Chemomechanical Effect and Healing Potentiality of Different Formulations of Calcium Hydroxide on Root Canal Dentin and Periapical Tissues.

(An In Vitro-In Vivo study)

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Summary

Calcium hydroxide is considered an effective intracanal medicament for the eradication of many bacterial strains and its byproducts in addition to its role in the relief of inflammation. However it has a critical disadvantage through its weakening effect of the mechanical properties of root canal dentin. Many vehicles were used for mixing of calcium hydroxide and it was proofed by many authors that the mixing vehicle has a direct effect on the degree and the rate of calcium hydroxide formulations. In our study three vehicles were used; saline, chlorhexidine and iodoform.

This study consisted of three parts;

The first part was designed to detect the chemical effect of calcium hydroxide on the root canal dentin and the surrounding periapical tissues regarding the changes in pH and the calcium weight percent after immersion of the dressed samples in normal saline for one, two and three months.

PH changes were measured using digital pH meter and the changes in the internal and external dentin calcium weight percent were measured using EDAX system.

The results of this section showed an increase in the pH by time for both dentin and the surrounding media with higher

Dedicated to

The soul of my precious father, To
my great mother, my lovely wife And
my beautiful daughters

Thank you for supporting me all the time.

Acknowledgement

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Contents

List of Errata.

- Page 56 last line (*Sopro II Radiovisiograph) shifted to page 55.
- Page 73, paragraph 2, line 5. Was: The indentation on the internal canal space; the indentation on the external Dentin was made approximately 2-2.5 mm. from the canal lumen. Now: The indentation on the inner dentin was made at 0.5-1 mm from the canal lumen and the indentation on the outer dentin was made approximately 2-2.5 mm. from the canal lumen.
- Page 75, figure 12. Was: Photograpg. Now : Photograph.
- Pages 113-120. All Kgf/mm2 now Kgf/mm^2.
- Page 116, paragraph 2 line 6. Was: The minimum value was 37.9 Kgf/mm^2. Now: The minimum value was 39.7 Kgf/mm^2.
- Page 122, table 20 the control was 42.6. Now 54.8
- Page 139-141 all Ca(OH)2 now: $Ca(OH)_2$.
- Page 160 paragraph 1 was: con. Now: can.

LIST OF FIGURES

LIST OF TABLES

Aim of the study.

This study was designed to evaluate:

I- In vitro.

A- The chemical changes in root canal dentine after the application of different formulations of calcium hydroxide as regards:

1. The changes in the PH of root canal dentin with different depths and of the surrounding medium.
2. Changes in the calcium weight percent of the root canal dentin.

B-The effect of different formulations of calcium hydroxide intra canal dressings on the mechanical properties of root canal dentin as regards:

1. Fracture resistance.
2. Dentin microhardness.

II- In vivo.

A- The healing potentiality of different formulations of calcium hydroxide on the induced periapical lesions in dogs as regards the total inflammatory cell count.