



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



**THE EFFECT OF FOUR OBTURATION  
TECHNIQUES ON PUSH OUT BOND STRENGTH  
OF BIOCERAMIC (TOTALFILL) AND AH PLUS  
SEALERS (COMPARATIVE STUDY)**

A Thesis

Submitted to the Council of the College of Dentistry / University of  
Baghdad in partial fulfillment of the requirement for the degree of Master  
of Science in Conservative dentistry.

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# ABSTRACT

**Introduction:** The goal of a root canal treatment is three dimensional obturation with a complete seal of the root canal system. The aim of the study was to evaluate and compare the effect of four obturation techniques, cold lateral compaction (CLC), single cone (SC), warm vertical compaction (WVC), carrier-based obturation technique guttacore (GC) on the push out bond strength of Bioceramic (TotalFill) and AH plus sealers at different root levels.

**Materials and methods:** eighty maxillary molars with a straight palatal root and mature apices were used, after sectioning of the palatal roots to 11mm from the root apex, their canal was instrumented with Edge Endo X7 Rotary system files in sequence (20/04-40/04). Then the samples were divided into two groups according to sealer used A group (bioceramic sealer) B group "AH PLUS sealer" each group subdivided into 4 subgroups according to obturation technique each group n=10: group A1, B1: obturated by CLC, group A2, B2: SC, A3, B3 WVC, group A4, B4:(gutta core obturator).After obturation roots were stored in an incubator at 37 C and 100% humidity for two weeks after that these samples were embedded in clear acrylic before sectioning into 2mm thickness slices at (2 mm,4.5 mm,7 mm) (apical, middle, coronal) level from root apex.The universal testing machine were used for a push-out test to evaluate the bond strength at a speed of 0.5mm/min. Mode of failure evaluate by digital microscope at 60X magnification, and parametric tests used to evaluate data, at (p<0.05) significance level.

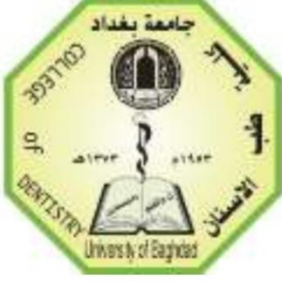
**Result:**

the obturation techniques had a significant effect on the bond strength of total fill BC, and AH plus. The GC, WVC in total fill showed significantly

higher bond strength especially in apical third (9.482,8.119 MPa respectively) ,and in different root canal regions at ( $p<0,001$ ) compared to AH Plus and other cold techniques. GC, WVC in AH plus showed lowest bond strength among all groups especially in GC coronal third ( $1.182\pm 0.311$  MPa), and CLC in AH plus significantly highest bond strength among all groups especially coronal third ( $13.363 \pm 1.966$  MPa), cohesive mode of failure was the most predominant in all groups.

**Conclusion:**

As a conclusion of this study, BC (TotalFill) sealer had higher bond strength when used in WVC and GC regarding to other techniques and when compared to AH plus sealer ,the AH plus show decreased the bond strengths in WVC and GC.



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## تأثير قوة فصل المادة الرابطة الى الخارج لنوعين من السدادات اللبية (TOTALFILL و AH PLUS) بأستخدام أربع طرق لغلق الجذر (تقييم بطريقه المقارنة)

تقدم هذه الرسالة إلى مجلس كلية طب الأسنان / جامعة بغداد كجزء من متطلبات نيل ماجستير العلوم في طب الأسنان التحفظي

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