EVALUATION OF ROOT AND CANAL MORPHOLOGY OF MAXILLARY FIRST MOLAR IN EGYPTIAN POPULATION USING TWO DIFFERENT METHODS

Thesis submitted to the Faculty of Dentistry, Ain Shams University, in partial fulfillment for requirements for Master Degree in

Endodontics

By

Alaeddin Sadek Eltaeb

B.D.S

2009

Faculty of Dentistry – University of Zawia

Department of Endodontics

Faculty of Dentistry

Ain Shams University

2016

Supervisors

Prof. Dr. Salma Hassan EL Ashry

Professor of Endodontics, Endodontic department, Faculty of Dentistry,
Ain Shams University

Dr. Maram Farouk Obeid

Lecturer in Endodontics, Endodontic Department, Faculty of Dentistry,
Ain Shams University

بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم
سورة البقرة الآية (32)

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 colleagues who stood beside me and haven't saved effort to help me.

Acknowledgment

*First of all thanks to almighty **Allah** the most kind and most merciful.*

*I wish to express my deepest gratitude and sincere appreciation to **Dr. Salma Hassan EL Ashry** Professor of Endodontics, Faculty of Dentistry Ain Shams University. Her guidance and collaboration helped me to overcome the obstacles and difficulties that arose along the way until my thesis got completed.*

*I would like to thank **Dr. Maram Farouk Obeid** Lecturer in Endodontics, Faculty of Dentistry Ain Shams University for offering me much of her time, effort and support throughout the whole work.*

List of contents

List of figures

List of tables

The success of endodontic therapy depends on thorough canal debridement and effective filling of the root canal system, for which knowledge of morphology of the root canals is a critical prerequisite.

Numerous reports on the root canal morphologies of different populations were published. The methods commonly used in analyzing the root canal morphology are teeth clearing after canal staining1, conventional radiographs2, radiographic assessment enhanced with contrast media3, and more recently computed tomographic techniques4.

Conventional radiography technique is usually used to identify roots canal number and curvature. However, beside its advantages of being quick and easy method, it's unlikely to show the complexities of root canal anatomy.

In comparison, the technique of clearing the teeth has a considerable value in studying the anatomy of the root canal system as it allows through examination of the pulp chamber and root canals. Still it remains useful only as a teaching tool with little or no clinical applicability.

The application of cone-beam computed tomography (CBCT) scanning was introduced in the field of endodontics in 1990. It uses a cone-shaped beam of radiation to acquire data in a single 360° rotation, which reveal the internal architecture of an object. When compared with conventional CT imaging; the CBCT is more accurate, with higher resolution, and lower scanning time. CBCT has many potential applications in endodontics and the latest are localization and description of root canal systems and analysis of canal morphology.

Internal complexities of the root canal are genetically determined and have definitive importance in root canal cleaning and shaping procedures. Thus, it's very important to be familiar with variations in tooth anatomy, especially root canal system.

Morphological variations in root canal anatomy due to ethnicity have been reported in many studies; therefore, identifying the root canal anatomy of maxillary first molar of different ethnic populations is required for successful endodontic treatment.

To identify variations in root canal morphology we used:

A). Clearance technique.

B). CBCT.

Maxillary first molar:

The maxillary first permanent molars are considered as the most complicated root and canal anatomy. The pulp chamber of maxillary first permanent molar is widest in buccolingual dimension, the pulp chamber's cervical outline form has a rhomboid shape, sometimes with rounded corners [5]. The mesiobuccal angle is an acute angle; the distobuccal angle is an obtuse angle and the palatal angles are basically right angles. However, it's generally considered to be three-rooted with four canals. Although Hess w [6] reported the prevalence of four root canals in maxillary permanent molar teeth to be 53%. It's generally considered to be 3 roots and 4 canals (i.e., MB, DB, and P) forming tripod. The palatal root is the longest, with the largest diameter, and generally offers the easiest access [5].The mesiobuccal root have been extensively investigated in both ex