

EFFECT of SURFACE CLEANING on ZIRCONIA and ZIRCONIA-REINFORCED LITHIUM SILICATE CERAMIC-RESIN BONDING STRENGTH

Objectives: It is claimed that a reliable bond is created by effectively cleaning the contaminated surfaces of restorations with proper surface cleaners. This study aimed to evaluate the effect of different surface cleaning methods on the bonding of resin cement to zirconia and zirconia-reinforced lithium silicate ceramic.

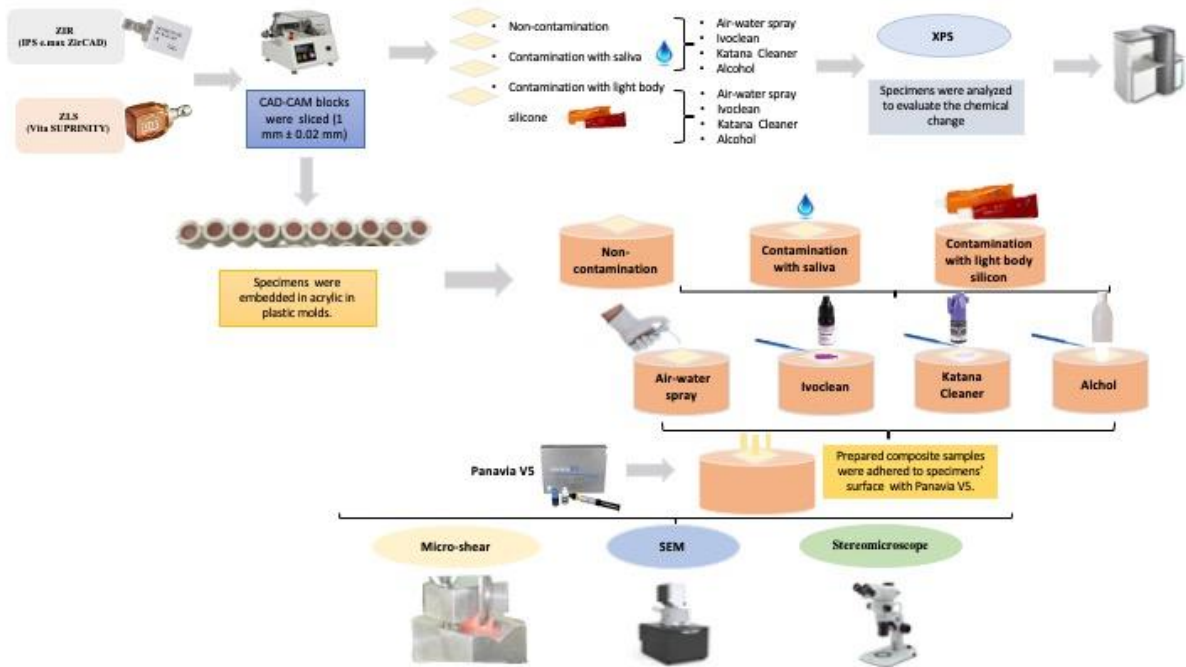
Materials and methods: 54 slices obtained from zirconia-reinforced lithium silicate (ZLS) (Vita Suprinity) and zirconia (ZIR) (IPS e.max ZirCAD) blocks. The final thickness of the specimens set to 1 mm \pm 0.02 mm. The specimens divided into nine groups both for ZLS and ZIR: non-contamination, saliva - air/water spray, saliva - Ivoclean, saliva - Katana Cleaner, light body - air/water spray, light body - Ivoclean, light body - Katana Cleaner and light body – alcohol. X-ray photoelectron spectroscopy (XPS) analysis performed to determine chemical change to each group; SEM analysis performed for microscopic surface changes. The resin bond strength values were obtained by performing the micro-shear bond strength (mSBS) test. The specimens examined with a stereomicroscope to investigate the failure types.

Results: Contamination with saliva and light body silicone decreased the bond strength significantly ($p < 0.05$). The mSBS value of ZLS-non contamination group was the highest (27.69 ± 7.1) and the mSBS obtained after decontamination of the saliva with the Katana Cleaner (15.32 ± 7.5) was statistically higher for ZLS specimens ($p < 0.001$). For ZIR specimens highest mSBS value was obtained with Katana Cleaner (18.95 ± 6.9 , $p = 0.803$). The highest mSBS values for ZLS and ZIR specimens found after decontamination of the light body silicone with alcohol (23.26 ± 3.1 , $p = 0.220$; 19.77 ± 8.6 , $p = 0.729$). According to XPS analysis, Ivoclean removed element C better than other cleaners from the surface, similarly alcohol removed element Si better than other cleaners.

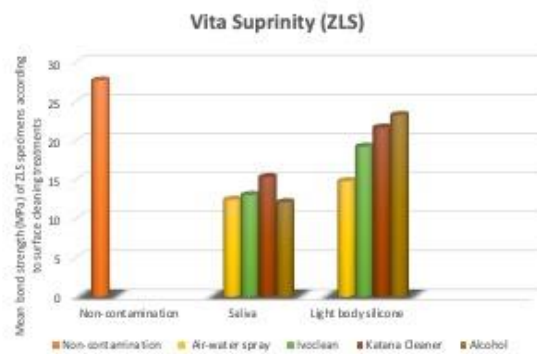
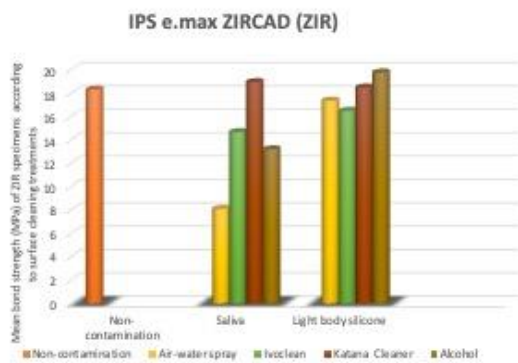
Conclusion: Katana Cleaner could be used as a surface cleaner after contamination with saliva, and alcohol found to be more effective after contamination with light body silicone.

Keywords: Cleaner; Contamination; Saliva; Zirconia; Zirconia-Reinforced Lithium Silicate

Figure: Workflow of the study



Graph 1: MPa values of the groups



Graph 2: Percentage of failure types according to groups

