
# Cleaning Ability and Cyclic Fatigue of ProTaper Next File (X2) Used in Reciprocation Motion

Thesis submitted to
Faculty of Dentistry
Ain Shams University
For Partial fulfillment of requirements for the
Master degree in Endodontics

By
**Asmaa Mamdouh Abd Elmoniem**
B.D.S
(2009)
Faculty of Dentistry
Ain Shams University

**2018**

# Supervisors

**Dr. Abeer Abd Elhakim Elgendy**
Professor of Endodontics
Faculty of Dentistry
Ain Shams University

**Dr. Maram Obeid**
Associate Professor of Endodontics
Faculty of Dentistry
Ain Shams University

**2018**

# *Dedication*

***I would like to dedicate my Thesis to my family who helped me a lot and without them I couldn't have achieved anything.***

***I dedicate it also to my husband who stood beside me and haven't saved effort to help me.***

***Also, to my dear daughter who witnessed all that and didn't complain.***

# Acknowledgement

*I am greatly honored to express my thankful gratitude to* ***Dr.Abeer Abd Elhakim El-gendy****, Professor of Endodontics, Faculty of Dentistry, Ain Shams University for her continuous encouragement, guidance, support and help.*

*I would like to express my thankful gratitude to* ***Dr. Maram Obeid****, Associate Professor of Endodontics, Faculty of Dentistry, Ain Shams University for her support and valuable comments throughout this work.*

*Personal appreciation and thanks to all stuff members of Endodontic Department, my friends and colleagues for their effort and help whenever asked.*

# List of Contents

# List of Figures

## *List of figures*

# List of Tables

# Introduction

The fundamental aim of endodontic treatment is to prevent or cure apical periodontitis where microorganisms invade and colonize the entire pulp space system, and treatment is directed towards the elimination of bacteria and prevention of re-infection. Mechanical preparation and chemical disinfection are commonly considered together and referred to as *"*Chemomechanical preparation*"*. It is a significant segment in pulp space therapy and is directly related to concomitant disinfection and subsequent obturation.

Nickel titanium (NiTi) instruments are widely attractive among dentists because they enable more predictable preparation for root canals and significantly better treatment outcomes compared with stainless steel instruments. However, the potential for fracture of these instruments is still a main concern associated with their use.

M-Wire alloy which prepared using a thermal process that can substantially increase the flexibility and mechanical strength of NiTi instruments have shown improved cyclic fatigue resistance and mechanical properties compared with those made of conventional superelastic NiTi wires [(1)]. Recently, ProTaper Next files (PTN) used this technology. PTN files feature an off-centred rectangular cross-section design for greater strength and a