AAO Foundation Final Report

Type of Award: Research Aid Award (RAA)

Name(s) of Principal Investigator(s): Dr. Jennifer Yau

Period of AAOF Support: July 1, 2017 through June 30, 2018

Amount of Funding: $5000

Summary/Abstract:

Introduction: Class I and II patients differ skeletally and dentally, which lead to disparities in orthodontic treatment. The aims of this study are to use cone-beam computed tomography (CBCT) to identify the factors involved with Class II correction and to evaluate the treatment changes using 3D superimposition. **Methods**: Sixteen Class I patients (mean age 12.9 ± 1.3 years) and twenty-two Class II patients (mean age 12.5 ± 1.1 years) received orthodontic treatment by one sole practitioner. CBCTs were taken before (T1) and after (T2) comprehensive therapy. Voxel-based superimposition and landmark locations were used to analyze the CBCTs and SPSS software was used for statistical analysis. **Results**: The Class I and II groups were comparable in age, sex, and treatment time. At T1, the Class II patients had a significantly more retrognathic mandible, greater overjet/overbite, upright maxillary incisors, proclined mandibular incisors, and mesially rotated maxillary molars. At T2, the overjet and molar rotations improved in Class II patients, but all other discrepancies remained. From T1 to T2, the occlusal plane increased in the Class II group and decreased in the Class I group (p=0.0002), and the maxillary molar rotated more mesial-in for the Class I group (p=0.01). Multiple regression analysis showed that molar rotation was able to explain 25% of the variation (r=0.488) when molar relationship was the dependent variable. **Conclusions**: Class II molar correction was achieved mostly through dentoalveolar effects with molar rotation being an important factor. Voxel-based superimposition is able to accurately and reproducibly superimpose 3-dimensional images. CBCT supersedes lateral cephalograms and study casts in analyzing orthodontic treatment effects.

1. **Were the original, specific aims of the proposal realized?** Yes. The original aims were to accomplish a study that (1) uses cone-beam computed tomography (CBCT) to three-dimensionally evaluate dental and skeletal movements involved with orthodontic correction of Class II molar occlusion; (2) determines the contributing factors in correcting Class II malocclusions; and (3) tests the reliability and validity of 3D CBCT superimposition method. This study was completed with all three objectives realized.

2. **Were the results published?** No, the results have not been published yet.
   a. **If so, cite reference/s for publication/s including titles, dates, author or co-authors, journal, issue and page numbers**. N/A
   b. **Was AAOF support acknowledged?** AAOF support will definitely be acknowledged if the results get published.
   c. **If not, are there plans to publish? If not, why not?** Yes, there are plans to publish. The paper was submitted to AJODO for review on June 5, 2018.

3. **Have the results of this proposal been presented?** No, the results have not been presented yet.
   a. **If so, list titles, author or co-authors of these presentation/s, year and locations**. N/A
   b. **Was AAOF support acknowledged?** AAOF support will definitely be acknowledged if the results get presented.
   c. **If not, are there plans to do so? If not, why not?** There are currently no plans to have a presentation on the results because the paper was recently completed. However, if a good opportunity arises, I will be very interested in presenting the results.

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

   The generous funding from AAOF has facilitated my research process by allowing me to purchase necessary equipment for my study. More importantly, AAOF has allowed me to continue my research even as a private practitioner. It can be difficult for a recent orthodontic graduate to be in private practice and still participate in the academic field. Through the Research Aid Award, I have been given the opportunity to be a private clinician as well as a researcher. I am grateful to AAOF for their financial support as well as their recognition and encouragement.