

# Cyclic and static bond strength of metal orthodontic brackets bonded to ceramic surfaces using different conditioning techniques



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## **Abstract**

**Objective:** Evaluations of cyclic and static shear bond strength of metal orthodontic brackets bonded to ceramic faced metal disks using different conditioning techniques.

**Material and methods:** a total of 120 ceramic faced metal disks were fabricated. The specimens were divided into 4 groups: group one: the ceramic surface was etched with hydrofluoric acid alone. In group two: hydrofluoric acid and saline were used. In group three: after etching with hydrofluoric acid, the ceramic surface was sandblasted with aluminum oxide powder. Group four: the surface was etched using the YSGG solid state laser with water atomization (BIOLASE- USA).

All metal brackets were bonded to the ceramic surfaces in all groups using trans bond XT adhesive (3M, Germany) with a fixed amount of force application using a surveyor.

Cyclic and static shear bond strength testing was carried out on 15 specimens for each group. The collected data were subjected to analysis of variance and post hoc tests.

**Results:** in both tests, cyclic and static shear bond strength, the sandblasting process with hydrofluoric acid significantly increased the shear bond strength, with no significant difference among the three other groups.

**Conclusion:** cyclic loading significantly decreases bond strength. Sandblasting of ceramic surfaces provides higher bond strength than using hydrofluoric acid or hydrofluoric acid with saline.