative



support to assist different member societies to organise local and international conferences, both in Hong Kong, Macau and the Mainland. Our secretariat has different packages of services to suit societies' needs include handling minutes, accounts, regular meetings, as well as annual scientific meetings etc.

On the charity side, The Federation's Foundation continues to organise Public talks on different important health issues, as well as conduct projects for bereaved children, such as, our Drama Putonghua Course, Music & Academic Scholarships. On the fraternity side, we have successfully organised a basketball tournament in the Wanchai Southorn Playground and the Annual Federation dinner with the theme as "Rainbow Extravaganza" on New Year's Eve in 2016.

Finally, I have to thank all for the effort and support from our ExCo members, Foundation directors, council members and staff of the secretarial board in the past year. We cannot succeed without your collaboration. With continuous support and contribution, we are confident in further excelling in 2017. We look forward to working alongside with you all in the near future. Once again, on behalf of the Federation, I wish you and your family all the best, and may you all have a happy, healthy, wealthy and prosperous year ahead.

Thank you.





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Editorial

Dr Wilson LEE

FCDSHK (Orthodontics), FHKAM (Dental Surgery), MOrthRCS (Edin), MOrth (HK), AdvDipOrtho (HK), MRACDS (Ortho), BDS (HK), BSc (Toronto)

Specialist in Orthodontics, Private Practice;
Part-time Clinical Lecturer, Faculty of Dentistry, The University of Hong Kong;
Executive Committee Member (HKSO), Asian Pacific Orthodontic Society

Editor



Dr Wilson LEE

Orthodontics is the first specialty field within Dentistry. In Hong Kong, there are currently 64 Specialists in Orthodontics within the Dental Council of Hong Kong registry, which is the largest number of specialists amongst the eight specialties in Dentistry. It gives me great pleasure and honour to be the editor for this issue on Orthodontics.

In Latin terms, Orthodontics means ‘straight teeth’. Traditionally, orthodontists deal with the diagnosis, prevention and correction of dental and skeletal discrepancies. Soft tissue components in diagnosis and treatment planning have become more and more important nowadays, as patients not only want straight teeth, but also a beautiful smile and facial profile. This is the philosophy nowadays we refer to as “Face Driven Orthodontics”.

In this issue on Orthodontics, authors with various experiences and backgrounds will share their knowledge from early diagnosis of common orthodontic problems, to the most advanced technology in treatment of malocclusion and dentofacial deformities.

We shall start the issue with why an early orthodontic assessment in children is the foundation for a healthy and beautiful smile when they grow up. The myth of “having orthodontic treatment or assessment when all permanent teeth have erupted” will be explained in details why this is wrong. Pre- and Post-treatments photos are used for better understanding of various problems to watch for in primary school children.

The second article is about craniofacial orthodontics, written by an experienced team at the United Christian Hospital – Dr Ricky W.K. Wong (Orthodontics), Dr Siu-chung Fung (Oral & Maxillofacial Surgery) and Dr Angus Ho (General Dentistry). The article talks about the interdisciplinary treatment on patients with craniofacial problems, from cleft lip and palate to craniofacial syndromes and anomalies. The roles of the orthodontist, oral and maxillofacial surgeon, paediatrician, ENT surgeon as well as the plastic surgeon are described. Orthodontists also play an adjunctive role in management of severe obstructive sleep apnoea by preparing them for maxillomandibular advancement surgery or providing them with myofunctional therapy. Not only are we able to restore the functions of these less fortunate patients, we can also improve their aesthetics and self-esteem while providing them with the best available care in a hospital setting.

The next three articles will be on various advances in orthodontic treatments.

Dr Franklin She will discuss in detail about the orthodontic management of a patient with gummy smile in which an interdisciplinary approach was adopted to achieve the best possible result. Dr She has a unique diagnosis and treatment planning of cases whose smiles show excessive gingival display due to increased vertical maxillary growth. Orthodontic Temporary Anchorage Devices



(TAD) or mini-screws have been the paradigm shift in our specialty in the past decade, and one of the indications is discussed and utilised in this article. In most circumstances, we are able to use this method to reduce the percentage of patients who require orthognathic surgery. An inter-disciplinary treatment approach with Dr Adrian Seto (Restorative Dentistry) and Dr Mei Chong (Oral & Maxillofacial Surgery) is also demonstrated in this article.

Invisalign® is a removable orthodontic appliance which has stirred immense interests in the field of orthodontics in the past decade due to its very successful city-wide marketing strategy. Dr Charlene Wu will discuss the importance of its treatment planning and how these removable appliances can provide sequential teeth movements with the illustration of two clinical cases. It is crucial that patients are informed and doctors are aware of the limitations of teeth movements by Invisalign®.

The final clinical article is about Incognito™, which is now the most popular lingual fixed orthodontic appliance. As some of the cases might not be suitable for treatment by removable appliance, Incognito™ is the choice for better control of teeth movement three-dimensionally, as it is an invisible fixed appliance with brackets and wires. An update on the versatility of the appliance is also illustrated with two clinical cases.

We will finish the issue with a sharing session by Dr David T.O. Leung who is the orthodontist pioneering in charitable work in the China Mainland for over 20 years. For the first ten years, he spent almost half of his time in the Mainland working with poor families and children with the objective of guiding them out of poverty. Areas like Qingyuan, Tibet, Henan, Shenyang, Baoding, Yunnan and so on have seen Dr Leung's footsteps. He will share his memorable experiences of his dental servicing work in the Mainland, gently reminding us that "living for others" is the most rewarding feelings in our lives.

I hope this issue will provide more insight into the Orthodontics specialty, and I wish you all a very happy, healthy and prosperous Year of the Rooster!!

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Why do children need early orthodontic assessment?

Dr Franklin Tsang-tsang SHE

FCDSHK (Orthodontics), FHKAM (Dental Surgery), MOrthRCS (Edin), MOrth (HK), AdvDipOrtho (HK), BDS (HK)

Specialist in Orthodontics, Private Practice; Part-time Clinical Lecturer, Faculty of Dentistry, The University of Hong Kong

Dr Wilson LEE

FCDSHK (Orthodontics), FHKAM (Dental Surgery), MOrthRCS (Edin), MOrth (HK), AdvDipOrtho (HK), MRACDS (Ortho), BDS (HK), BSc (Toronto)

Specialist in Orthodontics, Private Practice; Part-time Clinical Lecturer, Faculty of Dentistry, The University of Hong Kong; Executive Committee Member, Asian Pacific Orthodontic Society



Dr Franklin Tsang-tsang SHE

Dr Wilson LEE

This article has been selected by the Editorial Board of the Hong Kong Medical Diary for participants in the CME programme of the Medical Council of Hong Kong (MCHK) to complete the following self-assessment questions in order to be awarded 1 CME credit under the programme upon returning the completed answer sheet to the Federation Secretariat on or before 31 January 2017.

Introduction:

Orthodontists are dental specialists who diagnose, prevent and treat dental and facial irregularities which include eruption disorder of permanent teeth, bad bite (malocclusion) and facial disproportion (dentofacial deformities).

These problems arise from disruption of normal growth and development of the dentofacial complex (i.e. teeth, dentoalveolar process, maxilla and mandible) which can be inherited or acquired. Thumb-sucking, dental disease, premature loss of primary and permanent teeth, trauma or medical problems such as chronic upper airway obstruction and mouth breathing are some of the examples of the acquired factors.

Orthodontic problems leaving unattended tend to worsen over time and they could cause complications such as chewing difficulties, speech disorder, tooth wear and periodontal disease. Furthermore, unerupted teeth can associate with pathological changes, while protruded front teeth increase risks of dental trauma.¹

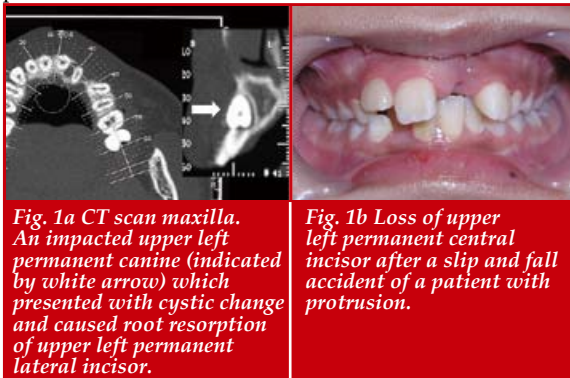


Fig. 1a CT scan maxilla. An impacted upper left permanent canine (indicated by white arrow) which presented with cystic change and caused root resorption of upper left permanent lateral incisor.

Fig. 1b Loss of upper left permanent central incisor after a slip and fall accident of a patient with protrusion.

In addition to the functional and physical disadvantages, there are psycho-social concerns which some patients may be subject to teasing. It may cause a damaging and long-lasting effect on the patient's self-esteem while orthodontic treatment can reduce its adverse impact.²

The Hong Kong Society of Orthodontists and American Association of Orthodontists recommend that all children have a check-up with an orthodontic specialist no later than age 7. It is the optimal time for assessment of the occlusion and jaw relationship when the first permanent molars and incisors erupt into the oral

cavity. While treatment may not be started until years later, early assessment allows the specialist to detect and evaluate problems and plan appropriate treatment at the optimal time. In some cases, early treatment may be initiated to intercept the existing problems. This early intervention may prevent more serious problems from developing and make treatment at a later age shorter and less complicated.

Medical practitioners are often the first to see orthodontic problems in young patients. The purpose of this article is to introduce some basic clinical signs to assist you in recognising common developing problems.

An ideal occlusion and a perfect face in Orthodontics:

Before discussing how to identify problems in the seven-year-old patient, it is advantageous to understand what is ideal on occlusion and facial balance at permanent dentition and what is normal variation during the transition from deciduous to permanent dentitions.



Fig. 2a Intraoral front view of an ideal occlusion which is the result of orthodontic treatment.

Fig. 2b Intraoral left buccal view of ideal occlusion. Upper and lower teeth fit like a set of matching gears.

Fig. 2c Extraoral frontal view. Slight lip separation and exposure of upper incisors are normal. Ideal proportion of lower face with upper lip-to-base of upper lip to chin is 1-to-2.

Fig. 2d Extraoral lateral profile. Base of lower lip curvature is slightly behind the lower lip – It is ideal to have mandible which is slightly behind the maxilla.

At the frontal view, with teeth bite together, the upper midline should line up with the lower midline. Upper

arch is slightly wider than the lower. Furthermore, about one half to two thirds of the length of the bottom teeth should be visible.

When the mouth is open, all the teeth should be aligned in a flowing curve shaped. They should all be contacting each other with no overlapping or spacing between them.

At the sagittal view, the cusps or pointed ends of the upper molars, premolars and canines should fit perfectly between two teeth on the lower arch like a set of matching gears (Fig. 2b). The backs of the upper incisors should rest in gentle contact with the fronts of the lower ones. This means that the upper teeth are in front of the lower ones when the bite is closed.

For the ideal facial proportions; at the frontal view, the upper lip length halves the length measuring from the base of upper lip to the bottom of the chin (lower facial height proportion).³ When the lips are relaxed, their range of separation should be from 0 to 3mm; the upper incisors should be in line with the base of the upper lip or visible up to 2mm in male and 4mm in females.⁴ The upper dental midline which was mentioned before should match with the midline of the philtrum of upper lip and the chin point. The face should look symmetrical, although perfect symmetry does not exist clinically. During a social smile, it is ideal to show 2mm of gum above the upper incisors and the curve joining the incisal edges of upper incisors should be parallel to the base of lower lip.⁵

At sagittal view, when the patient is standing straight with the eyes looking forward, the base of upper lip curvature should be in line with the forehead and slightly in front of base of lower lip curvature. It indicates a balanced position of the maxilla, mandible, the teeth and the supporting dental alveolar processes. The shape of the chin should be well defined.

It is normal to look less than ideal in a seven-year-old:



Fig. 3a Intraoral frontal view showing spacing between upper central incisors in a typical 7 to 8 years old child.
Fig. 3b Dental panoramic radiograph showing developing permanent teeth in the dentoalveolar process of the child in Fig. 3a.
Fig. 3c Increased lip separation can be a normal feature in a 7 years old child.
Fig. 3d Sagittal growth of lower jaw may catch up in the future for a 7 years old child.

An ideal occlusion in permanent dentition exists rarely in our population, and normal occlusions occur only in 7% in Chinese.^{4,6} Certainly, for a child in the age of 7, with a lot of dentofacial development coming ahead, perfect tooth alignment and facial proportional are not to be expected and variations from ideal is not a cause for alarm. This child presents with a “ugly duckling” stage of transitional development which is called ‘mixed’ dentition, of which deciduous and permanent teeth are both present. The spacing and malalignment of upper permanent central incisors could be normal in a seven-year-old child. Furthermore, increased lip separation when the lips are at rest, a relatively retrusive mandible and reduced lower facial height proportion are normal as the future growth might improve the problems by itself.⁷

The dental panoramic radiograph can clearly show the arrangement of teeth in mixed dentition. The presence of permanent first molars, upper and lower central incisors and lower lateral incisors and the remaining deciduous teeth in the oral cavity. In the dentoalveolar process, the rest of permanent teeth are developing at various stages. The space between the upper central incisors will reduce when the rest of permanent teeth erupt in a slightly forward position.⁸

Clinical signs of orthodontic problems and complications:

Common orthodontic problems to look for in 7-10 year olds:

- Moderate to severe skeletal discrepancies
- Delayed eruption
- Hypodontia or hyperdontia
- Infraocclusion or submergence of teeth
- Large overjet (protruded front teeth)
- Deep overbite
- Centre line discrepancies
- Crowding
- Anterior and/or posterior crossbites
- Impacted first molars or canines
- First molar tooth with poor prognosis
- Abnormal soft tissue patterns
- Persistent parafunctional habits

We will discuss in the followings the common clinical signs, causes and complications of some of the dental, skeletal and facial developmental problems of children during early mixed dentition stage.

Anterior crossbite



Fig. 4a Pre-treatment. Receded gum of lower central incisors (Indicated by white circle), with anterior crossbite between the upper and lower central incisors.

Fig. 4b Post-treatment. Interceptive orthodontic treatment was done to correct the anterior crossbite.



Clinical signs and causes

- At least one of the lower incisors are biting in front of upper incisors.
- It could be a localised problem involving one or two incisors which is caused by teeth erupting in the wrong place;
- or a generalised problem which the whole lower dentition is in front of the upper due to under-development of maxilla or over-development of mandible in sagittal dimension.

Complications

- Receding gum - Lower incisors are pushed outside the dentoalveolar process causing loss of supporting bone and soft tissue.
- Functional shift - Patient tends to bite with the mandible protruded to compensate for bite interference at incisors. It has a negative impact on future growth and development and makes the correction more difficult as permanent teeth erupt and settle in a shifted jaw position.^{9,10}

Protrusion ("buck teeth")



Fig. 5a Pre-treatment. Extraoral frontal view.
 Fig. 5b Pre-treatment. Increased distance between upper and lower incisors (increased overjet).
 Fig. 5c Post-treatment. Extraoral frontal view.
 Fig. 5d Post-treatment. Normal distance between upper and lower incisors (normal overjet).

Clinical signs and causes

- Upper incisors are biting too much forward comparing to the lower.
- Patient appears to have a retrusive lower jaw and/ or protrusive upper jaw indicating under-development of mandible or over-development of maxilla in sagittal dimension.
- Lower lip is trapped behind the back of upper incisors during swallowing.

Complications

- Prone to trauma of upper incisor during a slip and fall accident.¹
- Prone to trauma of palate - As the lower incisors is biting behind the upper, they tend to over-erupt and bite on the palatal soft tissue.
- Bullying - Patient has higher prevalence of being bullied comparing to other problems.²

Posterior crossbite (Narrow upper jaw)



Fig. 6a Pre-treatment. Maxilla is narrower than the mandible.

Fig. 6b Post-treatment. After orthopaedic expansion of the maxilla, it is now wider than the mandible which is normal.

Clinical signs and causes

- Lower arch is wider than the upper arch which is caused by under-development of the width of maxilla.¹¹
- Dental and facial midline deviation due to functional shift.
- Posterior crossbite often co-exists with other problems

Complications

- Eruption disorder and crowding - A narrow maxilla reduces space for eruption of permanent teeth.
- Functional shift - Patient tends to bite with the mandible shift to the side to compensate for the upper and lower arch width discrepancy. It contributes to the development of skeletal asymmetry.

Deep bite (increased overbite)



Fig. 7a Pre-treatment. Lower incisors were covered by the upper incisors completely (deep overbite). Risk of upper incisor traumatising soft tissue is indicated by white arrow.

Fig. 7b Post-treatment. Upper incisors covered one-third of lower incisors which is normal.

Clinical signs and causes

- Not showing lower front teeth at all when biting together.
- It might co-exist with other problems such as increased overjet.
- It is caused by a sagittal discrepancy of incisor or jaw relationship which allows the incisor to over-erupt into a vertical problem.

Complications

- Receding gum - As the upper incisors are biting in front of the lower without vertical support, over-erupted upper incisors and lower incisors can bite on the supporting soft tissue and bone instead of the opposing teeth which causes trauma.
- Tooth wear - too much overlapping of upper and lower incisors causes enormous stress on the incisors when the mandible moves during chewing. It creates cracks and wears of the teeth.
- Temporomandibular joint dysfunction - the condyles are being pushed behind the glenoid fossa which can induce internal derangement of joint and masticatory muscle disorders in long term.¹²

Oral habit (Thumb sucking, mouth breathing or tongue thrust) and anterior open bite



Fig. 8a Pre-treatment. Upper incisors did not overlap the lower incisors vertically (anterior open bite). It can be caused by parafunctional habit and medical conditions such as adenoid hyperplasia.

Fig. 8b Post-treatment. Upper incisors overlapped lower incisors.

Clinical signs and causes of Open Bite¹³

- Sucking thumb during sleep after 6 years old.
- Tongue protruded to attain oral seal during swallowing.
- Adenoid face.
- Mouth breathing.
- Upper permanent incisors fail to contact the lower incisors when biting all the way down (Anterior open bite)
- Usually the problem exists at primary dentition.

Complications

- Underdevelopment of the width of maxilla causing posterior crossbite.
- Excessive development of the height of dentoalveolar process causing gummy smile and anterior open bite.
- Chewing difficulties and speech disorder.

Crowding (Overlapping teeth)



Fig. 9a Pre-treatment. Severe crowding of permanent incisors.

Fig. 9b Post-treatment. Four permanent teeth (premolars) were extracted, maxilla was expanded to gain space for alignment.

Clinical signs and causes

- Overlapping of permanent incisors in mixed dentition.
- It is caused by the discrepancy between tooth size and the length and width of the dental arch.

Complications

- Eruption disorder of other permanent teeth due to lack of space.
- Receding gum – lower incisors are pushed away from the supporting bone and soft tissue in a crowded space.

Eruption disorder and spacing

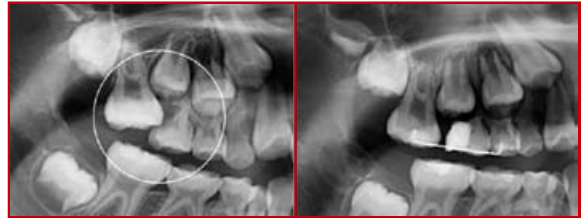


Fig. 10a Pre-treatment. The panoramic radiograph illustrates ectopic eruption of upper right permanent first molar caused by premature resorption of the root of upper right deciduous second molar which is indicated by white circle.

Fig. 10b Post-treatment. The upper right permanent first molar was aligned and stabilised by a piece of metal wire bonded to the deciduous upper first molar. Space was created to allow the eruption of the premolars.

Clinical signs and causes

- Asymmetric pattern of eruption - the eruption of the same tooth on the other side of the dental arch is delayed beyond 6 months.
- Abnormal spacing
- Disruption of normal sequence of permanent teeth eruption. - this can be caused by physical obstruction such as an extra tooth in the dentoalveolar process, crowding, early loss of deciduous teeth, abnormal eruption path of the erupting tooth, failed normal eruption mechanism or the tooth is congenitally missing.
- Some craniofacial syndromes, medical conditions and therapies would affect tooth eruption.

Complications

- Chewing difficulties and aesthetic inconvenience.
- Pathology which is associated with the physical obstruction such as cystic change and root resorption.
- Drifting of other permanent teeth to the unerupted tooth space.
- The ability for a tooth to erupt spontaneously reduces when the root formation has completed. It complicates the treatment for a delayed diagnosis.

Individual orthodontic assessment is the key:

As mentioned before, early diagnosis does not necessarily mean early treatment. As the nature of each problem is different and different problems could co-exist, it would be impossible to discuss here about the best treatment timing for individual problem. The common myth saying 'wait until all the permanent teeth are erupted before getting braces or having an orthodontic assessment' would definitely lead to delay in interceptive treatment in a significant number of child patients.

Furthermore, orthodontic treatment often requires the patient to wear the corrective appliance which is fixed in the oral cavity. On the other hand, some appliances are removable which may or may not include a headgear.¹⁴ ¹⁵ It could be a challenge to the oral hygiene, dietary habit and management of after-school time for the patients and parents.



Last but not least, as the nature of orthodontic problems relates to the disruption of growth and development of dentofacial complex which are partly related to genetic influence, it leads to limitations to the treatment. There are patients who must be treated early, while long term follow-up is necessary and another phase of treatment (Phase 2) is required for comprehensive management in puberty or in response to a relapse in adult. On the other hand, there are patients who are best to be managed in adulthood with combined orthognathic surgery and orthodontic treatment.¹⁶



Fig. 11a Pre-treatment. Phase 1. Anterior and posterior crossbites were due to under-development of maxilla in sagittal and transverse dimension.

Fig. 11b Post-treatment. Phase 1. Maxilla was expanded and protracted to correct the anterior and posterior crossbites. Decalcification was presented as white spots (indicated by white arrow) on upper permanent incisors which was a complication of orthodontic treatment. It was caused by frequent intake of food and drinks with high sugar content and inadequate oral hygiene.

Fig. 11c Five years post-treatment of phase 1. Excessive and undesirable lower jaw growth caused relapse of anterior crossbite.

Fig. 11d Post-treatment. Phase 2. Combined orthognathic surgery and orthodontic treatment after cessation of dentofacial growth.

Therefore, there is no specific age or stage of growth which is optimal for orthodontic treatment as all individuals are different in growth and development aspects.

In conclusion, the indications and objectives for the treatment, complications, the choice of the appliance and the compliance required, optimal timing and prognosis should be assessed individually by an Orthodontic specialist which includes a detailed discussion with the patients and parents in many aspects. After all, orthodontic treatment, for many patients, is an elective procedure to improve quality of life. As such, the practice of shared decision making is definitely advantageous in patient management in a contemporary orthodontic practice.

References

1. Thiruvengkatachari B, Harrison J, Worthington H, O'Brien K. Early orthodontic treatment for Class II malocclusion reduces the chance of incisal trauma: Results of a Cochrane systematic review. *Am J Orthod Dentofacial Orthop* 2015;148(1):47-59.
2. Seehra J, Newton JT, Dibiasi AT. Interceptive orthodontic treatment in bullied adolescents and its impact on self-esteem and oral-health-related quality of life. *Eur J Orthod* 2013;35(5):615-21.

3. Jacobson A, Jacobson RL. Radiographic cephalometry : from basics to 3-D imaging. 2nd ed. Chicago: Quintessence Pub.; 2006.
4. Proffit WR, Fields HW, Sarver DM. Contemporary orthodontics. 4th ed. St. Louis, Mo.: Mosby Elsevier; 2007.
5. Sarver DM. The importance of incisor positioning in the esthetic smile: the smile arc. *Am J Orthod Dentofacial Orthop* 2001;120(2):98-111.
6. Lew KK, Foong WC, Loh E. Malocclusion prevalence in an ethnic Chinese population. *Aust Dent J* 1993;38(6):442-9.
7. Yeung CY, McGrath CP, Wong RW, et al. Frontal facial proportions of 12-year-old southern Chinese: a photogrammetric study. *Head Face Med* 2015;11:26.
8. Mitchell L. An introduction to orthodontics. 4th ed. Oxford: Oxford University Press; 2013.
9. Anderson I, Rabie AB, Wong RW. Early treatment of pseudo-class III malocclusion: a 10-year follow-up study. *J Clin Orthod* 2009;43(11):692-8.
10. Rabie AB, Gu Y. Diagnostic criteria for pseudo-Class III malocclusion. *Am J Orthod Dentofacial Orthop* 2000;117(1):1-9.
11. Thilander B, Wahlund S, Lennartsson B. The effect of early interceptive treatment in children with posterior cross-bite. *Eur J Orthod* 1984;6(1):25-34.
12. Sonnesen L, Svensson P. Temporomandibular disorders and psychological status in adult patients with a deep bite. *Eur J Orthod* 2008;30(6):621-9.
13. Ngan P, Fields HW. Open bite: a review of etiology and management. *Pediatr Dent* 1997;19(2):91-8.
14. Bendeus M, Hagg U, Rabie B. Growth and treatment changes in patients treated with a headgear-activator appliance. *Am J Orthod Dentofacial Orthop* 2002;121(4):376-84.
15. Phan KL, Bendeus M, Hagg U, Hansen K, Rabie AB. Comparison of the headgear activator and Herbst appliance--effects and post-treatment changes. *Eur J Orthod* 2006;28(6):594-604.
16. Hagg U, Tse A, Bendeus M, Rabie AB. Long-term follow-up of early treatment with reverse headgear. *Eur J Orthod* 2003;25(1):95-102.

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MCHK CME Programme Self-assessment Questions

Please read the article entitled "Why do children need early orthodontic assessment?" by Dr Franklin Tsang-tsang SHE and Dr Wilson LEE and complete the following self-assessment questions. Participants in the MCHK CME Programme will be awarded CME credit under the Programme for returning completed answer sheets via fax (2865 0345) or by mail to the Federation Secretariat on or before 31 January 2017. Answers to questions will be provided in the next issue of The Hong Kong Medical Diary.

Questions 1-10: Please answer T (true) or F (false)

- 1. The optimal time for the first orthodontic check up is at puberty.
2. Chronic upper airway obstruction is an acquired factor for development of orthodontic problems.
3. Orthodontic problems include eruption disorder of permanent teeth, malocclusion and dentofacial deformities.
4. Most people in permanent dentition present with ideal occlusion.
5. Spacing between upper central incisors can be a normal feature at the age of 7.
6. Anterior crossbite can cause receding gum.
7. Recent research has shown that children with protruded upper incisors have a significantly higher chance of trauma to upper incisors during a slip and fall accident.
8. A 9-year-old girl presents with crowded lower front teeth would definitely benefit with early orthodontic treatment to align them, so that other permanent teeth can erupt in better position.
9. Further investigation is indicated if the lower right first permanent molar has erupted 6 months ago, and the lower left first permanent molar still has not erupted.
10. Deep overbite can cause wearing of lower incisors.

ANSWER SHEET FOR JANUARY 2017

Please return the completed answer sheet to the Federation Secretariat on or before 31 January 2017 for documentation. 1 CME point will be awarded for answering the MCHK CME programme (for non-specialists) self-assessment questions.

Why do children need early orthodontic assessment?

Dr Franklin Tsang-tsang SHE

FCDSHK (Orthodontics), FHKAM (Dental Surgery), MOrthRCS (Edin), MOrth (HK), AdvDipOrtho (HK), BDS (HK)
Specialist in Orthodontics, Private Practice; Part-time Clinical Lecturer, Faculty of Dentistry, The University of Hong Kong

Dr Wilson LEE

FCDSHK (Orthodontics), FHKAM (Dental Surgery), MOrthRCS (Edin), MOrth (HK), AdvDipOrtho (HK), MRACDS (Ortho), BDS (HK), BSc (Toronto)
Specialist in Orthodontics, Private Practice; Part-time Clinical Lecturer, Faculty of Dentistry, The University of Hong Kong; Executive Committee Member, Asian Pacific Orthodontic Society

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Answers to December 2016 Issue

Treatment of chronic hepatitis C

- 1. T 2. F 3. T 4. T 5. T 6. T 7. T 8. F 9. T 10. T



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Craniofacial Orthodontics in Hong Kong

Dr Ricky Wing-kit WONG

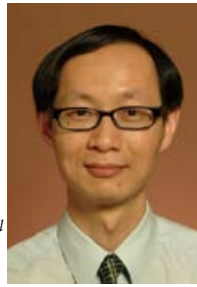
BDS (HK), MOrth (HK), PhD (HK), MOrth RCSEd, MRACDS (Orthodontics), FRACDS, FHKAM (Dental Surgery), FCDSHK (Orthodontics), FDS RCSEd
Consultant, Department of Dentistry and Maxillofacial Surgery, United Christian Hospital

Dr Siu-chung FUNG

BDS (HK), MDS (HK), FRACDS, FHKAM (Dental Surgery), FCDSHK (Oral and Maxillofacial Surgery)
Chief of Service, Department of Dentistry and Maxillofacial Surgery, United Christian Hospital

Dr Angus Cheuk-hin HO

BDS (HK)
Dental Officer, Department of Dentistry and Maxillofacial Surgery, United Christian Hospital



Dr Ricky Wing-kit WONG

Dr Siu-chung FUNG

Dr Angus Cheuk-hin HO

Introduction

Craniofacial orthodontics is the sub-specialty of orthodontics which concerns with orthodontic, dento-facial orthopaedic and myofunctional treatment of patients with craniofacial anomalies, syndromes, and other complicated conditions.

In Hong Kong, the Department of Dentistry and Maxillofacial Surgery in the United Christian Hospital (UCH) is the only centre providing Craniofacial Orthodontic Services in the Hospital Authority. It works closely with oral and maxillofacial surgeons, paediatricians, paediatric surgeons, ENT surgeons, plastic surgeons, respiratory physicians and experts in other disciplines.

The followings are some craniofacial conditions requiring craniofacial orthodontics.

Cleft lip and palate

The craniofacial orthodontist provides pre- and post-operative orthodontic and dento-facial orthopaedic support to various surgeries for cleft lip and palate patients.

Newborn babies presented with cleft lip, alveolus and palate may require pre-surgical naso-alveolar moulding (NAM, Fig. 1).¹ It utilises an orthopaedic plate and nasal stent to modify the morphology of the nose and pre-maxilla region, so as to minimise the severity of the cleft deformity and to improve the outcome of the primary lip-nose repair surgery.

Children with cleft palate or alveolus may require secondary alveolar bone grafting surgery when they are in the mixed dentition. Alveolar bone grafting surgeries aim to facilitate tooth eruption, join the alveolar ridge segments to prevent collapse of the alveolar and hard palate, provide support to alar base, and close any oro-nasal fistula. It can also stabilise the premaxilla in bilateral cases.² Pre-operatively, orthodontic treatment is needed to facilitate the bone grafting surgery. After the bone grafting surgery, orthodontic treatment is also needed to achieve optimal dental root relationship with the grafted bone. An early post-operative orthodontic treatment to align teeth and move adjacent dental roots into the bone-grafted area may prevent post-operative bone resorption and allow correct positioning of teeth.³ In cases where the alveolar cleft is too wide, or the jaw size discrepancy is too severe, combined

interdental distraction osteogenesis and orthodontics are performed. (Fig. 2)



Fig. 1 Naso-alveolar moulding (NAM) device



Fig. 2 Combined interdental distraction osteogenesis and orthodontics

Patients with cleft lip and palate often develop severe discrepancies in the relationship of the two jaws, resulting in severe facial disharmony, dental malocclusion, psychological and social burdens.⁴ Combined surgical orthodontic treatments will be performed to correct the severe skeletal discrepancy. Definitive lip-nose revision surgery will then be considered at the end of the combined surgical orthodontic treatment.

Craniofacial anomalies and syndromes

Craniofacial syndromes and anomalies require multi-disciplinary management involving the medical, surgical, dental and allied health professionals. The craniofacial orthodontist focuses on the orthodontic and dento-facial orthopaedic management of facial skeletal discrepancy and dental malocclusion of these patients.

Craniosynostosis is a condition in which the fibrous sutures in the skull fuse prematurely. The condition can be isolated or syndromic (e.g. Apert syndrome, Crouzon syndrome, Pfeiffer syndrome). Premature fusion of cranial sutures inhibits the growth of the cranium and facial bones, hence it leads to a number of complications, including increased intra-cranial pressure, facial deformity and risk of upper airway obstruction. Classical intra-oral presentations of craniosynostosis include severe maxillary hypoplasia, severe dental crowding, and a reduced tongue space in the oral cavity. Craniofacial orthodontics involves monitoring of the craniofacial growth and provides treatment for the dental malocclusion, facial disharmony and possible airway problems. Combined treatments with distraction osteogenesis of the jaws and orthodontics are performed



to align the teeth, improve the facial aesthetics and create more space in the oral cavity to house the tongue. (Fig. 3)



Fig. 3 12-year-old boy with Apert syndrome. Maxillary and mandibular intra-oral distractors in situ to widen the jaws.

The Pierre Robin Sequence (PRS) comprises mandibular micrognathia, glossoptosis, with or without U-shaped cleft palate.⁵ The small and retrusive mandible leads to the tongue falling backward, thus resulting in airway obstruction and difficulty in feeding. The prevalence of obstructive sleep apnoea syndrome (OSA) is about 85% of all infants with PRS.⁶ For milder cases, infants can be treated with a myofunctional and dento-facial orthopaedic device called the Pre-Epiglottic Baton Plate (PEBP). The PEBP was first developed by Buchenau et al.⁷ as a non-invasive first-line treatment of OSA in infants with PRS (Fig. 4a). Our centre modified the technique and is now among the few centres in the world successful in providing this treatment. The craniofacial orthodontist works closely with the paediatrician in order to prescribe the PEBP to the infant. The paediatrician conducts an infant polysomnography to determine the severity of OSA of the infant. He is also responsible to do a real-time endoscopy (Fig. 4b) to guide the orthodontist to measure and adjust the baton plate at the correct position in the posterior tongue base region, so as to support the tongue and prevent it from falling backward and obstructing the airway. The baton plate is adjusted to avoid touching the baby's epiglottis for stimulation of his gag reflex. As the growth of the mandible usually catches up after the first few months of life, most of the mild airway obstruction will resolve spontaneously and hence the PEBP can be weaned off.



Fig. 4a Pre-epiglottic baton plate



Fig. 4b Endoscopic image showing the baton at the back of the tongue, without touching the epiglottis

For severe cases, mandibular distraction osteogenesis is an effective way to secure the airway, prevent or allow early decannulation of tracheostomy and relieve symptoms of OSA in PRS infants.⁸ However, complications of the surgery may include disturbance of the dental development, dental malocclusion as in anterior open bite, condylar resorption, dental injury, etc.⁹ Hence, orthodontics, dento-facial orthopaedics, myofunctional therapy as well as combined surgical

orthodontic treatments may be indicated in these patients when they grow up.

Hemifacial microstomia involves deformity of the eye, mandible, ear, cranial nerve, associated soft tissues and possible extra-cranial features.¹⁰ The O.M.E.N.S. classification system¹¹ is commonly used to classify the presence and severity of its phenotypic features. The ramus and condyle of the mandible and the associated temporomandibular joint may be hypoplastic three-dimensionally or even completely absent. The hypoplastic mandible and associated soft tissues cause deformity of the dento-alveolar complex, affecting the development of the maxilla, dental occlusion and facial symmetry. Very often, multiple stages of complex orthodontic, dento-facial orthopaedic and combined surgical orthodontic treatments together with distraction osteogenesis, temporomandibular joint reconstruction and soft tissues augmentation surgeries may be required to correct the dento-facial deformities of this group of patients. (Fig. 5)

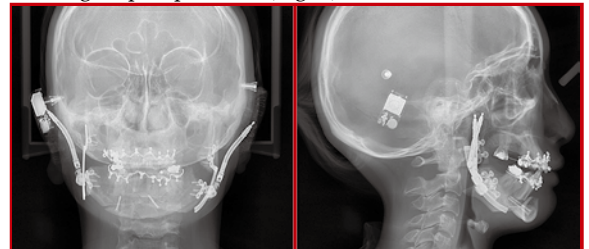


Fig. 5 Hemifacial microstomia patient treated with combined orthodontic and distraction osteogenesis treatment

Obstructive sleep apnoea

The prevalences of OSA in primary school boys and girls in Hong Kong were 5.8% and 3.8% respectively.¹² Currently, tonsillectomy and adenoidectomy (T&A) remains the first line therapy for children with OSA. However, the curative rate of T&A is far from satisfactory. A study found that more than 50% of children undergoing T&A were found to have persistent sleep disordered breathing post-operatively.¹³ It was suggested that the partial response might be attributable to craniofacial structural factors including the maxilla and mandible. A recent systematic review and meta-analysis suggested that OSA children tend to have more narrow maxilla with high palatal vault, retrusive chin, steep mandibular plane, vertical direction of growth and a tendency toward Class II malocclusion.¹⁴ Hence, correcting the craniofacial risk factors could improve OSA in children. Indeed, emerging evidences suggested that orthodontic treatments, including orthopaedic mandibular advancement and rapid maxillary expansion, might be effective in managing paediatric OSA.^{15, 16} Fig. 6a, 6b showed the functional appliances and rapid maxillary expansion we use to treat patients with OSA in our clinic.

For adult patients with mild to moderate OSA, oral appliances have been well proven to be an effective alternative to continuous positive airway pressure therapy.^{17, 18} Apart from short term adverse effects such as dental pain, temporomandibular joint discomfort, gingival soreness, etc., long term use of oral appliances

may cause changes in dental occlusion and incisor angulations. Hence, oral appliances should not be an one-off prescription, instead its use should be closely monitored.

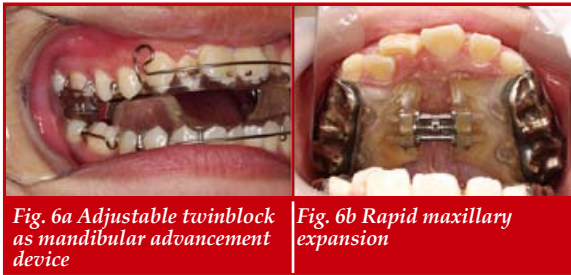


Fig. 6a Adjustable twinblock as mandibular advancement device

Fig. 6b Rapid maxillary expansion

Orthodontics plays an adjunctive role in adults with severe OSA. The maxillomandibular advancement surgery is a well-proven effective way to treat severe OSA, with a success rate of over 80% reported in multiple meta analyses.^{19, 20, 21} In addition, surgical maxillary expansion, maxillomandibular expansion, mandibular distraction osteogenesis and midface distraction osteogenesis were also found to be beneficial in OSA treatment.^{22, 23, 24} These surgical procedures might alter dental occlusion and orthodontic support is sometimes required for better functional and aesthetic outcomes. (Fig. 7)



Fig. 7a, b Pre-treatment: AHI 38, RDI 58.1, Lowest Oxygen 87.8%



Fig. 7c, d 7-month post-treatment: AHI 1.8, RDI 2.2, Lowest Oxygen 90%

Orthodontists have long been recognising the effect of the orofacial muscles on dento-facial growth and development. Various orthodontic appliances are designed to modify or utilise the muscles for correcting dental malocclusion, skeletal discrepancy, and parafunctional habits. Orofacial myofunctional therapy was first used as an adjunctive management of OSA by Guimaraes.²⁵ It involves a series of exercises of the lips, tongue, soft palate and muscles of the lateral pharyngeal wall. A systematic review and meta-analysis demonstrated that myofunctional therapy decreased AHI by about 50% in adults (120 patients

in nine studies) and 62% in children (25 patients in two studies).²⁶ Craniofacial orthodontists are in a good position to assess the craniofacial hard and soft tissues and prescribe orofacial myofunctional therapy, orthodontic and dento-facial orthopaedic treatments for OSA patients.

Conclusion

Craniofacial orthodontists, together with a team of medical and dental specialists, are important in the successful management of complex craniofacial conditions. This article serves as a brief introduction to this wide range of patient spectrum and treatment modalities in the field of craniofacial orthodontics in Hong Kong.

References

- Grayson BH, Cutting C, Wood R. Preoperative columella lengthening in bilateral cleft lip and palate. *Plast Reconstr Surg.* 1993;92(7):1422-1423.
- Nahai FR WJ, Burstein FD, Martin J, Thomas J. The Management of Cleft Lip and Palate: Pathways for Treatment and Longitudinal Assessment. *Seminars in Plastic Surgery.* 2005;19(4):275-285.
- Toscano D, Bacliero U, Gracco A, Siciliani G. Long-term stability of alveolar bone grafts in cleft palate patients. *Am J Orthod Dentofacial Orthop.* 2012;142(3):289-299.
- Vig KW, Mercado AM. Overview of orthodontic care for children with cleft lip and palate, 1915-2015. *Am J Orthod Dentofacial Orthop.* 2015;148(4):543-556.
- Robin P. Glossoposis due to atresia and hypotrophy of the mandible. *American Journal of Diseases of Children.* 1934;48:541-547.
- Anderson IC, Sedaghat AR, McGinley BM, Redett RJ, Boss EF, Ishman SL. Prevalence and severity of obstructive sleep apnea and snoring in infants with Pierre Robin sequence. *Cleft Palate Craniofac J.* 2011;48(5):614-618.
- Buchena W, Urschitz MS, Sautermeister J, et al. A randomized clinical trial of a new orthodontic appliance to improve upper airway obstruction in infants with Pierre Robin sequence. *J Pediatr.* 2007;151(2):145-149.
- Ow AT, Cheung LK. Meta-analysis of mandibular distraction osteogenesis: clinical applications and functional outcomes. *Plast Reconstr Surg.* 2008;121(3):54e-69e.
- Verlinden CR, van de Vijfeijken SE, Jansma EP, Becking AG, Swennen GR. Complications of mandibular distraction osteogenesis for congenital deformities: a systematic review of the literature and proposal of a new classification for complications. *Int J Oral Maxillofac Surg.* 2015;44(1):37-43.
- Horgan JE, Padwa BL, LaBrie RA, Mulliken JB. OMENS-Plus: analysis of craniofacial and extracraniofacial anomalies in hemifacial microsomia. *Cleft Palate Craniofac J.* 1995;32(5):405-412.
- Vento AR, LaBrie RA, Mulliken JB. The O.M.E.N.S. classification of hemifacial microsomia. *Cleft Palate Craniofac J.* 1991;28(1):68-76; discussion 77.
- Li AM, So HK, Au CT, et al. Epidemiology of obstructive sleep apnoea syndrome in Chinese children: a two-phase community study. *Thorax.* 2010;65(11):991-997.
- Guilleminault C, Huang YS, Glamann C, Li K, Chan A. Adenotonsillectomy and obstructive sleep apnea in children: a prospective survey. *Otolaryngol Head Neck Surg.* 2007;136(2):169-175.
- Flores-Mir C, Korayem M, Heo G, Witmans M, Major MP, Major PW. Craniofacial morphological characteristics in children with obstructive sleep apnea syndrome: a systematic review and meta-analysis. *J Am Dent Assoc.* 2013;144(3):269-277.
- Huynh NT, Desplats E, Almeida FR. Orthodontics treatments for managing obstructive sleep apnea syndrome in children: A systematic review and meta-analysis. *Sleep Med Rev.* 2016;25:84-94.
- Ngiam J, Cistulli PA. Dental treatment for paediatric obstructive sleep apnea. *Paediatr Respir Rev.* 2015;16(3):174-181.
- Lim J, Lasserson TJ, Fleetham J, Wright J. Oral appliances for obstructive sleep apnoea. *Cochrane Database Syst Rev.* 2006(1):CD004435.
- Ferguson KA, Cartwright R, Rogers R, Schmidt-Nowara W. Oral appliances for snoring and obstructive sleep apnea: a review. *Sleep.* 2006;29(2):244-262.
- Holtz JE, Guilleminault C. Maxillomandibular advancement for the treatment of obstructive sleep apnea: a systematic review and meta-analysis. *Sleep Med Rev.* 2010;14(5):287-297.
- Pirklbauer K, Russmueller G, Stiebellehner L, et al. Maxillomandibular advancement for treatment of obstructive sleep apnea syndrome: a systematic review. *J Oral Maxillofac Surg.* 2011;69(6):e165-176.
- Zaghi S, Holtz JE, Certal V, et al. Maxillomandibular Advancement for Treatment of Obstructive Sleep Apnea: A Meta-analysis. *JAMA Otolaryngol Head Neck Surg.* 2016;142(1):58-66.
- Abdullatif J, Certal V, Zaghi S, et al. Maxillary expansion and maxillomandibular expansion for adult OSA: A systematic review and meta-analysis. *J Craniomaxillofac Surg.* 2016;44(5):574-578.
- Hamada T, Ono T, Otsuka R, et al. Mandibular distraction osteogenesis in a skeletal Class II patient with obstructive sleep apnea. *Am J Orthod Dentofacial Orthop.* 2007;131(3):415-425.
- Taylor BA, Brace M, Hong P. Upper airway outcomes following midface distraction osteogenesis: a systematic review. *J Plast Reconstr Aesthet Surg.* 2014;67(7):891-899.
- Guimaraes K. Soft tissue changes of the oropharynx in patients with obstructive sleep apnea. *J Bras Fonaudiol.* 1999;1:69-75.
- Camacho M, Certal V, Abdullatif J, et al. Myofunctional Therapy to Treat Obstructive Sleep Apnea: A Systematic Review and Meta-analysis. *Sleep.* 2015;38(5):669-675.



Interdisciplinary management of gummy smile

Dr Franklin Tsang-tsang SHE

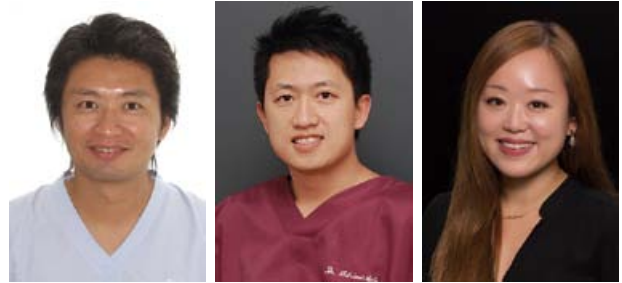
BDS (HK), MOrth (HK), MOrth RCSEd, AdvDipOrth (HK),
FCDSHK (Orthodontics), FHKAM (Dental Surgery)
Specialist in Orthodontics

Dr Adrian Wing-chun SETO

BDS (HK), MDS (Pros) (HK), AdvDipProsthodont (HK)
General dentist

Dr Mei-man CHONG

BDS(HK), MDS(OMS)(HK), MOMS RCSEd., AdvDipOMS(HK),
FHKAM(Dental Surgery), FCDSHK(OMS)
Honorary Dental Officer,
Oral and Maxillofacial Surgery, The Prince Philip Dental Hospital



Dr Franklin Tsang-tsang SHE Dr Adrian Wing-chun SETO Dr Mei-man CHONG

Introduction:

The patient (Fig. 1) was a 28 years old female with the chief complaint of a gummy smile¹, increased overjet, protrusive maxillary dentoalveolar process, defective crowns on upper incisors, trismus and pain on masseter muscle and temporomandibular joint on the left side.



Fig. 1a-j Clinical photos - Pre-treatment

She was initially referred by the first author to the Oral and Maxillofacial Surgery, Faculty of Dentistry, The University of Hong Kong for orthognathic surgery and the management of Temporomandibular joint dysfunction (TMD). The patient was subsequently diagnosed with idiopathic condylar resorption (Fig. 2). Conservative treatment with an occlusal splint was given to relieve the pain; the occlusion and the condyles were monitored by the third author which revealed no progression of condylar resorption over four years.

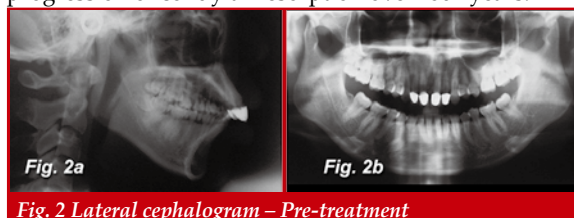


Fig. 2 Lateral cephalogram – Pre-treatment

After confirming that the condylar lesion was stable, the patient was offered combined surgical and orthodontic therapy which was the gold standard to manage her dentofacial deformities. However, she declined the orthognathic surgery due to surgery fear and contacted the first author to explore the possibility of camouflaging the problems by orthodontic means.

In order to achieve the best aesthetic result, the patient was referred to the second author before commencement of orthodontic treatment for a joint consultation. After the overall treatment plan was established together and the orthodontic treatment had started, he monitored the periodontal condition throughout the course of orthodontic tooth movement, advised on the final tooth position before the orthodontic appliance was debonded. The crowns were replaced at orthodontic retention.

We consider good collaboration was the key to achieve the result which we are going to present in this article. Despite the fact that the management of the patient was separated into orthodontics and restorative/aesthetic dentistry perspectives in the following sections, an interdisciplinary approach was adopted during treatment.

Orthodontics:

Table 1 Problem list

Extra-oral:
Protrusive maxilla
Retrusive mandible
Convex profile
Increased incisal exposure at rest
Incompetent lips
Protruded, everted and long upper lip
Gummy smile
Dental, skeletal and occlusion:
Sagittal dimension
Class II molar and canine relationship
Maxillary dentoalveolar protrusion
Mandibular retrognathism
Skeletal class 2 basal relationship
Increased overjet
Transverse dimension
Narrow maxilla
Constricted lower arch
Vertical dimension
Increased overbite
Increased curve of Spee
Anterior vertical maxillary excess
Short ramus with increased mandibular plane angle
Clockwise cant of occlusal plane (Roll)
Space condition:
Median diastema at upper central incisors region
Spacing at quadrant 2
Function:
Thick upper labial frenum
Stable idiopathic condylar resorption

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Reference: 1. Baysen A, Lynch E, Ellwood R et al. Caries Res 2001;35:41-46.

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Table 2 Treatment objectives:

Upper incisors and extra-oral features

Intrude (3mm) and retract (7mm) upper incisors to normalise incisal exposure at rest, improve gummy smile and maxillary dentoalveolar protrusion
Accept mandibular retrognathism

Occlusal plane:

Anti-clockwise rotation of upper occlusal plane (Pitch); Clockwise rotation of lower occlusal plane (Pitch) with intrusion of incisors and maintain vertical position of mo-lars
Accept clockwise cant (Roll)

Occlusion:

Accept class II molar relationship
Correct canine relationship to class I
Normalise overjet (Reduce 9mm overjet to 2mm) and overbite
Achieve Andrew's six keys ideal occlusion²

Condylar position:

Maintain, monitor progression of resorption

Table 3 Treatment plan:

Biological limit

Alveolar process

Visual treatment objective (VTO) (Fig. 3a)³ was performed by moving the incisors to the objective position and confirmed that the roots of the incisors were located in the middle of dentoalveolar process. It served as a template to guide the tooth movement.

Attached gingivae

The amount of upper incisor intrusion was verified clinically to confirm that sufficient amount of attached gingivae would remain after treatment to maintain optimum periodontal health.

Mechanical tooth movement

The objective incisor and occlusal plane relationships were transferred to the occlusogram^{4,5} for space and anchorage analysis.

Space analysis and extraction plan (Fig. 3b)

With 7mm of incisor retraction, occlusogram illustrated that there were 7mm crowd-ing at quadrant one and 5mm crowding at quadrant two. The upper first premolars had to be extracted to gain space for intrusion and retraction of the upper anterior segment.

Anchorage analysis (Fig. 3b)

Ratio of posterior segment protraction to anterior segment retraction – Quadrant one, 0.7mm (Absolute anchorage requirement)
Quadrant two, 2.7mm (Maximum anchorage requirement).

Orthodontic appliance set up

0.022" slot straight wire appliance (Smartclip, 3M Unitek) in MBT prescription
Orthodontic miniscrews IO16107 (Orlus, Ortholution) at 16 and 26mb and IO14107 between upper and lower central incisors after frenectomy

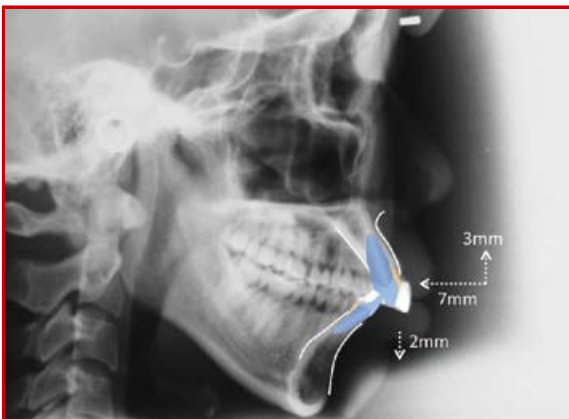


Fig.3a Visual treatment objectives (VTO) – Objective central incisors position in blue. Upper incisor intrusion 3mm, retraction 7mm. Lower incisor intrusion 2mm



Fig.3b Occlusogram of upper arch – Retraction of upper central incisors 7mm and extraction of upper first premolars. Lines in red indicated objective arch form. Dots in green and red indicated contact points of incisors, canines, second premolars and molars. Dots in blue indicated mesial contacts of first molars. Quadrant 1 – Upper first molar was not allowed to move forward at all indicated absolute anchorage requirement. Quadrant 2 – Upper first molar moved mesial 2mm indicated maximum anchorage requirement.

Orthodontic treatment progress, biomechanics and result:

Leveling and alignment

Extraction of the upper first premolars and maxillary frenectomy (Fig. 4) were performed by the third author before banding and bonding of orthodontic appliances. The patient was reviewed in 6-8 weeks' intervals during the course of orthodontic treatment. The leveling and alignment was done by progressive replacement of 0.014", 0.014" and 0.016" tandem and finally 0.021" x 0.025" superelastic Nickel Titanium (NiTi) arch wire. Orthodontic miniscrews were inserted under local anaesthesia. A powerchain which exerted 40g of force connected the miniscrew located between the upper incisors to the archwire perpendicularly. The application of force produced intrusion and proclination of the upper and lower anterior segments (Fig. 5a). This mechanics continued during space closure to control the inclination during retraction and intrusion.



Fig. 4a Site for placement of miniscrew between upper central incisors - Before Frenectomy

Fig. 4b Site for placement of miniscrew between upper central incisors - After Frenectomy

Space closure

Space closure was done by sliding mechanics on 0.019" x 0.025" stainless steel arch wires for most of the time. 100g of force was applied by powerchains connecting the miniscrews at 16 26mb to the 6mm extensions projecting perpendicularly to the arch wire between the lateral incisors and canines. The application of force retracted the upper anterior segment with controlled tipping and the incisal edge had a tendency to extrude (Fig. 5b). The segment was uprighted by two different mechanisms – First-ly, the bracket-wire interaction in Geometry 3 relationship (Fig. 5c)⁶ and secondly, the intrusion force which was produced by the application of the powerchain from the miniscrews between the upper central incisors to the arch wire which was mentioned in the last paragraph (Fig. 5a).

The positions of the upper incisors were monitored by Lateral cephalograms which were taken every six months. The VTO was superimposed on the radiographs

to illustrate the discrepancy between the existing tooth positions to the final goal and verify that the roots were still positioned within the alveolar process. Based on the findings on the superimposition, the mechanics could be modified accordingly in response to the treatment progress.

At the end of space closure, after confirming by the VTO superimposing on the lateral cephalogram and the occlusion observed clinically that distal tipping of the upper incisors and canines were allowed and the molars could be moved forward into good occlusal interdigitation; the extraction space was closed by 0.018" x 0.025" stainless steel archwire with T loops located between the upper canines and lateral incisors. The loops were activated without any pre-activation and the teeth slide along the arch wire for space closure with reciprocal anchorage between the anterior and posterior segments. Controlled tipping of the incisors was allowed as the 3rd order play between the incisor brackets to the arch wire was around 25 degrees. At the same time, Tip Edge Plus brackets were used at this stage on the upper canines which maximised the 2nd order play between the archwire and the bracket slots. It allowed tipping of the canines into class I relationship (Fig. 5d).

Enamel stripping was done on the lower incisors and the space was closed by sliding mechanics on 0.019" x 0.025" stainless steel arch wire with 100g of force delivered by powerchains connecting the hooks on the bands of the first molars to the short ex-tensions located between the canines and lateral incisors.

Dot in white indicated Center of Resistance (CR) of upper anterior segment. Dot in black with white outline indicated CR of lower anterior segment. Dot in green with white outline indicated CR of upper posterior segment. The segments were connected to powerchains which delivered force for tooth movement. The alignment of the powerchain represented the line of force application.



Fig. 5a Force systems of upper and lower anterior segments at CR and miniscrews between central incisors were illustrated. There was no clinical effect on the miniscrews as they were stable structures.



Fig. 5b Force system of upper anterior segment at CR and the miniscrew at mesial buccal re-gion of upper first molar was illustrated. The segment which was outlined in white was retracted and tipped distally. The incisal edge had a tendency to extrude to the position indicated in yellow.

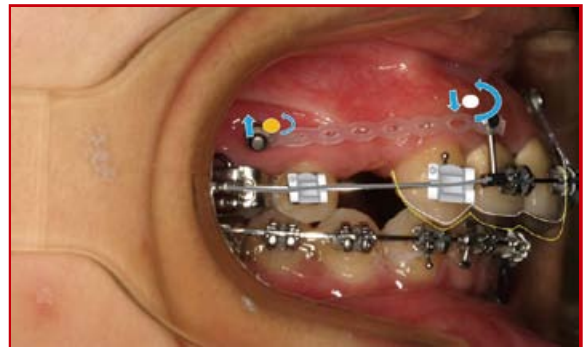


Fig. 5c Force system of CR of upper anterior and posterior segments produced by bracket-wire interaction when the anterior segment was moving towards the position indicated in yellow. The 0.019" x 0.025" stainless steel archwire produced the force system in geometry III. It helped to resist the extrusion and distal tipping of the anterior segment in the expense of intrusion and mesial tipping of posterior segment.



Fig. 5d Tippedge plus bracket (Highlighted by white circle) was bonded on upper canine to allow distal tipping at the final phase of space closure.

Finishing and detailing

An 0.018 round third generation beta titanium arch wire was used to offset and step down the upper right canine and upper left 2nd premolar. 125gm 8mm diameter latex elastics was used for vertical suck in. The patient was referred to the second author to confirm that the final occlusion was acceptable.

Retention

Vacuum-form suck-down retainers which were made by 1mm Polypropylene film (Essix C+, Densply) were delivered immediately after debonding. The patient was instructed to wear them full time for the first six months and then continued with night time wear. After the crowns on the upper incisors were replaced, upper and low-er fixed retainers (Ortho Flextech, Reliance) were bonded by composite resin and new vacuum form retainers were made to accommodate both the dentition and the bonded fixed retainers.

Result

Extensive remodelling of the maxillary dentoalveolar process by controlled root movement of the upper central incisors improved the protrusion (Fig. 6a). Satisfactory result can be seen from the cephalometric superimposition (Fig. 6b) and post-treatment photos and radiographs (Fig. 7 and 8). Treatment objectives were fulfilled.



Fig. 6a Extensive remodeling (Resorption of labial surface) of the maxillary dentoalveolar process induced by orthodontic tooth movement was evident by the progressive pro-trusion of the miniscrew (Highlighted by white circle) located between upper central incisor which was a stable structure. (Left - Immediately after insertion of miniscrew, Right - Immediately before debond)

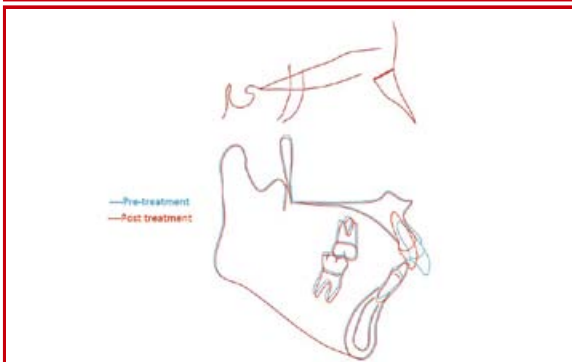


Fig. 6b Cephalometric superimposition on stable structures of cranial base. Pre-treatment in blue and post-treatment in red. Upper incisors were intruded and retracted and the root was in the middle of alveolar process.



Fig. 7 Clinical photos - Post-orthodontic treatment



Fig. 8a Lateral cephalogram - Post-treatment

Fig. 8b Dental panoramic radiograph - Post-treatment

Restorative and aesthetic Dentistry:

Table 4 Problem list before orthodontic treatment:

White aesthetic
Shade
Mismatched anterior porcelain-fused to metal (PFM) crown shade with the natural teeth (Fig. 1f)
Incorrect hue, chroma and value of PFM crowns
Dark value natural teeth
Lack of translucency and characteristics in PFM crowns
Lack of micro- and macro-texture in PFM crowns
Dimension
PFM crown width to length ratio - 94% (Ideal: 75-85%) (Fig. 9a)
Over-contouring
Incisal edges were shorter than canines
Position
Median diastema
Pink aesthetic
Inflamed gingivae induced by overhang PFM crown margin
Uneven levels of gingival zeniths
Loss of interdental papilla tissue between the upper central incisors
Gingival display to crown length ratio - 59% which indicated advanced level of gummy smile (Fig. 9a)

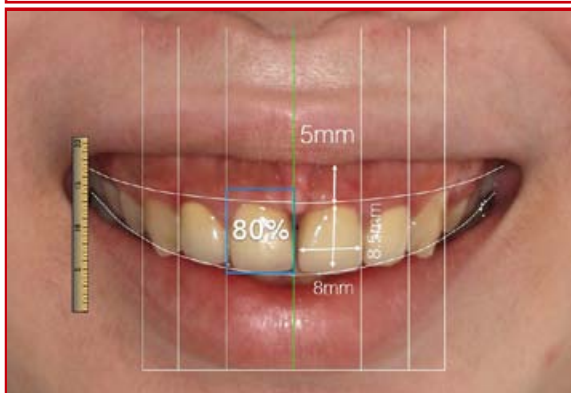


Fig. 9a Use of Digital Smile Design (DSD) software retrospectively on the pre-orthodontic treatment smile photo - Crown width to length ratio was 8:8.5mm (94%) which made the central incisor appeared to be square. The blue rectangle on upper right central incisor represented the width to length ratio of the planned crown which is 80%. 5mm gingival displayed above the incisor indicated an advance level of gummy smile before ortho-dontic treatment.

Table 5 Restorative and aesthetic treatment objectives after orthodontic treatment:

White aesthetic
Whiten upper and lower dentitions
Improve incisor crown aesthetics in terms of shade, reflection, refraction, textures and internal characteristics
Maintain stable and harmonised occlusion
Pink aesthetic
Correct levels of gingival zenith
Restore papillary tissue
Maintain periodontal health

Restorative and aesthetic dentistry treatment plan, progress and result:

Digital Smile Design (DSD) software for diagnosis and treatment planning

At the finishing and detailing stage of orthodontic treatment, the smile of the patient was captured and analysed based on the facial and dental proportion using a sequence of high quality digital photographs⁷(Fig. 9b). A 3-D planning was converted from the 2-D digital smile design^{8,9} to evaluate the necessity of fine orthodontic tooth movement of individual teeth in the anterior segment.

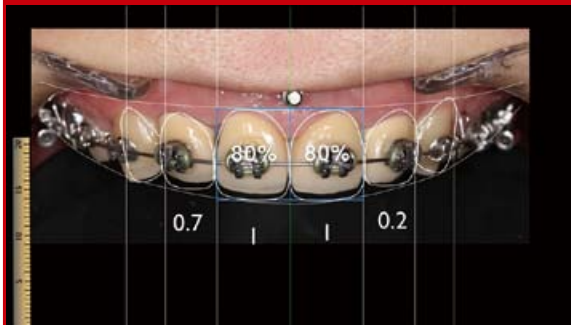


Fig. 9b Digital photo assessment for fine tuning of tooth position before debonding of orthodontic brackets.

Provisional stage

Old PFM crowns were removed after debonding of the orthodontic appliance. The first set of provisional crowns was made with bis-acrylic composite (ProTemp 4 Temporisation Material, 3M ESPE) with proper and well-polished crown margins to allow healthy growth of the gingivae. The shape and profile of these temporary crowns were made according to the waxing up model. The gingival contour was refined with the aid of YSGG laser (Waterlase MD Turbo, Biolase CA) (Fig. 10a).

After 2 weeks, a second set of provisional crowns was made after fine tuning of the gingival contour with laser. The gingival tissue was guided to grow along the profile of the provisional crowns. The contact area of the two central incisors was maintained at 5mm away from the underlying crestal bone to allow growth of central papilla¹⁰. In addition, low level laser therapy and biomodulation with 940nm diode laser (Ezlase, Biolase CA) were carried out to encourage the growth of soft tissues¹¹ at a two-weeks interval for 2 months (Fig. 10b & c).



Fig. 10a The first set of provisional crowns for the four incisors were placed to guide the growth of gingival tissue right after laser gingival contouring.

Fig. 10b Second set of provisional crown. Note the growth of central papilla.

Fig. 10c Third set of provisional crown had incorporated with more fine details on labial surface. High polished provisional crown margin allowed healthy growth of gingivae.

Tooth whitening

In-office one-visit tooth bleaching with high intensity of LED light was done to enhance the shade.

Definitive stage

Lithium disilicate crowns (IPS e.max Press, Ivoclar Vivadent) were selected owing to the superior optical properties¹². The crowns were made by heat-pressed procedure followed by core cutback and the layering porcelain veneering technique (Fig. 10d & e). The macro- and micro-textures of the labial surface were carefully designed according to a biomimetic approach¹³ (Figure 10f). Digital photos were taken to verify the likeness of the final crowns with the digital plan (Fig. 11a). These crowns were cemented with composite luting cement (Multilink Automix, Ivoclar Vivadent) after confirmation with the digital plan and acceptance of the patient (Fig. 11b-f). The anterior guidance was maintained by the central incisors (Fig. 12a). Immediate dentine sealing (IDS) procedure^{14,15} was performed to reduce post-cementation sensitivity.



Fig. 10d Internal characteristics of natural teeth was copied.

Fig. 10e A high contrasted digital photo illustrates the papillae of dentine layer and patches throughout the transparent enamel layer.

Fig. 10f Macro- and micro-texture of the final crowns



Fig. 11a The provisional crowns (Top) final crowns (Bottom) and committed the shape and position of original DSD treatment planning.



Fig. 11b Final result of the lithium disilicate crowns.

Fig. 11c Lateral view



Fig. 11d Internal and external characteristics in mouth

Fig. 11e Marginal ridges on palatal aspect are important for distribution of occlusal force



Fig. 11f Periapical radiographs taken with provisional crowns (left) and final crowns(right). The distance from crest bone to contact area of crowns was well maintained to 5mm throughout the treatment.



Fig. 12a Protrusion was guided by two central incisors

Fig. 12b The biomimetic anterior crowns blend in with her natural smile

Result

The patient was called for review 2 weeks after permanent cementation of the crowns. There was no post-cementation sensitivity and the aesthetic result was satisfied by the patient (Fig. 12b and 13).

Conclusions:

This case report illustrated the collaboration of Orthodontics, Restorative/ Aesthetic Dentistry and Oral and Maxillofacial surgery in managing maxillary dentoalveolar protrusion, gummy smile, defective crowns and TMD. Further elaborations on topics such as assessment of biological limitation in orthodontic camouflage of dentofacial deformities, biomechanics and the use of computer software for diagnosis and treatment planning were not possible due to the limitation of space. Readers who are interested to further discussions are welcome to contact the corresponding author Dr. She by writing to 'she@smileclinic.com.hk'.



Fig. 13a-j Clinical photos – Post-restorative treatment

References

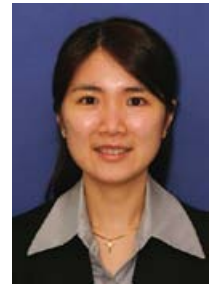
1. Kokich VO, Jr., Kiyak HA, Shapiro PA. Comparing the perception of dentists and lay people to altered dental esthetics. *J Esthet Dent* 1999;11(6):311-24.
2. Andrews LF. The six keys to normal occlusion. *Am J Orthod* 1972;62(3):296-309.
3. Ricketts RM. Bioprogressive therapy. Denver, Colo.: Rocky Mountain/Orthodontics; 1979.
4. Fiorelli G, Melsen B. The "3-D occlusogram" software. *Am J Orthod Dentofacial Orthop* 1999;116(3):363-8.
5. Marcotte MR. The use of the occlusogram in planning orthodontic treatment. *Am J Orthod* 1976;69(6):655-67.
6. Burstone CJ, Koenig HA. Force systems from an ideal arch. *Am J Orthod* 1974;65(3):270-89.
7. Coachman C, Calamita MA. Digital Smile Design: A tool for treatment planning and communication in esthetic dentistry. *Quintessence of Dent Technol* 2012;35:103-11.
8. Coachman C, Van Dooren E, Gurel G, et al. Interdisciplinary treatment planning. In: Cohen M, editor. Chicago: Quintessence Pub.; 2012. p. 119-74.
9. Tak On T, Kois JC. Digital Smile Design Meets the Dento-Facial Analyzer: Optimizing Esthetics While Preserving Tooth Structure. *Compend Contin Educ Dent* 2016;37(1):46-50.
10. Tarnow DP, Magner AW, Fletcher P. The effect of the distance from the contact point to the crest of bone on the presence or absence of the interproximal dental papilla. *J Periodontol* 1992;63(12):995-6.
11. Mahajan A. Lasers in Periodontics - A Review. *Eur J Dent Med* 2011;3(1):1-11.
12. Gehrt M, Wolfart S, Rafai N, Reich S, Edelhoff D. Clinical results of lithium-disilicate crowns after up to 9 years of service. *Clin Oral Investig* 2013;17(1):275-84.
13. Magne P, Belsler U. Bonded porcelain restorations in the anterior dentition : a biomimetic approach. Chicago: Quintessence Pub. Co.; 2002.
14. Duarte S, Jr., de Freitas CR, Saad JR, Sadan A. The effect of immediate dentin sealing on the marginal adaptation and bond strengths of total-etch and self-etch adhesives. *J Prosthet Dent* 2009;102(1):1-9.
15. Magne P, Kim TH, Cascione D, Donovan TE. Immediate dentin sealing improves bond strength of indirect restorations. *J Prosthet Dent* 2005;94(6):511-9.

Invisalign® Orthodontic Treatment

Dr Charlene CL WU

FCDSHK (Orthodontics), FHKAM (Dental Surgery),
M Orth RCS (Edinburgh), MOrth (HK), BDS (HK)(Hons)

Specialist in Orthodontics, Private Practice; Part-time Clinical Lecturer, Faculty of Dentistry, HKU



Dr Charlene CL WU

Introduction

The Invisalign® system, introduced by Align Technology (San Jose-Santa Clara, California) in 1999 uses the concept of Kesling's¹ tooth positioning appliance in the 1940s and combines with modern computer-aided design (CAD), computer-aided manufacturing (CAM) and stereolithography technology to perform orthodontic treatments with removable transparent appliances made from 0.75mm thick medical grade, high molecular weight and thermoplastic polymers.

In the past 17 years, Invisalign treatment is increasing in popularity among adult patients because of the aesthetics and comfort² as compared to traditional fixed appliance treatments. The effectiveness of treatment outcomes are the concerns of all clinicians (Orthodontists and general dentists) and some authors have reported that only crown tipping movement and intrusion can be accomplished by thermoplastic appliances³. The predictability of programmed tooth movements varied from 29.6% to 88%^{4, 5}, whereas extrusion was reported as the least reliable movement^{5, 6} and the upper molar distalisation movement claimed to have the highest accuracy⁴. Due to the heterogeneity of all the reported studies, a strong conclusion regarding the efficacy of Invisalign treatment could not be drawn from the literature⁷. The continuous innovations from Align Technology since 2009 with introduction of Optimised Attachments, Power Ridges, SmartTrack and SmartStage wish to improve the predictability of more advanced tooth movements and root torque control. The new ClinCheck software launched in 2015 called "ClinCheck Pro" allows clinicians to have better control of their desired treatment outcomes.

Case Report 1

A 39 years old female came with a chief concern of lower incisors spacing. She presented with straight lateral profile and retrusive lips. There was a history of periodontal disease with generalised bone loss and gingival recession. She had Angle Class I malocclusion with bimaxillary retroclination on a skeletal Class I base. Teeth 18, 17, 38, 2 lower incisors and 48 were missing (Fig. 1a). 28 was vertically impacted. Upper midline was shifted to the left. 70% deep overbite with increased curve of spee was noted in lower arch. Over-erupted upper and lower incisors with occlusal canting were found in the upper arch. Both arches were narrow and asymmetrical in shape. Moderate spacing

was present in the lower arch and mild crowding was present in her upper arch.

Invisalign orthodontic treatment with non-extraction approach was delivered to expand both arches and to apply buccal crown torque for uprighting of lower molars. Then an attempt was made to redistribute the lower spacing to open up an 8mm space distal to 43 for implant supported prosthesis (Fig. 1f). Interproximal reduction was performed in her upper and lower incisal regions to reduce the size of dark triangles and compensate for tooth size discrepancy due to missing 1 tooth size in her lower arch. Periodontal maintenance was mandatory throughout the Invisalign orthodontic treatment and was delivered by a Periodontist. Total treatment time was 22 months with 1 refinement treatment performed (total number of aligners U:19+21=40 L:17+27=44; aligners were changed every 2 weeks).

Successful root tip control on the upper incisors was achieved which helped to level the upper occlusal plane and a good volume of bone (Fig. 1b & 1c) was created for the feasibility of implant prosthetic replacement at her lower right canine region with Invisalign orthodontic appliance. ClinCheck software (Fig. 1b) helps to provide good estimation on the size of pontic placement (possibility of replacing only 1 lower tooth in place of 2 missing teeth) and Bolton analysis for handling the tooth size discrepancy. This allows the clinician and patient to visualise the treatment outcomes before the commencement of treatment which serves better communication and planning.



Fig. 1a Pre-treatment intra-oral photos of Case1



Fig. 1b Comparison of Invisalign anticipated results and post-treatment intra-oral photos of Case 1



Fig. 1e Comparison of pre and post treatment extra-oral photos of Case 1

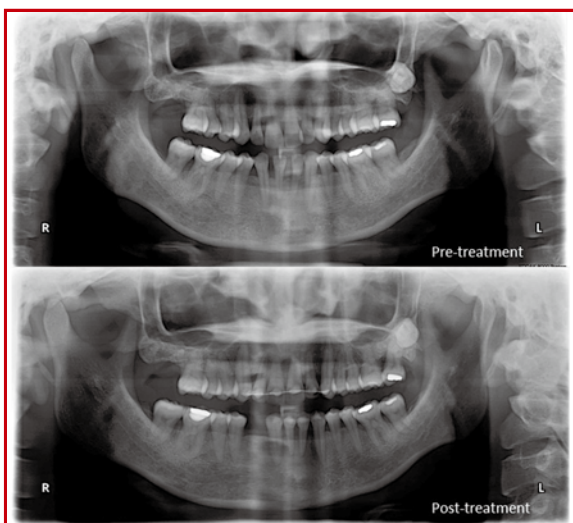


Fig. 1c Comparison of pre and post treatment panoramic radiographs of Case 1



Fig. 1f Intra-oral photos and panoramic radiograph after placement of implant supported prosthesis of Case 1

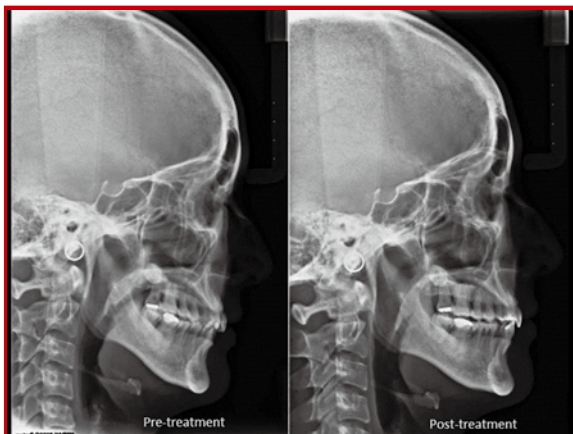


Fig. 1d Comparison of pre and post treatment cephalometric radiographs of Case 1

Cephalometric readings:

Table 1: Comparison of pre and post treatment cephalometric readings of Case 1

	Chinese		Pre-treatment	Post-treatment
Angle (°)	Mean	SD	Value	Value
NS Ba	130	4.5	125	125
SNA	82	3.5	82	82.5
SNB	79	3	80	80.5
SN Pg	81	3.5	82	82.5
ANB	3	2	2	2
SN / MnP	34	4.5	35	37
SN / MxP	8	3	8	8
Mx P / Mn P	26	5	27	29
LFH proportion	55%		56%	56%
UI / MxP	118	6	106	105
LI / MnP	97	7	79	85
UI / LI	115	8	148	141

Case Report 2

A 46 years old Chinese male presented with a chief concern of proclined upper incisors. He had a past history of periodontal disease where generalised gum recession, pockets formation and loss of alveolar bone were noted. He presented with a convex lateral profile, a retrognathic mandible and an acute nasal labial angle. The lips were protrusive and incompetent (Fig. 2e). Angle Class II malocclusion with bimaxillary proclination and 11mm overjet on a skeletal Class II base (Fig. 2a & 2d). 80% deep overbite with deeply increased curve of spee noted in his lower arch. Lower midline off to the right by 5mm, scissorbite on teeth 14 & 15, both arches were narrow with all premolars and molars tilted lingually. All wisdom teeth, 17 and 36 were missing (Fig. 2c). 42 was discoloured where both 41 & 42 had received root canal treatment. Mild crowding was present in both incisal regions. Attrition was found on all upper and lower front teeth, generalised gingival recession and horizontal bone loss were noted.

Invisalign orthodontic treatment with non-extraction approach was adopted. Sequential distalisation with class II elastic support (7 months bilateral and 2 months unilateral on right side only) and interproximal reduction were performed in his upper arch to gain space for overjet correction. Arch development with transversal dental expansion was performed to regain arch symmetry, correct scissorbite on right and create space for lower midline correction. Sectional fixed appliance was placed on his lower right quadrant (from teeth 43 to 47) for 4 months to achieve roots parallelism due to off tracking from anticipated Invisalign tooth movements. Implant with a temporary prosthesis (performed by a Specialist in Periodontology) was placed on his missing 36 site before commencement of his Invisalign refinement treatment to act as an absolute anchor to aid lower incisors intrusion for overbite normalisation and at the same time provide class II elastic support for further overjet correction. The total treatment took 22 months (Initial: U&L 35 aligners changed every 2 weeks; Refinement: U&L 30 aligners changed every 1 week). Periodontal maintenance was performed throughout the Invisalign orthodontic treatment by a periodontist.

A good improvement in the facial profile was achieved after retraction of the upper incisors by retroclination and upper molar distalisation (Fig. 2e & 2d). Arch symmetry was regained in both arches with the lower midline corrected (Fig. 2b). A sectional fixed appliance provides rigidity to upright 45 & 46 which helps to overcome the weakness of Invisalign appliance. The lower curve of spee was leveled with intrusion of the lower incisors, so as to normalise the overbite. Sequential upper molar distalisation with Invisalign appliance under class II elastic support showed good improvement in the molar relationship.



Fig. 2a Pre-treatment intra-oral photos of Case 2



Fig. 2b Comparison of Invisalign anticipated results and post-treatment intra-oral photos of Case 2

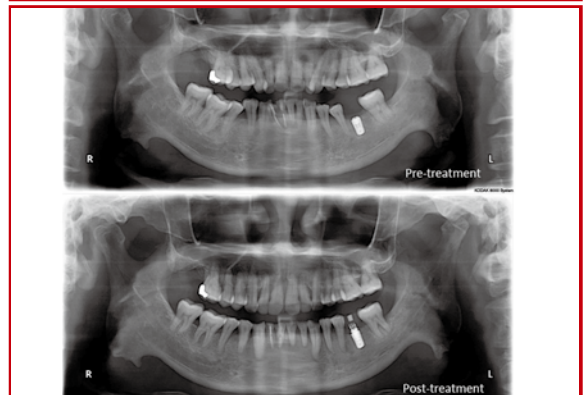


Fig. 2c Comparison of pre and post treatment panoramic radiographs of Case 2

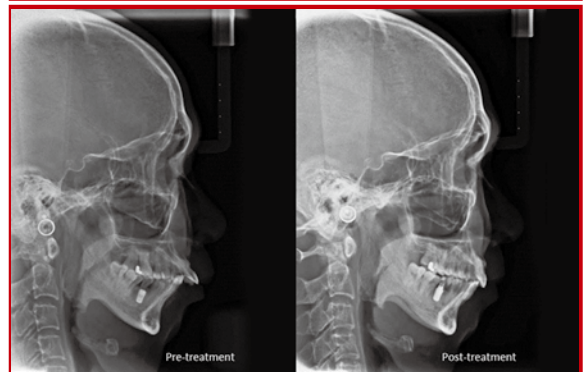


Fig. 2d Comparison of pre and post treatment cephalometric radiographs of Case 2



Fig. 2e Comparison of pre and post treatment extra-oral photos of Case 2

Cephalometric readings:

Table 2: Comparison of pre and post treatment cephalometric readings of Case 2

	Chinese		Pre-treatment	Post-treatment
	Mean	SD	Value	Value
Angle (°)				
NS Ba	130	4.5	126	126
SNA	82	3.5	82.5	82
SNB	79	3	75.5	75
SN Pg	81	3.5	76	75.5
ANB	3	2	7	7
SN / MnP	34	4.5	31	33
SN / MxP	8	3	9.5	9
Mx P / Mn P	26	5	21	24
LFH proportion	55%		53.5%	53.5%
UI / MxP	118	6	133	106
LI / MnP	97	7	106	107
UI / LI	115	8	100	123

Discussion

Invisalign proves to be a good pushing appliance to provide dental expansion (arch development) and opens up space with a good volume of bone for the dental implant site. The patient's compliance (20-22 hours wear per day) is crucial to make sure a planned orthodontic force is properly delivered since Invisalign is a removable orthodontic appliance. Incorporation of elastics into the aligner system helps to reinforce anchorage and improve the sagittal, transversal and vertical tooth movement control. Periodontal patients usually exhibit a certain degree of drifted and collapsed dentition due to bone loss, those with no detectable tooth mobility are literally good candidates for Invisalign treatment as they will have long clinical crown heights for aligner engagement. The Invisalign appliance also allows better plaque control and provides better periodontal health in periodontal patients during orthodontic treatments as compared to conventional fixed appliances^{8,9}. Despite all of these, periodontal maintenance is still needed throughout the orthodontic treatment. The ClinCheck software is an excellent tool for formulation of orthodontic treatment plans in case of tooth size discrepancy and for patient communication. On the other hand, the limitations of the Invisalign

appliance cannot be neglected as all planned tooth movements are anticipations only. Patients need to be well informed before commencement of Invisalign treatment that additional aligners and sectional fixed appliance will be needed in case of "Off tracking" movements. Appropriate case selection in terms of tooth movement difficulty and patient commitment are crucial to clinical success.

Conclusion

A proper diagnosis, careful ClinCheck set-ups and good clinical monitoring are essential for producing satisfactory Invisalign orthodontic treatment outcomes.

References

1. Kesling HD. Coordinating the predetermined pattern and tooth positioner with conventional treatment. *Am J Orthod Oral Surg* 1946;32:285-93.
2. Miller KB, McGorray SP, Womack R, et al. A comparison of treatment impacts between Invisalign aligner and fixed appliance therapy during the first week of treatment. *Am J Orthod Dentofacial Orthop* 2007;131(3):302.e1-9.
3. Brezniak N. The clear plastic appliance: a biomechanical point of view. *Angle Orthod* 2008;78(2):381-2.
4. Simon M, Keilig L, Schwarze J, Jung BA, Bourauel C. Forces and moments generated by removable thermoplastic aligners: incisor torque, premolar derotation, and molar distalization. *Am J Orthod Dentofacial Orthop* 2014;145(6):728-36.
5. Rossini G, Parrini S, Castroflorio T, Deregis A, Debernardi CL. Efficacy of clear aligners in controlling orthodontic tooth movement: a systematic review. *Angle Orthod* 2015;85(5):881-9.
6. Kravitz ND, Kusnoto B, BeGole E, Obrez A, Agran B. How well does Invisalign work? A prospective clinical study evaluating the efficacy of tooth movement with Invisalign. *Am J Orthod Dentofacial Orthop* 2009;135(1):27-35.
7. Lagravere MO, Flores-Mir C. The treatment effects of Invisalign orthodontic aligners: a systematic review. *J Am Dent Assoc* 2005;136(12):1724-9.
8. Levrini L, Mangano A, Montanari P, et al. Periodontal health status in patients treated with the Invisalign(R) system and fixed orthodontic appliances: A 3 months clinical and microbiological evaluation. *Eur J Dent* 2015;9(3):404-10.
9. Azaripour A, Weusmann J, Mahmoodi B, et al. Braces versus Invisalign(R): gingival parameters and patients' satisfaction during treatment: a cross-sectional study. *BMC Oral Health* 2015;15:69.

Incognito™ Lingual Orthodontic Appliance – An Update

Dr Wilson LEE

FCDSHK (Orthodontics), FHKAM (Dental Surgery), MOrthRCS (Edin), MOrth (HK), AdvDipOrtho (HK), MRACDS (Ortho), BDS (HK), BSc (Toronto)

Specialist in Orthodontics, Private Practice;
Part-time Clinical Lecturer, Faculty of Dentistry, The University of Hong Kong;
Executive Committee Member (HKSO), Asian Pacific Orthodontic Society



Dr Wilson LEE

Introduction

Nowadays, orthodontic patients have become more knowledgeable and are aware of available treatment options and appliances, and their demands are getting higher.¹ Not only do they want excellent alignment of teeth, they also want a better facial profile and smile line. I consider this as “Face Driven Orthodontics” philosophy. Most patients, including adolescents, want to improve the alignment of their teeth and smiles without showing the metal braces, and prefer treatment with invisible orthodontic appliances.² Despite clear ceramic brackets are widely available in the market, some patients still prefer to have ‘invisible’ braces when they have their teeth straightened.

Due to widely publicised marketing campaigns, a large number of patients today approach specialist clinics requesting clear aligner treatment, assuming that they are the comprehensive orthodontic solutions for all orthodontic cases. As specialists in orthodontics, we know that clear aligners are removable orthodontic appliances and have their limitations in controlling tooth movement three-dimensionally. A well-referenced study has shown that the mean accuracy of tooth movement for Invisalign® was only 47%.³ In contrast, lingual appliances are fixed orthodontic appliances, controlling teeth movements with lingual brackets and archwires. With the assistance of modern computer-aided design/computer-aided manufacturing (CAD/CAM) technology, lingual appliance allows clinicians to provide patients invisible treatment options, which are accurate and more predictable, and the orthodontists have more control of the final teeth positioning and inter-arch relationship.

Incognito™ Lingual Orthodontic Appliance

Dr Fujita and Dr Kurz patented the first ever lingual orthodontic appliance in the late 1970's⁴⁻⁷. There was an immense interest in using this revolutionary invisible appliance especially among orthodontists in Japan and USA in the 1980's. However, there was a sudden decrease in their clinical usage afterwards, mainly due to difficulties in finishing and detailing of the case and rebonding of the appliance during treatment. Patient comfort and speech had also been affected due to the thickness of the lingual appliance.

Dr Dirk Wiechmann of Germany invented the Incognito™ lingual appliance in the late 1990's and had created enormous interests in lingual appliances in the last decade.⁸⁻¹¹ The appliance was distinguished from other bracket systems because it was the first lingual orthodontic appliance system of which the brackets and

the wires were custom made for individual patients, and fabricated using state-of-the-art CAD/CAM technology and wire bending robots. The appliance thickness was reduced and bracket rebonding protocol had improved. From the final teeth set-up, brackets and wires were all designed and fabricated digitally. Thus accuracy in finishing the case was able to be as close to the digital set-up models as possible. A research study of 94 consecutive patients in a lingual orthodontic clinic had shown that discrepancies in position and rotation between the set-up models and outcome were small for all teeth, generally less than 1mm and 4 degrees, except for the second molars, where slightly larger but clinically insignificant discrepancies were observed.¹²

Update on Appliance Manufacturing Process

The latest advances in the manufacturing process include usage of intraoral digital scanners to take the impressions of the teeth and adjacent soft tissues directly. This replaces the use of traditional dental impression materials. Grünheid et al showed that digital models from intraoral scans can be as accurate as those from alginate impressions.¹³ Naidu and Freer reported that the intraoral scanner system tested can be used to measure tooth-widths and calculate Bolton ratios with clinically acceptable accuracy and excellent reliability and reproducibility.¹⁴ For Incognito™ lingual appliance, the patient's teeth and adjacent soft tissue are scanned digitally with a scanner (3M™ True Definition Scanner) a therapeutic set-up of the teeth model is digitally made via the Treatment Management Protocol (TMP) based on Andrews' six keys to normal occlusion¹⁵, or the orthodontist could prescribe online the detailed set-up criteria (e.g. arch form, individual teeth angulations and torques) to the technicians.

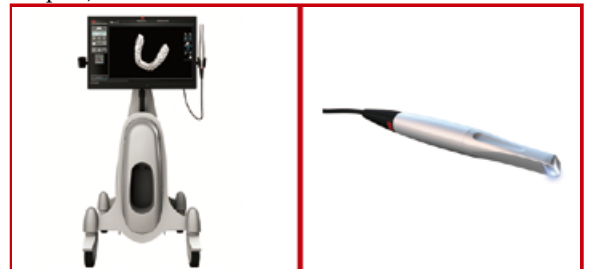


Fig. 1a: One type of digital intraoral scanner. The scanned data of the teeth, occlusion and adjacent soft tissues are sent to the manufacturer's server wirelessly. The technicians will use the data to produce a digital model.

Fig. 1b: The intraoral scanner wand which is used to capture the data digitally within oral cavity.

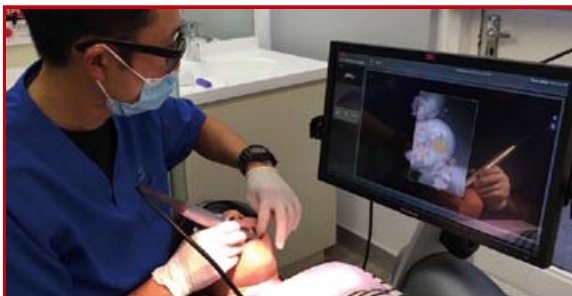


Fig. 1c: The intraoral scanner at work clinically.

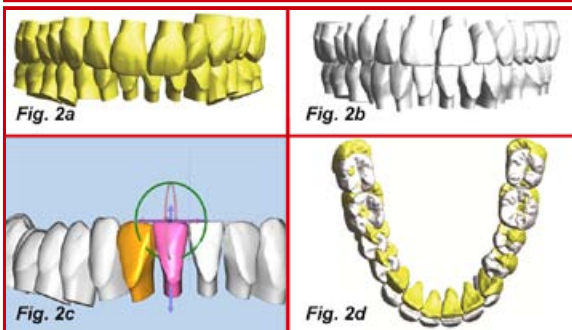


Fig. 2a: Scanned data are transferred and converted into a pre-treatment digital study model. Fig. 2b, Post-treatment digital model set-up according to the orthodontist's prescription. Fig. 2c, teeth position can be manipulated digitally to obtain a desired final positions of individual teeth. This is an example of setting up the final position of lower right central incisor (pink in colour). Fig. 2d, superimposition of pre- and post-treatment digital model set-up of lower arch (yellow and white respectively). Orthodontists can use this to plan the movement of teeth and individual final teeth positions three-dimensionally.

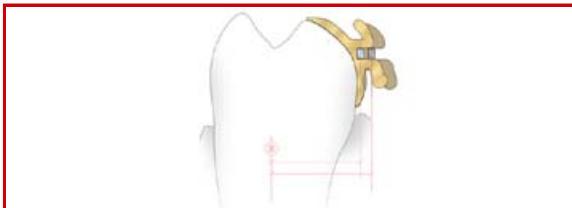


Fig. 3: The latest generation of Incognito brackets and their wire slots are 60% closer to the tooth surface. The shaded portion is the older version and the gold portion is the latest version of the bracket. This can further reduce intraoral discomfort and closer to the centre of resistance of the long axis of the tooth, thus for better control of tooth movement. All photos in this figure (except Fig. 1c) are courtesy of 3M Oral Care®.

Effect on speech and function

As the appliances are placed on the lingual side of the teeth, they have traditionally affected speech and eating disturbances after initial bonding. With the improvement in production and reduction of thickness of the brackets, discomfort has reduced significantly together with the standard post-bonding protocol. We have suggested to leave the brackets without archwires for two weeks after initial bonding, so that patients can adapt to the brackets during their daily activity. Research has shown that initial discomfort and eating disturbances reduce gradually after two weeks,¹⁶ and the new and thinner lingual brackets have much less oral discomfort than the previous generation lingual brackets.¹⁷

Rebonding of brackets

The base pad of each lingual bracket is first plotted on the lingual surface of each tooth on a CAD/CAM

software, with the aim of maximising the surface area of bonding surface. The large size of the pad not only gives greater bond strength, but also makes it easier to adapt to the individual tooth during bracket rebonding. Then the low profile bracket bodies are inserted, making sure the bracket profile is as thin as possible in order to maximise patient comfort during daily function. The CAD/CAM software will help select the height, angulation and torque of the brackets. As such, the individual patients' prescriptions of the appliance are built into each bracket.

Finishing and detailing

As lingual appliance is the only invisible, aesthetic and fixed orthodontic appliance, the orthodontist has complete control of the teeth movement three dimensionally. The pre-fabricated archwire provided with the wire bending robots would help to save the orthodontist's chairside time.

Reduction of caries incidence

One of the most common risks in orthodontic treatment is caries lesions developed during the treatment. The incidence of caries lesions among orthodontic patients was significantly high despite caries preventive therapy.¹⁸ There were research reports on the reduction of caries incidence when comparing patients treated with lingual against those with labial fixed orthodontic appliances. Van der Veen et al have reported that the number of white spot lesions that developed or progressed on labial surfaces of patients treated with labial fixed appliances was almost five times higher than those in lingual surfaces of those treated with lingual fixed appliances.¹⁹ In removable aligner treatment, patients may think that it would be easier to maintain good oral hygiene since they can remove the appliance at will. But as the aligners are prescribed to be worn over twenty hours daily for optimal results, some patients would drink fluid even with their aligners on. A report has shown that this is detrimental to the enamel if the fluid is acidic or cariogenic soft drinks, and demineralisation around composite attachments and gingival inflammation could result.²⁰

Archwire production

The 3-dimensional geometry of each archwire is calculated with the CAD/CAM software and the information is transferred to the state-of-the-art archwire bending robot. All the archwires in the sequence of treatment have the same geometry to obtain the final position of the teeth in the digital set-up model. Although the arch wires are custom made and bent, it is still up to the Orthodontists to do some final adjustments and detailing on the chair sides. There are some differences in archwire design between cases, e.g. that require extraction of teeth and those don't need extraction, and it is the Orthodontist who decides all the arch form and shapes of the archwires. Common wires used are 0.014-inch superelastic (SE) Nickel-Titanium (NiTi) wire, 0.016-inch SE NiTi wire, 0.016x0.022-inch SE NiTi wire, 0.016x0.024-inch Stainless Steel wire with extra torque in the incisors, and 0.0175x0.025-inch or 0.0182x0.0182-inch Titanium Molybdenum Alloy (TMA) wire for finishing and detailing.

Clinical Indications

Incognito™ is generally suitable for treatment of all skeletal discrepancies and malocclusions regardless of

age, as long as the patient has a permanent dentition with a healthy periodontium. Two clinical cases are illustrated in Figs. 4 and 5.

Conclusions

Incognito™ lingual orthodontic appliance has revived interests in orthodontic patients who seek invisible lingual braces to straighten the teeth. It is the only customised, individually fabricated, fixed and invisible lingual orthodontic appliance. It has the advantages of easier rebonding protocol with individually fitted bracket base. Wire bending is reduced with pre-fabricated archwires provided. Teeth movements and incisors torque control are also improved with Incognito™ compared to the removable orthodontic aligners. Incognito™ lingual orthodontics is suitable for treatment of all malocclusions, and for all ages.

Case Presentation



Fig. 4: 14-year old boy with a chief complaint of malaligned front teeth and protruded lips on a Class I skeletal base. Treatment plan was extraction of upper first premolars and lower second premolars with Incognito™ lingual fixed appliance. (4a) Pre-Treatment right buccal occlusion photo; (4b) Right buccal occlusion photo after extractions of premolars and bonding of lingual fixed appliance; (4c) Upper arch photo: upper first premolars were extracted and the spaces were closed by sliding mechanics gradually by 0.016x0.024-inch Stainless Steel archwire with extra 15 degree palatal root torque on upper incisors; the brackets were bonded to the palatal sides of the teeth, with the custom made archwires fitting on the individual bracket slots; (4d) Lower arch photo: lower second premolars were extracted and space were closed gradually by 0.016x0.024-inch Stainless Steel archwire; (4e) Post-treatment shows that the teeth are in good inter-digitation and incisors are in normal angulation; (4f) 1-year-8-month post-treatment. Notice the stability of the results under the retention protocol; (4g) Pre-treatment lateral cephalogram superimposed on patient's lateral profile, notice the protrusion of the front teeth causing incompetent lips; (4h) Post-treatment lateral cephalogram superimposed on patient's lateral profile, notice the reduced convexity of the lips profile and better relaxed lips position.



Fig. 5: 21 years old adult female with a chief complaint of underbite, crossbite and crooked front teeth. Treatment plan was with Incognito™ lingual appliance with extraction of 4 first premolars. Fig. (5a)-(5c) Pre-treatment extra-oral photos showing that she has a concave profile, incompetent lips and protruded lips; Fig. (5d)-(5e) Pre-treatment intra-oral frontal and right buccal occlusion photos; Fig. (5f)-(5g) eight months after start of treatment, notice the anterior crossbite and crowding have been relieved, and space closures have begun on 0.016x0.024-inch Stainless Steel archwires; Fig. (5h)-(5i) finishing and detailing stage. Notice some tooth coloured composite resin buttons for inter-arch elastics wear to improve the occlusion and inter-arch relationship; 0.0182x0.0182-inch TMA wire were used to detailed individual teeth positions; Fig. (5j)-(5k) Post-treatment intra-oral frontal and right buccal occlusion photos; (5l)-(5n) Post-treatment extra-oral photos. Notice the much improved lips resting position, frontal smile, and the lateral profile with a better lower lip to chin curvature and profile.

References

1. Proffit WR, Fields HW, Sarver DM. Contemporary orthodontics. 4th ed. St. Louis, Mo.: Mosby Elsevier; 2007.
2. Fritz U, Diedrich P, Wiechmann D. Lingual technique--patients' characteristics, motivation and acceptance. Interpretation of a retrospective survey. J Orofac Orthop 2002;63(3):227-33.
3. Kravitz ND, Kusnoto B, BeGole E, Obrez A, Agran B. How well does Invisalign work? A prospective clinical study evaluating the efficacy of tooth movement with Invisalign. Am J Orthod Dentofacial Orthop 2009;135(1):27-35.
4. Fujita K. Development of lingual bracket technique. (Esthetic and hygienic approach to orthodontic treatment) (Part 1) Background and design. Shika Rikogaku Zasshi 1978;19(46):81-6.
5. Fujita K. [Development of lingual-bracket technique. (Esthetic and hygienic approach to orthodontic treatment) (Part 2) Manufacture and treatment (author's transl)]. Shika Rikogaku Zasshi 1978;19(46):87-94.



6. Kurz C, Gorman JC. Lingual orthodontics: a status report. Part 7A. Case reports-- nonextraction, consolidation. J Clin Orthod 1983;17(5):310-21.
7. Kurz C, Swartz ML, Andreiko C. Lingual orthodontics: a status report. Part 2: Research and development. J Clin Orthod 1982;16(11):735-40.
8. Wiechmann D. Lingual orthodontics (part 1): laboratory procedure. J Orofac Orthop 1999;60(5):371-9.
9. Wiechmann D. Lingual orthodontics (part 2): archwire fabrication. J Orofac Orthop 1999;60(6):416-26.
10. Wiechmann D. Lingual orthodontics (Part 3): Intraoral sandblasting and indirect bonding. J Orofac Orthop 2000;61(4):280-91.
11. Wiechmann D. Lingual orthodontics (Part 4): Economic lingual treatment (ECO-lingual therapy). J Orofac Orthop 2000;61(5):359-70.
12. Grauer D, Proffit WR. Accuracy in tooth positioning with a fully customized lingual orthodontic appliance. Am J Orthod Dentofacial Orthop 2011;140(3):433-43.
13. Grunheid T, McCarthy SD, Larson BE. Clinical use of a direct chairside oral scanner: an assessment of accuracy, time, and patient acceptance. Am J Orthod Dentofacial Orthop 2014;146(5):673-82.
14. Naidu D, Freer TJ. Validity, reliability, and reproducibility of the iOC intraoral scanner: a comparison of tooth widths and Bolton ratios. Am J Orthod Dentofacial Orthop 2013;144(2):304-10.
15. Andrews LF. The six keys to normal occlusion. Am J Orthod 1972;62(3):296-309.
16. Shalish M, Cooper-Kazaz R, Ivgy I, et al. Adult patients' adjustability to orthodontic appliances. Part I: a comparison between Labial, Lingual, and Invisalign. Eur J Orthod 2012;34(6):724-30.
17. Hohoff A, Stamm T, Ehmer U. Comparison of the effect on oral discomfort of two positioning techniques with lingual brackets. Angle Orthod 2004;74(2):226-33.
18. Richter AE, Arruda AO, Peters MC, Sohn W. Incidence of caries lesions among patients treated with comprehensive orthodontics. Am J Orthod Dentofacial Orthop 2011;139(5):657-64.
19. van der Veen MH, Attin R, Schweska-Polly R, Wiechmann D. Caries outcomes after orthodontic treatment with fixed appliances: do lingual brackets make a difference? Eur J Oral Sci 2010;118(3):298-303.
20. Moshiri M, Eckhart JE, McShane P, German DS. Consequences of poor oral hygiene during aligner therapy. J Clin Orthod 2013;47(8):494-8.

Dermatological Quiz



Dermatological Quiz

Dr Lai-yin CHONG

MBBS(HK), FRCP(Lond, Edin, Glasg), FHKCP, FHKAM(Med)
Specialist in Dermatology & Venereology



Dr Lai-yin CHONG



Fig.1: Pigmented macules at the back

A 40-year-old man presented with a two-year history of pruritic pigmented skin lesions at his upper back. The lesions gradually progressed to his lower back as well (Fig. 1). He was otherwise well. His past health was good.

Questions

1. What would be your spot diagnosis and differential diagnoses of his skin lesions?
2. What investigations will you order to establish the diagnosis?
3. What are the possible underlying systemic diseases?
4. How do you classify this disorder?

(See P.37 for answers)

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CHARITY? DONATION? OR WHAT?

Dr David Ting-on LEUNG

BDS (Sydney), MSc (Georgetown), FHKAM (Dental Surgery),
FCDSHK (Orthodontics), MDGDP (UK)

*Specialist in Orthodontics; Private Practice in Orthodontics;
Director, China Tibetan Children Health and Education Fund Ltd;
Director, LISAC Foundation.*



Dr David Ting-on LEUNG

At the beginning of this year, on a cool crispy morning on my first-ever European cruise trip, I was surprised to receive an international call from Hong Kong. It was from Dr Wilson Lee who invited me to share my experiences on Volunteer and Charitable work during my last 23 years since 1993. Since that call, I have been thinking of what should be the main theme of my sharing. The secret is the more you have "sacrificed" the more you have in return! Donations-money, time or both; Charity-starts from people around you, then gradually expand wider and wider as one's ability allows.

工作嗎?

I decided that it should not only be the nature of our work which have been comprised of: workers-concerned group serving surrounding factory workers near Hong Kong; student scholarships for higher education in Qingyuen 清遠, in Tibet schools; dental service groups to Henan 河南, Shenyang 沈陽, Burma 緬甸, Taiwan 台灣, etc. 等等; drug-rehabilitation support group in Hong Kong & Taiwan; dental clinic training centres with Yunnan 雲南 provincial Hospital and at Baoding 保定; In co-operation to establish a dental training school (bare-foot dentists) in Anfei, Hefei 合肥; Burma student centre; Tibet 西藏 scholarships to Tibet Medical students; Tibet housing centres; Yunnan primary schools buildings and so on. All these work spanned over a period of 23 years from 1993 till present. For the first 10 years, I spent roughly about half a month of every month away from Hong Kong. Each project has been a challenge but was also very rewarding.



Fig. 2 China Tibetan Children Health & Education Fund is a charitable organisation launched in 2005, with a mission to help and achieve a better environment for Tibetan children to grow and develop. The Fund arouses the public's awareness about health care and educational needs of Tibetan children, while also undertakes specific projects to provide actual improvements.

知足常樂

The most memorable experience would have been my first dental servicing trip into the Chinese rural areas in Henan 河南. The dental service lasted for seven days organised by HIS Foundation in June of 1993. We visited the rural primary schools. Each school had about 500 students. The work involved dental examinations in the morning and treatments in the afternoon. The students were extremely friendly and curious of our work. This was repeated continually for the next five days. Saturday was a day of rest and recreation. On Sunday, after the Sunday service at a local church, we returned to Hong Kong. Besides the cultural "shock", the most memorable part was how little money we spent each day to get-by. One meal in Hong Kong was about a month's salary in the rural China back then. And yet, the people we met were happy. Happiness certainly is not from how much we own, rather it is how much we can share with people in needs.



梁定安醫師(右一)在河南省
推動兒童口腔衛生教育

Fig. 1 Dr Leung delivered oral health education in Henan province in 1990's.



Fig. 3 Dr David Leung (left) as Director of LISAC foundation, together with Ms Chen Xujing (second from left), Vice-Principal of Guangming Secondary School of Qingyuan city, visited the students and families in poverty supported by the foundation in 2005.

Cross-country, Cross-culture services

A lot goes with cross-country, cross-culture services. There are many different ways to achieve what we want and there are things we do not understand about local situations.

For example, we organised a medical team to operate on cleft patients for free. Then we found out that at the end, the Hospital was charging all the patients. Shouldn't it be free? Eventually, we realised that the Hospital was on its own. It had to make ends meet. The Hospital had to pay for all its out-going expenses, e.g. Hospital beds, staff salary, operation materials, electricity, water etc. etc. Although all our services were free, the Hospital was only charging us their expenses and not making any profits. That was their Donation.

Another time, we had a dental team to the Village providing dental services. At the same time, we gave all the students a gift pack. Suddenly, we saw the teachers were taking some of these gift packs as well. Oh, the teachers need our care too. They were just as poor as the students. So on our next trip, we prepared for everyone in the school!

While all participants paid for all our own expenses, we found the local official NGO was charging us expenses. Later we found out that they had to make all their ends meet. They did not have any fund.

While we go overseas, there are so many things we need to know about the local situation and customs. We have also need to bear in mind what the local culture is, their ways of operation, their cultures, their dos and don'ts. Otherwise, it may end up having good hearts but not doing work.

We must be ready to accept the local environments as it is in Cross-country service. Accept the accommodation, the food and the way things are being done, etc. It is not a sight-seeing trip, rather it is a servicing trip. The people need our help but the most important point is to treat them with respect. We are just fortunate enough to be born better, but not born superior. We must have a humble heart to serve others and to have the proper

attitude and respect to the recipients. Isn't this the essence of helping each other including ourselves.

心在哪裡，人就在哪裡

Volunteering and donations begin from our hearts. Each one of us already has what we can offer to other people. As a health professional, we can offer our medical and dental knowledge and do the best we can for our patients. We begin in our clinics to our patients, to our staff and to people around us. It is our attitudes towards one another. If we still have the ability and chance, we can offer more with our time and money. It is very heart-breaking to see how some of our fellow colleagues treated patients as a cash machine without providing the best they can.

誰是我的鄰居？

A frequent statement is "I am not ready and / or who is my neighbour?"

Are we ready?! We are certainly very much ready than anyone else. We have a very good profession. We have knowledge and skill to go through our life.

Who is our neighbour? Any person that we come across is our neighbour. If we have the heart, we can see the needs of others.

Let us continue to remind each other that our life is short. However, "living for others" is still the most rewarding in our lives, to share our lives, our resources and especially our belief with others.

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1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

1 * FMSHK Officers' Meeting
* HKMA Council Meeting

2

3 * HKMA Yau Tsim Mong Community Network - What's New in the Treatment of Respiratory Illness? (Session 1) - Update in the Management of Idiopathic Pulmonary Fibrosis
* HKMA Kowloon West Community Network - Update in Immunotherapy

4 * Hong Kong Neurosurgical Society Monthly Academic Meeting - White matter matters
* HKMA Central, Western & Southern Community Network - Latest development in Lung Cancer Management

5 * HKMA Hong Kong East Community Network - Impact of Alcohol on Health
* HKMA Kowloon East Community Network - Certificate Course on DM (Session 1): How new basal insulin help in management in DM?
* HKMA New Territories West Community Network - Cervical Cancer Prevention - what can we do more?
* FMSHK Executive Committee Meeting

6 * Joint Surgical Symposium - Cerebrospinal Fluid Leakage

7 * Refresher Course for Health Care Providers 2016/2017

8

9

10 * HKMA Kowloon West Community Network - Novel Drugs for Stroke Prevention in Non-Valvular AF

11

12 * HKMA Hong Kong East Community Network - Update on Long Term Management of Postmenopausal Osteoporosis
* HKMA Kowloon East Community Network - News in Cancer treatment: Immunotherapy
* HKMA New Territories West Community Network - Atopic Dermatitis & Psoriasis Management in Hong Kong
* FMSHK Foundation Meeting

13 * HKMA Central, Western & Southern Community Network - Cancer Immunotherapy in Lung Cancer
* HKMA Yau Tsim Mong Community Network - What's New in the Treatment of Respiratory Illness? (Session 2) - Allergic Rhinitis and Asthma: Reviews and Updates

14 * 12th HKMA Sports Night

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Date / Time	Function	Enquiry / Remarks
3 TUE	8:00 PM FMSHK Officers' Meeting Organiser: The Federation of Medical Societies of Hong Kong; Venue: Gallop, 2/F, Hong Kong Jockey Club Club House, Shan Kwong Road, Happy Valley, Hong Kong	Ms. Nancy CHAN Tel: 2527 8898
	9:00 PM HKMA Council Meeting Organiser: The Hong Kong Medical Association; Chairman: Dr. CHOI Kin; Venue: HKMA Dr. Li Shu Pui Professional Education Centre, 2/F, Chinese Club Building, 21-22 Connaught Road Central, Hong Kong	Ms. Christine WONG Tel: 2527 8285
6 FRI	8:00 AM-9:00 AM Joint Surgical Symposium - Cerebrospinal Fluid Leakage Organiser: Department of Surgery, The University of Hong Kong & Hong Kong Sanatorium & Hospital; Chairman: Dr. LUI Wai-Man; Speaker: Dr. YU Chung-Ping, Dr. CHENG King-Fai; Venue: Hong Kong Sanatorium & Hospital	Department of Surgery, Hong Kong Sanatorium & Hospital Tel: 2835 8698 Fax: 2892 7511 1 CME Point (Active)
10 TUE	1:00 PM HKMA Yau Tsim Mong Community Network - What's New in the Treatment of Respiratory Illness? (Session 1) - Update in the Management of Idiopathic Pulmonary Fibrosis Organiser: HKMA Yau Tsim Mong Community Network; Chairman: Dr. HO Kit Man, Carmen; Speaker: Dr. CHAN Ka Wing, Joseph; Venue: Pearl Ballroom, Level 2, Eaton, Hong Kong, 380 Nathan Road, Kowloon	Ms. Candice TONG Tel: 2527 8285 1 CME Point
	1:00 PM HKMA Kowloon West Community Network - Update in Immunotherapy Organiser: HKMA Kowloon West Community Network; Chairman: Dr. CHAN Siu Man, Bernard; Speaker: Dr. AU Siu Kie; Venue: Crystal Room IV-V, 3/F., Panda Hotel, 3 Tsuen Wah Street, Tsuen Wan, N.T.	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
11 WED	7:30 AM Hong Kong Neurosurgical Society Monthly Academic Meeting -White matter matters Organiser: Hong Kong Neurosurgical Society; Chairman: Dr. LI Lai Fung; Speaker: Dr. TSANG Chun On, Anderson; Venue: Seminar Room, G/F, Block A, Queen Elizabeth Hospital	Dr. LEE Wing Yan, Michael Tel: 2595 6456 Fax. No.: 2965 4061 1.5 points College of Surgeons of Hong Kong
	1:00 PM HKMA Central, Western & Southern Community Network - Latest development in Lung Cancer Management Organiser: HKMA Central, Western & Southern Community Network; Chairman: Dr. LAW Yim Kwai; Speaker: Dr. TSE Yiu Cheong, Adrian; Venue: HKMA Dr. Li Shu Pui Professional Education Centre, 2/F, Chinese Club Building, 21-22 Connaught Road Central, Hong Kong	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
12 THU	1:00 PM HKMA Hong Kong East Community Network - Impact of Alcohol on Health Organiser: HKMA Hong Kong East Community Network & Hong Kong Alliance for Advocacy Against Alcohol of Hong Kong College of Community Medicine; Chairman: Dr. CHAN Nim Tak, Douglas; Speaker: Dr. CHOW Chun Bong, BBS, JP; Venue: The Hong Kong Management Association (香港管理專業協會), Room 201, 2/F, Pico Tower, 66 Gloucester Road, Wan Chai, Hong Kong	Ms. Candice TONG Tel: 2527 8285 1 CME Point
	1:00 PM HKMA Kowloon East Community Network - Certificate Course on DM (Session 1): How new basal insulin help DM management in private practice? Organiser: HKMA Kowloon East Community Network; Chairman: Dr. AU Ka Kui, Gary; Speaker: Dr. CHAN Wing Bun; Venue: Lei Garden Restaurant (利苑酒家), Shop no. L5-8, apm, Kwun Tong, No. 418 Kwun Tong Road, Kwun Tong, Kowloon	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
	1:00 PM HKMA New Territories West Community Network - Cervical Cancer Prevention - what can we do more? Organiser: HKMA New Territories West Community Network; Chairman: Dr. LEE Shin Cheung; Speaker: Dr. HO Ka Wai; Venue: Plentiful Delight Banquet, 1/F, Ho Shun Tai Building, 10 Sai Ching Street, Yuen Long	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
	8:00 PM FMSHK Executive Committee Meeting Organiser: The Federation of Medical Societies of Hong Kong; Venue: Council Chamber, 4/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong	Ms. Nancy CHAN Tel: 2527 8898
14 SAT	2:15 PM Refresher Course for Health Care Providers 2016/2017 Organiser: Hong Kong Medical Association & HK College of Family Physicians & HA-Our Lady of Maryknoll Hospital; Speaker: Dr. CHENG Tin Sik; Venue: Training Room II, 1/F, OPD Block, Our Lady of Maryknoll Hospital, 118 Shatin Pass Road, Wong Tai Sin, Kowloon	Ms. Clara TSANG Tel: 2354 2440 2 CME Point
17 TUE	1:00 PM HKMA Kowloon West Community Network - Novel Drugs for Stroke Prevention in Non-Valvular AF Organiser: HKMA Kowloon West Community Network; Chairman: Dr. CHAN Ching Pong; Speaker: Dr. WU Chee Wo; Venue: Crystal Room IV-V, 3/F., Panda Hotel, 3 Tsuen Wah Street, Tsuen Wan, N.T.	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
19 THU	1:00 PM HKMA Hong Kong East Community Network - Update on Long Term Management of Postmenopausal Osteoporosis Organiser: HKMA Hong Kong East Community Network; Chairman: Dr. KONG Wing Ming, Henry; Speaker: Dr. MA Pui Shan; Venue: The Hong Kong Management Association (香港管理專業協會), Room 201, 2/F, Pico Tower, 66 Gloucester Road, Wan Chai, Hong Kong	Ms. Candice TONG Tel: 2527 8285 1 CME Point
	1:00 PM HKMA Kowloon East Community Network - News in Cancer treatment: Immunotherapy Organiser: HKMA Kowloon East Community Network; Chairman: Dr. CHUNG King Keung; Speaker: Dr. WONG Hiu Yan, Hilda; Venue: V Cuisine, 6/F., Holiday Inn Express Hong Kong Kowloon East, 3 Tong Tak Street, Tsung Kwan O	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
	1:00 PM HKMA New Territories West Community Network - Atopic Dermatitis & Seborrheic Dermatitis Management in Hong Kong Organiser: HKMA New Territories West Community Network; Chairman: Dr. CHEUNG Kwok Wai, Alvin; Speaker: Dr. CHAN Yung, Davis; Venue: Atrium Function Room, Lobby Floor, Hong Kong Gold Coast Hotel, 1 Castle Peak Road, Gold Coast, Hong Kong	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
20 FRI	1:00 PM HKMA Central, Western & Southern Community Network - Cancer Immunotherapy in Lung Cancer Organiser: HKMA Central, Western & Southern Community Network; Chairman: Dr. POON Man Kay; Speaker: Dr. KAM Koon Ming, Michael; Venue: HKMA Dr. Li Shu Pui Professional Education Centre, 2/F, Chinese Club Building, 21-22 Connaught Road Central, Hong Kong	Mr. Ziv WONG Tel: 2527 8285 1 CME Point
	1:00 PM HKMA Yau Tsim Mong Community Network - What's New in the Treatment of Respiratory Illness? (Session 2) - Allergic Rhinitis and Asthma: Reviews and Updates Organiser: HKMA Yau Tsim Mong Community Network; Chairman: Dr. LEUNG Wai Fung, Anders; Speaker: Dr. TAI Kian Bun; Venue: Pearl Ballroom, Level 2, Eaton, Hong Kong, 380 Nathan Road, Kowloon	Ms. Candice TONG Tel: 2527 8285 1 CME Point
21 SAT	6:00 PM 12th HKMA Sports Night Organiser: The Hong Kong Medical Association; Chairman: Dr. CHAN Hau Ngai, Kingsley; Dr. IP Wing Yuk; Venue: The Grand Hall, 28 Harbour Road, Wanchai, Hong Kong	Mr. Ian KWA Tel: 2527 8285
26 THU	8:00 PM FMSHK Foundation Meeting Organiser: The Federation of Medical Societies of Hong Kong; Venue: Council Chamber, 4/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong	Ms. Nancy CHAN Tel: 2527 8898

Upcoming Meeting

 11-12/3/2016
9:00am-5:00pm

12th International Symposium on Healthy Aging "Wellness and Longevity: From Science to Service"
Organiser: Research Centre of Heart, Brain, Hormone & Healthy Aging, Li Ka Shing Faculty of Medicine, HKU; Chairman: Dr Joseph SK Kwan & Dr Cora SW Lai, HKU; Venue: 3/F, Ballroom, Sheraton Hong Kong Hotel & Towers

 Phoebe Chow
Tel: 3917 9866 Fax: 2816 5258



Answers to Dermatological Quiz

Answer:

- Clinically this is typical of macular amyloidosis with brownish pigmented macules distributed over the upper back in a reticulated and rippled pattern. Although this pattern is often emphasised as a characteristic feature of macular amyloidosis, it only presents in less than 50% of cases. Constant friction and rubbing with a brush or towel was thought to be related to macular amyloidosis. However in practice, Chinese patients seldom have such a history. The incidence of macular amyloidosis is more common among Asians, Middle Easterners, and South Americans. The differential diagnoses in this patient include post-inflammatory hyperpigmentation, morphea and poikiloderma.
- A skin biopsy with special stain can confirm the diagnosis of cutaneous amyloidosis. Although Crystal violet is more sensitive in diagnosing amyloidosis, it is non-specific in cutaneous amyloidosis. Congo red is more specific and it shows a characteristic apple-green birefringence viewed under polarising light. In the histology, the amyloid deposits are usually found within the dermal papillae as minute globular bodies.
- Primary cutaneous amyloidosis can present as three clinical entities, namely lichen amyloidosis (papular form), macular amyloidosis and nodular amyloidosis. Papular and macular entities are purely cutaneous diseases without any underlying systemic involvement. The nodular form may be associated with paraproteinaemia, though uncommon.
- Amyloidosis can be broadly classified as follows:
 - Primary cutaneous amyloidosis (as discussed above)
 - Secondary cutaneous amyloidosis (usually incidental histological findings in some benign and malignant cutaneous neoplasms or chronic inflammatory skin diseases)
 - Primary systemic amyloidosis (15% with multiple myeloma, may also occur in multiple endocrine neoplasia)
 - Secondary systemic amyloidosis (chronic inflammatory diseases such as rheumatoid arthritis (50%), juvenile chronic polyarthritis, ankylosing spondylitis, inflammatory bowel diseases, familial periodic fever syndromes, chronic infections like tuberculosis or empyema, and certain neoplasms). Unlike the other three groups, there is no cutaneous involvement in this group of amyloidosis.

Dr Lai-yin CHONG

MBBS(HK), FRCP(Lond, Edin, Glasg), FHKCP, FHKAM(Med)
Specialist in Dermatology & Venereology

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² HBV DNA <69 IU/ml

³ Missing=excluded/addition of emtricitabine included

CHB=chronic hepatitis B; HBeAg=hepatitis B e-antigen; HBV=hepatitis B virus

Reference: 1. Marcellin P, Gane E, Flisiak R, et al. Long Term Treatment with Tenofovir Disoproxil Fumarate for Chronic Hepatitis B Infection is Safe and Well Tolerated and Associated with Durable Virologic Response with no Detectable Resistance 8 Year Results from Two Phase 3 Trials (OR-229). The Liver Meeting 2014: American Association for the Study of Liver Diseases (AASLD); 2014 November 7-11, 2014; Boston, MA, USA.

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