



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**MONA MAGHRABY**



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# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

### قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



### يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**MONA MAGHRABY**



**Faculty of Dentistry**

**Endodontic Department**

***The Effect of Combined Passive Ultrasonic  
Irrigation and XP-ENDO Finisher on Bacterial  
Biofilm: a comparative study***

**Thesis**

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**By**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ رَبُّنَا إِنَّا نَعْلَمُ لَنَا الْإِمَامُ الْمُنْتَقَى  
إِنَّا نَعْلَمُ نَبِيَّ الْعَالَمِينَ الْحَكِيمَ

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## **Dedication**

- ❖ To my Dearest Parents.**
- ❖ To my Supportive Husband.**
- ❖ To my Daughters.**
- ❖ To my Great Family.**
- ❖ To my Dear Professors.**

**I am grateful for the continuous support and  
motivation.**



# List of Contents

List of Figures		II
List of Tables		III
List of Abbreviations		IV
Introduction		1
Review of Literature		4
I. Endodontic Microflora and Biofilm. II. Irrigation in Endodontics. III. Agitation Techniques in Endodontics.		
Aim of the Study		37
Materials & Methods		38
Results		56
Discussion		67
Summary & Conclusions		79
References		82
Arabic Summary		

# List of Figures

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE</b>
1	Showing XP-ENDO Finisher mounted on endodontic motor.	39
2	Showing Irrisafe tip #20/0.02-21mm.	40
3	Showing Navitip gauge 30 and length 27mm.	41
4	Showing Isomet 4000.	48
5	Showing samples splitting.	48
6	Showing 1mm thickness sample.	49
7	Showing A Zeiss Lsm 710, Axio Observer Confocal Laser Scanning Microscope.	50
8	Showing stains (Propidium Iodide & Acridine Orange) used to prepare samples for CLSM evaluation.	52
9	Showing ACURA 826 used to measure 10 microliters of each stain.	53
10	Showing sample being vortexed for 10 seconds.	53
11	Showing sample under CLSM lens.	54
12	Bar chart showing average of dead bacteria (%) for different irrigation techniques within each root section.	58
13	Bar chart showing average of dead bacteria (%) for different root sections.	60
14	Bar chart showing average of dead bacteria (%) for different root sections within each irrigation technique.	62
15	Bar chart showing average of dead bacteria (%) for different irrigation techniques.	64
16	Showing CLSM image demonstrating live bacteria in a positive control sample.	65
17	Showing CLSM image demonstrating dead bacteria in a negative control sample.	65
18	showing live and dead bacteria in coronal, middle and apical thirds of different agitation techniques using CLSM.	66

# List of Tables

<b>TABLE NO.</b>	<b>TITLE</b>	<b>PAGE</b>
1	Descriptive Statistics For Dead Bacteria (%) Values Of Different Groups.	56
2	Mean $\pm$ Standard Deviation (SD) Of Dead Bacteria (%) For Different Irrigation Techniques Within Each Root level.	58
3	Mean $\pm$ Standard Deviation (SD) Of Dead Bacteria (%) For Different Root Sections.	59
4	Mean $\pm$ Standard Deviation (SD) Of Dead Bacteria (%) For Different Root levels Within Each Irrigation Technique.	62
5	Mean $\pm$ Standard Deviation (SD) Of Dead Bacteria (%) For Different Irrigation Techniques.	63

## **List of Abbreviations**

<b>CLSM</b>	<b>Confocal Laser Scanning Microscope</b>
<b>ANP</b>	<b>Apical Negative Pressure</b>
<b>NaOCl</b>	<b>Sodium hypochlorite</b>
<b>PUI</b>	<b>Passive Ultrasonic Irrigation</b>
<b>SEM</b>	<b>Scanning Electron Microscope</b>
<b>NiTi</b>	<b>Nickle Titanium</b>
<b>CSI</b>	<b>Conventional Syringe Irrigation</b>
<b>XPF</b>	<b>XP-ENDO Finisher</b>

# Introduction

Failure of the root canal treatment remains a challenge in endodontics due to the variation in root canal system that allows shelter for tissue remnants, bacteria and bacterial byproducts that act as a persistent source of infection. The aim during root canal treatment is to meticulously clean root canal complexities and eradicate bacterial biofilm.

As studies proved that due to the complex nature of the pulp morphology about 30% - 50% of canal walls remain untouched using standard NiTi endodontic files (either hand or rotary), thus those areas remain a harbor for the microbiota leading to future reinfection, pathosis and failure of treatment. Mechanical instrumentation using recent NiTi rotary files must be complemented by proper chemical disinfection to optimize disinfection as that the configuration of files never corresponds to the canal geometry.

Studies proved that during conventional syringe irrigation the solution reaches only 1-2mm beyond needle tip leaving a source of reinfection apically. Another drawback is the vapor lock effect which results from the inability of a liquid to properly penetrate

narrow microchannels, which results in air entrapment within the root canal. This micro-gas bubble will impinge the disinfectant from reaching the full working length, thus compromises proper disinfection. Thus, it is not satisfactory to disinfect the root canal system without mechanical agitation either manually or dynamically.

Recently, agitation techniques as ultrasonic activation (initiates acoustic streaming and cavitation within the fluid) are used to improve penetration of irrigant into lateral canals and up to the working length to ensure proper disinfection of full canal system which will improve the success rates of endodontic treatment.

Recently, XP-ENDO Finisher (flexible, size #25, non-tapered, non-cutting, single NiTi file used as a final irrigation step) has a unique design and helical movement that allows it to reach untouched areas and disrupt biofilm while preserving dentine. Many studies proved that XPF showed favorable results in removing smear layer, debris, organic tissue, biofilm and bacteria from the main root canal ; while its effect on isthmus remains debatable.