

EVALUATION OF PUSH-OUT BOND STRENGTH AND ADHESIVE PATTERN OF THE EPOXYAMINE RESIN SEALER MODIFIED WITH BIOGLASS



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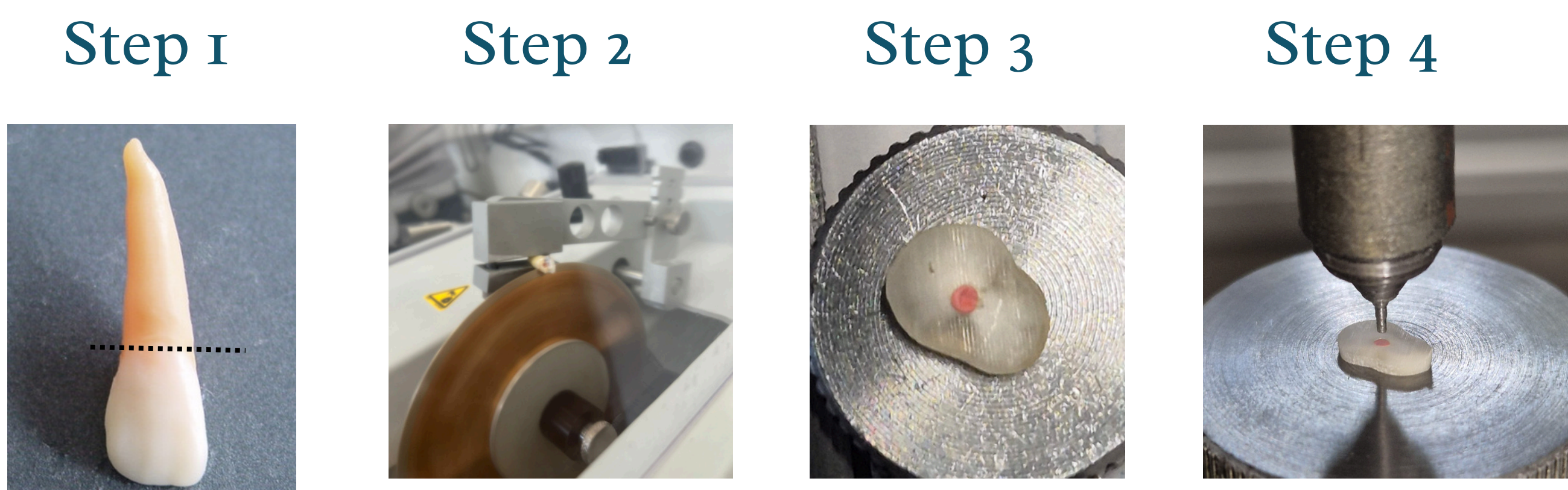
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Aim

This study aimed to evaluate the effect of incorporating 5% (by mass) Bioglass 45S5 particles into AH Plus Jet, an epoxy resin-based sealer, on the push-out bond strength and adhesive pattern of the sealer.

Figure 1. Chronological process of implementing the method



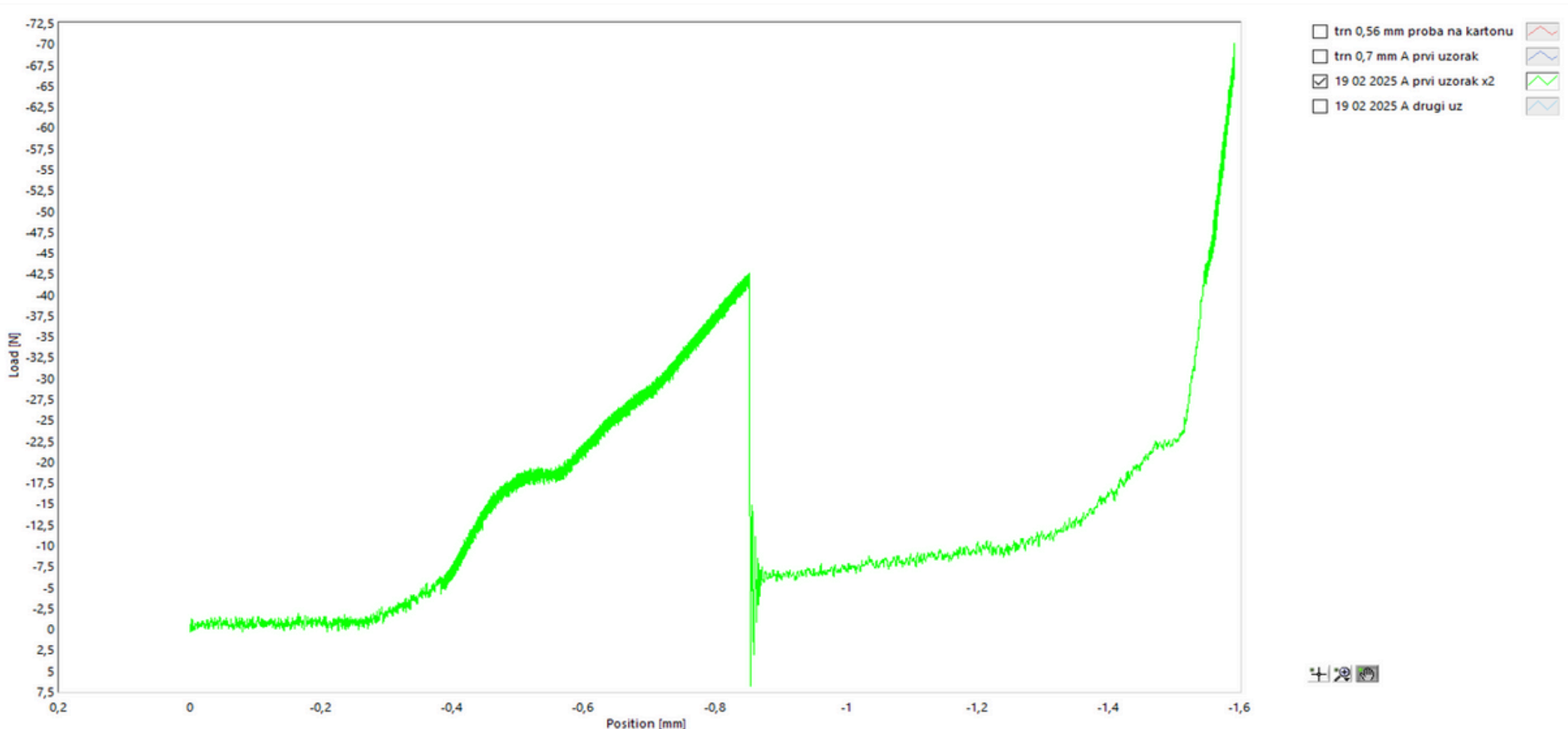
Methodology

Twenty single-rooted human teeth were instrumented using Reciproc R50, 2% NaOCl, followed by 17% EDTA. The teeth were randomly divided into 2 groups (n=10): (1) experimental group, AH Plus Jet was modified by adding 5% bioglass 45S5 particles, (2) control group, unmodified AH Plus Jet. Teeth were obturated with gutta-percha and the respective sealer using the single-cone technique. Each root was sectioned 3 mm from the apex to obtain 2-mm-thick slices (Figure 1). Push-out bond strength was measured using a universal testing machine (speed 1 mm/min, 0.5 mm plunger). Adhesive patterns were evaluated using digital microscopy at 100× magnification. Data were analyzed using Student's t-test at a 5% significance level.

Results

The mean push-out bond strengths were statistically similar between the two groups ($p > 0.05$), with the control group exhibiting slightly higher values (35.6 MPa + 2.75) compared to the experimental group (30.3 MPa + 5.7). Analysis of the adhesive patterns revealed that the experimental group showed minimal sealer remaining on the dentinal walls after the push-out test, whereas the control group exhibited significantly more areas with residual sealer ($p < 0.05$).

Figure 2: Diagram of the representative sample



Conclusion

The addition of 5% bioglass 45S5 particles to AH Plus Jet did not significantly affect the push-out bond strength compared to the unmodified sealer. However, the unmodified sealer demonstrated a more pronounced adhesive pattern on the dentinal walls than the bioactive-modified sealer.

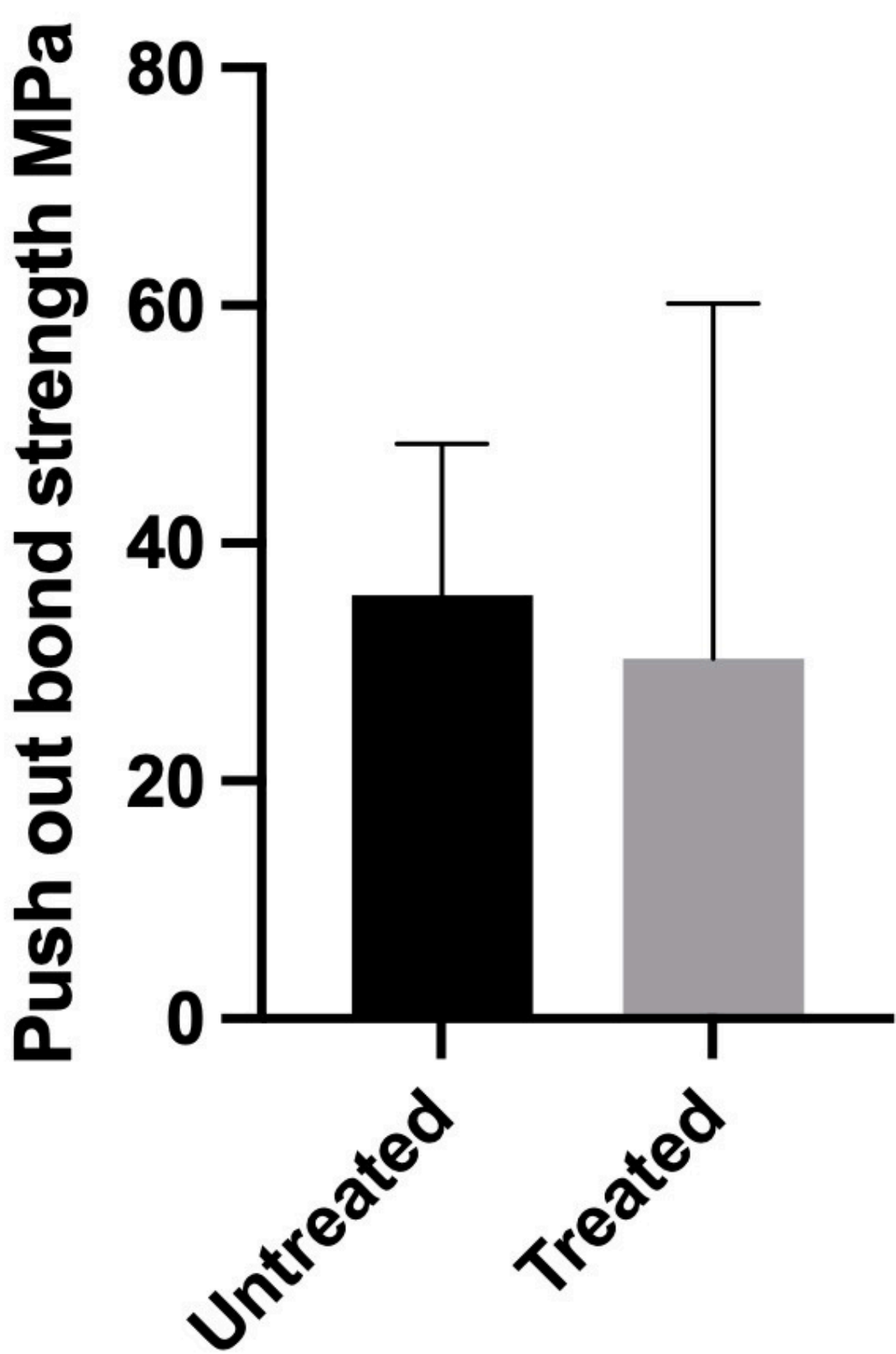


Figure 3: Push out bond strength was measured for samples sectioned 3 mm from the apex. Bar chart presenting mean and standard deviation values for push out bond strength (MPa) in different groups.