Comparison Between the Effect of Pulpotec and Effect of Calcium Hydroxide Dressings on Interappointement Pain Relief for Symptomatic Posterior Teeth with Acute Pulpitis and Periodontitis: Randomized Control Trial Part 6

A thesis submitted to the faculty of oral and dental Medicine, in partial fulfillment of the requirements of Master Degree in Endodontics

> Presented by Mariam Rafik Rizkalla B.D.S(2007)

Department of Endodontics Faculty of Oral and Dental Medicine Cairo University 2014

SUPERVISORS

Dr. Manar Yehia Fouda

Assistant Professor of Endodontics
Faculty of Oral and Dental Medicine
Cairo University

Dr. Hany Samy Sadek

Lecturer of Endodontics
Faculty of Oral and Dental Medicine
Cairo University

Acknowledgement

I would like to express my deep gratitude and grateful appreciation to **Dr. Manar Yehia Fouda**, assistant professor of Endodontics, Faculty of Oral and Dental Medicine, Cairo University, who gave me the confidence and support to complete my master's thesis issue. You challenged me to look for solutions. I have learned to believe in my future, my work and myself.

I would like to gratefully acknowledge the support, supervision and kindness of **Dr. Hany Samy Sadek**, Lecturer in the department of Endodontics, Faculty of Oral and Dental Medicine, Cairo University. His moral support and continuous guidance enabled me to begin and complete my work successfully and he gave me generous help throughout my study.

Finally, endless thanks are extended to head of endodontic department, all my professors, colleagues and staff members of the endodontic department for their support and concern.

Dedication

I dedicate this work especially to my father for his encouragement to go for my master's degree and his unconditional love,

without you I wouldn't have done it.

To my lovely mother for all her care, support, patience and love,

and for my sister and brother

Your prayers make everything possible

List of Contents

List of Contents iv				
Li	st of Abbreviations	vi		
List of Figuresv				
Li	st of Tables	ix		
1-	Introduction	1		
2-	PICO Approach	3		
3-	Review of Literature	4		
	A- Evidence-Based Dentistry	. 4		
	B- Randomized Controlled Trial	6		
	C- Meta-analysis	7		
	D-Vital dental pulp	. 8		
	E-Vital pulp therapy	. 9		
	I. Indirect pulp capping	10		
	II. Direct pulp capping	10		
	III. Pulpotomy	11		
	F-Pulpotomy of mature permanent teeth	11		
	G- Calcium Hydroxide	19		
	I. Presentation	19		
	II. Ca(OH) ₂ as pulp capping and pulpotomy material	. 20		

H- Pulpotec	31
I- Postoperative pain	35
J- Postoperative follow up	37
K- Amalgam as final Restoration	38
4- Aim of Study	39
5- Materials and Methods	40
6- Results	59
I. Results	59
II. Selected Cases	69
7- Discussion	78
8- Summary and Conclusion	86
9- References 8 10-Appendix 9	

List of Abbreviations

Ca (OH) ₂	Calcium Hydroxide.
PD	Pulpotec.
VAS	Visual Analogue Scale.
MTA	Mineral trioxide aggregate.
CEM	Calcium enriched mixture.
NEC	New endodontic cement.
SD	Standard deviation.
NaOCI	Sodium hypochlorite.
RCT	A randomized controlled trial.

List of Figures

Figure no		Page no
Figure 1	Evidence-based pyramid ranks the reliability of evidence from low (bottom of pyramid) to high (RCT)	5
Figure 2	CONSORT 2010 flow diagram of the trial.	41
Figure 3	Diagnostic Sheet.	45
Figure 4	Diagnostic Sheet.	46
Figure 5	Ethylchloride spray – cold pulp test.	48
Figure 6	Electric vitality test.	48
Figure 7	Visual Analogue Scale (VAS).	52-53
Figure 8	Pulpotec Materials.	55
Figure 9	Calcium Hydroxide Materials.	56

Figure 10	Bar chart representing mean age values in the two groups.	60
Figure 11	Bar chart representing gender distributions in the two groups.	61
Figure 12	Bar chart representing examined teeth in the two groups	61
Figure 13	Bar chart representing clinical findings in the two groups	62
Figure 14	Bar chart representing radiographic findings in the two groups	63
Figure 15	Bar chart representing mean VAS in the two groups	65
Figure 16	Line chart representing changes by time in mean VAS of the two groups	66
Figure 17	Bar chart representing degrees of pain in the two groups	68
Figure 18	Preoperative x-ray for case report no. 1	69
Figure 19	Postoperative x-ray	71
Figure 20	1 month follow up with pulpotec	72
Figure 21	3 months follow up with pulpotec	72
Figure 22	6 months follow up with pulpotec	73
Figure 23	Preoperative x ray for case no. 2	74
Figure 24	Postoperative x ray with Ca(OH) ₂	76
Figure 25	3 weeks follow up with Ca(OH) ₂	77

List of Tables

Table no		Page no
Table (1)	Materials and devices	40
Table (2)	Signs of failure and success	55
Table (3)	Mean, standard deviation (SD), frequencies (n), percentages and results of Student's t-test and Chi-square (x^2) test for comparison between demographic data in the two groups.	61
Table (4)	Frequencies (n), percentages and results of Chi-square (x^2) test for comparison between clinical findings in the two groups.	63
Table (5)	Frequencies (n), percentages and results of Chi-square (x^2) test for comparison between radiographic findings in the two groups	64
Table (6)	Mean, standard deviation (SD) values and results of Mann-Whitney U test for comparison between VAS in the two groups	65
Table (7)	Mean, standard deviation (SD) values and results of Wilcoxon signed-rank test for the changes by time within Ca(OH) ₂ group	66
Table (8)	Mean, standard deviation (SD) values and results of Wilcoxon signed-rank test for the changes by time within Pulpotec	67
Table (9)	Frequencies (n), percentages and results of Chi-square (x^2) test for comparison between incidence and degree of pain in the two groups	68

Introduction

Introduction

Pulpotomy is defined as the surgical removal of the entire coronal pulp presumed to be partially or totally inflamed and quite possibly infected leaving intact vital radicular pulp within the canals. Pulpotomy is one of the most widely used techniques in vital pulp therapy for primary and permanent teeth with carious pulp exposures.

This procedure is done to promote healing, retain vitality of radicular pulp and provide pain relief. Dentin bridging may occur as a treatment outcome of this procedure depending on the type of medicament used. Many materials are used for pulpotomy such as Ca(OH)₂, formocresol, glutaraldehyde, ferric sulphate, mineral trioxide aggregate (MTA), laser and Pulpotec recently.

Ca(OH)₂ is one of the commonly used intra coronal medicaments in endodontics as it has pain preventive properties. Studies have suggested that these pain preventive properties are because of its antimicrobial effect, alkaline pH of 12 and tissue altering effect.

Pulpotec is radiopaque, non-resorbable paste for the treatment of pulpitis in vital molars, both permanent and deciduous. The addition of pharmacological constituents ensures an aseptic treatment for signs & symptoms of pulpitis. In most cases, Pulpotec treatment is practically painless, and revealed good results in healing and maintaining pulp vitality due to its constituent of corticosteroids.

So the present study was directed to compare the effect of Pulpotec and the effect of $Ca(OH)_2$ dressings on inter-appointment pain relief.

PICO

P (Proplem, Patient):

Patient with symptomatic acute pulpitis with periodontitis.

I (INTERVENTION):

Pulpotec used as intra-coronal dressing.

C (COMPARATOR):

Calcium hydroxide used as intra-coronal dressing.

O (OUTCOME):

Pain relief measured by operator and patient using visual analogue scale (V.A.S).