



**AAO Foundation Final Report Form
(a/o 5/31/2016)**

Please prepare a report that addresses the following:

Type of Award

Biomedical Research Award

Name(s) of Principal Investigator(s)

Toru Deguchi

Title of Project

Stability of self-tapping and -drilling miniscrews by biomechanical evaluation

Period of AAOF Support (e.g. 07-01-17 to 06-30-18):

07-01-16 to 06-30-17

Amount of Funding

\$28,800

Summary/Abstract (250 word maximum)

Objective: Our purpose of this study was to 1) compare biomechanical aspect in two different surgical methods (drilling vs self-drilling) in placing temporary anchorage devices (TADs), and 2) investigated the relationship between the biomechanical and morphological (by cone beam CT:CBCT) aspects. **Materials and Methods:** Twenty five Class II patients had miniscrew ($\phi 1.4 \times 6 \text{mm}$) in both sides of maxilla, one side with drilling and the other with self-drilling. Maximum torque (MT) and Periotest (at the time of placement: T1, after one month of 50g application: T2, and 3 months after with 150g of force application: T3) was measured. CBCT was taken at the time of placement of the miniscrew, and cortical bone thickness (CBT), cortical bone density (CBD), and root proximity (RP) was measured. Statistics was performed by multivariate analysis of variance was conducted, and for the correlation between the biomechanical and morphological variables were analyzed by Pearson's correlation method ($p < 0.05$). **Results:** There was no significant difference in all of the variables between drilling and self-drilling. There was significant difference in Periotest (failed: 17.35 ± 7.8 ; success: 2.66 ± 5.71) and MIT (failed: 1.87 ± 0.49 ; success: 4.81 ± 1.89) between failed and successful miniscrews. There was a significant correlation between MIT vs Periotest ($R^2 = 0.81$), and RP vs Periotest ($R^2 = 0.87$). **Conclusions:** We conclude that there is no difference in any of the biomechanical and morphological aspects between drilling and self-drilling. MIT ($< 2.0 \text{N cm}$) and Periotest (> 10) value may be able to use predict the stability that may be alternative way to CBCT to avoid radiographic exposure.

Response to the following questions:

1. Were the original, specific aims of the proposal realized?
Yes, but RFA value is not presented since it resulted in significantly unstable value.
2. Were the results published?

- a. If so, cite reference/s for publication/s including titles, dates, author or co-authors, journal, issue and page numbers
 - b. Was AAOF support acknowledged?
 - c. If not, are there plans to publish? If not, why not?
Not yet. We are waiting for the final data (removable torque value if we could obtain from all patients). After all data is collected will be submitted to the Journal.
3. Have the results of this proposal been presented?
 - a. If so, list titles, author or co-authors of these presentation/s, year and locations
Partial data was presented as “Biomechanical Characteristics in the Use of TADs” by T. Deguchi at the 9th World Implant Orthodontic Conference (WIOC) in 2017 Kobe, Japan.
 - b. Was AAOF support acknowledged? Yes
 - c. If not, are there plans to do so? If not, why not?
 4. To what extent have you used, or how do you intend to use, AAOF funding to further your career?

I would like to use the AAOF fund for further grant application for NIH grant.

Please return to AAOF via email attachment to
aaofevp@aaortho.org