



401 N. Lindbergh Blvd.
St. Louis, MO 63141
Tel.: 314.993.1700, #546
Toll Free: 800.424.2841, #546
Fax: 800.708.1364
Cell: 314.283.1983

Send via email to: jbode@aaortho.org and cyoung@aaortho.org

AAO Foundation Final Report Form

Type of Award: Orthodontic Faculty Development Fellowship Award (OFDFA)

Name of Principal Investigator: Isil Aras, D.D.S., M.S., Ph.D.

Institution: Jacksonville University

Title of Project: Faculty Development Plan & Research (Effects of Miniscrew-Supported Rapid Maxillary Expansion in Late Adolescents and Young Adults: A Cone Beam Computed Tomography and Rhinomanometry Study)

Period of AAOF Support: 07-01-19 to 06-30-20

Amount of Funding: \$20,000

Summary/Abstract:

The goal of this proposal was to enhance my knowledge and skills as a junior faculty member in patient care, research activities, and teaching. I am currently serving in the capacity as assistant professor at the School of Orthodontics at Jacksonville University.

One area of focus in my proposal was to provide pilot data on a maxillary expansion study. The study should enable the groundwork on which to build a treatment approach with regards to expanding the maxilla in mature individuals, without resorting to surgically assisted treatment modalities. It was previously reported that 30% of adults seeking orthodontic treatment presented with a transverse discrepancy requiring maxillary expansion. However, progressive interdigitation of the intermaxillary suture with age brings about more dentoalveolar outcomes than skeletal results in mature individuals. A failure to achieve the desired skeletal outcomes can have detrimental effects on dentoalveolar and periodontal structures. To address the side-effects and achieve true expansion of the basal bone, miniscrew-assisted rapid palatal expansion (MARPE) was introduced for use in mature individuals. Maxillary transverse deficiency also has implications for the nasal airways; effective expansion of the maxilla will benefit the nasal floor and impaired breathing. The aim of the proposed randomized clinical trial was to compare the outcomes of conventional rapid maxillary expansion and miniscrew-assisted rapid maxillary expansion using cone-beam computed tomography and rhinomanometry.

The second part of my proposal was aimed at improving my teaching abilities. After starting my

new position at Jacksonville University, I was assigned to teach the Literature Review IV and V courses, which cover American Board of Orthodontics (ABO) articles. Through this course, residents are able to implement the evidence-based facts into their clinical practice. With the support of the AAOF, I was able to improve my proficiency in analyzing current data and communicating my knowledge to residents based on the educational courses that I have attended. The final aim of the AAOF grant was to further my clinical and patient-care skills through training in MARPE and Invisalign treatments.

Responses to the following questions:

- 1. Were the original, specific aims of the proposal realized?**
- 2. Were the results published?**
- 3. Have the results of this proposal presented?**

(I) Research Component:

This section of my proposal was aimed at the successful expansion of the maxilla in mature individuals. As per my proposed randomized controlled trial, patients with stage 5-6 cervical vertebrae maturity fulfilling the inclusion and exclusion criteria were recruited to the study groups. For 82% power at the 0.05 level, based on a pooled standard deviation of 1.43 mm and a 1.7 mm detectable difference in nasal cavity width at the level of the maxillary first molars, 13 patients were required in each group according to our power analysis. Assuming a dropout rate of 15%, 30 patients were recruited and assigned to either conventional rapid maxillary expansion or MARPE group. As there was no ear, -nose and throat (ENT) specialist performing rhinomanometric measurements in the Jacksonville area, our provost, Dr. Sapienza Ph.D., CCC-SLP, purchased a rhinomanometry device and trained me to perform my own airway measurements. As her research has focused on airway protection and breathing, this training played an important role in my current and future airway studies.

During the course of the research plan, I have placed mini-screws, acquired CBCT scans, carried out rhinomanometric measurements, and supervised the treatment of the patients; thus, and I continue being the responsible person for the monitoring and treatment of the research subjects. However, due to the COVID-19 outbreak, our clinic was closed for 3.5 months. We recently opened and are working at half capacity without recruitment of no new patients until further notice. This is because the institutional review board committee suspended all research activities involving human subjects. Therefore, the project has not been finalized; no publications or presentations have yet been made available regarding the proposal. 12 subjects had been enrolled in this study until the beginning of the COVID-19 lockdown. CBCT and rhinomanometry measurements were completed for six subjects; the remaining six are approaching the end of the 4-month retention period in preparation for the final set of measurements. Patient recruitment is still under progress; and, the project is still ongoing.

As part of research involvement during the fellowship period, I served as a reviewer for 17 manuscripts for the American Journal of Orthodontics and Dentofacial Orthopedics, 5 manuscripts for Orthodontics and Craniofacial Research, and 5 for the Angle Orthodontist.

In addition, I have continued to publish and present some other research activities during the fellowship period. Listed below are publications in progress, wherein *AAOF support will be acknowledged*:

- 1- **Aras I**, Yalcin A, Gode S, Aras A, Sezgin B, Durusoy D, Eyigor S. Evaluation of swallowing in relation to oropharyngeal dysphagia in patients with operated cleft lip and palate. Submitted to the Cleft Palate-Craniofacial Journal. *Under review following the first revision.*
- 2- Pasaoglu A, **Aras I**. Cleft Lip and Palate YouTube™ Videos: Content usefulness and sentiment analysis. Submitted to the Cleft Palate-Craniofacial Journal. *Under review following the second revision.*
- 3- Aycan A, **Aras I**, Gode S, Aras A, Sezgin B, Durusoy D, Eyigor S. Evaluation of swallowing in relation to oropharyngeal dysphagia before and after rapid palatal expansion in patients with skeletal transversal maxillary deficiency. *The manuscript is currently being written and is planned to be submitted to the Angle Orthodontist.*
- 4- **Aras I**, Bavbek N, Kaya B, Aras A. Three-dimensional evaluation of the effects of lateral agenesis and peg-shaped lateral incisors on morphologic tooth symmetry. *The statistical analysis is currently in progress. The manuscript is planned to be submitted to the AJODO.*
- 5- Pasaoglu A, Aras I, Othman E, Aras A. Comparison of 2 treatment protocols using fixed functional appliances in Class II malocclusion: Treatment results and stability. Am J Orthod Dentofacial Orthop. 2020;157;474-480.
- 6- Kilic A, Brown A, **Aras I**, McCracken L, Hughes L. Using virtual technology for fear of medical procedures: a systematic review of the effectiveness of virtual reality-based interventions. *Manuscript currently being written.*
Prospero link:
https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=152327
- 7- Garcia-Nunez W, Vezina G, **Aras I**. Three-dimensional comparison of retention protocols with thermoform retainers. This research was presented as a poster in the AAO Annual Session 2020. *Manuscript currently being written and will soon be submitted to the AJODO.*

(II) Educational and Teaching Components:

The second goal of my Fellowship plan was to acquire a strong grounding and advanced skills in interpreting data, and then to achieve proficiency in communicating with residents as an educator, to foster high-quality orthodontists.

As meta-analysis is considered to provide the strongest evidence-based knowledge, my primary goal was to become efficient in that analysis technique. The Meta-Analysis Workshop that would have taken place in New York during the period March 1–3 was postponed to an as yet undetermined date because of the coronavirus pandemic. However, some videos were uploaded to the website as part of the remote learning process. I also finalized the purchase of the Comprehensive Meta-Analysis software and manual, and examined the resources contained therein. I feel confident in interpreting advanced statistical data. One of my objectives was to perform a meta-analysis on MARPE studies. I completed the literature search (of four databases) with the help of a professional librarian. At this time, I am on a provisional list of workshop attendees.

American Dental Education Association (ADEA) Annual Meeting what would have been held in March, was canceled due to the COVID-19 outbreak. The Carla Evans Educational Leadership Conference was also canceled. Attendance at future meetings will be considered.

I attended The Clear Aligner Faculty Education Workshop held in Chapel Hill. During that workshop, we explored key aspects of communicating knowledge to residents to allow them to implement complex treatment plans that require a steep learning curve. The aim was to increase the competence of the residents in terms of translating their didactic knowledge to the clinical setting (i.e., aligner treatment).

I have acted as the first supervisor for 11 residents during their thesis projects this year. Additionally, I served as the second supervisor for three other thesis projects supervised by other faculty members. I am currently writing-up the thesis of a student who I mentored last year as a manuscript. The research was presented as a poster at AAO 2020; however, due to some statistical problems associated with the complex nature of the research, we had to rerun the statistical analysis three times, which has delayed the submission process.

I was responsible for the Literature Review IV and V courses, which cover American Board of Orthodontics (ABO) articles. All of the residents of 2019 (15 individuals) passed the written part of their ABO exam. As a result of the highly positive feedback garnered from the residents and the excellent success rate we achieved, I was given the same responsibility this year again. With the help of the AAO Orthodontic Faculty Development Fellowship Award, I purchased latest edition textbooks, which have allowed me to develop my curriculum and keep it up-to-date. This year we again achieved a 100% pass rate. My other responsibilities include conducting diagnostic and progress seminars, as well as special topics. Additionally, I am serving as a member of the Academic Integrity Council of Jacksonville University.

(III) Clinical Patient Care:

The final element of the AAO Foundation support involved advancing my clinical skills. For an orthodontist, this is important regardless of whether one is an academician, researcher, or clinician. I received clinical and laboratory training in MARPE in Boston at Tufts University, which I implemented during patient care at Jacksonville University. MARPE procedures are now used routinely in our clinic to treat maxillary transverse deficiencies in adolescent and adult patients.

Additionally, I completed the Aligner Intensive Fellowship course, which is the most comprehensive course related to clear aligners currently available. It is a 4-month online course conducted by Dr. Moshiri and Dr. Nicozisis.

I also supervised the patient care provided by 30 residents and 5 fellows and mentored them in the completion of the ABO certification process at the end of their residency education.

4. To what extent have you used, or how do you intend to use AAOF funding to further your career?

The Orthodontic Faculty Development Fellowship Award provided by the American Association of Orthodontists Foundation has allowed me to develop a strong foundation in clinical patient care, research, teaching, and education. I achieved independence in data mining, which was

helpful given the myriad uncertainties and limitations of published results. I also contributed to the literature by writing six manuscripts and served as a reviewer for more than 25 manuscripts submitted to peer-reviewed journals. I now can offer two additional treatment modalities to my patients that I was not able to offer previously. Moreover, I was able to train high-quality residents who will provide excellent care to the public.

Our profession is characterized by continual progress. Every well-established treatment plan is a work in progress. The seeds of continuous development have been planted in my career by the AAOF. The knowledge that I acquired during the period 2019–2020, through the generosity of the AAOF, will allow me to further advance my career and abilities. I feel privileged to have received such generous support from the AAO Foundation, which has been instrumental in the exponential progress achieved in our field.