

Republic of Iraq
Ministry of Higher Education
And Scientific Research
University of Baghdad
College of Dentistry



**In Vitro Comparative Assessment of the Effect of The
Push out Bond Strength of Three Types of Sealers With
Two Obturation Techniques**

A Thesis

Submitted to the Council of the College of Dentistry at the University of
Baghdad in Partial Fulfillment of the Requirement for the Degree of Master of
Science in Conservative Dentistry

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2017 A.D.

1438 A.H.

Abstract

The clinical success of root canal treatment is directly related to the obturation technique and the properties and type of the sealer. Several varieties of obturation techniques and sealer are available, each with advantages and disadvantages and it is serious to choose the right one material. The purpose of this study was to determine and compare the push-out bond strength of root filled with Total fill Bioceramic, AH Plus and Gutta-flow[®]2 sealers using Gutta-Fusion obturation system versus single Reciproc Gutta percha cone.

Sixty freshly extracted human mandibular premolars with single rooted canal were used in the present study. The teeth were decoronated and instrumented with kinematic reciprocation movement of RECIPROC[®] Ni-Ti rotary system up to R40 with taper 0.06. The smear layer of the root canals was removed using standardized protocol of irrigation (3 ml of 5.25% NaOCl after each file followed by 1 ml of 17% EDTA for 1 min and the final rinsing with 3 ml distilled water). The teeth were then divided randomly into 2 groups (n=30) according to the type of obturation GuttaFusion versus single cone. Each group was also subdivided into three subgroups according to the type of sealers used as followings; **Group I AH:** Single Reciproc Gutta percha with AH Plus sealer, **Group I GF:** Single Reciproc Gutta percha with GuttaFlow[®]2, **Group I BC:** Single Reciproc Gutta percha with Total fill Bioceramic sealer; **Group II AH:** Gutta fusion with AH plus sealer, **Group II GF:** Gutta fusion with Gutta flow[®]2, **Group II BC:** Gutta fusion with Total fill sealer.

The obturated roots were stored in incubator at 37 °C with 100% humidity for seven days, then the roots were embedded in clear acrylic resin and each root was sectioned into three slices of 2 mm thick (apical, middle, coronal).The specimen were fixed on an acrylic base and the load was applied by the punch in direction apico-coronally using a universal testing machine at speed of

0.5mm/min. The push out bond strength value represented by (MPa) unit was calculated by dividing the load on the surface area in collaboration with image J computer program.

The bond strength values were statistically analyzed using two-way ANOVA; the slices were examined with a stereo-microscope to observe the failure mode.

Within the limitation of this study, the results showed that Push out bond strength of Gutta flow[®]2 and total fill sealers were significantly lower than that of AH plus sealer.

The push out bond strength showed the highest bond strength in teeth obturated with Gutta fusion obturators than those of single Reciproc Gutta percha cone.

The highest mean value of push out bond strength in using AH plus sealer and Gutta fusion obturators.