AAO Foundation Award Final Report

Principal Investigator	Madhur Upadhyay
Co-Investigator	Sumit Yadav PhD, Assistant professor, University of Connecticut.
Secondary Investigators	
Award Type	Orthodontic faculty Development fellowship award
Project Title	R*obert M. Ricketts Sunflower Orthodontic Fellowship Award*
Project Year	2011-2012
Institution	University of Connecticut
Summary/Abstract (250 word maximum)	Activities performed during the grant period: EDUCATION: 1. Assumed position of Course Director for the graduate course 'Craniofacial Growth & Development'. 2. Co-director in the course titled 'biomechanics in dental sciences – II .' ADMINISTRATIVE: 1. Director: Orthodontic fellowship program (OFP) at the university of Connecticut. 2. Clinic Director, Division of Orthodontics, University of Connecticut. RESEARCH: 1. The three-dimensional (effects of a single force applied using a Cantilever Spring on a palatally impacted maxillary canine. Aim: The purpose of this research was to delineate the three-dimensional (3D) effects of a single force applied using a Kilroy spring on a palatally impacted maxillary canine positioned at different angulations (5 to 40 degrees) with respect to the line of force application. Methods: A dentoform cast was modified to simulate a palatally impacted canine. Load cells placed in the dentoform simultaneously measured the three forces (Fx, Fy, and Fz) and three moments (Mx, My, and Mz) on the canine. The activation range and force system attenuation were measured for eight different positions of a palatally impacted canine (5 to 40 degrees) as the canine moves toward the occlusal plane. The results were analyzed statistically. Results: The minimum activation range for the Kilroy spring was 11 mm, and the maximum was 14 mm. At all the different impacted canine positions, the Kilroy spring had a low load deflection rate and did not require reactivation for the successful management of a palatally impacted maxillary canine. Conclusion: A 3D force system at different bracket angulations (ie, different positions of the impacted maxillary canine) can be

	successfully quantified using the orthodontic force transducer. Quantification of the force system provides critical information for appropriate selection of an optimal appliance.2012;13:22–33., previously known as WJO vol 12, 2012) 2. Skeletal and dental considerations in orthodontic treatment mechanics: a contemporary view Summary Orthodontics has undergone a paradigm shift in the last 40 years. There have been both technical and philosophical changes ushered by the development of new appliances, techniques, and by the explosion in the amount of research being conducted all around the world. However, the application of any new concept requires a firm understanding of the fundamentals of orthodontics. This paper presents a broad review of some fundamental concepts of treatment mechanics that enable us to bring about skeletal and dental correction of the presenting malocclusion. The basic concepts of facemask therapy, mechanics, and biology of tooth movement will be discussed with an insight into the challenges facing us in the future.
Were the original, specific aims of the proposal realized?	Yes.
Were the results published? If not, are there plans to publish? If not, why not?	Yes.
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?	1. To delineate the three-dimensional (3-D) effects of a single force applied using a Cantilever Spring on a palatally impacted maxillary canine positioned at different angulations (5°-40°) with respect to the line of force application. (Published in Orthodontics (chic) 2012;13:22–33., previously known as WJO vol 12, 2012) 2. Skeletal and dental considerations in orthodontic treatment mechanics: a contemporary view (Accepted for publication in the European Journal of Orthodontics).
To what extent have you used, or how do you intend to use, AAOF funding to further your career?	I think the AAOF has laid down a good foundation for my future career in academics. I have utilized the funds effectively to get certain studies started and improve my clinical skills in certain areas.