

Bonding of Fiber Posts with Different Cements

Poster



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Introduction: Since their development in 1989 the use of fiber posts on endodontically treated teeth has become common on dentistry and it is supported by clinical evidence. There has been many developments by the different manufactures improving the reliability and durability of the cements used with the fiber posts.
Objectives: Measure the bond strength of cement with the push-out test in different root thirds (cervical, middle and apical) at 24h and at 6 months with and without restoration and with different cements

Methods: 90 monoradicular teeth, crowns were cut and endodontic treatment of the root (AH plus[®] Dentsply De Trey, Germany and gutta-percha Kerr, Germany) was made. The roots were stored in distilled water at 37 °C. 24h after the canal preparation was made with a calibrated drill system (Rebilda[®], Voco, Cuxhaven, Germany). The glass fiber post (Rebilda[®] Post, Voco, Cuxhaven, Germany) was cemented with three different cements RelyX[®] Unicem ((3M ESPE, St Paul, MN, USA), Rebilda DC (Voco, Cuxhaven, Germany), core•X[™] flow, (Dentsply, Konstanz, Germany). The roots were stored in distilled water at 37 °C.

They were divided in three groups for each cement. Each group was composed of 10 roots: group A was stored for 24h with a Cavit (3M, St Paul, MN, USA) filling, group B for 6 months with Rebilda (Voco, Germany) filling and group C without restoration for 6 months. The roots were sectioned at slow speed with a Acucutom 50 (Isomet, Struers, Switzerland) in order to get 1 mm disks of the three different root thirds (apical, medial and coronal). All specimens were prepared and loaded to fail with the push-out test, Instron 3345 (Instron, Bucks, United Kingdom). The significance of the differences in strength among luting cements and root thirds was assessed by one-way ANOVA and ANOVA with Brown-Forsythe tests, followed by the Scheffe test for multiple comparisons (p-value of 0.05)

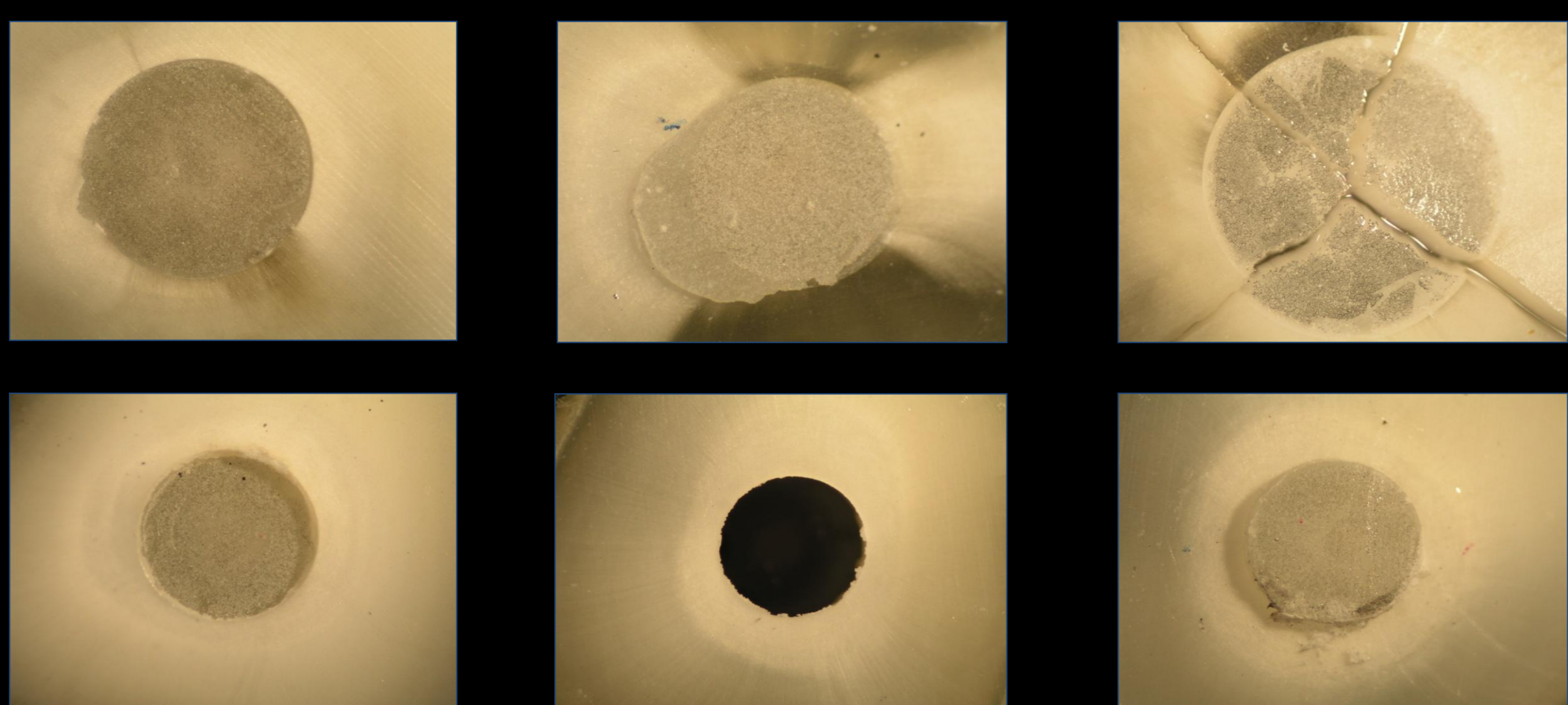
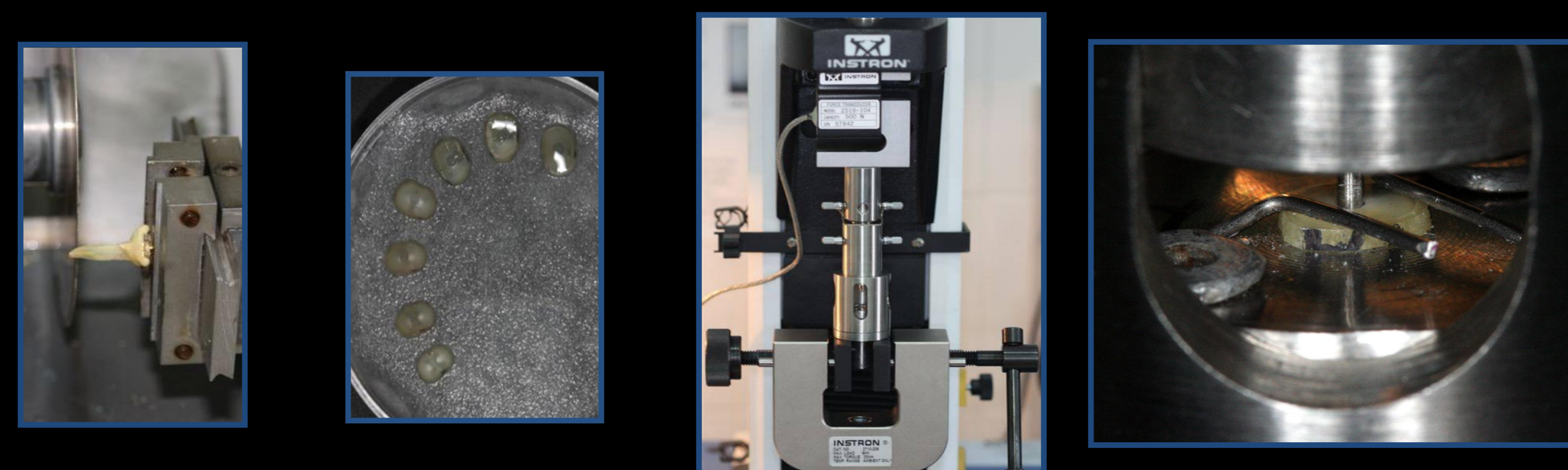
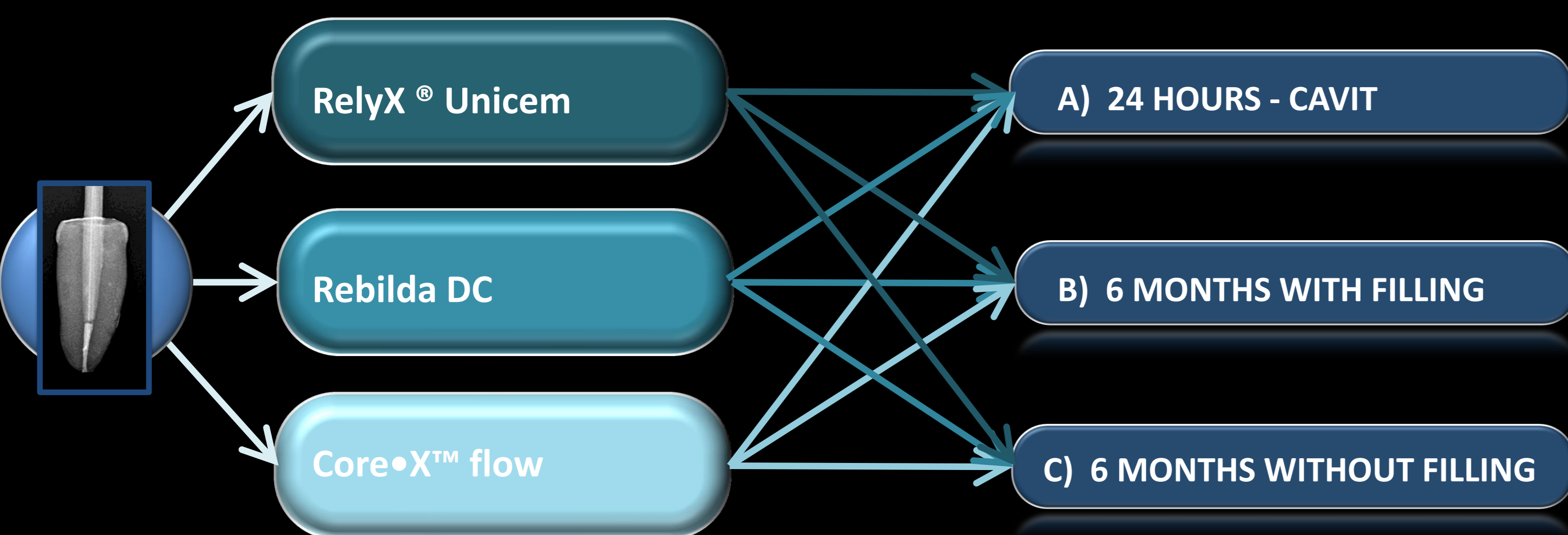
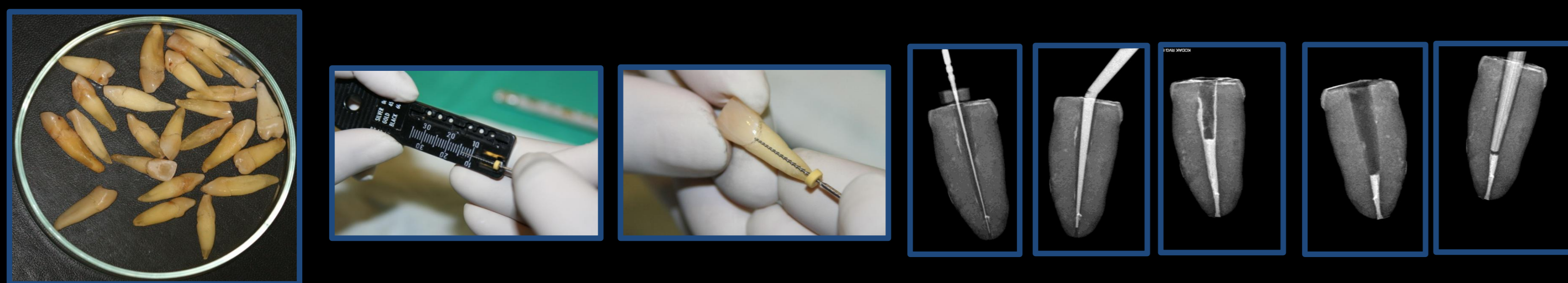


TABLE I. Push-Out Test Results (MPa), 24h with Cavit (3M, USA)

| | Cervical $\bar{x} \pm s$ | Middle $\bar{x} \pm s$ | Apical $\bar{x} \pm s$ | Comparison |
|---------------------------|------------------------------|------------------------------|-----------------------------|------------|
| core•X [™] flow | 8.16 ± 3.26 ^{a,1} | 7.50 ± 2.13 ^{a,1,2} | 4.84 ± 1.85 ^{a,2} | 0.014 |
| RelyX [®] Unicem | 7.17 ± 3.58 ^{a,1} | 7.34 ± 3.93 ^{a,1} | 10.14 ± 5.11 ^{b,1} | 0.233 |
| Rebilda DC | 20.78 ± 13.31 ^{b,1} | 9.65 ± 6.60 ^{a,1,2} | 8.34 ± 8.00 ^{a,2} | 0.015 |
| Comparison* | 0.005 | 0.473 | 0.128 | - |

TABLE II. Push-Out Test Results (MPa), 6m with Rebilda (Voco, Germany) filling

| | Cervical $\bar{x} \pm s$ | Middle $\bar{x} \pm s$ | Apical $\bar{x} \pm s$ | Comparison |
|---------------------------|-----------------------------|--------------------------------|----------------------------|------------|
| core•X [™] flow | 12.84 ± 4.42 ^{a,1} | 9.46 ± 2.88 ^{a,b,1,2} | 6.25 ± 2.62 ^{a,2} | 0.001 |
| RelyX [®] Unicem | 12.30 ± 7.65 ^a | 13.66 ± 7.84 ^b | 17.10 ± 7.19 ^b | 0.357 |
| Rebilda DC | 9.55 ± 1.41 ^{a,1} | 7.50 ± 1.14 ^{a,2} | 4.77 ± 1.16 ^{a,3} | < 0.001 |
| Comparison* | 0.338 | 0.042 | < 0.001 | - |

TABLE II. Push-Out Test Results (MPa), 6m without filling

| | Cervical $\bar{x} \pm s$ | Middle $\bar{x} \pm s$ | Apical $\bar{x} \pm s$ | Comparison |
|---------------------------|-----------------------------|-----------------------------|-----------------------------|------------|
| core•X [™] flow | 10.54 ± 2.43 ^{a,b} | 7.90 ± 1.96 ^{a,2} | 5.05 ± 1.60 ^{a,3} | < 0.001 |
| RelyX [®] Unicem | 14.03 ± 5.62 ^{b,1} | 18.43 ± 4.42 ^{b,1} | 19.81 ± 6.84 ^{b,1} | 0.079 |
| Rebilda DC | 8.73 ± 1.34 ^{a,1} | 10.41 ± 0.89 ^{a,2} | 6.79 ± 1.65 ^{a,3} | < 0.001 |
| Comparison* | 0.018 | < 0.001 | < 0.001 | - |

\bar{x} arithmetical mean; s, standard deviation;
Cements with same letters do not significantly differ (reading vertically).
Thirds with same number do not significantly differ among them (reading horizontally); ANOVA and ANOVA with Brown-Forsythe (*) tests.

Results: For Group A there was no statistical significant difference in any of the cements. For Groups B and C RelyX[®] Unicem (3M, St Paul, MN, USA) had higher results that were statistical significant different from the other cements. At 6 months RelyX[®] Unicem (3M, St Paul, MN, USA) and Rebilda DC (Voco, Cuxhaven, Germany) had higher results without a restoration.

Conclusion: Dentin bond strength of the resin adhesives fell over time but RelyX[®] Unicem (3M, St Paul, MN, USA) improved even without a restoration.

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