

University of Toronto

THE ROLE OF LIGHT EMITTING DIODE PHOTOTHERAPY (LED) IN ORTHODONTIC TOOTH MOVEMENT (OTM)

S Chung*, S Gong, B Tompson

Department of Orthodontics, Faculty of Dentistry, University of Toronto

Objective: An increase in orthodontic treatment efficiency has been reported with laser application. However, lasers require a controlled clinical environment for safe and effective delivery. This study will investigate if light emitting diode (LED) phototherapy is a viable alternative. Results from our study will offer clues to the potential use of LED to accelerate the rate of orthodontic tooth movement (OTM) in the clinical setting.

Methods: Eleven patients undergoing orthodontic treatment at the Faculty of Dentistry, UT, were selected. Inclusion criteria included bilaterally symmetric extraction of premolars and full banding and bonding of appliances. During space closure of the extraction site, LED phototherapy was applied to one side of the dental arch for 21 minutes daily for 4-12 weeks. LED phototherapy was recorded by the LED unit as well as by the patient. To permit measurements of space closure on dental casts, dental impressions were taken at 3 time points using a chromatic alginate with long dimensional stability (Kromopan) immediately prior to (T0), during (T1) and after space closure (T2). The rate of space closure of the control and LED treated sides were compiled and compared with each other.

Results: All eleven patients were compliant with LED application. On average the duration of usage was 78% at T1 and 82% at T2. Preliminary results suggest that no significant differences resulted from the application of LED phototherapy.

Conclusions: The results suggest that extra-orally delivered LED phototherapy does not significantly alter the rate of OTM. This is to contrary previous findings with laser phototherapy mediated modulation of OTM and could be related to the duration or method of LED delivery. Further investigations are needed to determine whether LED phototherapy application can influence the rate of OTM.

Supported by: *University of Toronto, Faculty of Dentistry Dental Research Institute*