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Comparison of the frictional characteristics of aesthetic orthodontic brackets measured using a modified *in vitro* technique.

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I appreciate the authors for this informative and well-written article. The article presents a comprehensive analysis of the data, but I have some queries which are listed below.

Q1. Four types of ceramic brackets and a conventional stainless steel brackets were tested in this study. However, the authors did not present a prescription for each bracket. The sliding friction can be affected by torque at wire-bracket interface. I wonder if a prescription of each bracket was identical in this study.

Q2. To measure coefficient of friction (COF), the authors used 0.017 × 0.025-inch (in) archwire for the 0.018-in slot brackets and 0.019 × 0.025-in archwire for the 0.022-in slot brackets. Despite what was mentioned by the authors, plays due to lateral clearances between bracket slot walls and archwires were different in the 0.018-in (about 4.1°) and 0.022-in groups (about 9.6°) in this study. Why did not the authors choose 0.016 × 0.025-in archwire for the 0.018-in slot brackets (about 4.1°)? If there were no differences in the amount of play between two groups, significant differences of the COFs in two groups would not present.

Q3. The authors reported that the ceramic bracket with a 0.022-in stainless steel slot showed the lowest mean COF, followed by the conventional stainless steel bracket with a 0.022-in slot. I would like to know why the frictional resistance of a 0.022-in ceramic bracket with a metal slot was lower than conventional metal bracket, even though it was not statistically significant. Is there a difference in the physical properties of the metal used in the two bracket slots?

Questioned by
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A1. All of the brackets used in this study were maxillary premolar brackets and had the same prescription values (−7° torque and 0° angulation). However, as stated in the study, the effect of the prescription values were eliminated by bonding the bracket on a metal sphere which could be moved in the 2 dimensions of the space and using the guidance wires before the tested archwire placement. This technique helped position the bracket slots to prevent any excessive contact (binding) between the tested wires and the slot walls during the measurements.

A2. The plays due to lateral clearances between bracket slot walls and archwires were different in the 0.018-in and 0.022-in groups. The amount of ideal plays could be 4.65° and 7.24° when 0.017 × 0.025-in archwire used in 0.018-in slot and 0.019 × 0.025-in archwire used in 0.022-in slot.[1] If the 0.016 × 0.025 archwire would have been used, it would be similar in 0.018-in slot group as well. However, as stated in the article, one of

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the main aims of this study was to test bracket/archwire combinations for actual clinical applications. The 0.017 × 0.025-in archwires are more frequently used in 0.018-in brackets when space closure is necessary.[2] The point raised in this question could be tested in a future study.

A3. This statistically insignificant difference may be due to the variations between the manufacturing processes of the brackets. The finishing procedures of the slots of these two brackets could be different as well.

Replied by
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References

1. Arreghini A, Lombardo L, Mollica F, Siciliani G. Torque expression capacity of 0.018 and 0.022 bracket slots by changing archwire material and cross section. Progress in Orthodontics 2014;15:53.
2. Segner D. Wire selection for optimal biomechanic efficiency in the MBTTM Versatile+ Appliance System. Orthod Perspect 2011;18:1.

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