

UNIVERSITI TEKNOLOGI MARA

**DIAGNOSTIC ACCURACY OF
PERIAPICAL RADIOGRAPH,
CONE BEAM
COMPUTED TOMOGRAPHY,
AND INTRASURGICAL
MEASUREMENT TECHNIQUES
FOR ASSESSING
FURCATION DEFECTS**

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PhD

August 2020

AUTHOR'S DECLARATION

I declare that the works in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been applied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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Faculty : Dentistry

Thesis title : Diagnostic Accuracy of Periapical Radiograph, Cone
Cone Beam Computed Tomography, and Intrasurgical
Measurement Techniques for Assessing Furcation
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ABSTRACT

The periapical radiograph (PA), which conventionally used as an adjunct in the diagnosis of molar with furcation involvement (FI) may lead to inaccuracy in furcation analysis. Cone beam computed tomography (CBCT) is increasingly used in the periodontology field to overcome the limitations of conventional radiographs. However, the difference in the accuracy of the measurement of furcation defects between PA and CBCT remains unclear. Hence, this study aims to evaluate the accuracy of CBCT, PA, and intrasurgical measurement techniques in the assessment of molars with furcation defects. This parallel, single-blinded, randomised controlled trial (RCT) consisted of 22 periodontitis patients who had molar with advanced FI. All patients followed the same inclusion criteria and were treated following the same protocol, except for radiographic taking (CBCT vs. PA). This study proposed and evaluated five parameters that represent the extent and severity of furcation defects in molars teeth, including CAL (clinical attachment loss), BL-H (bone loss in horizontal direction), BL-V (bone loss in vertical direction), RT (root trunk), and FW (width of the furcation defect). Intrasurgical measurements of furcation defects were compared with CBCT and PA-based data measurement. The results showed there were no statistically significant differences between the CBCT and intrasurgical measurements for any clinical parameter ($p > 0.05$). However, there were statistically significant differences in all measurements ($p < 0.05$) except for the RT parameter between PA and intrasurgical measurements. The majority of the measurements from CBCT and PA were underestimated when compared to the intrasurgical measurements. Meanwhile, the sensitivity were 62.8% and 56.9% for CBCT and periapical, respectively. In conclusion, when compared to the intrasurgical measurements, CBCT provided better diagnostic, sensitivity, and quantitative information on CAL, height, depth, and width of the furcation defects than PA.

ACKNOWLEDGEMENT

In the name of ALLAH, the most gracious and the most merciful with Selawat and Salam to Prophet Muhammad S.A.W. Alhamdulillah, thanks to ALLAH S.W.T for blessing me with His mercifulness for my health, strength, and life all this time. With the help and permission of ALLAH, a lot of effort and self-confidence in doing this DCLinDent (Periodontology) program, I was granted the opportunity to accomplish this challenging journey.

Firstly, I would like to take this opportunity to express my gratitude and thanks go to my supervisor Assoc. Prof Dr. Mohd Yusmiadil Putera bin Mohd Yusof and Dr. Erni Noor for their guidance advice, valuable suggestion, encouragement, and moral support throughout this journey. A million thanks to them for being so nice, patient, and for giving me lots of information while providing the implementation of this research.

My appreciation goes to the Dean Faculty of Dentistry UiTM Sungai Buloh, Professor Dato' Dr. Mohamed Ibrahim Abu Hassan, Associate Professor Dr. Aida Nur Ashikin Abd Rahman (Deputy Dean Academic), Madam Nur Aliana Hidayah Mohamed (Postgraduate Coordinator), and Dr Farha Ariffin (Program Director for DCLinDent Periodontology) for their support for this study. Special thanks to my colleagues (Postgraduates Periodontics Students) and friends for helping me with this project. Thanks for your help, motivation, and immense knowledge.

Continuing my studies wouldn't be possible without generous support from Ministry of Health (MOH) and Jabatan Perkhidmatan Awam (JPA). Thank you for making this possible.

I am not forgetting Miss Izyan Hazwani Baharuddin (Statistician), who has kindly to assist me in doing statistical analysis and sharing her knowledge and expertise in this study, and Dr Nor Hidayah Reduwan (Radiology Lecturer) who is so lovely and kind in dealing my queries regarding radiology and radiographic imaging techniques. Thanks for being supportive, may ALLAH bless all of you always.

Finally, this thesis is dedicated to the loving husband, Mohd Murtadha Mansor, who is always by my side when times I needed him most and providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis, my dearest daughters, Auni Ibtisam and Amni Insyirah who served as my inspiration to pursue this undertaking, and my parents, Mohamed Yusof Mohd Rabi and Norizah Md Salleh who never stop praying and supporting me throughout this programme and research. This piece of victory is dedicated to all of you. Alhamdulillah.

Last but not least, to UiTM lecturers, staff, and those who have directly or indirectly contributed to this research whom I am not mentioned. Thank you so much.

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