

## AAO Foundation Award Final Report

Type of Award, Orthodontic Faculty Development Fellowship Award  
“T.M.Grabber Teaching Fellowship Award”

Name(s) of Principal Investigator(s) : Dina Stappert, DDS

**Title of Project:** Gingival Clefts - Evaluation of the characteristics that make one more susceptible to gingival clefts. (A preparation for In Vivo Tissue Engineering for Orthodontists and Dentofacial Orthopedics: Morphing Bone with Nonautogenous Bone Graft Followed by Orthodontic Tooth Movement”)

Period of AAOF Support (July 1, 2013 – June 30, 2014)

Amount of Funding: \$15,000

Summary/Abstract (250 word maximum)

Introduction: Comprehensive orthodontic treatment often involves extractions to help eliminate crowding of teeth. Removal of a tooth leads to a decreased amount of bone in the region in which the tooth was removed. Once a tooth is removed, the remaining teeth are moved into the extraction site. In 35% of these cases, a gingival cleft occurs in the area where the tooth was extracted. A cleft is an invagination of the tissue measuring a minimum of 1mm in depth. These ingrowths have been associated with causing a slowing of the closure process, compromised oral hygiene, subclinical inflammation of the gums and reduced bone in between the teeth. We believe that a person’s biotype, the thickness of bone, the quantity of the gingiva tissue have a relationship to the likelihood of gingival clefting.

Hypothesis: We hypothesize that those with thin biotype and/or decreased amount of buccal bone and keratinized gingiva are more likely to have a gingival cleft than those with a thick biotype. In this observational study, the biotype of patients undergoing bicuspid extraction will be examined, the buccal bone and width of keratinized gingiva will be measured and the incidence of gingival clefts will be calculated.

Materials and Methods: Selected patients who needed four bicuspid extractions as part of their routine orthodontic tx were followed and monitored for development of gingival clefts. Amount of buccal plate lost during extraction was measured and noted.

Statistical Analysis:

Power analysis was based on available evidence that gingival clefts occur in 35% of space closures. Therefore, a sample size of 43 in each group (N = 86) is necessary for an alpha = 0.05 and power = 0.80.

Group differences will be determined through One-way ANOVA and subsequent post hoc test. Associations will be evaluated using chi-square test and a linear regression analysis.

Preliminary Results:

43 participants enrolled in study. 143 extractions completed.

22 extraction sites have closed. Of the 22 that have closed 16 have had gingival cleft, 6 have not.

Expecting 60 sites to be closed within the next two months

Response to the following questions:

1. Were the original, specific aims of the proposal realized? Yes, this research has provided the foundation and basis for more clinical orthodontic research

- **Educational Goals accomplished:**

- Self-directed learning experiences

- AAO Resource Center, Webinars, Journals, ADEA Journal of Dental Education, ADA Education Round, Education Scholar, ADEA Faculty Development Listserv

- Professional development resources

- AAO, AAP, ADEA, ADEA Curriculum Resource Center, ADEA Online Library, MedEdPORTAL
- 6 Elements Course Part I and II

- Collaborative learning experiences

- 2013 Winter Conference AAO and AAP (Orthodontists and Periodontists working together)
- 2013 Young Leadership in Orthodontics: Shaping a Vision for the Profession

(I have been accepted for participation for February 7, 2013)

- 2013 AAO and AAP Winter Meeting
- AAO 113<sup>th</sup> Annual Session
- MASO Annual Session

- **Teaching Goals accomplished:**

<ul style="list-style-type: none"> <li>• <b>Year 1 (Resources)</b></li> <li>• Conduct peer reviewed course design (Dr. Preis)</li> <li>• Self-directed learning for teaching MedEdPORTAL</li> <li>• Guiding residents project for Master's degree via directed study</li> <li>• Precepting postgraduate clinic</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Year 1 (Goals)</b></li> <li>• Teach doctoral and postdoctoral orthodontic courses</li> <li>• Teach Orthodontic honors/clerkship program</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Year 2</b></li> <li>• Develop and improve the curriculum design for multidisciplinary courses using ITL knowledge (Ortho/Perio, Ortho/Oral Surgery)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Year 2</b></li> <li>• Take on responsibility of directorship of postdoctoral interdisciplinary courses with periodontics and orthognathic surgery(2014)</li> <li>• Foster master student through thesis defense and completion of Master's degree. Submit resulting article for publication. (2015)</li> </ul>

- **Clinicalj Goals accomplished:**

<ul style="list-style-type: none"> <li>• <b>Year 1 (Resources)</b></li> <li>• Start 50 orthodontic cases</li> <li>• Treatment plan and execute multidisciplinary cases with periodontics and orthognathic</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Year 1 (Goals)</b></li> <li>• Participate in <u>Diagnosis and Treatment Planning for Orthognathic Surgery</u>: (Dr. Tim Tremont, 20 C.E. Credit hours and certificate.</li> </ul>
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<i>surgery</i>	
<ul style="list-style-type: none"> <li>• <b>Year 2</b></li> <li>• <i>Start next 50 orthodontics cases</i></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Year 2</b></li> <li>• <i>Begin case selection and work up for ABO certification</i></li> </ul>

2. Were the results published? If not, are there plans to publish? If not, why not?

The final clinical results will be established in early 2015 and upon completion of data analysis I will prepare manuscript for publication (JCO or AJODO)

Title: Gingival Clefts - Evaluation of the characteristics that make one more susceptible to gingival clefts. Dina Stappert, DDS; Mark Reynolds, DDS Robert Geiman, DDS
3. Have the results of this proposal been presented? If so, when and where? If not, are there plans to do so? If not, why not?

The data will be presented at the AAO in May 2015
4. To what extent have you used, or how do you intend to use, AAOF funding to further your career?

The plan is to build upon the clinical data established in this particular research project for a research sequel. Once the final data analysis is complete, the intention is to submit my next IRB for continuing research:

Title: In Vivo Tissue Engineering for Orthodontics and Dentofacial Orthopedics: Morphing bone with nonautogenous bone graft followed by orthodontic tooth movement

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