

The First PAOO (Periodontally Accelerated Osteogenic Orthodontics) Certification Course in Latin America - Hosted By the Universidad De Los Andes, Santiago De Chile

Francisco Muñoz^{1,2} and Ziyad S. Haidar^{3-6*}

¹Programa de Especialización en Cirugía Bucal y Maxilofacial, Facultad de Odontología, Universidad de Los Andes, Santiago de Chile

²FastOrtodent, Vitacura, Santiago de Chile

³Programa de Magíster en Investigación e Innovación en Ciencias de la Odontología,

⁴Facultad de Odontología, Universidad de Los Andes, Santiago de Chile

BioMAT'X, Facultad de Odontología, Universidad de Los Andes, Santiago de Chile

⁵Centro de Investigación Biomédica, Facultad de Medicina, Universidad de Los Andes, Santiago de Chile

⁶Plan de Mejoramiento Institucional (PMI) en Innovación I+D+i, Universidad de Los Andes, Santiago de Chile

***Corresponding Author:** Prof. Dr. Ziyad S. Haidar, DDS, Cert Implantol, MSc OMFS, MBA, PhD; Professor and Scientific Director, Facultad de Odontología, Universidad de los Andes, Mons. Álvaro del Portillo 12.455 - Las Condes, Santiago, Chile. Founder and Head of BioMAT'X (Biomaterials, Pharmaceutical Delivery and Cranio-Maxillo-Facial Tissue Engineering Laboratory and Research Group), Biomedical Research Center (CIB), PMI I+D+i, Department for Research, Development and Innovation, Universidad de los Andes, Mons. Álvaro del Portillo 12.455 - Las Condes, Santiago, Chile.

Received: October 14, 2015; **Published:** November 07, 2015

Between August 28th and 29th of 2015, the Universidad de los Andes hosted at its elegant and state-of-art ESE Business School facilities, the First Certification Course in Periodontally Accelerated Osteogenic Orthodontics or PAOO, of its kind, in Latin America.

Synopsis

Today, the demand for shorter treatment time with none to minimal side effects (*i.e.* root resorption, gingival recession, tooth decalcification, etc ...) is a main request of adults seeking orthodontic treatment [1,2]. Unlike children, adults have special biological conditions (*i.e.* slower cell mobilization and collagen conversion, increased risk of periodontal disease and almost inexistent alveolar and maxillary growth) which prevent speeding up treatment via conventional means (*i.e.* applying stronger forces) without increasing risk of hyalinization, among other complications [1-3]. To overcome such limitations, different techniques are constantly explored and developed, to accelerate tooth movement, with surgical endeavors reporting the highest success rates. Indeed, this led the Wilcko brothers (a periodontist and an orthodontist) to introduce, in 2001, a new technique for surgically-assisted tooth movement in orthodontics [4,5]. Their technique combined classic corticotomies/osteotomies of the alveolar bone with the use of bone grafts in order to maintain and increase the thickness of the cortical plates into which teeth were moved. Wilcko's novel "Periodontally Accelerated Osteogenic Orthodontics" or the PAOO technique gained acceptance and popularity given its safe, predictable and effective results as well as benefits versus traditional orthodontics; which included: accelerated differential tooth movement, reduced treatment time, less root resorption, enhanced expansion, increased traction of impacted teeth, increased post-treatment stability and increased robustness of the periodontium (including recently reported increase in the width of keratinized gingiva) [1,3,6]. With grafting, no more limits regarding pre-existing alveolar volume existed, allowing the teeth to be moved 2 to 3 times more (distance) and in almost 1/3rd of the conventional/traditional time [1,2,4,6].

Main indications for PAOO, presently, include moderate to severe crowding, Class II malocclusions requiring expansion and/or extractions, mild Class III malocclusions, extrusion for open bite and intrusion for deep bite [1,6]. Furthermore, PAOO has also been suggested to reduce the need and extension of orthognathic surgery in specific patients, opening new and exciting frontiers and possibilities within maxillofacial surgery [1,3]. The rapid tooth movement and stability, as a result of PAOO, has been attributed to a localized and temporal osteoporosis-like/increased turnover state of the bone, referred to as "Regional Acceleratory Phenomenon" or RAP [1]. Briefly, RAP is a

Citation: Ziyad S. Haidar and Francisco Muñoz. "The First PAOO (Periodontally Accelerated Osteogenic Orthodontics) Certification Course in Latin America - Hosted By the Universidad De Los Andes, Santiago De Chile". *EC Dental Science* 3.1 (2015): 435-439.

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natural event within the bone healing process which usually follows fracture, osteotomy and/or grafting. The PAOO procedure, therefore, is a combination of selective decortications (facilitating orthodontics and alveolar augmentation) involving the activation and recruitment of precursor cells into the wounded/injured site, leading to subsequent 2 to 10-fold increase in hard and soft tissue healing [7]. In PAOO, RAP begins within few days of the surgical intervention, peaks at 1-2 months post-surgery and usually lasts up to 4 months (though 6 and up to 24 months may be necessary to completely subside). It is noteworthy that as long as tooth movement continues, RAP will follow [1].

Remarks: Collectively, it is safe to say that PAOO is a new and un-explored territory in Dentistry. Indeed, most of available evidence, accumulating day-to-day, is generated from humble observational and case-control studies. Randomized multi-center prospective trials with more patients and longer follow-ups are currently undergoing. The authors [8], for example, are simultaneously investigating the potential of incorporating oral-derived mesenchymal stem cells or growth-factor embedded nano particles within “Leukocyte and Platelet-Rich Fibrin” or L-PRF, as bio-scaffolds, to further boost, with predictability, bone formation, tooth movement ability, treatment time and post-orthodontic stability, in PAOO.

The Course: This daring initiative was organized and delivered by Dr. Thomas Wilcko (DDS, Specialist in Periodontology - Wilckodontics Inc., Erie, Pennsylvania), Dr. Francisco Muñoz (DDS, Specialist in Oral Surgery –FastOrtodent, Santiago, Chile) and Dr. Silvana Palacios (DDS, Specialist in Orthodontics –FastOrtodent, Santiago, Chile). The course was supported by the Faculty of Dentistry of the Universidad de los Andes, the OREMA Clinic and Foundation, Wilckodontics Inc. (holders of Accelerated Osteogenic Orthodontics™ and AOO™- US Patent #6,109,916.) and CORFO (Corporación de Fomento de la Producción/Chilean Economic Development Agency), besides other industrial sponsors; Perio•Aid®-Dentaid S.A., Colgate-Palmolive Company-Chile, DentaMax Chile, L.T.D.A. and American Orthodontics, Sheboygan, WI, US, to list a few.

It is worth mentioning that FastOrtodent, founded in 2014, by Dr. Francisco Muñoz and partners, is a dental care center specialized in PAOO. The professional team (first Chilean specialists certified in the art and science of PAOO) identified the advantage of the PAOO technique to decrease treatment time between 50% and 75% from conventional braces and increase the limits of tooth movement, allowing the resolution of more complex cases. Through a strategic and fruitful alliance/relationship with Wilckodontics Inc., USA, they decided to pass on this benefit to their private patients and then spread this philosophy to colleagues in Chile and Latin America, via offering this certification course, in Spanish.

With more than 220 attendees, mainly specialists in Orthodontics (62%), Periodontics (18%), Oral and Maxillo-Facial Surgery (10%), plus 15 (10%) post-graduate residents from UAndes, the PAOO Certification Course provided, over 2 full days, an in-depth knowledge of all the general and specific aspects that rule this technique. Among them the attendants had access to the current and most recent evidence in relation to History of PAOO, Physiology and Metabolism in PAOO, Regional Acceleratory Phenomenon (RAP), Orthodontics and PAOO, Surgery and PAOO, Accelerated Movement, Increased Scope of Movement, Increased Post-op Stability, Space Closure in PAOO, Exposures using PAOO, Periodontal Aspects of PAOO, Obstructive Sleep Apnea Syndrome (OSAS) and PAOO, also, Clinical Cases analyzing Class I, Class II, Class III and Extreme Cases.

General Objective of the First Certification Course in PAOO held in Latin America

This two full day course is designed to expose the clinician to the advanced surgical and orthodontic aspects of the PAOO technique in order to maximize clinical potential. At the end of the course, the participant/trainee will understand and be able to apply the science and art of PAOO in patient diagnosis, treatment planning and execution (all orthodontic and surgical aspects).

Specific Objectives:

1. Historical review of surgically-assisted orthodontic tooth movement leading to PAOO
2. Understand the physiological and biological concepts governing/underlying PAOO
3. Understand RAP: Is it responsible for rapid orthodontic tooth movement?

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4. Case Selection: Learn the indications and contraindications for PAOO
5. Understand why corticotomy/decortications and how to perform
6. Understand flap design and when, why and how to graft
7. Learn closure techniques and timing of ortho-treatment
8. Applying PAOO to practical clinical cases
9. Understanding the limitations of PAOO
10. Review complications and side-effects

PAOO Certification Course Didactic Components:

1. History of PAOO – 1800's thru 2015
2. Physiology and Metabolism of PAOO
3. Physiology and Metabolism of RAP
4. Orthodontics and PAOO
5. Surgery and PAOO
6. Accelerated Orthodontic Movement
7. Ranges of Orthodontic Movement
8. Grafts in PAOO
9. Increased Post-Operative Stability
10. Space Closure in PAOO
11. Fenestration and "Tunneling" in PAOO
12. Periodontal Aspects (Keratinized Gingiva Augmentation) in PAOO
13. Obstructive Sleep Apnea Syndrome (OSAS) and PAOO
14. Clinical Case Analysis (Specialists and Residents):
15. Treatment of Class I with Severe Discrepancies
16. Maxillary and Mandibular Compression/Trauma
17. Treatment of Class II
18. Treatment of Class III
19. Treatment of Extreme Cases
20. Round Table (Q & A session and interactive discussions)

Ratings and General Consensus for the First Certification Course in PAOO in Chile

Briefly, the survey method of data collection using a questionnaire with specific individual questions was distributed and answered by 84.7% of the course attendants. The general consensus revealed that contents of the lectures, mode of delivery, speakers, overall organization and facilities was outstanding (mean average rating reported is 4.7 out of 5).

Hence, we are now keen and encouraged to expand the PAOO philosophy in Latin America. Indeed, courses are under development for 2016 to take place at the Sao Paulo Orthodontics Congress (major orthodontics event in Latin America) as well as in Mexico, Peru, Argentina and possibly, in the US; where a joint venture with Wilckodontics Inc, aiming to extend the PAOO technique into combinatorial skeletal anchorage, is in the works, for example. Furthermore, the course generated new partnerships with scientific researchers, where key queries and hypothesis formulated and undergoing investigation. This is chiefly true in light of growing belief that PAOO is a true form of tissue engineering. It is recognized today that PAOO can offer an attractive treatment option for our patients.

Conclusions

As part of a well-thought, intensive and didactic-based curriculum, this evolving PAOO certification course aims to enhance the knowledge and skills of the clinicians (mainly periodontists, orthodontists, oral surgeons and oral rehabilitation professionals) on how

to move teeth rapidly and decrease over all treatment time by almost 50%. An advanced understanding of underlying bone physiology and mechanics is key for mastering accelerated tooth movement in conjunction with minimal root resorption. Furthermore, the course provides insights, from evidence-based science as well as clinical expertise, on grafting materials and decortification patterns best fit in the diverse orthodontic scenarios. The comprehensive patient-centered curriculum discusses alternatives to orthognathic procedures whilst recognizing limitations and likely pitfalls. Overall, this course prepares the clinician to incorporate the PAOO technique and procedure into practice, with ease.

Acknowledgements

This work was supported by generous funding and operating grants provided to the BioMAT'X Research Group, partner of CIBRO (Centro Investigación en Biología y Regeneración Oral) and part of CIB (Centro de Investigación Biomédica), through the Faculty of Dentistry and PMI (Plan de Mejoramiento Institucional en Innovación I+D+i), Department for Research, Development and Innovation, Universidad de Los Andes, Santiago de Chile. Dr. Francisco Muñoz acknowledges significant support from FastoOrtodent, Wilckodontics Inc., Clínica y Fundación OREMA as well as CORFO-Chile.

Conflict of Interest

Authors of this article declare having no conflict of interest.

Illustration



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Volume 3 Issue 1 November 2015

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