



Effectiveness of XP-Endo Finisher in Cleaning Root Canal Walls

(An In Vitro-Study)

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By
Osama Aly Ibrahim Alsaid

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Faculty of Dentistry
Ain Shams University

Ain Shams University
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Supervisors

Prof. Dr. Abeer Abd Elhakim El-Gendy

Professor of Endodontics

Faculty of Dentistry

Ain Shams University

Ass. Prof. Dr. Mohamed Mokhtar Nagy

Associate Professor of Endodontics

Faculty of Dentistry

Ain Shams University

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

" قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا ۖ إِنَّكَ أَنْتَ الْعَلِيمُ
الْحَكِيمُ "

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Dedication

This thesis is dedicated to:

My great parents;

Who lead me through the valley of darkness with light of hope and support

My beloved sister;

The symbol of love and giving

My brothers;

Who stand by me when things look bleak

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LIST OF ABBREVIATIONS

NaOCL:	Sodium hypochlorite
EDTA:	Ethylene diamine tetra acetic acid
NiTi:	Nickel titanium
M-phase:	Martensite phase
A-phase:	Austenite phase
ANP:	Apical negative pressure
MDA:	Manual dynamic agitation
PUI:	Passive ultrasonic irrigation
SAF:	Self-adjusting file
APP:	Apical positive pressure
SEM:	Scanning electron microscope
OS:	One Shape file system
PTU:	ProTaper Universal file system
PTN:	ProTaper Next
WL:	Working length
AHTD:	Accumulated hard-tissue debris

INTRODUCTION

Introduction

The success of endodontic treatment depends significantly on the quality of cleaning and shaping of root canal system. However, adequate chemo-mechanical canal preparation is difficult to achieve due to the complex canal morphology ⁽¹⁾.

Both hand and rotary instrumentation create smear layer of different thickness on the canal walls as a consequence of cutting dentin. This layer contains remnants of dentin, pulp tissue, microorganisms and covers canal walls touched by instruments. In addition, this layer closes tubules and reduces the effect of irrigating solutions, significantly affects the quality of obturation and outcome of endodontic treatment ⁽¹⁾.

The limited efficacy of instruments alone in the cleaning root canals makes it necessary to add rinsing of canals using appropriate irrigants ⁽¹⁾. Several irrigants have been used to decrease residual debris, bacteria, necrotic tissues and the smear layer which is formed by the mechanical instrumentation of the root canal system. Sodium hypochlorite (NaOCl) has become the most commonly used irrigant in endodontics. Alternative irrigant solutions as Ethylene diamine tetra acetic acid (EDTA) and a calcium chelating agent have been suggested for the effective removal of the smear layer ⁽²⁾.

Different devices for irrigation delivery have been proposed to increase the flow and distribution of irrigating solutions within the root canal system ⁽³⁾.

Recently the new XP-endo Finisher file (FKG Dentaire, Swiss Endo, Switzerland) is supposed to be used to enhance cleaning of the root canal while conserving dentin. It has been reported that XP-endo Finisher curved bulb can reach 100-times of a corresponding sized file ⁽²⁾ which enables it to transform into any canal shape and reach irregularities, fins and resorptive areas. It is designed to be used with irrigants after initial root canal instrumentation for removing of vital and/or necrotic tissues, dentinal debris and smear layer accumulated during instrumentation ⁽³⁾.

Studying the effectiveness of the XP-endo Finisher file on debris and smear layer removal after root canal instrumentation using single versus multiple filing systems is of great importance.