Diagnostic Accuracy of Cone Beam Computed Tomography with Different Voxel Sizes versus Root Sectioning for Detecting the Second Mesio-Buccal Root Canals of the Maxillary Posterior Teeth

(Diagnostic Accuracy Study)

Thesis

submitted to the Faculty of Dentistry, Cairo University for partial fulfillment of the requirements for Doctor Degree in Oral and Maxillofacial Radiology

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Dedication

To my **father**, who taught me that the best kind of knowledge to have is that which is learned for its own sake and who taught me that even the largest task can be accomplished if it is done one step at a time.

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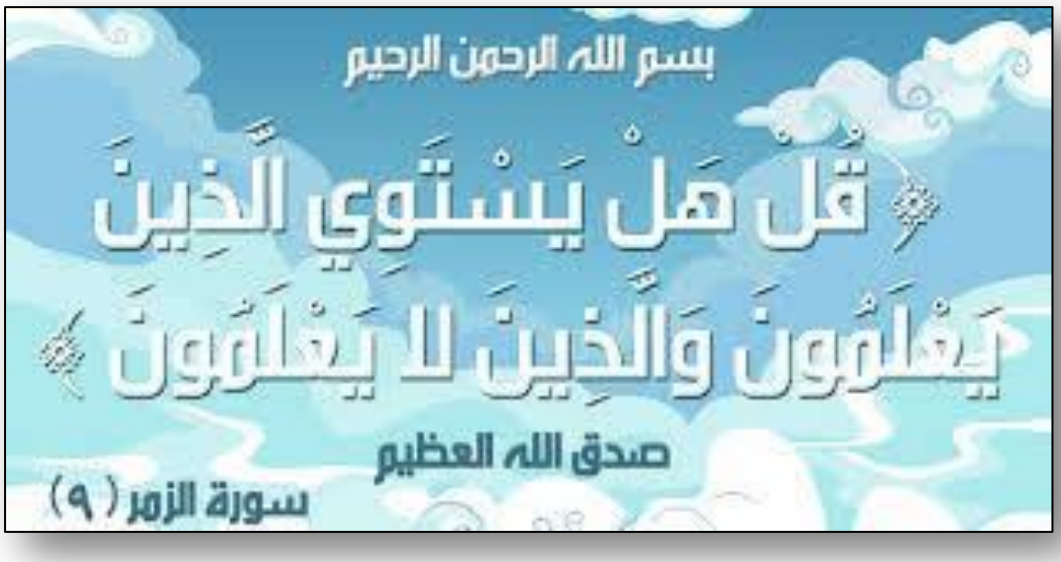
بسم الله الرحمن الرحيم
قُلْ هَلْ يَسْتَوِي الَّذِينَ
يَعْلَمُونَ وَالَّذِينَ لا يَعْلَمُونَ
صدق الله العظيم
سورة الزمر (٩)

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List of Abbreviations

MB1	First Mesiobuccal Root Canal
MB2	Second Mesiobuccal Root Canal
MB3	Third Mesiobuccal Root Canal
3D	Three-Dimensional
2D	Two-Dimensional
CBCT	Cone-Beam Computed Tomography
CT	Computed Tomography
µCT	Micro Computed Tomography
MRI	Magnetic Resonance Image
CCD/ IIT	Charge-Coupled Device/ Image Intensifier Tube
FPD	Flat Panel Detector
CsI	Cesium Iodide
MPR	Multiplanar Reformation
DVR	Direct Volume Rendering
IVR	Indirect Volume Rendering
MIP	Maximum Intensity Profile
DICOM	Digital Imaging and Communications in Medicine
MSCT	Multi-Slice Computed Tomography
MDCT	Multi-Detector Computed Tomography
TMJ	Temporomandibular Joint
SNR	Signal to Noise Ratio
CNR	Contrast to Noise Ratio
VRF	Vertical Root Fractures
HRF	Horizontal Root Fractures
RCs	Root Canals
IADT	International Association of Dental Traumatology
AAE	American Association of Endodontists
AAOMR	American Academy of Oral and Maxillofacial Radiology
ERR	External Root Resorption

IAN	Inferior Alveolar Nerve
ULD	Ultra Low Dose
LED	Light‑Emitting Diode
EDTA	Ethylenediaminetetra Acetic Acid
SOM	Surgical Operating Microscope
ROI	Region of Interest
ALARA	As Low As Reasonably Achievable
SD	Standard Deviation
AUC	Area Under Curve
ROC	Receiver Operating Characteristic Curve
FN	False Negative
FP	False Positive
PPV	Positive Predictive Value
NPV	Negative Predictive Value
PIRT	P: Population I: Index R: Reference T: Target

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