

# Modified PAOO for Soft and Hard Tissue Augmentation: A Prospective Clinical Study

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*2024 Research Aid Awards (RAA)*

*Dr. Jason Poon*

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jdpoon22@upenn.edu  
O: 281-788-3355

# FollowUp Form

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## *Award Information*

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*In an attempt to make things a little easier for the reviewer who will read this report, please consider these two questions before this is sent for review:*

- Is this an example of your very best work, in that it provides sufficient explanation and justification, and is something otherwise worthy of publication? (We do publish the Final Report on our website, so this does need to be complete and polished.)*
- Does this Final Report provide the level of detail, etc. that you would expect, if you were the reviewer?*

### **Title of Project:\***

Modified PAOO for Soft and Hard Tissue Augmentation: A Prospective Clinical Study

### **Award Type**

Research Aid Award (RAA)

### **Period of AAOF Support**

July 1, 2024 through June 30, 2025

### **Institution**

The Trustees of the University of Pennsylvania

### **Names of principal advisor(s) / mentor(s), co-investigator(s) and consultant(s)**

Dr. Chenshuang Li, Dr. Yu-cheng Chang, Dr. Nipul Tanna

### **Amount of Funding**

\$6,000.00

## Abstract

(add specific directions for each type here)

Please see the attached file.

## *Respond to the following questions:*

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### Detailed results and inferences:\*

If the work has been published, please attach a pdf of manuscript below by clicking "Upload a file".

OR

Use the text box below to describe in detail the results of your study. The intent is to share the knowledge you have generated with the AAOF and orthodontic community specifically and other who may benefit from your study. Table, Figures, Statistical Analysis, and interpretation of results should also be attached by clicking "Upload a file".

To date, 12 of the 15 planned participants have been recruited for the PAOO study. Six cases have been treated, and six additional patients are scheduled. Recruitment remains open to enroll the final three participants. One case has successfully completed the full 6-month postoperative follow-up, including final CBCT and gingival thickness measurements.

Preliminary findings on phenotype modification show promising results:

Keratinized tissue width: Increased at all sites, with a minimum of 2 mm.

Gingival thickness: Increased at all sites, with a minimum of 1 mm.

Buccal bone thickness: Increased at all sites, with a minimum of 1 mm.

These meet the criteria of the American Academy of Periodontology's phenotype modification consensus stating that therapeutic goals for any hard or soft tissue surgical intervention to be categorized as thick phenotype a minimum of 2mm of keratinized tissue width, 1mm of gingival thickness should be achieved, and buccal bone anatomic dimensions measuring greater than 0.75mm are considered thick periodontal phenotype. Remaining participants are currently in the postoperative healing phase and will undergo CBCT at the 6-month mark.

A significant challenge emerged in the study: The selected collagen membrane resulted in a 100% complication rate due to early exposure and infection. The membrane demonstrated poor intraoperative handling characteristics, notably loss of structural integrity and inability to maintain form during placement. As a result, the research team is evaluating alternative collagen membranes with improved handling and tensile properties. Other membranes have been used for PAOO with stable outcomes over a year and did not experience early exposures—highlighting the need for a more robust membrane option in this protocol.

### Were the original, specific aims of the proposal realized?\*

The specific aims of the study were to evaluate variations in PAOO interventions and assess associated hard and soft tissue changes. From a resident running the project's standpoint, prospective studies are more challenging than anticipated. Participant recruitment, awaiting orthodontic set ups, scheduling indicated surgeries, and adequate post operative timeline of 6 months post intervention made it a challenge to complete all items within the projects projected timeframe. not all planned data collection and surgical interventions could be completed. However, for the single case that reached full surgical treatment and follow-up, all specific aims were successfully achieved. The findings from this case provide valuable insight

and may help guide future understanding of healing patterns and postoperative management strategies in PAOO patients.

**Were the results published?\***

No

**Have the results of this proposal been presented?\***

Yes

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

The AAOF funding has been instrumental in supporting the early phases of my academic and clinical research career. It provided the foundation to launch a prospective clinical study investigating variations in PAOO approaches and the impact on hard and soft tissue outcomes — an area of relevance in orthodontic tooth movement and interdisciplinary care as it relates to addressing thinner periodontal phenotypes. Through this process, I've developed critical skills in research protocol design, data collection, and clinical documentation, while also strengthening collaborations with my faculty mentors and surgical colleagues.

Although the study is resulted in limited data collection (only 1 reached 6 months for a post operative CBCT), the preliminary findings have already shaped how I think about phenotype modification and surgical decision-making, primarily with the 100% failure rate with the selected collagen membrane. I intend to build upon this work by encouraging the department to continue the study, for them to have the appropriate clinical follow-up (ie CBCTs), and pursuing presentation opportunities.

**Accounting: Were there any leftover funds?\***

\$1,341.41

***Not Published***

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**Are there plans to publish? If not, why not?\***

There were plans to publish but at this time point the project requires more surgical follow up.

## *Presented*

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**Please list titles, author or co-authors of these presentation/s, year and locations:\***

Location: University of Pennsylvania School of Dental Medicine

Title: Modified PAOO for Soft and Hard Tissue Augmentation, A Prospective Clinical Study

Authors: Dr. Jason Poon, Dr. Yu-cheng Chang, Dr. Chenshuang Li, Dr. Tun-Jan (TJ) Wang, Dr. Nipul Tanna

**Comment:** *The AAOF PARC commends you on your efforts to place this work in the public domain and help advance our understanding of PAOO. We encourage you (your dept colleagues) to continue these studies to complete the project toward your original aims.*

## **Was AAOF support acknowledged?**

If so, please describe:

Yes, absolutely the AAOF's support was acknowledged (on slides and verbally) during the presentation, alongside encouragement for other orthodontic co-residents to apply for the AAOF funding. My experience with this project and the AAOF was the highlight of my residency experience as a dual perio-ortho resident.

## *Internal Review*

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### **Reviewer comments**

### **Reviewer Status\***

Approved

## File Attachment Summary

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### *Applicant File Uploads*

*No files were uploaded*