OBJECTIVE
This study evaluated the push-out bond strength of fiber posts cemented in root canals in conjunction with either dental cement or dental fiber cones or dental cement and unidirectional fibers. The goal was to find out if additional material in the root canal replacing the cement has an effect on the push-out bond strength.

BACKGROUND
Fiber posts have been used in restoring endodontically treated teeth to provide retention and high fracture resistance when there is minimal coronal tooth structure. Since the introduction of fiber posts, there has been less vertical root fractures; however adhesive failure and debonding of the post have been the primary mode of failure. There are many obstacles to creating a stable, lasting adhesive interface: high C-factor in the post-space, loss of collagen fibers from irrigating solutions, and the loss of intrinsic humidity. The inherent shrinkage of resin cements after setting can result in increased stress at the interface between the cement and dentin, leading to lower bond strength.

METHODS
18 extracted human central incisors were used by cutting off crowns. Root canals have been performed using rotary instruments (WaveOneGold, Dentsply) up to size 40 (0.08mm). The canals have been filled with gutta-percha points and sealed (Ribbon, ThermaSealPlus, Dentsply). Unilocore post drills (size-yellow) were used for 12mm into the canal. The canal was flared out from a bottom diameter of 1.15mm to a top diameter of 3.2mm with a prefabricated master pattern.

RESULTS
Statistical significant differences were found in regard to Push Out Bond Strength among all three groups (p=0.00023). Apical are statistically significant different in terms of Push Out Bond Strength (p=0.00023). The highest bond strength was found in the apical slices of the tests. When using fibers as an additional filler material the middle portion had the second highest Push Out Bond Strength. The Baseline and Cones group has shown a different type of failure and that is adhesive failure between post and cement.

CONCLUSIONS
This study concludes that more replacement of the cement in the root canal with any solid filling materials can help in increasing the bond strength and reduces stress at the dentin cement interface.

REFERENCES
3. FIBERS same post size and in addition unidirectional fibers (QuartzSplintUD, RTD, France) for 5mm into the canal. The roots have been stored for 24h at 100% humidity and 37°C before sectioning into 1mm slices to obtain a coronal, middle and apical slice using a bicrader diamond saw (Figures 1-5). All slices have been subjected to a push-out bond strength test at a universal testing machine (NESTRON-1011) at a crosshead speed of 1mm/min.

A failure analysis has been done after the push-out tests using a Zeiss optical light microscope (10x). The failures have been categorized in four groups. See scheme with Failure Categories (Figure 6). Two Way ANOVA analysis was used at a 95% confidence interval. The statistical computing was performed using open source statistical software R from the Free Software Foundation’s GNU General Public License, USA, 2014.

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