Background

Bite opening via the use of bonded resin dental adhesives has become common practice in the specialty of orthodontics. These ”bite turbos” are effective in avoiding potentially harmful interferences between brackets and dentition or assisting in treatment mechanics. Orthodontists often use band cements for this purpose due to their bond strength, filler content, and coloration.

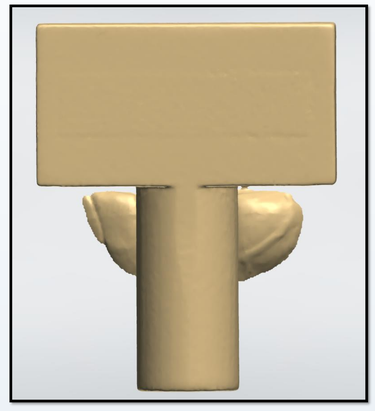
Although extensive research has been conducted for the intended purpose of these materials, little is known concerning their rate of wear. The aim of this study was to determine wear rate of three popular bite turbo materials. This knowledge will assist providers in selecting an appropriate material to predictably open a patient’s bite.

Materials and Methods

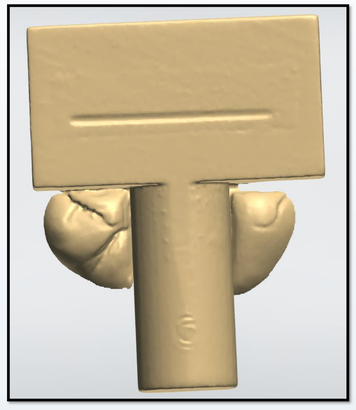
Three popular bite turbo materials were selected to undergo wear testing; namely, Ultra Band-Lok (Reliance, Itasca, IL), Transbond Plus Band Cement (3M, Monrovia, CA), and Triad Gel (Sirona Dentsply, York, PA). An oscillating toothbrushing machine retrofitted with a stainless steel stylus antagonist was utilized to induce localized, two body wear. All samples were placed in a customized specimen jig and photopolymerization was completed per manufacturer’s guidelines.

A baseline scan was obtained for each sample using the 3Shape R2000 Orthodontic Scanner (3Shape, Copenhagen, Denmark). Wear simulation was performed in distilled water with 49N of force at 60 RPM. Each group underwent 4,500 cycles followed by a progress scan. Groups subsequently underwent an additional 9,000 cycles and final scans were obtained. Progress and final images of each sample were superimposed over the initial scan and volumetric loss was determined at each timepoint using Boolean subtraction.

Materials and Methods (co



Initial Scan



Final Scan

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Results

Following analysis of volumetric loss at each timepoint, it was significant difference in the rate of wear between each group. susceptible to abrasive forces, followed by Transbond Plus B Band-Lok. This relationship was consistent between the prog

Average values of total volumetric loss (Final Scan)		
Material	Mean (mm^3)	Std. Devi
Ultra Band-Lok*	0.4939	0.378
Transbond Plus	1.1527	0.390
Triad Gel*	3.9087	0.590

*Outliers removed

Conclusion

It was concluded that the wear rate of the three materials test significantly. The rate of wear was as follows: Ultra Band-Lok Cement<Triad Gel. It is important to note that a relatively rapi of an inferior product. Instead, this information can be used to for a given clinical situation.

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